Knowledge to Support Reading and Writing Among Teachers of Students Who Are Blind Or Visually Impaired

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ABSTRACT

KNOWLEDGE TO SUPPORT READING AND WRITING AMONG TEACHERS OF
STUDENTS WHO ARE BLIND OR VISUALLY IMPAIRED

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Northern Illinois University, 2021
Lindsay N. Harris, Director

The purpose of this dissertation was to produce two manuscripts and a conference paper reporting on analyses of data from a survey that investigated the knowledge, beliefs, and self-perceptions of 236 teachers of students who are blind or visually impaired (TSBVIs) with regard to literacy instruction. The first manuscript investigated the linguistic awareness and dyslexia beliefs of TSBVIs, and the relation of these factors to demographic characteristics and teacher training. With regards to linguistic awareness, results indicated no association with the number of courses TSBVIs had taken on teaching reading to students who are blind or visually impaired, highest degree obtained, or years of experience as a TSBVI. With regards to the accuracy of dyslexia beliefs, results indicated no association with the number of reading courses taken or highest degree. However, the accuracy of dyslexia beliefs increased significantly with years of experience.

The second manuscript assessed TSBVIs’ perceived reading teaching abilities and whether these perceptions are related to their training, teaching experience, or linguistic awareness. With regards to the number of reading-teaching courses, results indicated a positive association with TSBVIs’ perceived reading-teaching ability. However, years of teaching experience was not correlated with perceived reading-teaching ability. Perceived reading-
teaching ability was associated with two subcomponents of linguistic awareness but was higher than warranted by TSBVIs’ demonstrated knowledge.

The third section of this dissertation is a conference proposal, which assessed the perceived ability of TSBVIs to identify and support students with reading disabilities and whether their perceptions are related to their training, teaching experience, or dyslexia beliefs. Regarding TSBVIs’ perceptions about identifying and supporting students with visual impairments, findings revealed no association with the number of reading-teaching courses they took or their years of experience in the field. Additionally, the accuracy of dyslexia beliefs was not associated with TSBVIs’ perception of their ability to identify and support students with or at risk for a reading disability.

Taken together, the findings from this series of project suggest that, as with general-population teacher preparation, TSBVIs’ teacher preparation is not strongly geared toward fostering linguistic awareness, and TSBVIs do not typically acquire linguistic awareness through experience in the field. A heightened understanding of visual anatomy and physiology may increase TSBVIs’ resistance to the misconception that dyslexia arises from visual perception difficulties. However, it is concerning that nearly a quarter continue to believe that a significant reason for dyslexia-caused difficulties is visual problems. Years of experience working with students who are blind or visually impaired seems to be the best safeguard against this misunderstanding. Presumably, repeated encounters with students whose reading difficulties are unrelated to their visual difficulties convince TSBVIs of the language-based nature of dyslexia. Moreover, their self-perceived ability for teaching reading and identifying and supporting students with visual impairments was not associated with training and experience variables.
ACKNOWLEDGMENTS

To be gritty is to keep putting one foot in front of the other. To be gritty is to hold fast to an interesting and purposeful goal. To be gritty is to invest day after week after year in a challenging practice. To be gritty is to fall down seven times and rise eight.

—Angela Duckworth

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INTRODUCTION: OVERVIEW OF THE THREE STUDIES

Students who are blind or visually impaired face many challenges in learning to read. The complexity of the braille code, decreased learning opportunities at school and home, lack of exposure to environmental print, underdeveloped semantic representations, and reading avoidance may all contribute to the reading struggles of children with visual impairments. Although some of these factors are not malleable (e.g., the complexity of braille, the inaccessibility of print in the environment), some are (e.g., availability of learning opportunities, desire to avoid reading). Thus, from a practical perspective, researchers interested in remedying the reading achievement gap between children with visual impairments and children with typical sight would be well advised to focus on the malleable factors. In the present study, I investigate one such potentially malleable factor, i.e., teacher training and knowledge.

Children who are visually impaired or blind do not attain a reading level comparable to that of children with typical sight until, on average, halfway through the seventh grade (Boroson, Barker, & Li, 2017). Recent investigations have reported that linguistic awareness in general-population teachers is unexpectedly low (McCutchen et al., 2002) and linked with students’ reading outcomes, such that higher teacher linguistic awareness is associated with more positive outcomes for students (e.g., McCutchen et al., 2009; Piasta et al., 2009; Moats & Forman, 2003). Linguistic awareness refers to awareness of reading-related language constructs such as awareness of sounds (phonological awareness) and the ability to reflect on and manipulate units of meaning (morphological awareness). The apparent importance of teacher linguistic awareness for providing effective reading instruction, considering the persistent reading delays of students
who are blind or visually impaired, is the first motivation of the present dissertation. A finding that the low levels of linguistic awareness observed in general-population teachers is also present in teachers of students who are blind or visually impaired (TSBVIs) could indicate that quality of instruction is a factor in the reading outcomes of students with visual impairments.

Moreover, studies investigating teachers’ understanding of dyslexia report that general-population teachers exhibit misconceptions about dyslexia (Wadlington & Wadlington, 2005) and confuse dyslexia with a visual processing deficit rather than understanding it to be a phonological processing deficit (Washburn et al., 2011, p. 165). Because scholars have suggested that reading disabilities are underdiagnosed in visually impaired students (Jones, Smith, Hensley-Maloney, & Gansle, 2015), research is needed to understand dyslexia beliefs among teachers of students with visual impairments. If TSBVIs also hold the misconception that dyslexia is a visual disorder, they will likely attribute the reading difficulties to vision rather than to a phonological processing deficit.

An understanding of teachers’ self-perceptions about their knowledge will have implications for teacher education and professional development. Determining whether actual and perceived knowledge about reading-related constructs are well-aligned will provide insight about areas where the greater emphasis may be needed. Scientific research about early reading acquisition and reading difficulties has shown that teachers’ actual and self-perceived linguistic awareness are often poorly calibrated (Cunningham et al., 2004; Cunningham, Davidson, & Zibulsky, 2007; Cunningham & Zibulsky, 2008; Cunningham, Zibulsky, & Callahan, 2009). Because teachers with low levels of linguistic awareness who provided explicit decoding instruction produced fewer gains in student word reading than teachers (Piasta et al., 2009), a false sense of knowledge on the part of teachers is particularly pernicious. Because the question
of knowledge calibration has not been explored in TSBVIs, this dissertation also examines this issue.

Finally, the dissertation also investigates the alignment of dyslexia beliefs between TSBVIs who perceive their ability to identify and support students with or at-risk for a reading disability to be minimal, moderate, very good, and expert. Learning disabilities like dyslexia may pose additional layer of complexities for students with blindness and visual impairments. Teachers of blind or visually impaired children who believe their students cannot have dyslexia because they hold this misconception yet perceive themselves to be skilled at identifying and remediating reading disabilities among their students, may overlook or misidentify reading difficulties or employ ineffective or counterproductive instructional techniques. Therefore, it is imperative that TSBVIs are cognizant of the characteristics of struggling students in their caseload, to identify and support visually impaired students with reading difficulties.

Overarching Themes and Research Questions

This dissertation examined the levels of linguistic awareness among TSBVIs, the accuracy of their dyslexia beliefs, and self-perceptions of their reading-teaching skill and ability to identify and support students with blindness and visual impairments. This dissertation project also examined whether these factors are associated with TSBVIs’ training and experience to understand the role of teacher-preparation programs and time in the field in TSBVI reading-related expertise. A series of statistical procedures were conducted to answer the following overarching questions:
Q1: What level of linguistic awareness do TSBVIs possess, and do TSBVIs have accurate beliefs about dyslexia? Is the accuracy of dyslexia beliefs and linguistic awareness related to their years of experience and training?

Q2: Are TSBVIs’ self-perceptions of their ability to teach reading to children with visual impairments related to their linguistic awareness? Is the alignment of these factors predicted by training and experience variables?

Q3: Are TSBVIs’ self-perceptions of their ability to identify and support children with visual impairments who have reading disabilities related to their dyslexia beliefs? Is the alignment of these factors predicted by training and experience variables?

Current Status of Manuscripts One and Two

In the summer of 2020, the editors of a special issue of the journal Reading and Writing entitled “Practitioners’ Knowledge to Support Reading and Writing: New Directions and Approaches” invited my coauthors and me to submit what became the first manuscript of this dissertation project for peer review. The manuscript, entitled “Linguistic Awareness and Dyslexia Beliefs Among Teachers of Students Who are Blind or Visually Impaired,” assessed the levels of linguistic awareness and accuracy of dyslexia beliefs among TSBVIs. It also investigated whether TSBVI linguistic awareness and dyslexia beliefs are associated with training and experience variables.

The first draft was submitted to the journal on December 4, 2020, and a first revision was invited on March 25, 2021. Based on the advice received, my co-authors and I made multiple major changes to the paper to respond to the criticism. These included providing reliability information (e.g., Cronbach’s alpha) for the subscales of the Survey of Basic Language
Constructs and confidence intervals around the mean scores (whether based on raw data or percentages). We also calculated the confidence intervals around the mean scores presented from past studies. Notably, we revised the entire manuscript, clarifying and adding detail. The Introduction section of the paper was revised to provide insight into the reading process and reading instruction for students who are blind or visually impaired (including acknowledging the different media formats they use) to strengthen the rationale for studying the linguistic awareness and dyslexia beliefs of teachers of these students. The revised manuscript also included more nuanced discussions of findings and an explanation of how the current study extends and contributes to existing scholarship. The first revision was submitted on June 8, 2021.

A second revision was invited on August 12, 2021, and the manuscript is currently in its third round of review. In addition to the required changes, we corrected a few typographical and formatting errors. Also, the editors and reviewers recommended a statistical computation of items that involved comparison of subscale performance (e.g., ability vs. knowledge, full Dyslexia Beliefs Index vs. visual items) rather than reliance on descriptive statistics. The reviewers also suggested we revise the Discussion section so that it points to the extant literature.

The second manuscript of this investigation, titled “Confidence and Competence for Evidence-Based Reading Instruction Among Teachers of Students with Visual Disabilities,” was written during the summer of 2021. The manuscript was first submitted to Exceptional Children on August 14, 2021, and a rejection was received on August 23, 2021. The editor explained that the manuscript was not sent out for review because Exceptional Children does not publish survey research unless the sample is broad and representative of the population being studied. Despite having a large sample size, we were unable to show that our sample of TSBVIs was nationally representative of this population. The manuscript was then submitted to the journal Scientific
Studies of Reading on September 3, 2021, and a rejection was received on September 8, 2021. The editor explained that the manuscript was not sent out for review because Scientific Studies of Reading typically only publishes studies of teacher knowledge that also include student outcome data. The manuscript was then submitted to Research in Developmental Disabilities, which has published numerous studies of teacher self-efficacy, on September 27, 2021. My coauthors and I received confirmation on September 30, 2021, that the manuscript is undergoing review at that journal.

Plan for the Conference Proposal

The conference paper is tentatively entitled “Cognitive and Metacognitive Competence to Support Children with Dyslexia Among Teachers of Students with Visual Impairments.” It investigates calibration of dyslexia knowledge and perceived ability to identify and support students with or at-risk for reading disabilities among TSBVIs. This question is particularly important in the case of TSBVIs because of the widespread misconception that dyslexia is a visual disorder. Teachers of children who are blind or visually impaired who believe their students cannot have dyslexia because they hold this misconception—yet perceive themselves to be skilled at identifying and remediating reading disabilities among their students—may overlook or misidentify reading difficulties or employ ineffective or counterproductive instructional techniques. I intend to submit the conference proposal to the Council for Exceptional Children in the spring of 2022.
Overarching Findings of the Studies and Contributions to the Literature

This research has produced some interesting results that might interest literacy education researchers and the vision education community. The findings of this study did not support our hypothesis that TSBVIs’ linguistic awareness deficits might contribute to the reading achievement gap between children with blindness and their typically sighted peers. However, their performance on the linguistic awareness assessment indicates that TSBVIs still need to attain further knowledge and expertise in this area. Because there is evidence that professional development in research-based reading instruction and basic language constructs for in-service teachers produces positive effects on both the teachers’ knowledge and abilities as well as their students’ reading performance, children with visual impairments and blindness would likely benefit from the expertise of TSBVIs in language-related constructs.

Overall, the accuracy of TSBVIs’ dyslexia beliefs was strikingly similar to the previously reported accuracy of general-population teachers’ dyslexia beliefs (e.g., Washburn et al., 2014). However, their belief that visual deficits are a major cause of dyslexia and their subscription to the misconception that dyslexia involves seeing letters and words backward is interesting. These findings have established that, like general-education teachers, TSBVIs have an incomplete understanding of the language-based nature of dyslexia and have gaps in their knowledge that should be remediated. Given previous findings that less-knowledgeable teachers can slow children’s reading growth (Piasta et al., 2009) and the potential for inappropriate interventions if dyslexia is believed to be a visual disorder (Fletcher & Currie, 2011), dyslexia should receive accurate and sufficient coverage in teacher preparation programs, including TSBVI preparation programs.
Analyses of the association of years of teaching experience with TSBVIs’ linguistic awareness (Study One) and their perceived reading-teaching abilities (Study Two) revealed nonsignificant associations. We found that even teachers who rated themselves as Very Good or Expert at teaching reading (Study Two) averaged only 68% on the linguistic awareness assessment. Thus, their confidence in evidence-based reading instruction outpaces their competence, which may adversely affect the reading outcomes of students with visual impairments. A dissociation between linguistic awareness and TSBVIs’ years of experience in the field suggests that TSBVIs cannot be expected to acquire expertise in the language-related constructs needed in early reading instruction through field or teaching experience. Instead, teacher preparation programs and colleges of education should systematically prepare TSBVIs to provide explicit instruction and offer ample practice in each construct.

Additionally, this study has established that number of reading courses taken by TSBVIs did not have an association with their linguistic awareness (Study One). Still, interestingly, number of reading teaching courses did influence TSBVIs’ self-perception of their abilities to teach reading skills (Study Two). These findings indicate that the reading education coursework lacks explicit instruction of reading constructs and instills a false impression that TSBVIs can effectively teach reading when they do not have the requisite knowledge for providing early reading instruction.

With regards to the self-perceived abilities of TSBVIs in the dyslexia domain, the initial analyses of the third paper have revealed that nearly half of the respondents perceived their ability to identify and support students with or at-risk for a reading disability as “Moderate” or “Very Good.” However, neither number of reading courses taken, nor years of experience was found to be associated with their self-perceived ability to identify and support students with or
at-risk for a reading disability. These findings highlight TSBVIs’ lack of preparedness to identify and support children with reading disabilities among teachers of students with visual impairments.

As discussed above, we found that the accuracy of TSBVIs’ dyslexia beliefs was not associated with their perceived ability to identify and support students with or at-risk for a reading disability. There is evidence that teachers’ knowledge calibration plays a vital role in pedagogical approaches to reading curriculum (Cunningham et al. 2004) and has important implications for students’ learning outcomes. Inadequate calibration of their actual and perceived skills across multiple domains may also influence the teachers’ receptivity to acquire further expertise in those domains. Knowledge calibration is particularly critical in the case of TSBVIs because of the reading achievement gap between children with visual impairments and typically sighted students, who are already at a disadvantage when it comes to reading and face many challenges in learning to read. If teachers of students who are blind or visually impaired have misconstrued knowledge that dyslexia is a visual deficit and thus cannot affect their students, yet believe themselves to be skilled at identifying signs of dyslexia, they may ignore signs that a student in their caseload may have or be at-risk for dyslexia.

This dissertation project has investigated two crucial aspects of teacher psychology: knowledge calibration and linguistic awareness of teachers of students with visual impairments. This research project has extended a body of research that grew out of cognitive psychology (knowledge calibration), e.g., Fischhoff, 1988; Lichtenstein & Fischhoff, 1977; Lichtenstein et al., 1982; Stanovich, 1999) into the domain of education. Extending cognitive psychology research into the field of education has allowed me to identify cognitive and metacognitive processes relating to learning and instruction in teachers of one at-risk group of students. An
improved understanding of these processes may ultimately improve reading outcomes among blind and visually impaired children.
References


STUDY ONE

LINGUISTIC AWARENESS AND DYSLEXIA BELIEFS AMONG TEACHERS OF
STUDENTS WHO ARE BLIND OR VISUALLY IMPAIRED

Abstract

Children in the United States who are blind or have visual impairments do not read at the comprehension level of a third-grader with typical sight until, on average, halfway through the seventh grade. As a first step toward narrowing that gap, the present study investigated levels of linguistic awareness among teachers of students who are blind or visually impaired (TSBVIs) because research in general-population teachers has demonstrated a link between teacher linguistic awareness and student literacy outcomes. It has also investigated the accuracy of dyslexia beliefs among TSBVIs and examined whether TSBVI linguistic awareness and dyslexia beliefs are associated with training and experience variables. A survey of licensed or certified TSBVIs (N = 236) in the United States revealed that TSBVIs’ understanding of linguistic concepts and dyslexia was comparable to that of educators in previous studies. Linguistic awareness was not associated with training and experience variables in the present study. Both master’s degree attainment and teaching experience increased the overall accuracy of TSBVIs’ dyslexia beliefs, but only years of experience diminished the misconception that dyslexia is a visual-processing disorder. Overall, these findings point to the entrenched nature of misconceptions about dyslexia and support TSBVIs’ taking a greater role in the literacy instruction of students who are blind or visually impaired.

Keywords: Teacher knowledge, teacher education, literacy, special education, blindness, visual impairment
Background

Children in the United States who are blind or have visual impairments underperform their peers with typical sight on measures of reading achievement (Boroson et al., 2017; Wagner et al., 2006) and, perhaps relatedly, exhibit lower rates of college attendance (Reed & Curtis, 2012) and higher rates of unemployment (McDonnell, 2009; Ryles, 1996) following high school. This underperformance in children with visual impairments persists despite working memory abilities equivalent or superior to that of children with typical sight (Hull & Mason, 1995; Rindermann et al., 2020; Withagen et al., 2013). Several factors have been suggested to explain this reading achievement gap, including blind and visually impaired children’s lack of exposure to environmental print (Bosman et al., 2006; Greaney & Reason, 2011; Hatton et al., 2010); underdeveloped semantic representations and general knowledge deficits (Gillon & Young, 2002; James & Stojanovik, 2007; Pérez-Pereira & Conti-Ramsden, 1999); reading avoidance (Ek et al., 2003), and the complexity of the braille code and the tactual nature of reading braille (Dodd & Conn, 2000; Greaney & Reason, 2011). Each of these factors undoubtedly contributes to the gap in reading achievement between students who are blind or visually impaired and children with typical sight. However, one potential contributor that has not been considered is the quality of the explicit reading instruction received by children with visual impairments. A growing literature has documented a link between teacher linguistic awareness and student reading outcomes (e.g., Lane et al., 2008; McCutchen et al., 2002; Piasta et al., 2009), but this literature has not specifically examined the linguistic awareness of those responsible for teaching reading to students with visual impairments.

It is plausible that, in intensive teacher-training programs that include coursework in ocular anatomy and pathology, orientation and mobility skills, assistive technologies and
communication systems, and advanced braille (e.g., Northern Illinois University Department of Special and Early Education, 2020), linguistic concepts such as phonological awareness, phonemic awareness, and morphological awareness are overlooked. A firm grasp of these concepts is fundamental to effective instruction in decoding, an area in which children with visual impairments have been found to underperform children with typical sight (Dodd & Conn, 2000; but see Greaney & Reason, 1999). Regardless of whether the linguistic awareness of teachers of students who are blind or visually impaired contributes to the reading achievement gap or whether children with visual impairment struggle disproportionately with decoding, however, we feel research into practitioners’ knowledge to support students’ reading and writing should be extended include all educators who have a role in the literacy instruction of children. An investigation of the linguistic awareness of educators of students with visual impairments is thus the first aim of the present study.

The second aim of this study is an investigation of the dyslexia beliefs of teachers of students who are blind or visually impaired. A number of researchers (e.g., Wadlington & Wadlington, 2005; Washburn et al., 2011a., 2014) have stressed the need for an accurate understanding of dyslexia on the part of all teachers because, although teachers cannot diagnose dyslexia, they do provide reading instruction to learners with difficulties and refer students for diagnosis. Students with reading difficulties who are identified early for intervention have the best outcomes (Foorman, 2003; Torgesen, 2002). Moreover, when discrepancies exist between teachers’ and students’ perceptions of the students’ abilities, student performance can suffer as a result (Carlisle & Andrews, 1993).

We were also curious to learn whether teachers of children who are blind or have visual impairments subscribe to the common misconception that dyslexia involves seeing words or
letters backwards, can be helped by using colored lenses, or otherwise results from a visual disorder. Dyslexia is a language-based disorder that arises from a phonological processing deficit and is unrelated to visual functioning (Allington, 1982; Bell & Mino, 2015; Moats, 1994; Vellutino et al., 2004). Reading disabilities may be underdiagnosed in students with visual impairments because school districts are reluctant to saddle students with visual impairments with an additional label or because the visual impairment appears to be the source of the reading difficulty (Erin & Koenig, 1997; Jones et al., 2015). If teachers of children who are blind or visually impaired believe their students cannot have dyslexia because they hold the misconception that dyslexia is visual in nature, it could further prevent students with visual impairments from receiving appropriate interventions.

Reading Instruction and Teachers of Students Who Are Blind or Visually Impaired

U.S. children who are blind or have visual impairments are typically eligible for early intervention services, provided by a state-licensed or -certified special education teacher specializing in the education of children with visual disabilities, from age three. Because such vision specialists in Illinois, where this study’s authors are based, receive professional educator licensure designating them a “Teacher of Students who are Blind or Visually Impaired” (TSBVI), that is the term we adopt in this article. The licensure process for TSBVIs, including the minimum degree and exam(s) required, varies by state (The Early Childhood Personnel Center, 2020).

Once they begin formal schooling, the least restrictive environment for children with visual impairments is often deemed to be a mainstream elementary school, particularly if they do not have secondary cognitive or physical impairments (Cameto & Nagle, 2007). In school,
students with visual impairments spend over half the school day learning alongside typically sighted peers: according to the U.S. Department of Education, 68% of children with visual impairments spend the majority of the school day inside general classes (Hussar et al., 2020), with 64.3% spending more than 80% of their day in general classes (U.S. Department of Education, 2020). Time outside the general classroom is often spent in a resource room or other one-on-one setting, led by a TSBVI. In school, they often divide their days between two settings: a mainstream classroom, led by a general-education teacher, and a resource room or other one-on-one setting, led by a TSBVI. The TSBVI instructs students in concept development, daily living skills and, for tactual readers, the braille code (Texas School for the Blind and Visually Impaired, n.d.). Importantly, TSBVIs share responsibility for literacy instruction with the general-education teacher (Kamei-Hannan, Holbrook, & Ricci, 2012; Jones, Smith, Hensley-Maloney, & Gansle, 2015).

According to the American Printing House for the Blind (2017), the various primary reading media of students with visual impairments in the United States are as follows: braille (7.8%), auditory readers (10.8%), pre-readers (16.4%), print (32.3%), pre-readers (16.4%), and non-readers/symbolic readers (32.7%). Auditory readers and non-readers/symbolic readers often have multiple disabilities and/or cognitive impairments that prevent them from pursuing written literacy. High levels of linguistic awareness and accurate dyslexia beliefs are of greatest importance for TSBVIs when they are teaching students who read braille or print. However, given the heterogeneity of the population of children with visual impairments in terms of age, visual status, primary reading medium, and many other variables, most TSBVIs will have at least a few braille or print readers on their caseload at any given time.
Teacher Linguistic Awareness and Student Literacy Outcomes

A concept crucial to literacy instruction is metalinguistic ability or *linguistic awareness*, “the ability to reflect consciously upon the nature and properties of language” (Van Kleeck, 1982, p. 237). Research in general-population teachers in English-speaking countries has demonstrated a link between teacher levels of phonological awareness (a subset of phonological awareness ability), phonemic awareness, morphological awareness, and understanding of the principles of grapheme-phoneme mapping (i.e., phonics), on the one hand, and student literacy outcomes, on the other.

For example, McCutchen, et al. (2002) conducted a study with kindergarten and first-grade teachers that investigated teachers’ knowledge of basic language constructs and the relationship of growth in that knowledge to student outcomes. Teachers’ (N = 44) initial linguistic awareness was low in comparison to expectations. Approximately half of the teachers (N = 24) then attended a two-week summer institute at which they were exposed to basic language concepts. During the following school year, students of teachers who attended the institute showed greater compositional fluency, phonological awareness, word-reading skills, spelling skills, and overall reading gains relative to their peers whose teachers did not receive linguistic awareness training.

To understand the relation between teacher linguistic awareness and reading growth in struggling readers, a second study assigned third-, fourth-, and fifth-grade classrooms to a control or intervention condition, with teachers of intervention classrooms again receiving linguistic awareness training (McCutchen et al., 2009). Struggling readers in intervention classrooms showed significantly higher levels of performance at year end on measures of spelling, writing fluency, composition quality, word reading, comprehension, and vocabulary, with teacher
linguistic knowledge positively related to improvements in spelling and composition quality. Additional analyses indicated that the literacy gains in intervention classrooms generalized to all students, not just struggling readers, although lower-performing students exhibited greater effect sizes.

Piasta et al. (2009) identified an important mechanism of the effect of teacher linguistic awareness on student reading ability. Namely, teacher linguistic awareness in a study of first-grade teachers (N = 42) and students (N = 437) was not associated with student learning if it was not coupled with classroom time devoted to explicit instruction. The word-reading growth of students of more-knowledgeable teachers was moderated by the frequency with which the teachers engaged in explicit decoding instruction, such that more instruction was associated with greater gains. Interestingly, students of less-knowledgeable teachers experienced smaller gains with greater instruction time, reflecting the crucial role of accurate teacher knowledge in student learning. These and other studies that have examined the relationship between teacher linguistic awareness and student literacy skills indicate that students of teachers with advanced linguistic knowledge have improved reading and writing skills relative to students of teachers without this knowledge (e.g., Bos et al., 2001; Lane et al., 2008; Moats, 1994). Hence, if TSBVIs exhibit relatively lower levels of linguistic awareness than has been observed in general-education teachers, it could partially account for the reading delays observed in students with visual impairments.

**Teacher Dyslexia Beliefs**

Past studies of the dyslexia beliefs of teachers and educators have tended to show they harbor many misconceptions and are prone to believing that dyslexia results from visual
problems. For instance, in their study with elementary school teachers, Washburn et al. (2011a) found that teachers confused dyslexia with a visual processing deficit rather than a phonological processing deficit. Similarly, Washburn et al. (2014) reported that preservice teachers in the United States and United Kingdom shared the common misconception that the core deficit in dyslexia is visual. The participants in their study also believed that dyslexia is caused by reversals of letters and words. These findings and others (Moats, 1994; Williams & Lynch, 2010) show that, although educators exhibit some knowledge about dyslexia, myths about dyslexia as a visual disorder are persistent. Consequently, appropriate phonology-based interventions for students with dyslexia may not be delivered (Fletcher & Curie, 2011).

Whether TSBVIs also subscribe to these misconceptions has not been investigated. We undertook such an investigation because, if TSBVIs are unaware of the language-based nature of dyslexia, they may attribute to visual disability reading difficulties that in fact stem from a reading disability. Conversely, they may attribute to dyslexia reading problems that stem from vision problems or, in the case of braille readers, difficulty mastering the braille code.

Relation of Teacher Experience and Training to Linguistic Awareness and Dyslexia Beliefs

Examining associations of teacher training and experience variables with levels of linguistic awareness has potential to provide insight into the source of gaps in teacher knowledge and avenues for repairing these gaps. The extant literature, however, paints a complicated picture of the relationship of years of teaching experience, number of reading courses taken, and highest degree earned with linguistic awareness and dyslexia beliefs in general-population teachers. For instance, some studies have reported a negative relation of years of teaching experience with linguistic awareness (e.g., Cunningham et al., 2004; Spear-Swerling & Zibulsky, 2014), though it
is commoner to find no relation (e.g., Fielding-Barnsley & Purdie, 2005; Sekel, 2003) or a positive relation (e.g., Mather et al., 2001; Spear-Swerling & Cheesman, 2012) between these variables. Similarly, some studies have found no relation between number of reading courses taken and linguistic awareness (Fenty & Uliassi, 2018; Sekel, 2003; Spear-Swerling & Zibulsky, 2014; Washburn et al., 2011b) whereas others have found linguistic awareness is positively associated with number of reading courses taken (Spear-Swerling & Brucker, 2003; Spear-Swerling & Cheesman, 2012). As for the relation of highest degree to linguistic awareness, we are unaware of research addressing this specific question. The picture regarding the relation of teacher experience and training variables to dyslexia beliefs is likewise complicated (e.g., Knight, 2018; Soriano-Ferrer et al., 2016; Wadlington & Wadlington, 2005).

Because of the inconsistent evidence from past studies of general-population teachers and a lack of understanding of how evidence from this population might generalize to TSBVIs, we have no a priori hypotheses regarding the relation of years of teaching experience, number of reading courses taken, and highest degree earned with linguistic awareness and dyslexia beliefs among TSBVIs in the present study.

Research Questions

The study was framed according to the following research questions:

*Research Question 1*: What level of linguistic awareness do TSBVIs possess, and how does their level of linguistic awareness compare to that of other educators?

*Research Question 2*: Is TSBVIs' linguistic awareness related to number of courses taken on reading and literacy skills instruction, highest degree obtained, or years of teaching experience?
Research Question 3: Do TSBVIs have accurate beliefs about dyslexia, and how does the accuracy of their beliefs compare to the accuracy of other educators’ beliefs?

Research Question 4: Is the accuracy of TSBVIs’ a) overall dyslexia beliefs or b) beliefs about the role of vision in dyslexia related to number of courses taken on reading and literacy skills instruction, highest degree obtained, or years of teaching experience?

Method

The survey used in this investigation comprised five sections: (1) background and demographic information (12 items); (2) self-perception of teaching abilities (2 items); (3) linguistic awareness (38 items); (4) dyslexia beliefs (16 items); and (5) open-ended questions designed to elicit responses about TSBVIs’ experiences as teachers of visually impaired learners and their struggles to accommodate the unique needs of visually impaired learners (2 items). Data from sections 1, 3, and 4 are analyzed in the present study. Background and demographic items pertained to respondents’ gender, race/ethnicity, geographic location, employment setting, experience teaching students with reading disability, highest degree, certifications, and number of courses taken on reading and literacy skills instruction (categorical variables), and years of teaching experience, age of students in caseload, and number of students with visual impairments taught during their career (continuous variables). Linguistic awareness was assessed using a modified version of the Survey of Basic Language Constructs (Binks-Cantrell et al., 2012), and dyslexia beliefs were assessed using a modified version of the Dyslexia Beliefs Index (Wadlington & Wadlington, 2005). These instruments are described in detail below.
Participants and Procedure

Data were collected over a five-week period in the spring of 2020. Licensed or certified TSBVIs who were currently employed or had been employed within the last 18 months as a TSBVI at institutions across the United States and Puerto Rico were invited to participate in an online survey via email or social media. Email addresses were obtained from websites of state schools for the blind and state databases of public employees. Additionally, TSBVIs were contacted via groups and individual accounts on Facebook, LinkedIn, and Twitter, and posts were made to listservs used by educators of individuals with visual impairments. The emails and social media and listserv posts included a brief description of the project along with a link to the survey. The link connected respondents to the Qualtrics online survey platform, where informed consent was obtained before the presentation of survey questions. The informed consent form indicated the purpose of the study and the estimated time the survey would take an individual to complete. The form also noted that consent was voluntary and could be withdrawn at any time. All data was collected anonymously so that responses could not be re-identified with the respondents. Nonrespondents were prompted via email or a post on the social media site or listserv to complete the survey one and two weeks after the initial email. All consent forms, surveys, and related study materials were approved by a university Institutional Review Board.

Of the 363 respondents who began the survey, 236 completed it through the Survey of Basic Language Constructs, and all but four of those continued through the Dyslexia Beliefs Index. The sample size is therefore 236 for all analyses reported below except for those specific to the Dyslexia Beliefs Index, for which it is 232. There were two versions of the survey, which differed only in aspects of user interface. One was designed for respondents with typical sight
and contained visually complex matrices; the other was designed for respondents with visual impairments and was more compatible with screen readers. Of the 236 participants included in analyses, eight selected the accessible version of the survey. The mean time to complete the survey was 51 minutes.

Measures

Survey of Basic Language Constructs

We assessed linguistic awareness using the 38 knowledge and ability items from the Survey of Basic Language Constructs (SBLC; Binks-Cantrell et al., 2012), which assess phonological awareness, phonemic awareness, morphological awareness, and understanding of phonics. The survey included 8 phonological awareness items, 13 phonemic awareness items, 8 morphological awareness items, and 9 phonics items. Twelve of these items assessed TSBVIs’ knowledge (e.g., *A phoneme refers to____*), and 26 of them assessed ability (e.g., *How many phonemes are in the word “box”?*). In some instances, an item was modified for clarity (e.g., *spinster* was replaced with *unicycle* in the syllable- and morpheme-counting sections, because we suspected the etymology of the former would be too obscure for modern educators to parse.) Cronbach’s alpha for the modified SBLC and its subsections were as follows: .88 (overall), .73 (knowledge), .80 (phonemic awareness), .80 (phonics understanding), .83 (phonological awareness), .85 (ability), and .89 (morphological awareness). These values indicate an acceptable level of internal consistency for the subsections of the SBLC and for the survey as a whole.
Our tool for assessing accuracy of dyslexia beliefs was a slightly modified version of the instrument used by Washburn et al. (2014), who in turn had adapted it from Wadlington & Wadlington’s (2005) Dyslexia Beliefs Index (DBI). Our changes to the Washburn et al. (2014) version consisted of the removal of three items for length and because of ambiguity as to the correct response.\(^1\) Thus, our version of the DBI contained 16 items. Participants were asked to determine if 16 statements about dyslexia were “definitely false,” “probably false,” “probably true,” or “definitely true.” Four of the items specifically addressed the misconception of dyslexia as a visual disorder. These included the statements, *Seeing letters and words backwards is a characteristic of dyslexia; Dyslexia can be helped by using colored lenses and/or colored overlays; Eye tracking exercises are effective in remediating dyslexia-caused difficulties; One of the major reasons for dyslexia-caused difficulties is visual problems.* Cronbach’s alpha for the 16 items of the modified DBI was .58, which is lower than the .73 reported for the 19-item survey used by Washburn et al. (2014) and likely reflects TSBVIs’ diversity of training. Internal consistency of the four vision-related items was \(\alpha = .60\). for the four vision-related items. These values indicate a relatively poor level of internal consistency for the DBI and for the subset of vision-related items.

Responses of “definitely false,” “probably false,” “probably true,” and “definitely true” were coded with scores of 1 through 4. Each statement was either true or false, according to

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\(^1\) *Reading ability and intellectual ability are related* was removed because, although reading disability does not necessarily entail intellectual disability, intellectual disability is often accompanied by reading difficulties. *Dyslexia occurs more frequently in boys than in girls* was removed because the research on this point is inconclusive (see, e.g., Liederman et al., 2005; Moll et al., 2014; Quinn & Wagner, 2015). *Dyslexia affects a child’s performance exclusively in reading and language arts (literacy and English) subjects* was removed because, although Washburn et al. (2014) gave the correct answer as “True,” dyslexia can interfere with performance in other subject areas via its impact on motivation and self-esteem, and because most subject areas require reading.
current literature, and participants were awarded 4 points for selecting “definitely true” or “definitely false” as appropriate. Additionally, partial points were awarded for “probably” responses, with 3 points awarded to “probably true” and 2 points awarded to “probably false” for a true item, and 3 points awarded to “probably false,” and 2 points awarded to “probably true” to a false item.

**Training and Experience Variables**

TSBVIs were asked to respond to the question, “How many courses on teaching reading and literacy skills to students who are blind or visually impaired did you take during your teacher preparation?” by selecting one of six choices: 0, 1, 2, 3, 4, or 5+. To aggregate the data, four subgroups were identified: zero courses (n = 38), one course (n = 93), two courses (n = 65), and three or more courses (n = 40). Number of Reading Courses was treated as a categorical variable in analyses. TSBVIs were asked to respond to the question, “How many years of experience do you have working as a TSBVI?” by selecting an integer between 1 and 75 or “less than one year.” TSBVIs in our sample had between 0 and 46 years of experience, with a mean of 13.79 years (SD = 10.30). Years of Experience was treated as a continuous variable in analyses. TSBVIs were asked to respond to the question, “What is your highest degree obtained?” by selecting “bachelors,” “master’s,” or “doctorate.” Of the 236 participants, 35 (14.9%) TSBVIs held a bachelor’s degree, 195 (81.9%) TSBVIs held a master’s degree, and 6 (2.5%) TSBVIs held a doctoral degree. Highest Degree was treated as a categorical variable in analyses.
Results

To address Research Question 1, the mean, range, and standard deviation of scores on the SBLC and its individual subcomponents were examined. These are presented in Table 1. The mean number of overall points earned was 24.71 out of a possible 36, or 68.64%. Performance on subcomponents of the survey was as follows: Ability items: 18.28 out of a maximum of 25, or 73.12%; Knowledge items: 6.4 out of a maximum of 12, or 53.5%; Phonological Awareness: 6.94 out of 8, or 86.75%; Phonics Awareness: 4.81 out of 9, or 53.44%; Morphological Awareness: 4.59 out of 8, or 53.38%; and Phonemic Awareness: 8.36 out of 13, or 64.31%.

We then graphed the mean performance of TSBVIs on the SBLC and 95% confidence intervals around the mean in the present study alongside that of educators in previous studies (Figure 1). Percentages were calculated from published data when accuracy percentages were not explicitly reported in an article.

By examining the 95% confidence intervals around the mean score on the SBLC and its subcomponents across this and previous studies, we can get a sense of how TSBVIs’ linguistic awareness compares to that of other educators. TSBVIs’ mean linguistic awareness was surpassed only by that of teacher educators (university faculty) in most categories, and their mean performance on ability and morphological awareness items surpassed even that of teacher educators. However, the confidence intervals around these means were often wide (Figure 1), reflecting the diversity of backgrounds and training received by our sample. Even so, TSBVIs’ overall linguistic awareness and awareness of subcomponents is generally within the range of other educators’, indicating a comparable level of linguistic awareness to preservice and in-service general-population teachers.
To address Research Question 2, we performed a series of statistical tests. To determine if number of reading courses taken was related to linguistic awareness, a one-way ANOVA was conducted with number of courses taken (0, 1, 2, 3, 4, or 5) as the grouping variable and overall score on the modified Survey of Basic Language Constructs as the outcome variable. The findings revealed that there were no statistically significant mean differences between the levels of participants’ linguistic awareness, the number of reading courses taken, and the overall score on the SBLC ($F = .456, p = .81$).

To determine if highest degree earned was related to linguistic awareness, a one-way ANOVA was conducted with highest degree earned (bachelor’s, master’s, or doctorate) as the
grouping variable and overall score on the modified Survey of Basic Language Constructs as the outcome variable. The analysis revealed no statistically significant mean differences between the levels of TSBVs’ linguistic awareness, the highest degree earned, and the overall score on the SBLC \( F = .05, p = .95 \); Figure 2). Finally, to determine if years of teaching experience was related to linguistic awareness, Pearson's correlation coefficient was calculated for the variables. The findings revealed no significant correlation between TSBVs’ linguistic awareness and years of teaching experience \( r = -.008, p = .90 \). In sum, none of our training or experience variables were related to the linguistic awareness of.

![Linguistic Awareness by Number of Reading Courses and Highest Degree](image)

Figure 2. Linguistic awareness by number of reading courses taken and highest degree. Total N = 236. N per group is expressed on the individual bars of the graph.

To address Research Question 3, the mean, range, and standard deviation of the total score on the DBI and of the four items that probe misconceptions related to dyslexia as a visual
disorder were examined (see Table 1). The mean number of points earned on the survey as a whole was 48.56 out of a possible 64, or 75.88%, and mean accuracy of the four items specific to dyslexia as a visual disorder was 9.98 out of a possible 16, or 62.38%.

Table 1

*Performance on the Survey of Basic Language Constructs and the Dyslexia Beliefs Index (DBI)*

<table>
<thead>
<tr>
<th>Survey Items</th>
<th>Mean Correct (Maximum)</th>
<th>Std. Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ability</td>
<td>18.28 (25)</td>
<td>3.99</td>
</tr>
<tr>
<td>Total</td>
<td>24.71 (36)</td>
<td>5.79</td>
</tr>
<tr>
<td>Morphological Awareness</td>
<td>4.59 (8)</td>
<td>2.24</td>
</tr>
<tr>
<td>Phonics Awareness</td>
<td>4.81 (9)</td>
<td>2.11</td>
</tr>
<tr>
<td>Knowledge</td>
<td>6.42 (12)</td>
<td>2.69</td>
</tr>
<tr>
<td>Phonological Awareness</td>
<td>6.94 (8)</td>
<td>1.13</td>
</tr>
<tr>
<td>Phonemic Awareness</td>
<td>8.36 (13)</td>
<td>2.42</td>
</tr>
<tr>
<td>Overall Accuracy on DBI</td>
<td>48.56 (16-64)</td>
<td>4.33</td>
</tr>
<tr>
<td>Misconception of Dyslexia as a Visual Disorder</td>
<td>9.98 (4-16)</td>
<td>2.08</td>
</tr>
</tbody>
</table>

We then graphed the performance of TSBVIs on the DBI and 95% confidence intervals around the mean in the present study alongside that of educators in previous studies (Figure 3). Because our version of the DBI contains three fewer items than that of Washburn, Joshi, & Binks-Cantrell (2011a, 2011b) and Washburn et al. (2014), in Figure 3 we compare percentages
rather than raw scores. Percentages were calculated from published data when accuracy percentages were not explicitly reported in an article.

As is evident in Figure 3, the confidence intervals around TSBVIs’ and other educators’ mean performance on the DBI as a whole did not overlap, suggesting that TSBVIs generally held more accurate beliefs about dyslexia than other educators. Confidence intervals around TSBVIs’ mean accuracy to the subset of items relating to dyslexia as a visual disorder, however, fell within the range of other educators’, despite the means themselves’ being considerably higher.

To address Research Question 4, a one-way ANOVA was conducted with number of courses (0, 1, 2, 3, 4, or 5) as the grouping variable and overall score on the survey of dyslexia beliefs as the outcome variable. As in our analyses of linguistic awareness, the findings revealed no significant mean differences between the number of reading courses taken and accuracy of TSBVIs’ dyslexia beliefs ($F = .61, p = .63$; Figure 4). Descriptively, the highest-performing subgroup of TSBVIs was again that comprising individuals who had never taken a course on teaching reading and literacy skills (Figure 4).

To determine if highest degree earned was related to accuracy of dyslexia beliefs, a one-way ANOVA was conducted with highest degree earned (bachelor’s, master’s, or doctorate) as the grouping variable and overall score on the Survey of Dyslexia Beliefs as the outcome variable. Our results showed a statistically significant finding, where there was a mean difference based on highest degree earned and TSBVIs’ beliefs about dyslexia ($F = 3.69, p = .03$), such that accuracy of beliefs was positively associated with additional degrees. Post hoc Bonferroni comparisons revealed a statistically significant difference between the accuracy of dyslexia beliefs of bachelor’s- and master’s-degree holders ($p = 0.04$; Figure 4).
Figure 3. Comparison of dyslexia beliefs accuracy of U.S. educators in prior studies and U.S. TSBVIs in the present study. Accuracy of dyslexia beliefs in the four samples was assessed using the modified Dyslexia Beliefs Index (Wadlington & Wadlington, 2005) or items from it. Washburn et al. (2016) reported on the dyslexia beliefs of preservice teachers from four English-speaking countries, and Washburn et al. (2014) reported on the dyslexia beliefs of preservice teachers from the U.S. and U.K.; for ease of comparison, only the findings from U.S. preservice teachers are presented here. (Note: Because items were added to or omitted from the index across studies, here we compare percentages rather than raw scores. Percentages were calculated from published data when accuracy percentages were not explicitly reported in an article. We were unable to calculate CIs for Washburn et al. (2011a) from the given data.)
As a group, the six individuals with doctoral degrees scored the highest on the DBI, although the small size of the group likely prevents significant differences between it and other groups from emerging. To determine if years of teaching experience was related to accuracy of dyslexia beliefs, Pearson's correlation coefficient was calculated for the variables. The findings revealed a marginally statistically significant relationship between years of teaching experience as a TSBVI and accuracy of dyslexia beliefs ($r = .13, p = 0.05$).

Because we were particularly interested in whether TSBVIs view dyslexia as a visual disorder, we reran the above statistical tests using overall accuracy on just the four items that probed misconceptions related to dyslexia as a visual disorder as the dependent variable. A one-
way ANOVA using number of reading courses taken as the independent variable showed no statistically significant relationship between number of courses and misconceptions about dyslexia as a visual disorder \((F = 1.43, p = .22)\), mirroring the findings for the survey as a whole. Unlike findings for the survey as a whole, however, a one-way ANOVA using highest degree as the independent variable revealed that TSBVIs’ beliefs about dyslexia as a visual disorder are not associated with attainment of a master’s degree \((F = .78, p = .47)\). Finally, Pearson’s correlation coefficient was calculated using years of teaching experience and total score on items related to dyslexia as a visual disorder as variables. As for the survey as a whole, the statistically significant coefficient \((r = .16, p = .017)\) revealed that there is a positive, low correlation between years of teaching experience and accuracy of beliefs about visual problems as the cause of dyslexia-related difficulties.

In sum, although number of reading courses taken was not associated with accuracy of dyslexia beliefs in our survey of TSBVIs, possession of a master’s degree and more years of teaching experience were positively associated with accuracy of dyslexia beliefs. Years of teaching experience was negatively associated with TSBVIs’ belief in the misconception that dyslexia is a visual disorder, although possession of a master’s degree was not.

Discussion

In this study, we focused on identifying levels of linguistic awareness and accuracy of dyslexia beliefs among teachers of children who are blind or visually impaired, and how TSBVIs’ competence in these areas compares to the competence of other educators surveyed in past studies. We also investigated what training and experience variables contribute to the linguistic awareness and dyslexia knowledge of TSBVIs. The findings present a picture of a
population diverse in its experience and abilities, which shares many similarities and some important differences with other groups of educators.

We found that, although TSBVIs have some knowledge of metalinguistic concepts and dyslexia, this knowledge is not uniformly high nor evenly distributed. The mean scores of TSBVIs on the SBLC (68.64%) and the subset of items on the DBI about dyslexia as a visual disorder (62.38%) were lower than the 70% required to pass a teacher-preparation course, whereas their mean score on the DBI as a whole (75.88%) was above this threshold. However, the confidence intervals around the means on these measures were wide: for instance, the 95% confidence interval around the mean for the subset of items on the SBLC that tapped explicit knowledge of linguistic concepts ranged from 35% to 75%. This variability in knowledge may reflect the uniqueness of TSBVI preparation programs combined with the diversity of TSBVIs themselves. Because TSBVI coursework is typically less concerned with literacy education than is coursework for other teacher-preparation programs, a TSBVI may graduate having learned extremely little about reading and its related skills. However, TSBVIs in our sample were highly credentialled in other domains (on average, respondents held 1.94 accreditations in addition to their TSBVI endorsement), and a subset of participants had clearly received extensive training in this area.

With regards to linguistic awareness, Phonological Awareness was an area of particular strength and Phonics Awareness, and Morphological Awareness were areas of particular weakness. This pattern of greater awareness of English phonology than of English phonics and morphology is broadly consistent with that observed in studies of other samples of educators (e.g., Binks-Cantrell, Washburn, Joshi, & Hougén, 2012; Spear-Swerling, Brucker, & Alfano, 2005; Washburn, Binks-Cantrell, Joshi, Martin-Chang, & Arrow, 2016; Washburn, Joshi, &
Binks-Cantrell, 2011a; Washburn, Joshi, & Binks-Cantrell, 2011b; Zhao, Joshi, Dixon, & Huang, 2016). Again, the confidence intervals around the means on these measures were wide, particularly for morphological awareness, suggesting that linguistic awareness instruction is not consistently emphasized across TSBVI training programs.

With regards to accuracy of dyslexia beliefs, an apparent contradiction is evident in the pattern of results. Although the overall accuracy of TSBVIs’ dyslexia beliefs was a respectable 75.76%, and 78.88% of TSBVIs accurately responded definitely false or probably false to the misconception item “One of the major reasons for dyslexia-caused difficulties is due to visual problems,” the answers to other vision-related questions betray some level of belief that dyslexia is a visually based disorder. Only half of respondents correctly answered “probably” or “definitely” false to the statement, “Eye-tracking exercises are effective in remediating dyslexia-caused difficulties,” and 64.22% and 85.78%, respectively, incorrectly believed that dyslexia can be alleviated with colored overlays and that dyslexia is characterized by seeing letters and words backwards. The discrepancy between TSBVIs’ awareness that dyslexia is not due to “visual problems” and their subscription to the misconception that dyslexia involves seeing letters and words backwards is interesting. It appears that they conceptually differentiate between lower-level sensory processes and higher-level perceptual processes, viewing reversals as perceptual and categorizing them as something other than visual. Of course, the reversals and transpositions sometimes observed in people with dyslexia are not perceptual—they result from the difficulty children with dyslexia have leveraging visual representations of speech sounds into long-term memory (Ahmed et al., 2012; Kilpatrick, 2015). Belief in the misconception that colored lenses or overlays can be helpful in dyslexia is perhaps related to the fact that these materials can
increase the readability of text for individuals with certain visual impairments (Jones & Hensley-Maloney, 2015).

We were uncertain whether TSBVIs would display more accurate knowledge and beliefs than other educators, particularly with regards to dyslexia beliefs. Judging from 95% confidence intervals around the mean participant performance on the SBLC, DBI, and their subscales in this and past studies, TSBVIs have comparable levels of linguistic awareness to other educators and slightly superior knowledge of dyslexia to other educators. Admittedly, there was greater variability in the knowledge of our sample than in that of other samples, and there are differences beyond teacher population between our study and those with which we compared our results, including, their years of experience working with students with visual impairments, additional endorsements and certifications other than TSBVI, which limit our ability to infer similarities and differences. However, the general parity in literacy-related knowledge between TSBVIs and other educators appears to rule out a possibility that motivated this study: namely, that a gap in TSBVIs’ linguistic awareness relative to other teachers’ linguistic awareness is in part responsible for the reading achievement gap between children who are blind or visually impaired and children with typical sight. Our results indicate that previously suggested reasons for the achievement gap, such as children with visual impairments’ lack of exposure to environmental print, underdeveloped semantic representations, and reading avoidance, as well as the complexity of the braille code and the tactual nature of reading braille, are the likely sources of the disparity.

Linguistic awareness was not associated with number of reading courses, highest degree, or years of teaching experience in the present study. A nonsignificant association of linguistic awareness with years of teaching experience (e.g., Fielding-Barnsley & Purdie, 2005; Sekel, 2003) and number of reading courses (Fenty & Uliassi, 2018; Sekel, 2003; Spear-Swerling &
Zibulsky, 2014; Washburn et al., 2011b) has been reported in past studies, and this study corroborates those results. Linguistic awareness does not appear to be a current focus of reading courses offered to preservice teachers, nor does it appear to be something teachers acquire through experience in the field. The specific question of whether highest degree is associated with linguistic awareness has not been addressed in past studies, but research by Kelcey (2011) may help to explain the non-association between these variables in our sample. Kelcey (2011) found that participants with a master’s degree in elementary education had significantly below average knowledge, whereas participants with a master’s degree in literacy education had significantly above average knowledge. Thus, the fact of having a master’s degree may be in itself uninformative with respect to providing insight into teachers’ literacy-related knowledge; the content area of the degree may have more explanatory power.

Both master’s degree attainment and years of teaching experience (but not number of reading courses) was positively associated with overall accuracy of TSBVIs’ dyslexia beliefs, although only years of teaching experience was associated with the misconception that dyslexia is a visual-processing disorder. We were intrigued to find that accuracy of dyslexia beliefs, including accuracy of beliefs regarding the language-based nature of dyslexia, was correlated with teaching experience among TSBVIs. Presumably, repeated encounters with children whose reading difficulties are obviously unrelated to their visual difficulties convinces TSBVIs of the language-based nature of dyslexia.

Our finding that highest degree but not number of reading courses was associated with accuracy of dyslexia beliefs is of particular interest. It is not immediately obvious why reading courses would not improve knowledge of dyslexia whereas additional degrees would. It is possible that the decision to pursue a graduate degree is mediated by some as-yet unidentified
third variable, such as intellectual curiosity or suspicion of accepted wisdom. Graduate-level courses are also more likely to be taught by faculty with Ph.D.s or Ed.D.s than are undergraduate courses, whose instructors may have had less contact with original research literature. Although a master’s degree was positively associated with TSBVIs’ overall understanding of dyslexia, however, it did not disabuse them of the idea that dyslexia stems from a visual processing deficit. This dissociation, as well as why dyslexia beliefs are tied to education and experience whereas linguistic awareness is not, is a subject for future research.

Assumptions and Limitations

The results of this study should be interpreted in light of some limitations. First, it is possible that the participants who completed the relatively lengthy survey are not representative of U.S. TSBVIs as a whole. Demographic and background data on the larger population of TSBVIs is difficult to obtain, and so we cannot know if our sample is typical with respects to the characteristics that interested us, i.e., years of experience, highest degree, reading coursework, linguistic awareness, and dyslexia beliefs. Moreover, thirty-five percent of respondents who began the survey did not complete it, which could have biased our data.

Additionally, our level of analysis was relatively coarse: we did not collect information on the content of reading courses, for instance, or the percentage of respondents’ caseloads who were braille versus print readers, which would have allowed for further interpretation of our results. Future research could include questions about these factors to form a more fine-grained picture of the state of TSBVI knowledge.
A significant limitation of our study is the relatively poor internal consistency for the modified DBI and the subset of items relating to dyslexia as a visual disorder. Cronbach’s alpha for the 16 items of the modified DBI was $\alpha = 0.584$, which is lower than the $\alpha = 0.737$ reported for the 19-item survey used by Washburn et al. (2014). Internal consistency for the subset of four vision-related items was $\alpha = 0.604$. Given that values of Cronbach’s alpha between 0.5 and 0.6 indicate “poor” internal consistency and values between 0.6 and 0.7 indicate “questionable” internal consistency, our instrument may not have effectively tapped TSBVIs’ understanding of dyslexia (George & Mallery, 2003). The low reliability of the DBI in our sample compared to the reliability reported by Washburn et al. (2014) may have resulted from TSBVIs’ diversity of training or from our removal of the three ambiguous items. Regardless, all findings regarding the accuracy of TSBVI dyslexia beliefs should be interpreted cautiously in this study.

Finally, although we attempted to analyze our participants’ linguistic awareness and dyslexia beliefs in light of those of participants in previous studies, we were unable to use inferential statistics to compare the samples and can therefore make no definitive comparisons.

Conclusion

In this exploratory study, we showed that the linguistic awareness and dyslexia beliefs of teachers of students with visual impairments, though lackluster, appear to parallel those documented in prior studies of teacher educators, inservice teachers, and preservice teachers of children in the general population. The linguistic awareness that has been achieved by TSBVIs apparently does not stem from reading coursework, degrees beyond the bachelor’s degree, or years of teaching experience, because these variables were not associated with linguistic
awareness. Advanced degrees and years in the field may, however, improve knowledge of dyslexia, because these variables were associated with accuracy of dyslexia beliefs. Future research might explore the direction of causality in this relationship (does education and experience lead to improved knowledge, or do knowledgeable teachers pursue additional education and accrue experience?). Moreover, given the non-association of number of reading courses with any aspect of teacher literacy-related knowledge in this study, the nature and content of reading courses TSBVIs take during their teacher preparation is an interesting topic for future work.

A broader contribution of this study to the body of research on practitioners’ knowledge to support reading and writing is its focus on a population of teachers of students with developmental disabilities that can occur independently of learning disabilities. Although researchers have investigated the reading-related knowledge of teachers of struggling readers in the past (e.g., Al Otaiba & Lake, 2007; Kennedy, Driver, Pullen, Ely, & Cole, 2013), there has been very little investigation of the knowledge of teachers of students with other disabilities, particularly low-incidence disabilities. These students have the same need for (and right to) high-quality reading instruction as typically developing students and students with high-incidence disabilities such as dyslexia. We hope this study inspires future work in that domain.
References


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STUDY TWO
CONFIDENCE AND COMPETENCE FOR EVIDENCE-BASED READING INSTRUCTION AMONG TEACHERS OF STUDENTS WITH VISUAL DISABILITIES

Abstract
To optimize reading outcomes for students, it is important that perceived reading-teaching ability is well calibrated with linguistic awareness in teachers charged with literacy instruction. The present study investigated what factors contribute to self-perceptions of reading-teaching ability in teachers of students with blindness and visual impairments (TSBVI) and whether their self-perceptions are aligned with their knowledge. Two hundred and thirty-six (236) TSBVI completed a survey about their training, experience, and perceived abilities and an assessment of their linguistic awareness. Number of reading courses taken was related to perceived reading-teaching ability, despite past research indicating that number of reading courses taken is not related to linguistic awareness in this sample. Years of teaching experience was not related to perceived reading-teaching ability. Perceived reading-teaching ability was related to two subcomponents of linguistic awareness but higher than warranted by TSBVI’s demonstrated knowledge. We suggest it is important to ensure that TSBVI’s self-efficacy for literacy instruction is in step with their linguistic awareness.

Keywords: linguistic awareness, knowledge calibration, teacher efficacy, visual impairments, literacy instruction
Evidence-based reading instruction requires highly developed linguistic awareness on the part of teachers (Moats, 2020). This includes teachers of students with visual impairments (TSBVIs), whose students lag behind children with typical sight in literacy development (Boroson et al., 2017; Wagner et al., 2006). Though linguistic awareness is a necessary characteristic of a competent reading teacher, however, it is not sufficient. Teacher linguistic awareness does not translate to student reading gains if teachers lack the confidence to engage in explicit instruction of linguistic concepts; conversely, teachers whose confidence in their linguistic knowledge outpaces their actual knowledge may devote unproductive hours to reading instruction (cf. Piasta et al., 2009). In other words, perceived reading-teaching ability and linguistic awareness must be well calibrated in TSBVIs to optimize reading outcomes for students with visual impairments (that is, those who are blind or have low vision). The present study investigates calibration for evidence-based reading instruction amongst TSBVIs and the factors that contribute to their perceived reading-teaching ability.

The Importance of Linguistic Awareness for Evidence-Based Reading Instruction

In the Response-to-Intervention and Multi-Tiered Systems of Support frameworks and under the U.S. Department of Education’s 2015 Every Student Succeeds Act (ESSA), children are entitled to instruction with the strongest evidence base possible delivered by individuals who are highly qualified and knowledgeable (Fuchs & Fuchs, 2006; Kammei-Hannan et al., 2012; Slavin, 2020). Fien et al. (2021) observed that withholding evidence-based instructional practices differentially harms students with disabilities, and that early intervention and evidenced-based
practices “should be fundamental to any notion of equity in education” (p. S107). The science of reading has established that skilled word identification is the backbone of reading for understanding (Torgesen, 2000) and requires explicit instruction in the sound structure of language (phonological awareness), the identification and manipulation of the individual sounds of words (phonemic awareness), letter-sound correspondences (phonics), and common word parts (morphological awareness; Bowers et al., 2010; Castles et al., 2018; Rayner et al., 2001; Snow et al., 2005). Collectively, this metalinguistic knowledge is called linguistic awareness, and it does not emerge naturally from speaking a language or knowing how to read it. It cannot be assumed that teachers have acquired linguistic awareness simply by virtue of being skilled readers themselves.

Unsurprisingly given the importance of explicit linguistic awareness instruction for developing readers, students’ reading growth is tied to the linguistic awareness of their teachers (e.g., Ehri & Flugman, 2018; Foorman & Moats, 2004; McCutchen et al., 2002; Spear-Swerling & Brucker, 2004). For example, McCutchen et al. (2002) reported that kindergarten and first-grade teachers who attended a two-week summer institute on linguistic awareness \((n = 24)\) saw greater student gains in compositional fluency, phonological awareness, word-reading skills, spelling skills, and overall reading over the following year than a control group of teachers. A second study by McCutchen and colleagues (McCutchen et al., 2009) with teachers in grades three through five \((n = 30)\) replicated this finding and showed that, although the literacy gains in intervention classrooms generalized to all students, the greatest effect was on struggling readers. Piasta et al. (2009) also found a relation between first-grade teacher \((n = 42)\) linguistic awareness and student \((n = 437)\) reading gains but noted that the relationship was not a direct one: teacher
linguistic awareness was not associated with student learning if it was not coupled with classroom time devoted to explicit instruction.

**Linguistic Awareness among Teachers of Students with Visual Impairments**

To comply with federal law and in pursuit of equity for students with disabilities, teacher education programs must ensure that all teachers, including teachers of children with exceptionalities, have high levels of linguistic awareness (Moats, 2020). This is particularly true for TSBVI teachers, who provide instruction in both the core and expanded core curricula and share responsibility for literacy instruction with the general education teacher (Jones et al., 2015; Kammei-Hannan et al., 2012). Although students with visual impairments outperform students academically in many other Individuals with Disabilities Education Improvement Act disability categories (Wagner et al., 2006), their reading performance nevertheless falls short of that of students with typical sight. In the National Longitudinal Transition Study-2 of U.S. special education students, only one-quarter of students with visual impairments (n = 8,013, ages 13-16 at the study’s start) performed above the general population mean on reading comprehension, and 20% scored more than two standard deviations below the mean (Wagner et al., 2006). Similarly, longitudinal analyses of the Measures of Academic Progress standardized assessment data revealed that students with visual impairments (n = 224, grades 3-5 at the study’s start) did not achieve the reading level of a third-grader with typical sight until, on average, halfway through the seventh grade, and continued to lag behind students with typical sight when data collection ceased in grade 10 (Boroson et al., 2017). Perhaps relatedly, students with visual impairments also exhibit lower rates of college attendance (Reed & Curtis, 2012) and higher rates of unemployment (McDonnell, 2009; Ryles, 1996) than students with typical sight.
following high school. These statistics make plain the importance of providing students with visual impairments with teachers who have expertise in evidence-based reading instruction.

Linguistic awareness must be included in the already daunting list of competencies (e.g., Brown & Beamish, 2012) that must be mastered by TSBVIs.

Recent research by the authors of this study produced some cause for optimism on this front: although levels of linguistic awareness among TSBVIs were lackluster, they were comparable to those of general-population preservice and in-service teachers (Authors, in third round of review). On the Survey of Basic Language Constructs (SBLC; Binks-Cantrell et al., 2012), which assesses phonological awareness, phonemic awareness, morphological awareness, and understanding of phonics, TSBVIs averaged 65.03%. The 95% confidence interval around this mean (66.58%-70.69%) overlapped with 95% confidence intervals around mean SBLC scores from samples of teacher educators and general education elementary teachers (Binks-Cantrell et al., 2012; Washburn et al., 2011a). On the one hand, it is disheartening that TSBVIs’ mean level of linguistic awareness does not meet the threshold for earning a “C” in a college class; on the other hand, it is remarkable that TSBVIs appear as informed about reading-related linguistic concepts as general-education teachers. Given that TSBVIs’ preparation programs are heavily focused on coursework in ocular anatomy and pathology, orientation and mobility skills, assistive technologies and communication systems, and advanced braille (e.g., Northern Illinois University Department of Special and Early Education, 2020), it would not be surprising if phonological awareness, phonemic awareness, morphological awareness, and phonics were overlooked.

Authors (in third round of review) found morphological awareness and phonics to be the weakest subareas of linguistic awareness for TSBVIs and phonological awareness to be the
strongest sub-area. TSBVIs’ mean accuracy on the four subcomponents of the SBLC was as follows: phonological awareness, 86.75%; phonemic awareness, 64.31%; phonics, 53.44%; morphological awareness, 53.38%. The pattern of greater awareness of English phonology than of English phonics and morphology is broadly consistent with that observed in studies of other samples of educators (e.g., Binks-Cantrell et al., 2012; Spear-Swerling et al., 2005; Washburn et al., 2011a, 2011b, 2016; Zhao et al., 2016).

Precisely how linguistic awareness is engendered in TSBVIs is unknown. Investigation of potential predictors of linguistic awareness among TSBVIs by Authors (in third round of review) revealed that levels of linguistic awareness were not associated with highest degree obtained, years of teaching experience, or number of courses taken on teaching reading and literacy skills to students with visual impairments. In fact, the correlation coefficient of years of experience and linguistic awareness, though nonsignificant, was negative ($r = -.008$, $p = .90$), and the highest-performing subgroup of TSBVIs on the SBLC was that comprising individuals who had never taken a course on teaching reading and literacy skills. Whether TSBVIs training and experience variables are associated with their perceived reading-teaching ability, however, has not been investigated.

**A Role for Teacher Self-Perceptions of Abilities**

Also important for student reading outcomes is teachers’ perceived reading-teaching ability. Citing Bandura (1986), Ciampa and Gallagher (2018) noted that “Content knowledge acquisition and a college degree does not necessarily equate to a highly effective literacy teacher who has the requisite knowledge and skills to perform a task successfully” (p. 459). Teachers’ perceptions of their abilities, or self-efficacy, is related to instructional approaches and
implementation, classroom management, referral decisions, technology use, and classroom climate (Zee & Koomen, 2016). Just as content knowledge alone cannot ensure effective teaching, however, high teaching self-efficacy does not necessarily translate to quality instruction (Holzberger et al., 2013), particularly in the domain of reading (Zee & Koomen, 2016).

Numerous studies have demonstrated that perceived reading-teaching ability is associated with the number of reading courses teachers take during their teacher education programs, such that perceived ability is greater for teachers who have taken more reading courses (Ciampa & Gallagher, 2018; Clark, 2016; Feng et al., 2019; Helfrich & Clark, 2016; Maloch et al., 2003; Washburn & Mulcahy, 2020). Notably, none of these studies assessed teachers’ actual reading-teaching competence or linguistic awareness. (Studies that examined the relationship between number of reading courses taken and linguistic awareness have produced inconsistent results, with the majority reporting no association between the variables [e.g., Authors, in third round of review; Fenty & Uliassi, 2018; Sekel, 2003; Spear-Swerling & Zibulsky, 2014; Washburn et al., 2011b] but at least two reporting a positive association [Spear-Swerling & Brucker, 2003; Spear-Swerling & Cheesman, 2012]). Perceived reading-teaching ability is not, however, reliably associated with years of teaching experience (Ciampa & Gallagher, 2018; Clark, 2016; Sharp et al., 2016; Tschannen-Moran & Johnson, 2011; Zhao et al., 2016) and in one study an inverse relationship between experience and perceived ability was reported (Cunningham et al., 2004).

Perceived reading-teaching ability specifically has not been studied in TSBVIs and there is limited research on their general teaching efficacy. The nonsignificant association of years of experience with perceived ability in the domain of literacy reported in many studies of general-education teachers was replicated for general teaching efficacy in a study of Ohio TSBVIs (n =
A recent study of TSBVIs who provide early-intervention services \((n = 109)\), however, found that confidence in vision-specific skills was positively correlated with years of experience working with infants and toddlers with visual impairments (Ely et al., 2020). Instruction appears to be an area in which TSBVIs confidence is weak: of the seven subareas of teaching efficacy examined by Yeremeyeva Henderson (2014), only Efficacy to Enlist Community Involvement ranked lower than Instructional Self-Efficacy. TSBVIs were more confident in their ability to influence decision-making, enlist parental involvement, create a positive school climate, understand their discipline, and influence school resources than they were in their ability to instruct students. TSBVIs efficacy has direct consequences for students with visual impairments, as TSBVIs with higher teaching efficacy are more likely to recommend a child with a visual impairment be placed at a local school rather than a special school (Kim & Corn, 1998). It should be noted, however, that general teaching efficacy and efficacy for literacy instruction are separate constructs that do not completely overlap (Tschannen-Moran & Johnson, 2011); thus, how TSBVIs perceive their ability to teach reading, and how this perceived ability might relate to their preparation to teach reading, their years of experience, or their linguistic awareness is unknown.

**The Need for Knowledge Calibration**

Human beings display overconfidence in their own knowledge and abilities in a multitude of domains—that is, they are unaware of what they know and do not know (e.g., Fischhoff, 1988; Kruger & Dunning, 1999; Stanovich, 1999). When actual and perceived knowledge are not well calibrated, individuals may make unwise or even harmful decisions (e.g., Lam & Feller, 2020; Motta et al., 2018). Likewise, when actual linguistic awareness and perceived ability
related to literacy instruction are misaligned, student reading achievement may be negatively affected. Piasta et al. (2009) found that the students of teachers with higher levels of linguistic awareness experienced greater word-reading gains with increased time spent on explicit instruction, whereas the students of teachers with lower levels of linguistic awareness experienced smaller word-reading gains with increased time spent on explicit instruction. This interaction of instructional time with student learning is concerning considering that teachers devote more time to subjects for which they have greater self-efficacy (e.g., Cantrell et al., 2003; Graham et al., 2001), and are unlikely to be receptive to professional developments or seek out new information relating to topics about which they already consider themselves to be knowledgeable (Cunningham et al., 2004, 2009).

Unfortunately, research on knowledge calibration amongst reading educators has indicated that discrimination—that is, an awareness of one’s own knowledge state—in this population tends to be poor. In the first study of teachers’ knowledge calibration for literacy teaching, Cunningham et al. (2004) surveyed teachers of grades kindergarten through three (n = 722) about their phonological awareness, understanding of phonics, and knowledge of children’s literature; the researchers then asked them to rate their knowledge in each domain as “no experience,” “minimal skills,” “proficient,” or “expert” and subsequently divided them into low perceived knowledge and high perceived knowledge groups based on their responses. Analyses revealed no difference in phonics understanding between the low-perceived-knowledge and high-perceived-knowledge groups, and a significant difference in phonological awareness between the groups such that teachers in the high-perceived-knowledge group had lower levels of phonological awareness than teachers in the low-perceived-knowledge group. Only in the domain of children’s literature was there a significant difference between the groups in the
intuitive direction: teachers in the high-perceived-knowledge group scored higher than teachers in the low-perceived-knowledge group on the children’s literature assessment. Also worrying was the finding that teachers with three or fewer years of teaching experience rated their abilities higher than teachers with 15 or more years of teaching experience, and teachers with emergency or intern teaching credentials rated their abilities higher than teachers with full and clear teaching credentials.

Since then, studies of knowledge calibration for literacy instruction among teachers have proliferated. They have overwhelmingly replicated the findings of Cunningham et al. (2004): confidence and competence for literacy instruction are not well calibrated. Many studies found no association of perceived reading-teaching ability with linguistic awareness (e.g., Barr et al., 2016; Bostock & Boon, 2012; Meeks & Kemp, 2017; Sharp et al., 2016). Others found an association of perceived reading-teaching ability with only a specific subcomponent of linguistic awareness (Cunningham et al., 2009, phonemic awareness; Spear-Swerling et al., 2005, phonemic awareness and phonics; Zhao et al., 2016, morphological awareness). In all these studies, teachers’ perceived ability was substantially higher than what was warranted by their knowledge, which was also true in two studies that reported a statistical relationship between perceived reading-teaching ability and linguistic awareness (Al-Hazza et al., 2008; Washburn et al., 2011b).

Overview of the Present Study

In the present study, we return to the results of the linguistic awareness survey administered by Authors (in third round of review) with a new focus. The instrument containing the survey included an item that probed TSBVIs’ self-perceptions of their ability to teach reading
and literacy skills to students with visual impairments, and here we examine how TSBVIs’ perceived reading-teaching ability is related to their linguistic awareness. Also, having established that years of experience and number of reading courses taken is not statistically significantly related to linguistic awareness in our sample of TSBVIs, we investigate whether these variables are associated with perceived reading-teaching ability. Our overarching interest is to determine whether knowledge for reading instruction is well calibrated in TSBVIs and the factors that play into that calibration. Our research questions are as follows:

Research Question 1: Is there a significant difference in the number of reading courses taken by TSBVIs with higher and lower perceived reading-teaching ability?

Research Question 2: Is there a significant difference in the years of experience of TSBVIs with higher and lower perceived reading-teaching ability?

Research Question 3: Is there a significant difference in the linguistic awareness of TSBVIs with higher and lower perceived reading-teaching ability?

Research Question 4: Is there a significant difference in the subcomponents of linguistic awareness of TSBVIs with higher and lower perceived reading-teaching ability?

Method

The instrument used in this investigation comprised five sections: (1) background and demographic questionnaire (12 items); (2) self-perception probes (2 items); (3) linguistic awareness survey (38 items); (4) dyslexia beliefs survey (16 items); and (5) open-ended questions (2 items). Data from sections (1), (2), and (3) are analyzed in the present study.
Participants and Procedure

Data were collected over a five-week period in the spring of 2020. Licensed or certified TSBVIs who were currently employed or had been employed within the last 18 months as a TSBVI at institutions across the United States and Puerto Rico were invited to participate in an online survey via direct email, social media platforms, and listservs for educators of individuals with visual impairments. Invitations to participate included a brief description of the project and a link to the instrument. The link connected respondents to the Qualtrics online survey platform, where informed consent was obtained before research items were presented. All data was collected anonymously so that responses could not be re-identified with the respondents. Nonrespondents were prompted via email, social media, or listserv to complete the survey one and two weeks after the initial posts. All consent forms, surveys, and related study materials were approved by a university Institutional Review Board.

Of the 363 respondents who began the instrument, 236 completed it through the Survey of Basic Language Constructs; the data of these 236 were included in analyses. There were two versions of the instrument, which differed only in aspects of user interface. One was designed for respondents with typical sight and contained visually complex matrices; the other was designed for respondents with visual impairments and was more compatible with screen readers. Of the 236 participants included in analyses, eight selected the accessible version of the survey. The mean time to complete the survey was 51 minutes. Participant background and demographic characteristics are given in Tables 1 and 2.
<table>
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<td><strong>Participant Characteristics for Categorical Background Variables</strong></td>
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<td>Master’s</td>
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<th>Employment Setting¹</th>
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<td>Resource Room Students’ Homes</td>
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<td>Other race or ethnicity</td>
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<td></td>
</tr>
<tr>
<td>Prefer not to respond</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Endorsements Other than TSVI¹</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Assistive Technology Instructional Specialist</td>
<td>5</td>
</tr>
<tr>
<td>Early Childhood Education</td>
<td>14</td>
</tr>
<tr>
<td>Early Childhood Special Education (other than TSVI)</td>
<td>20</td>
</tr>
<tr>
<td>Elementary Education</td>
<td>47</td>
</tr>
<tr>
<td>Cortical/Cerebral Visual Impairment</td>
<td>4</td>
</tr>
<tr>
<td>Deaf/deaf/Hard of Hearing</td>
<td>6</td>
</tr>
<tr>
<td>Middle-Level Education</td>
<td>22</td>
</tr>
<tr>
<td>Orientation and Mobility</td>
<td>45</td>
</tr>
<tr>
<td>Reading</td>
<td>19</td>
</tr>
<tr>
<td>Secondary Education</td>
<td>16</td>
</tr>
<tr>
<td>Special Education (other than TSVI)</td>
<td>61</td>
</tr>
<tr>
<td>Vision Rehabilitation Therapy</td>
<td>1</td>
</tr>
<tr>
<td>No additional certifications</td>
<td>21</td>
</tr>
<tr>
<td>Other</td>
<td>15</td>
</tr>
</tbody>
</table>

*Note: N = 236. TSVI = Teacher of Students with Visual Impairments. ¹ Respondents were able to select more than one option.*
In general, our sample was predominantly female (93.6%) and White (94.4%), and 85%
possessed a master’s or doctoral degree. Respondents held 1.94 accreditations in addition to their
TSBVI endorsement, on average, with the most common additional endorsements being general
Special Education, Elementary Education, and Orientation and Mobility. The majority (57.3%)
of respondents were employed as itinerant teachers for a school district or cooperative, and many
were employed in more than one role. Respondents had on average 13.79 ($SD = 10.29$) years of
experience working as a TSBVI, and worked with students across a broad age range, with the
mean age of the youngest student in their current caseload being 4.31 ($SD = 3.80$) and the mean
age of the oldest student in their current caseload being 16.78 ($SD = 4.8$).

Measures

Survey of Basic Language Constructs

We assessed linguistic awareness using the 38 knowledge and ability items from the
Survey of Basic Language Constructs (SBLC; Binks-Cantrell et al., 2012), which assesses
phonological awareness, phonemic awareness, morphological awareness, and understanding of

Table 2

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Years of Experience Working as a TSVI</td>
<td>13.79</td>
<td>10.30</td>
<td>0</td>
<td>46</td>
</tr>
<tr>
<td>Age of Youngest Student in Caseload</td>
<td>4.31</td>
<td>3.80</td>
<td>0</td>
<td>19</td>
</tr>
<tr>
<td>Age of Oldest Student in Caseload</td>
<td>16.78</td>
<td>4.80</td>
<td>1</td>
<td>22</td>
</tr>
</tbody>
</table>

phonics. The survey included 8 phonological awareness items, 13 phonemic awareness items, 8 morphological awareness items, and 9 phonics items. Twelve of these items assessed TSBVIs’ explicit knowledge of linguistic concepts (e.g., *A phoneme refers to*____), and 26 of them assessed implicit ability (e.g., *How many phonemes are in the word “box”?*). In some instances, an item was modified from the original (2012) version for clarity (e.g., *spinster* was replaced with *unicycle* in the syllable- and morpheme-counting sections, because we suspected the etymology of former would be too obscure for modern educators to parse). Cronbach’s alpha for the modified SBLC and its subsections were as follows: .88 (overall), .73 (knowledge), .85 (ability), .83 (phonological awareness), .80 (phonemic awareness), .80 (phonics understanding), and .89 (morphological awareness). Descriptive statistics for participants’ performance on the SBLC and its subcomponents are given in Table 3.

**Self-Perception Item**

TSBVIs were asked to respond to the question, “How would you evaluate your skill at teaching reading and literacy skills?” by selecting one of four choices: (1) minimal, (2) moderate, (3) very good, or (4) expert. Following Cunningham et al. (2004), two subgroups of teachers were identified. A *Lower Perceived Ability* subgroup (*n* = 126) represented those TSBVIs who responded that they were either minimally or moderately skilled at teaching reading and literacy skills. A *Higher Perceived Ability* subgroup (*n* = 110) represented those TSBVIs who responded that they were either very good or experts at teaching reading and literacy skills. TSBVIs were almost evenly split between those with lower (53%) and higher (47%) perceptions of their abilities. Perceived Reading-Teaching Ability was treated as a dichotomous variable in analyses.
Table 3

**Performance on the Survey of Basic Language Constructs (SBLC)**

<table>
<thead>
<tr>
<th>Survey Items</th>
<th>Mean Correct (Maximum)</th>
<th>Std. Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall Linguistic Awareness</td>
<td>24.71 (38)</td>
<td>5.79</td>
</tr>
<tr>
<td>Ability</td>
<td>18.28 (26)</td>
<td>3.99</td>
</tr>
<tr>
<td>Knowledge</td>
<td>6.42 (12)</td>
<td>2.69</td>
</tr>
<tr>
<td>Phonics</td>
<td>4.81 (9)</td>
<td>2.11</td>
</tr>
<tr>
<td>Morphological Awareness</td>
<td>4.59 (8)</td>
<td>2.24</td>
</tr>
<tr>
<td>Phonological Awareness</td>
<td>6.94 (8)</td>
<td>1.13</td>
</tr>
<tr>
<td>Phonemic Awareness</td>
<td>8.36 (13)</td>
<td>2.42</td>
</tr>
</tbody>
</table>

*Note. N = 236. Overall Linguistic Awareness comprises the entire SBLC. Ability and Knowledge items include a subset of items from each of the four linguistic categories.*

**Number-of-Reading-Courses Item**

TSBVIs were asked to respond to the question, “How many courses on teaching reading and literacy skills to students who are blind or visually impaired did you take during your teacher preparation?” by selecting one of six choices: 0, 1, 2, 3, 4, or 5+. To aggregate the data, four subgroups were identified: zero courses ($n = 38$), one course ($n = 93$), two courses ($n = 65$), and three or more courses ($n = 40$). Number of Reading Courses Taken was treated as a categorical variable in analyses.
Years-of-Experience Item

TSBVIs were asked to respond to the question, “How many years of experience do you have working as a TSBVI?” by selecting an integer between 1 and 75 or “less than one year.” Years of Experience was treated as a continuous variable in analyses.

Results

To address Research Question 1, a chi-square test was performed to compare respondents in the two perceived ability levels (Lower Perceived Ability and Higher Perceived Ability) in terms of the number of courses on teaching reading and literacy skills to students with visual impairments they reported taking during their teacher preparation. The findings indicated a significant association, $\chi(15) = 12.145, p = .007$, between the number of reading courses taken and their perceived ability to teach reading and literacy skills.

To determine differences among the subgroups, a chi-square post-hoc test was performed based on the adjusted standardized residuals to control for Type-I error. The results of this test are presented in Table 4. Based on this analysis, TSBVIs’ self-perceived ability differed significantly only after taking three or more reading courses.

To address Research Question 2, an independent-samples t test was conducted to determine whether a statistically significant difference existed in the years of experience of TSBVIs between the Lower Perceived Ability ($M = 13.02, SD = 9.92$) and Higher Perceived Ability ($M = 14.67, SD = 10.59$) subgroups. The analysis found no significant relation of perceived reading-teaching ability with years of experience ($t [234] = 1.235, p = .21$, Cohen’s $d = 0.16$).
Table 4

Chi Square Results for Perceived Reading-Teaching Ability and Number of Reading Courses Taken

<table>
<thead>
<tr>
<th>Number of Reading Courses Taken</th>
<th>$\chi^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>.36 ($p = .55$)</td>
</tr>
<tr>
<td>1</td>
<td>4.84 ($p = .03$)</td>
</tr>
<tr>
<td>2</td>
<td>.04 ($p = .84$)</td>
</tr>
<tr>
<td>3+</td>
<td><strong>10.89 ($p &lt; .001$)</strong></td>
</tr>
</tbody>
</table>

*Note. N = 236. Significant chi-square value based on adjusted alpha of $p < .006$ in bold.*

To address Research Question 3, an independent-samples $t$ test was conducted to determine whether a statistically significant difference existed in the overall score on the modified SBLC between the Higher Perceived Ability ($M = 25.89$, $SD = 6.09$, 68.13% accuracy) and Lower Perceived Ability ($M = 23.67$, $SD = 5.32$, 62.29% accuracy) subgroups. A statistically significant difference was found ($t[234] = 2.983$, $p = .003$) with a modest effect size of 0.38 (Cohen’s $d$), indicating that TSBVIs who perceived themselves to be very good or experts at teaching reading and literacy skills had reliably greater linguistic awareness than TSBVIs who perceived themselves to be minimally or moderately skilled at teaching reading and literacy skills.

To determine if TSBVIs’ perception of their ability to teach reading and literacy skills was related to the individual subcomponents of linguistic awareness assessed by the SBLC, a one-way MANOVA was conducted with perceived reading-teaching ability (Higher Perceived Ability, Lower Perceived Ability) as the grouping variable and scores on the phonological
awareness, phonemic awareness, morphological awareness, and phonics subcomponents of the SBLC as the outcome variables. These four variables are combining as a latent composite outcome variable (or the dependent variable, which will be called linguistic awareness. The overall MANOVA demonstrated a statistically significant between-groups difference, Wilks’s lambda = .008, \( F(4, 231) = 3.55, p < .05, \) partial \( \eta^2 = .05. \) Follow-up tests were conducted using the Bonferroni correction for Type I error (Tabachnick & Fidell, 1996). According to this standard, the effects of morphological awareness and phonics were significant \( (ps < .001). \)

TSBVIs in the Higher Perceived Ability subgroup answered a mean of 5.03 \( (SD = 2.18) \) out of eight items correctly on the morphological awareness subcomponent and a mean of 5.29 \( (SD = 2.04) \) out of nine items correctly on the phonics subcomponent. TSBVIs in the Lower Perceived Ability subgroup answered a mean of 4.21 \( (SD = 2.23) \) out of eight items correctly on the morphological awareness subcomponent and a mean of 4.40 \( (SD = 2.08) \) out of nine items correctly on the phonics subcomponent.

**Discussion**

In this study we examined whether knowledge for evidence-based reading instruction is well calibrated in TSBVIs, as well as the potential factors that might affect TSBVIs’ perceptions of their ability to teach reading and literacy skills to students with visual impairments. Because effective reading instruction requires advanced linguistic awareness on the part of teachers, well-calibrated teachers have an accurate understanding of what they know and do not know with respect to linguistic awareness. That is, they consider themselves “very good” or “expert” at teaching reading when their knowledge of morphological awareness, phonological awareness, phonemic awareness, and phonics is advanced, and consider themselves “minimally” or
“moderately” skilled at teaching reading when their knowledge of these aspects of linguistic awareness is lower. The TSBVIs in our sample were somewhat calibrated in their knowledge, in that those who perceived themselves to be very good or experts at teaching reading had reliably higher levels of linguistic awareness than those who perceived themselves to be minimally or moderately skilled at teaching reading. However, the Higher-Perceived-Ability subgroup, who averaged 68.13% on the SBLC, had higher confidence in their abilities than is warranted by their demonstrated linguistic awareness.

Moreover, although TSBVIs with Higher Perceived Ability for teaching reading had a higher mean score on the overall linguistic awareness measure than TSBVIs with Lower Perceived Ability, there was no difference between these groups on the measures of phonological awareness and phonemic awareness. For these subcomponents of linguistic awareness, competence and confidence were poorly calibrated: TSBVIs who perceived themselves as skilled reading teachers had no more knowledge of phonology/phonemes than TSBVIs who perceived themselves as less skilled at teaching reading (and vice versa). This non-relation mirrors what many past studies have found: a discrepancy between confidence and competence for teaching reading (e.g., Al-Hazza et al., 2008; Barr et al., 2016; Bostock & Boon, 2012; Cunningham et al., 2004; Meeks & Kemp, 2017; Sharp et al., 2016; Spear-Swerling et al., 2005; Washburn et al., 2011b). The relation of overall linguistic awareness with perceived reading-teaching ability was driven by the morphological awareness and phonics subcomponents of linguistic awareness: TSBVIs who demonstrated greater knowledge of morphology and phonics rated themselves as more skilled at teaching reading than TSBVIs who demonstrated less knowledge of morphology and phonics. Despite this association, self-perceptions of reading-teaching ability (“very good” or “expert”) among our Higher-Perceived-Ability subgroup was arguably greater than what was
warranted by their level of knowledge in these domains, given that their mean percent accuracy to morphological awareness (62.88%) and phonics (58.78%) items falls below the average score needed to pass most undergraduate teacher preparation courses.

In finding that morphological awareness and phonics were related to perceived reading-teaching ability in TSBVIs, we replicated the findings of two previous studies that looked at associations of the SBLC with ratings of teachers’ self-perceived reading-teaching ability. Washburn et al. (2011b) reported that phonics was the only area in which elementary preservice teachers were well calibrated, and Zhao et al. (2016) reported that morphological awareness was the only significant predictor of self-perceived reading-teaching ability in Chinese teachers of English as a foreign language. It is interesting that morphological and phonics awareness, which tend to be areas of weakness for educators, should track teachers’ perceived ability more closely than phonological and phonemic awareness, which are areas of relative strength. Because educators know relatively little about morphology and phonics, they might devalue them in terms of their importance for teaching reading and literacy skills. These domains appear not to figure into TSBVI self-assessments of reading-teaching ability until some degree of competency in them has been achieved—i.e., when they become aware of what they do not know. Conversely, teachers who have knowledge of the most difficult aspects of linguistic awareness feel more confident in their ability to teach children to read.

Like the authors of many previous studies (Ciampa & Gallagher, 2018; Clark, 2016; Feng et al., 2019; Helfrich & Clark, 2016; Maloch et al., 2003; Washburn & Mulcahy, 2020), we found a significant relation between number of reading courses taken with respondents’ perceived reading-teaching ability. However, we are the first researchers investigating perceived reading-teaching ability who assessed linguistic awareness in their sample and so can speak to
the accuracy of our participants’ self-assessments. Authors (in third round of review) conducted a one-way ANOVA in this sample with number of courses taken as the grouping variable and overall score on the SBLC as the outcome variable and did not find a statistically significant relation between the variables \( F = .456, p = .81 \). In short, the confidence in their reading-teaching ability of TSBVIs who took more reading courses is unfounded. Prior researchers, noting the positive correlates of self-efficacy (e.g., Zee & Koomen, 2016), have interpreted the relationship between reading coursework and perceived reading-teaching ability as a basis for recommending that teacher education programs encourage more teacher candidates to take reading coursework, and that prospective teachers seek out teacher preparation programs with reading coursework (e.g., Feng et al., 2019). In light of our findings, those recommendations should be tempered. We agree that preservice teachers, general education and special education alike, need more linguistic awareness training before entering the classroom. However, existing reading courses offered by teacher preparation programs do not seem to reliably provide that training, and in fact seem to instill a false sense of preparedness in their students.

Finally, we observed what has been reported in many past studies regarding the relationship between years of teaching experience and perceived reading-teaching ability: one was not related to the other (Ciampa & Gallagher, 2018; Clark, 2016; Sharp et al., 2016; Tschannen-Moran & Johnson, 2011; Zhao et al., 2016). Although the failure of perceived ability to increase over time may seem puzzling at first, Zhao et al. (2016) point out that it is understandable given the tendency of less-experienced teachers to overestimate their abilities (e.g., Ciampa & Gallagher, 2018, 2021; Clark, 2016; Cunningham et al., 2004; Sharp et al., 2016; Washburn et al., 2011b). As years pass and teachers come to appreciate the complexity of
their chosen profession, they appear to correct for the overly generous assessments of their skills they made as novices (Hoy & Spero, 2005).

Our results indicate that, in assessing their reading-teaching ability, TSBVIs either believe their linguistic awareness is higher than it is or believe that other factors are more important for teaching reading than linguistic awareness. This latter interpretation is consistent with the findings of Zhao et al. (2016), who found that linguistic awareness accounted for only 7-10% of the variance in perceived reading-teaching ability in their sample of Chinese teachers of English as a foreign language. They noted that “teachers’ perceptions of their teaching abilities are also influenced by their pedagogical content knowledge and many other contextual factors” (Zhao et al., 2016, p. 142). TSBVIs’ perceptions of their ability to teach reading may be colored, for example, by their skill at determining a student’s appropriate literacy medium (i.e., print, braille, or auditory), their facility with assistive technologies, their knowledge of the braille code, and their ability to foster tactile discrimination and finger sensitivity in their students. We do not dispute the importance of these skills for ensuring that students with visual impairments receive quality literacy instruction. Rather, we encourage TSBVIs to weight the content of reading instruction at least as heavily as the context.

Limitations

Several limitations of the present study should be acknowledged. First, there was considerable attrition of respondents: of the 363 TSBVIs who began the instrument, only 236, or 65%, completed it through the Survey of Basic Language Constructs. We cannot rule out the possibility of similarities regarding perceived abilities or linguistic awareness among TSBVIs who did not complete the survey. For instance, those who found the linguistic awareness items
particularly challenging may not have persisted, which would have skewed the SBLC results in a positive direction. Second, choices we made in the phrasing of certain questions could have affected the way participants responded to them. For instance, we asked TSBVIs to evaluate their skill at teaching reading and literacy skills because many TSBVIs have prereaders on their caseloads for whom “literacy instruction” may consist of developing tactile discrimination. This phrasing may have caused TSBVIs to weight such non-linguistic skills more highly when rating their abilities. Similarly, we asked respondents specifically about reading courses they took on teaching reading and literacy skills to students with visual impairments, which means the total number of reading courses taken by our participants may be underrepresented in this paper. We also asked participants how many years of experience they had working as a TSBVI, so years of teaching experience in another capacity would not be reflected in our data.

Additionally, the present study assessed TSBVIs’ perception of their ability to teach reading and literacy skills with a single question, whereas previous studies have tended to question participants about their perceived abilities in different subcomponents of linguistic awareness independently (e.g., Al-Hazza et al., 2008; Barr et al., 2016; Bostock & Boon, 2012; Cunningham et al., 2004; Meeks & Kemp, 2017; Spear-Swerling et al., 2005; Washburn et al., 2011b). We are thus unable to speak to the specific aspects of linguistic awareness in which TSVIs have more and less confidence in their abilities. Future research might include separate self-perception questions for the different subcomponents of linguistic awareness, or use a more complex instrument, such as Tschannen-Moran and Johnson’s (2011) Teachers’ Sense of Efficacy for Literacy Instruction Scale to provide a more complex view of TSBVIs’ perceptions of their abilities in this domain.
Future Directions

Future research should further investigate whence TSVIs derive their sense of efficacy for teaching reading to students with visual impairments beyond the number of reading courses they took in their teacher-preparation programs. This aim might be best accomplished through a qualitative research approach such as semi-structured interviews. A more complete understanding of what instills confidence in TSBVIs to provide their students with evidence-based reading instruction will inform future decisions about preservice training and professional developments for TSBVIs and will ultimately benefit the students themselves.
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Northern Illinois University Department of Special and Early Education. (2020, December 2). *Special education: Visual disabilities program (M.S.Ed.*). https://www.cedu.niu.edu/seed/graduate-programs/masters-visual-disabilities.shtml


STUDY THREE

COGNITIVE AND METACOGNITIVE COMPETENCE TO IDENTIFY AND SUPPORT STUDENTS WITH READING DISABILITIES AMONG TEACHERS OF STUDENTS WHO ARE BLIND OR VISUALLY IMPAIRED

Abstract

The purpose of this quantitative study was to assess the perceived ability of teachers of students with blindness and visual impairments (TSBVIs) to identify and support students with reading disabilities and determine whether these perceptions are related to TSBVIs’ training, teaching experience, or dyslexia beliefs. Two hundred and thirty-six TSBVIs in the United States were surveyed for self-reports of their metacognitive competence (minimal, moderate, very good, excellent) to identify and support students with or at-risk for reading disabilities. No statistically significant relationship between TSBVIs’ number of reading-teaching courses taken or years of experience in the field and self-perceptions of ability to identify and support students with visual impairments was found. Additionally, no statistically significant association of TSBVIs’ accuracy of dyslexia beliefs with self-perceptions of ability to identify and support students with or at-risk for a reading disability was found.
Study Rationale

Students with visual impairments often read below grade level (Emerson, Holbrook, & D’Andrea, 2009), but understanding reading processes and disorders in students with blindness and visual impairments is a perennial challenge. There is evidence that when visual disabilities and learning disabilities coexist, one (typically the learning disability) goes unidentified or misidentified (Erin & Koenig, 1997; Layton & Lock, 2001). To provide evidence-based instruction to students with visual impairments and to deliver appropriate interventions (Jones et al., 2015), students must first be identified. Several factors contribute to the under-identification or misidentification of reading disabilities in students with visual impairments: one potential cause that has not been investigated is teachers’ metacognitive competence, or their perceived ability to identify and support students with visual impairments with or at-risk for a reading disability.

Human beings are often overconfident about their knowledge and expertise in many areas—in other words, they are often not cognizant of what they know and what they do not know. Research has reported a miscalibration of actual and perceived knowledge across a variety of domains (e.g., Fischhoff, 1988; Kruger & Dunning, 1999; Stanovich, 1999), including literacy instruction (Cunningham et al., 2009). When actual and perceived knowledge are not well calibrated, individuals may make unwise or even harmful decisions (e.g., Lam & Feller, 2020; Motta et al., 2018). Teachers of blind or visually impaired children who have a poor understanding of dyslexia yet perceive themselves to be skilled at identifying and remediating reading disabilities among their students, may overlook or misidentify reading difficulties or employ ineffective or counterproductive instructional techniques. Therefore, in this study we set out to explore whether perceived ability to help students with dyslexia and knowledge of
Research Question

The overarching research question guiding this study was:

_Are TSBVIs’ self-perceptions of their ability to identify and support students with visual impairments who have reading disabilities related to their dyslexia beliefs, years of experience working as a TSBVI, or number of reading courses taken?_

The sub-questions that guided the study are as follows:

1. How do teachers of students with visual impairments perceive their ability to identify and support students with or at-risk for a reading disability?

2. Are there significant differences in number of reading courses taken between TSBVIs who perceive their ability to identify and support students with or at-risk for a reading disability to be minimal, moderate, very good, and expert?

3. Are there significant differences in years of experience between TSBVIs who perceive their ability to identify and support students with or at-risk for a reading disability to be minimal, moderate, very good, and expert?

4. Are there significant differences in accuracy of dyslexia beliefs between TSBVIs who perceive their ability to identify and support students with or at-risk for a reading disability to be minimal, moderate, very good, and expert?
Methods and Instrumentation

Licensed or certified TSBVI\(s\) (\(N = 236\)) in the United States and Puerto Rico participated in a survey that investigated this question. The survey included questions about TSBVI\’s self-perceived ability to identify and support students with or at-risk for reading disabilities. It also included questions regarding participants\’ training and experience, and an assessment of the accuracy of their dyslexia beliefs using a modified version of the Dyslexia Beliefs Index (DBI) (Wadlington & Wadlington, 2005; Washburn et al., 2014).

Self-Perception Item

TSBVIs were asked to respond to the question, \textit{How do you perceive your ability to identify and support students with or at-risk for a reading disability?} Results showed that 11.86\% of the respondents indicated that their ability to identify and support students with or at-risk for a reading disability was “minimal,” 41.53\% of respondents indicated that their ability was “moderate,” 41.95\% of respondents indicated that their ability was “very good,” and 4.66\% of respondents indicated that their ability was “expert.”

Number-of-Reading-Courses Item

TSBVIs were asked to respond to the question, “How many courses on teaching reading and literacy skills to students who are blind or visually impaired did you take during your teacher preparation?” by selecting one of six choices: 0, 1, 2, 3, 4, or 5+.

Years-of-Experience Item

TSBVIs were asked to respond to the question, “How many years of experience do you
have working as a TSBVI?” by selecting an integer between 1 and 75 or “less than one year.”

Results

A chi-square analysis indicated no statistically significant association \[\chi(15) = 22.14, p = .104\] between the number of courses taken on teaching reading and literacy skills to children with blindness and visual impairments and participants’ perceived ability to identify and support students with or at-risk for a reading disability. A one-way analysis of variance (ANOVA) was conducted with perception of ability to identify and support students with or at-risk for a reading disability (minimal, moderate, very good, and expert) as the grouping variable and years of experience as the outcome variable. The findings revealed no statistically significant relation between the means \(F = 1.76, p = .16\), indicating that there is not a statistically significant association between years of experience and perception of ability to identify and support students with or at-risk for a reading disability.

A one-way ANOVA was also conducted with perception of ability to identify and support students with or at-risk for a reading disability (minimal, moderate, very good, and expert) as the grouping variable and the overall score on DBI as the outcome variable. The findings revealed no statistically significant relation between the means \(F = 1.65, p = .18\), indicating that there is not a statistically significant association of accuracy of dyslexia beliefs with perceived ability level among TSBVIs.

To determine if TSBVIs’ perception of their abilities to identify and support students with or at-risk for a reading disability was related to misconceptions that dyslexia is related to problems with vision, a one-way ANOVA was conducted with the perception of ability to
identify and support students with or at-risk for a reading disability (*minimal, moderate, very good, and expert*) as the grouping variable and total score on the four questions of the survey of dyslexia beliefs that address the misconception that dyslexia is related to problems with vision as the outcome variable. The findings revealed no statistically significant relation between the means ($F = .69, p = .56$), indicating that there are no statistically significant association of self-perceived ability to identify and support students with or at risk for a reading disability with subscription to the misconception that dyslexia is related to problems with vision among TSBVIs. See Figure 1.

Figure 1. Perceived reading-teaching ability of participants.
Conclusions and Implications

Teachers’ knowledge calibration plays a vital role in pedagogical approaches to reading curricula (Cunningham et al., 2004) and has important implications for students’ learning outcomes. This study has reported that TSBVIs’ self-perceptions of their ability to identify and support children with visual impairments who have reading disabilities is not aligned with the accuracy of the self-perceived ability and unrelated to their training, experience, and accuracy of dyslexia belief variables. TSBVIs in our exhibit an accurate self-perception of their abilities to identify and support students with visual impairments with or at-risk for reading disabilities. Presumably, their repeated encounters with students whose reading difficulties are unrelated to their visual difficulties convince TSBVIs of the language-based nature of dyslexia. This study lays the foundation to investigate further variables that might lead to determination of factors that instill an accurate sense of their preparedness.
References

Authors (in third round of review). [Details blinded to maintain integrity of the review process].


