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Educator Knowledge and Perception of Dyslexia in Eastern Idaho: A Survey Study

By

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Educator Knowledge and Perception of Dyslexia in Eastern Idaho: A Survey Study

Thesis Abstract – Idaho State University (2022)

The purpose of this study was to explore the attitudes about and knowledge of dyslexia in primary and secondary school educators (general education teachers, special education teachers, counselors, school psychologists, speech-language pathologists, social workers, and administrators) in Eastern Idaho via survey methodology. A survey was adapted from the Dyslexia Belief Index (DBI) created by Wadlington & Wadlington (2005) and distributed by email to 380 administrators and 5,173 other individuals employed within school districts in Eastern Idaho (Regions 4, 5, and 6), with 659 responses received. The questions fell within the broad categories of “attitudes,” “behavior,” “cognition,” “language and literacy,” and “misconceptions” related to dyslexia. Demographic data are reported and associations made between respondents’ current job classification and self-reported attitudes about and knowledge of dyslexia. Overall, attitudes towards dyslexia were positive across groups. General education teachers were more likely than other educators and administrators to not know whether statements about dyslexia were true or false. Special education teachers, counselors, school psychologists, speech-language pathologists, and social workers demonstrated the most accurate knowledge of dyslexia, despite misconceptions and gaps in knowledge observed across job classifications. Implications, limitations, and future directions are discussed.

Keywords: dyslexia, reading, Idaho, knowledge, misconceptions, attitudes, public school, special education, speech-language pathology

Introduction

Illiteracy and low reading skills are a national problem that must be addressed in order to better serve children who are being educated in public schools. This is evidenced by the fact that 63% of fourth grade students and 64% of eighth-grade students consistently demonstrated a lack of age-appropriate reading proficiency on the National Assessment of Educational Progress (NAEP) reading achievement test in 2017 (NAEP, 2017).

Dyslexia affects 5 to 17% of school-age children in the United States, 15 to 20% of the general population, and at least 80% of individuals with learning disabilities (Shaywitz & Shaywitz, 2003; Washburn et al., 2011). Dyslexia has been defined as a developmental linguistic (not visual) deficit in reading for children or adults who have otherwise normal cognitive abilities, motivation to read, and access to effective reading instruction (Shaywitz & Shaywitz, 2003). Children who are suspected of having a learning disability benefit from early identification of the disorder and are typically referred by parents and/or general educators (Christopoulos & Kean, 2020). Unfortunately, children with dyslexia frequently go unnoticed by teachers as their average, or above average cognitive abilities and self-implemented compensatory strategies often disguise the need for intervention until they need to read to learn (around 3rd grade), at which point they fall substantially behind their peers (Washburn et al., 2017).

The provision of better reading education is critical and is perhaps best explained by the old parable, “If you give a man a fish, you feed him for a day. If you teach a man to fish, you feed him for a lifetime.” Appropriate reading skills are not only important during the school years, but also throughout an individual’s life. Students struggling to read are more likely than their peers to drop out of high school, abuse drugs and alcohol, experience the criminal justice

system, and later live in poverty (Hanford, 2017). An astounding 80% of prison inmates are documented to be functionally illiterate, implying that there may be a relationship between incarceration and poor reading abilities. Moody et al. (2000) conducted a cross-sectional study of Texas inmates examining single word decoding abilities (a main feature of dyslexia). Of inmates studied, 47.8% were found to be deficient in word attack skills, while almost two thirds of inmates studied attained low scores on the reading comprehension measure that was administered, further supporting the idea that poor reading abilities may be a predictive factor for incarceration (Moody et al., 2000). It follows that in order to provide students with greater opportunity for brighter futures, we must emphasize the early identification of children struggling with reading and teach them using appropriate evidence-based reading instruction.

Defining Dyslexia

Ambiguity surrounding how best to define dyslexia is perhaps a contributing factor leading to confusion about what dyslexia truly is and how to identify and provide appropriate intervention for students with dyslexia. Variability in defining dyslexia is prevalent throughout the literature, but for the purposes of the present study, we have adopted the International Dyslexia Association's (IDA's) definition (Lyon et al., 2003, p. 2), with operational definitions for several terms to follow:

“Dyslexia is a **specific learning disability** that is **neurobiological in origin**. It is characterized by difficulties with accurate and/or fluent **word recognition** and by poor **spelling** and **decoding** abilities. These difficulties typically result from a deficit in the **phonological component of language** that is often unexpected in relation to **other cognitive abilities** and the provision of **effective classroom instruction**. Secondary consequences may include problems in **reading**

comprehension and reduced **reading experience** that can impede growth of **vocabulary** and **background knowledge**.”

A specific learning disability is a neurodevelopmental disorder which affects performance in math, writing, or reading and begins during the school-age years. Specific learning disabilities occur in the absence of intellectual disability and auditory or visual problems, and usually persist into adulthood. In order to qualify as a specific learning disability, proper instruction and fluency in the language of instruction are present (IDA, 2012). Dyslexia is an example of a specific learning disability.

Neurobiological in origin indicates the disability is caused by the physiology of an individual’s brain.

Word recognition is the ability of an individual to correctly identify written words, pairing them with their mental representations and meanings. Decoding skill (see definition below) is required for word recognition to take place. For example, an individual who knows the technical definition of the spoken word “ambivalent” will not be able to utilize that knowledge until they can decode and recognize the printed word. This often may result in individuals with dyslexia appearing not to know the meanings of words that are in fact within their lexicon (Shaywitz & Shaywitz, 2003).

Spelling is the ability to form words from letters.

Decoding is a process necessary for reading which involves the knowledge of how speech sounds (phonemes) are represented by letters (graphemes) and is necessary in order for the reader to recognize words on a printed page. In the Simple View of Reading (expanded upon below), decoding is considered to be the “ability to rapidly derive a representation from printed input that allows access to the appropriate entry in the mental

lexicon, and thus, the retrieval of semantic information at the word level” (Hoover & Gough, 1990, p. 130). Readers with dyslexia experience deficits in their ability to break words into their “underlying phonologic elements...[resulting in] difficulty in decoding and identifying the printed word” (Shaywitz & Shaywitz, 2003, p. 148).

The *phonological component of language* is the sound system of language. Every language has a series of sounds that can be combined to create meaningful words. In General American English for example, the letter “p” represents the phoneme, or sound /p/, which is produced by temporarily closing and then rapidly opening the lips while speaking without producing voicing.

Other cognitive abilities refer to intelligence quotient (IQ). Dyslexia is not dependent upon or resulting from deficient IQ (Tanaka et al., 2008).

Effective classroom instruction implies that the nature of the disability may not have its roots in inadequate instruction. For example, a child whose poor reading skill is determined to be a result of inappropriate reading instruction, such as no direct reading instruction, would not be considered to have dyslexia.

Reading comprehension is the reader’s ability to understand written words and requires pulling together both decoding skill and word recognition skill (Shaywitz & Shaywitz, 2003). It is being able to identify the who, what, when, where, and why of a text.

Vocabulary, also referred to as an individual’s *lexicon*, references the body of words that an individual understands (Merriam-Webster, 2021). For example, a toddler would likely have a smaller vocabulary than a 5-year-old, and a 5-year-old would likely have a smaller vocabulary than a 10-year-old.

And finally, based on the context in which the terms are used in the IDA definition of dyslexia, *reading experience* refers to the variety of reading activity that an individual has participated in, while *background knowledge* refers to prior knowledge that an individual may draw upon when reading. Background knowledge may be gained through reading experience, as well as classroom lessons and general life experience, among other things.

To add to this definition and the concepts therein, dyslexia has also been shown to be familial and heritable, which is knowledge that may aid in the proactive identification of individuals with dyslexia (Shaywitz & Shaywitz, 2003).

Misconceptions

Research suggests that there are a number of misconceptions related to dyslexia. In the past, many have thought that, given time, individuals with reading difficulty/dyslexia may grow out of it. However, dyslexia is a life-long condition that cannot be cured (International Dyslexia Association Ontario Branch, 2021). While this reality may seem grim, research shows that the earlier dyslexia is addressed, the better a child's overall academic success (Siegel, 2006).

Teachers, specifically, have been documented in past studies regarding teacher knowledge/attitudes to hold misconceptions about dyslexia, including that it is caused by a visual impairment, that colored overlays would help individuals with dyslexia, and that word/letter reversal when reading and writing is the main criterion for identifying the disorder (Washburn et al., 2017). Colored overlays are a controversial form of treatment for dyslexia, as there is little empirical evidence supporting their efficacy. Henderson et al. (2013) found that use of colored overlays did not significantly improve reading rate or comprehension for individuals with or without dyslexia. The use of such visual reading aids may even delay needed intervention for

students with dyslexia who are struggling to read, as their instructors may think that they have sufficiently addressed the issue by implementing ineffective compensatory strategies (Sjoblum et al., 2016). Further, contrary to popular belief, individuals with dyslexia do not *see* words and letters backwards – the source of the disability is linguistic, rather than visual. In other words, these individuals may have trouble naming letters, not visually perceiving them. Word and letter reversal in children with dyslexia does happen, however it is the result of a linguistic deficit, not a visual deficit, and is not the primary criterion for a diagnosis of dyslexia. In fact, word and letter reversals are common in all children learning to write/read.

In contrast to these misconceptions, Shaywitz and Shaywitz (2003) report “slow and laborious” reading and writing as the most telling symptom of a reading disorder in an otherwise high-achieving student. They indicate that “failure either to recognize or to measure the lack of automaticity in reading is perhaps the most common error in the diagnosis of dyslexia in older children” (p. 150). Additionally, dyslexia is also characterized by phonologically based language deficits and poor spelling (Shaywitz & Shaywitz, 2003). Phonologically based language deficits may present as abnormal difficulty with phonological and phonemic awareness tasks, such as rhyming, phoneme segmentation, and phoneme manipulation. Additionally, although dyslexia is commonly thought to affect boys more than girls, it actually affects them at comparable rates (Shaywitz & Shaywitz, 2003).

A prevalent misconception held by many educated individuals both in and outside of the school system is that individuals with dyslexia have difficulty reading due to a low IQ (Alexander-Pass, 2015; Shaywitz & Shaywitz, 2003). While research has shown that this belief is untrue, deficits in overall IQ *have* occurred as a result of how children with dyslexia learn new information (Ferrer et al., 2010). With some unpacking of this evidence, however, it becomes

clear that performance on IQ tests by children with dyslexia may be influenced by the fact that intelligence tests often rely on skills that reading and literacy are foundational to. Thus, dyslexia is not caused by a low IQ, but IQ may be negatively influenced by dyslexia. Contrary to the widely held belief that dyslexia is caused by a low IQ, cognition is often noted as a strength of individuals with dyslexia throughout the literature defining the learning disability. Individuals with dyslexia frequently demonstrate intellectual strengths in cognitive domains that are not heavily reliant on reading, such as mathematics (Miciak & Fletcher, 2020).

Preparation of Educators

Although it is estimated that somewhere between 5 and 17% of children in the United States have dyslexia, only 4.5% of students in United States public schools are diagnosed with a specific learning disability (SLD), an umbrella term which includes dyslexia, among other learning disabilities, indicating that students with dyslexia are going under-identified at alarming rates (Hanford, 2017; Lakshmi et al., 2019; Shaywitz & Shaywitz, 2003). Additionally, most students who are diagnosed with dyslexia are not identified until third grade at the earliest (Hanford, 2017). Considering the important role that educators should play in the identification of students with dyslexia, it is necessary to consider whether educators are sufficiently prepared to teach reading. In a study conducted in 2009, Joshi et al. examined reading content presented in textbooks used in teacher education courses to determine whether they conformed to the instructional recommendations set forth by the National Reading Panel. They analyzed texts based on their inclusion of the five components of reading, which are phonemic awareness, phonics, fluency, vocabulary, and text comprehension.

The first component of reading, *phonemic awareness* (PA) refers to awareness of individual sounds (phonemes) in a language and their relationship to other sounds in words or

syllables. Phonemic awareness includes “the ability to focus on and manipulate phonemes in spoken words,” which is assessed by tasks such as phoneme isolation, identification, blending, segmenting, counting, and manipulation (National Reading Panel, 2000). Phoneme isolation tasks require the student to recognize an individual sound in a word, for example, “What is the last sound in the word cat?” (/t/). Phoneme identification tasks require the student to detect the sound that different words have in common, for example, “What sound is the same in cat, car, and cape?” (/k/). Phoneme blending tasks require the student to put a series of individual sounds together into a word, for example, “What word do the sounds /d/ /ε/ /s/ /k/ make?” (“desk”). Phoneme segmentation tasks require the student to separate a word into individual sounds, for example, “What sounds are in the word kite?” (/k/ /aɪ/ /t/). Phoneme counting tasks require the student to identify how many sounds are present in a given word, for example, “How many sounds are in the word chip?” (3: /tʃ/ /ɪ/ /p/). Phoneme manipulation tasks require the student to move sounds around in a word, for example, “What word can you make if you move the first sound in the word zoo to the end of the word?” (“ooze”).

The next component of reading, *phonics*, is the relationship between the way a word is spelled and the way a word is pronounced, that is, how patterns and sets of letters (graphemes) are converted into sound (phoneme) patterns and sets in a language. Students may be taught rules of phonics which will assist in the progression of their reading skill. For example, the digraph (grapheme pair) “ph” is pronounced as the phoneme /f/, and the digraph “gh” is silent as in the words right, light, and taught. Some phonemic awareness skill is required before a student may begin to benefit from phonics instruction.

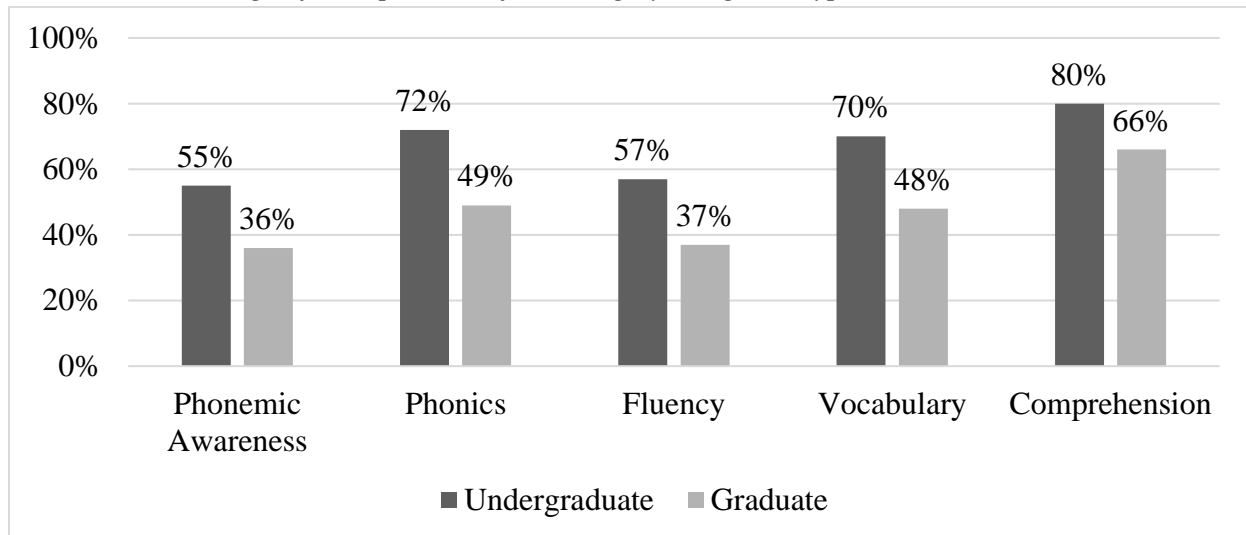
Fluency refers to the ability to “read text with speed, accuracy, and proper expression” (National Reading Panel, 2000). If children cannot decode sounds in words (phonemic

awareness) and recognize the relationship between graphemes and phonemes (phonics), their reading fluency will be severely hampered. Lack of fluency would express itself as slow and laborious reading, as opposed to the expected smooth and relatively effortless reading. And further, lack of fluency would negatively impact a child's ability to learn new vocabulary and access text at the level of comprehending what is read, with *vocabulary* being the stored body of words that we understand (Merriam-Webster, 2021) and *reading comprehension* being the meaning that we glean from a passage of written text. According to the National Reading Panel (2000), text comprehension is "a cognitive process that integrates complex skills and cannot be understood without [consideration of] ...vocabulary learning and instruction" (p. 4-1). Further, text comprehension occurs as a result of an interaction between the words on the page and the reader's interpretation of them based on their knowledge and experience (National Reading Panel, 2000).

Joshi et al. (2009) found that only 10 out of the 17 commonly used textbooks in teacher education programs analyzed included all five components of reading (phonemic awareness, phonics, fluency, vocabulary, and text comprehension) and defined them accurately. Further, in 2020, the National Council on Teacher Quality reviewed 775 undergraduate teacher preparation programs and 272 graduate teacher preparation programs. They found that a mere 26% of all programs adequately addressed all five components of reading within their curriculum, with 29% of undergraduate programs addressing all five, and only 17% of graduate programs addressing all five (see Figure 1 for breakdown of data; National Council on Teacher Quality, 2020). These findings raise significant concerns about whether educational institutions are providing preservice teachers with adequate knowledge of how to teach reading and identify struggling readers who require additional support.

Figure 1

Curricular Coverage of Components of Reading by Program Type



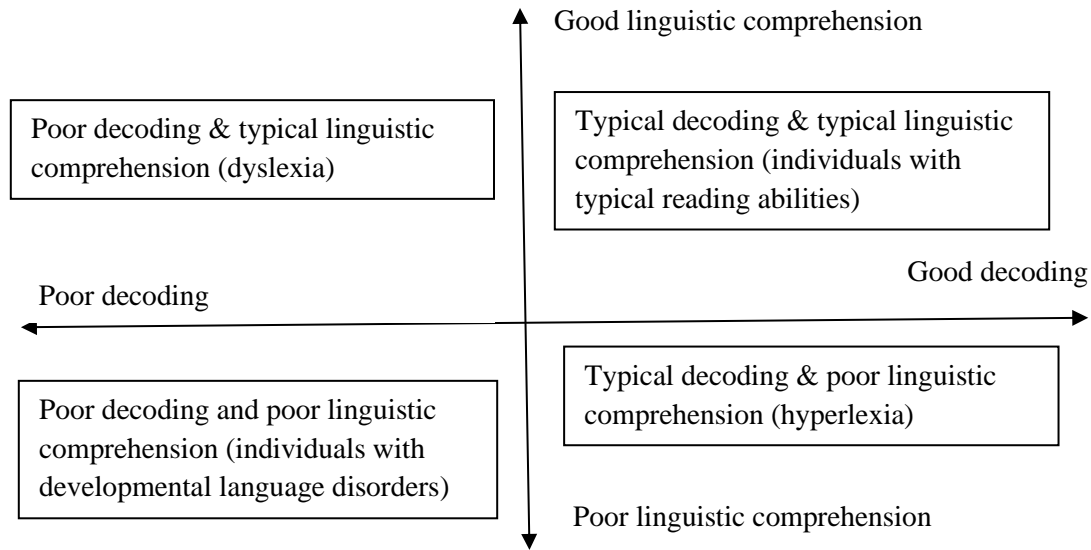
Note. Breakdown of percentage of teacher preparation programs that address each of the five components of reading, compared by program type. Adapted from National Council on Teacher Quality (2020).

What is Reading and Why is it Important?

According to the Simple View of Reading, decoding and linguistic comprehension are necessary and equally important abilities for skilled reading to occur (see Figure 2; Hoover & Gough, 1990). In this context, *linguistic comprehension* is defined as “the ability to take lexical information...and derive sentence and discourse interpretations,” (Hoover & Gough, 1990). Linguistic comprehension is assessed through tasks such as listening to an auditorily presented passage and answering questions about the content of the narrative. Based on the Simple View of Reading, poor reading skill may result from one of three possibilities: (a) adequate decoding skill combined with poor listening comprehension, (b) adequate listening comprehension combined with poor decoding skill, or (c) both poor linguistic comprehension and poor decoding skill (see Figure 2). Individuals presenting with dyslexia frequently exhibit characteristic patterns of poor decoding and good linguistic comprehension.

Figure 2

Graphic Depiction of Relationship between Linguistic Comprehension and Decoding According to the Simple View of Reading



Note. Adapted from Bishop & Snowling (2004).

Dyslexia is not just a scholastic issue; it has both social and emotional ramifications that impact individuals throughout the lifespan. In an exploratory study, Terras et al. (2009) examined the social, emotional, and behavioral impact of dyslexia on school-age children. They found that children with dyslexia are significantly more likely to exhibit social, emotional, and behavioral problems than their typically developing peers. Additionally, they found a correlation between this poor psychosocial adjustment and poor self-esteem in the children studied. Specifically, children with dyslexia were shown to have low perceived levels of scholastic competence (Terras et al., 2009).

Educator Knowledge

Research conducted regarding teacher knowledge and perceptions of dyslexia has revealed discrepancies in understanding of the disorder. A study done by Lakshmi et al. (2019) found that age and years of experience of teachers was mildly correlated with having an

increased knowledge of symptoms of dyslexia. Similar research done by Acheampong et al. (2019) found that there was a significant positive relationship between knowledge of dyslexia and having a bachelor's degree in special education. Somewhat contradictory to the findings of Acheampong et al. (2019), Wadlington and Wadlington (2005) found that primary educators had greater knowledge of dyslexia than both secondary educators and special education teachers.

A study conducted by Christopulos & Kean (2020) found that while general education teachers made almost 50% of referrals to special education, they had the most difficulty accurately identifying children with language impairment. These results can be extrapolated to the identification of children with dyslexia (a written language impairment), indicating that increased educator knowledge is necessary in order for the referral-based system that public education in the United States operates under to become more efficacious.

Although research outlining specific misconceptions has previously been conducted, there still exists a lack of research detailing teacher knowledge and perceptions of dyslexia which has contributed to the deficit in provision of services for children presenting with the disorder. As a result, these children often go undiagnosed. There is not one single assessment which may identify dyslexia, a fact which highlights the importance of educators knowing the signs and symptoms of dyslexia (Shaywitz & Shaywitz, 2003).

Purpose

Accordingly, the **long-term goal** of this research is to dispel misconceptions regarding dyslexia and expand the knowledge base of educators within the general education system. Ultimately, we want to aid educators in successful identification of children with reading disabilities, provide accessible services to treat children with reading disabilities, and supply information on effective instructional practices for teaching struggling readers. The **objective** of

this study was to explore the attitudes and knowledge base of educators regarding dyslexia. The **central hypothesis** was that the knowledge base of dyslexia in primary and secondary school educators (teachers, special education teachers, counselors, school psychologists, SLPs, social workers, and administrators) in Eastern Idaho would be lacking, and that general education teachers and administrators were more likely to hold misconceptions regarding dyslexia and have more negative perceptions of dyslexia than special education teachers, counselors, school psychologists, SLPs, and social workers. This hypothesis was formulated on the basis of findings from previous studies documenting misconceptions related to the characteristics of dyslexia, the conflicting beliefs of what causes dyslexia, and ambiguity related to the definition of dyslexia (Alexander-Pass, 2015; Lakshmi et al., 2019). Additionally, anecdotally, an SLP in Eastern Idaho recently expressed that the term “dyslexia” is avoided in local schools and may even be regarded as a nonexistent issue, indicating the need for increased awareness in order to better serve children struggling with reading. The **rationale** for the project was that although past research has documented teacher knowledge of dyslexia, to our knowledge, no studies have been conducted targeting educators in Eastern Idaho and comparing knowledge base between job classifications. This research provides documentation of dyslexia knowledge and attitudes in educators in Eastern Idaho.

Through two central aims, we tested the hypothesis. We aimed to determine the relationship between attitudes (aim 1) and knowledge (aim 2) and job classification. In aim 1 we explored attitudes towards dyslexia and reading disabilities held by educators in Eastern Idaho. For the **working hypothesis for aim #1**, we expected that attitudes would vary depending on job classification. Specialization in the fields of SLP, special education, social work, counseling, and school psychology as opposed to general education or administration were expected to be

predictors of a positive attitude towards dyslexia. In aim 2 we explored knowledge about dyslexia and reading disabilities demonstrated by educators in Eastern Idaho. For the **working hypothesis for aim #2**, we expected that knowledge would vary depending on job classification, with specialization in the fields of SLP, special education, social work, counseling, and school psychology as opposed to general education or administration expected to be predictors of more knowledge about dyslexia.

Methods

Survey Development

To test the hypotheses, we created a survey, adapted from the Dyslexia Belief Index developed by Wadlington & Wadlington (2005). The survey was conducted using Qualtrics Survey Software and followed a Likert scale, which allowed participants to rate the extent to which they agreed or disagreed with the statements presented (see Appendix A for a complete copy of the survey). The survey contained 56 items, exploring respondent demographics (e.g., highest level of education, major in highest level of education, geographic location in which highest level of education was attained, and current job classification), attitudes about dyslexia, and knowledge of dyslexia (knowledge of behavior, cognition, language/literacy, misconceptions, and other).

Participants

Approval was obtained from the Human Subjects Committee at Idaho State University prior to collection of data. Each participant provided voluntary informed consent prior to participation in the study. All participants were educators working in Eastern Idaho school districts (Regions 4, 5, and 6). Data for the study was gathered via email survey. Emails containing a link to the survey were first sent to 380 administrators employed within Eastern

Idaho public schools. They were asked to forward the survey to all educators of interest (primary and secondary school teachers, special education teachers, counselors, school psychologists, and SLPs) employed at their schools. Initial response rates were low, so researchers sent an additional round of surveys to 5,173 other educators employed within Eastern Idaho public schools. All email addresses were obtained from publicly available school websites. Responses were only received from those who chose to fill out the survey, which incorporated an element of volunteerism.

Research Design and Data Analysis

Descriptive statistics (frequencies, percentages, mean, and range) were calculated to describe demographics and response rates. Survey response comparisons between educators (sorted by job classification) are represented in tables for the following categories: highest level of education, major in highest level of education, geographical region in which highest level of education was obtained, and years of experience for current job classification.

Chi-square tests of independence were completed using IBM SPSS Statistics for Windows, Version 28 to explore the relationship between knowledge and attitudes of dyslexia and job classification (general education teacher, special education teacher, counselor, school psychologist, SLP, social worker, or administrator) in Eastern Idaho. A standard alpha of .05 was used to determine statistical significance between the criterion and predictor variables. We followed Chi-square's unique prerequisite that each cell must contain an expected count of at least 5 in 20% of the cells. In addition to exploring the significance of the relationships between variables, effect size was calculated using Cramer's V. Cramer's V is an effect size measurement for the chi-square test of independence, and it measures how strongly categorical fields are associated. In interpreting effect sizes, those lower than or equal to 0.2 are considered only

weakly associated, those between 0.2 and 0.6 are considered moderate results, and those greater than 0.6 are considered to be strongly associated.

Some of the response categories were collapsed in order to validate the use of chi-squares by meeting the prerequisite that there would be an expected count of at least 5 in 20% of the cells. Data were collapsed as follows. Current job classification was collapsed from 15 categories to four categories such that elementary, middle, and high school teachers became *general education teachers*; elementary special education teachers and counselors, middle school special education teachers and counselors, high school special education teachers and counselors, school psychologists, speech-language pathologists, and social workers became *other educators*; principals and superintendents became *administrators*; and other remained *other*. For all other variables of interest, level of agreement was collapsed from five categories to three categories such that strongly disagree and somewhat disagree became *disagree*; neither disagree nor agree became *neither* (nothing was collapsed here, the agreement label was simply shortened for presentation purposes); and somewhat agree and strongly agree became *agree*.

Results

Of the 5,553 surveys emailed, 659 were returned (11.87% response rate), and 590 were useable (89.53% of the total response rate). Surveys were excluded if participants responded “no” to informed consent or did not respond to questions associated with any of the study aims. Also, for each specific variable of interest detailed below, you will see the number of respondents (*n*) varies slightly. We only included respondents who answered all questions for each statistical analysis, resulting in slightly different numbers of respondents across comparisons (e.g., 376 general education teachers in Table 1 versus 370 general education teachers in Table 3). We queried educator knowledge of and attitudes toward dyslexia.

Combined with demographic data, this allowed for comparisons between the following four groups of educator respondents: 1) general education teachers, 2) other educators (elementary special education teachers and counselors, middle school special education teachers and counselors, high school special education teachers and counselors, school psychologists, speech-language pathologists, and social workers), 3) administrators, and 4) other. While each of these variable categories were included in the statistical analyses and are presented in the Tables, we only report results for the first three categories, given that the fourth category “other” appeared to consist of teacher aids and others who were not the primary focus of this study.

Variables of Interest

Demographics/Job Classification

For information related to demographics and job classification, see Table 1. The majority of general education teachers stated that their highest level of education was a bachelor’s degree, while the majority of other educators and administrators stated that their highest level of education was a master’s degree. With respect to major area of study in highest level of education, the majority of general education teachers responded K-12 or another unspecified major; the majority of other educators responded with either special education, counseling, SLP, or another unspecified major; and the majority of administrators responded educational administration. Then, regardless of job classification, the majority of respondents indicated they obtained their highest level of education within the Mountain region (Arizona, Colorado, Idaho, New Mexico, Montana, Utah, Nevada, or Wyoming). Finally, for years of experience in their current job classification, the majority of general education teachers reported 0 to 10, while other educators and administrators expressed varied responses. More other educators stated that they

had less than or equal to 5 years than any other available category. More administrators stated that they had between 5;1 and 10 years of experience than any other available category.

Table 1
Demographics and Job Classification (N=583)

	Current Job Classification							
	General Education Teacher (n = 376)		Other Educator (n = 117)		Administrator (n = 32)		Other (n= 58)	
	n	%	n	%	n	%	n	%
Highest level of education								
Associates	0	0.00%	0	0.00%	0	0.00%	9	15.52%
Bachelor's	219	58.24%	42	35.90%	0	0.00%	23	39.66%
Master's	148	39.36%	67	57.26%	19	59.38%	11	18.97%
PhD	3	0.80%	1	0.85%	2	6.25%	0	0.00%
Other doctoral	4	1.06%	0	0.00%	5	15.63%	5	8.62%
Other	2	0.53%	7	5.98%	6	18.75%	10	17.24%
Major in highest level of education								
K-12	109	28.99%	1	0.85%	0	0.00%	8	13.79%
Special Ed	8	2.13%	42	35.90%	0	0.00%	6	10.34%
English	34	9.04%	2	1.71%	0	0.00%	1	1.72%
Math	24	6.38%	0	0.00%	0	0.00%	1	1.72%
Science	23	6.12%	0	0.00%	0	0.00%	1	1.72%
History	17	4.52%	1	0.85%	0	0.00%	1	1.72%
Literacy	21	5.59%	1	0.85%	1	3.13%	4	6.90%
Foreign language	2	0.53%	0	0.00%	0	0.00%	0	0.00%
Art	3	0.80%	0	0.00%	0	0.00%	1	1.72%
Music	4	1.06%	0	0.00%	0	0.00%	1	1.72%
Phys Edu	4	1.06%	0	0.00%	0	0.00%	0	0.00%
ESL	6	1.60%	0	0.00%	0	0.00%	1	1.72%
Counseling	2	0.53%	15	12.82%	1	3.13%	0	0.00%
Psych	4	1.06%	5	4.27%	0	0.00%	0	0.00%
SLP	1	0.27%	18	15.38%	0	0.00%	0	0.00%
Social work	0	0.00%	10	8.55%	0	0.00%	0	0.00%
Edu admin	22	5.85%	6	5.13%	29	90.63%	8	13.79%
Other	92	24.47%	16	13.68%	1	3.13%	25	43.10%
Geographical region for highest level of education								
New England	5	1.33%	1	0.85%	0	0.00%	0	0.00%
Mid Atlantic	2	0.53%	0	0.00%	0	0.00%	0	0.00%
East North Central	9	2.39%	1	0.85%	0	0.00%	1	1.72%
West North Central	12	3.19%	2	1.71%	3	9.38%	1	1.72%
South Atlantic	12	3.19%	2	1.71%	0	0.00%	0	0.00%
West South Central	5	1.33%	1	0.85%	0	0.00%	3	5.17%
Mountain	316	84.04%	108	92.31%	27	84.38%	48	82.76%
Pacific	15	3.99%	2	1.71%	2	6.25%	5	8.62%
Years of experience for current job classification								

≤ 5 years	96	25.53%	42	35.90%	6	18.75%	31	53.45%
5;1 to 10 years	88	23.40%	23	19.66%	12	37.50%	9	15.52%
10;1 to 15 years	58	15.43%	8	6.84%	6	18.75%	7	12.07%
15;1 to 20 years	47	12.50%	15	12.82%	2	6.25%	3	5.17%
20;1 to 25 years	37	9.84%	14	11.97%	5	15.63%	3	5.17%
≥ 25;1 years	50	13.30%	15	12.82%	1	3.13%	5	8.62%

The statistical relationships between demographics and job classification are listed in Table 2. As can be seen, all comparisons were statistically significant at the $p < 0.05$ level or smaller, with the exception of geographical region for highest level of education, which was not statistically significant. Effect sizes ranged from small to medium.

Table 2

Demographics and Job Classification: Chi Square (X^2) and Cramer's V (ϕ_c)

Variables of Interest	X^2	df	p	ϕ_c	Effect size
Highest level of education	224.733	15	0.000	0.358	Medium
Major in highest level of education	581.511	51	0.000	0.577	Medium
Geographical region for highest level of education	24.296	21	0.277	0.118	Small
Years of experience for current job classification	35.665	15	0.001	0.143	Small

Aim #1. Job Classification and Attitudes

For information on attitudes related to dyslexia, see Table 3. Regardless of job classification, the majority of respondents disagreed with the following statements, “Giving students with dyslexia accommodations, such as extra time on tests, shorter spelling lists, special seating, and such is unfair to other students” (greatest difference of opinion being 6.27% between general education teachers and administrators), “Individuals with dyslexia have less potential to succeed academically than their peers” (greatest difference of opinion being 10.2% between other educators and administrators), “Being identified as dyslexic in order to receive special services causes more problems than struggling with dyslexia without identification and the resulting special services” (greatest difference of opinion being 4.92 between general education teachers and other educators), and “Regular education teachers receive sufficient training to work with students with dyslexia” (greatest difference of opinion 3.97% between general

education teachers and administrators). Again, regardless of job classification, the majority of respondents agreed with the following statements, “My informal education and/or life experiences have prepared me to work with individuals with dyslexia” (greatest difference of opinion being 12.1% between general educators and administrators), “Struggling readers who have been provided with adequate reading instruction should be evaluated for dyslexia” (greatest difference of opinion being 15.45% between general education teachers and administrators), and “Accommodations are necessary for individuals with dyslexia” with the greatest difference of opinion being 3.7% between general education teachers and administrators). Varied responses were observed for the remaining statements.

Respondents demonstrated varying levels of agreement/disagreement with the statement, “My formal education has prepared me to work with individuals with dyslexia,” with general educators, administrators, and other mostly disagreeing, and other educators mostly split between agreeing and disagreeing. The majority of general education teachers and other educators agreed with the statement, “I teach, counsel, and/or provide other services to one or more individuals with dyslexia” (difference being 13.71%), while administrators demonstrated varying levels of agreement/disagreement with this statement. The majority of other educators and administrators disagreed with the statement, “Special education teachers receive sufficient training to work with students with dyslexia” (difference being 1.75%), while general education teachers were split between mostly disagreeing and neither disagreeing or agreeing with this statement (difference of 6.22%). Finally, the majority of other educators disagreed with the statement, “After three to five hours of instruction, most educators can work competently with students with dyslexia,” while general education teachers and administrators were mostly split between levels of disagreement/agreement with this statement.

Table 3***Job Classification and Attitudes***

Level of Agreement	Job Classification							
	General Education Teachers (n = 370)		Other Educators (n = 118)		Administrators (n = 31)		Other (n=56)	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Giving students with dyslexia accommodations, such as extra time on tests, shorter spelling lists, special seating, and such is unfair to other students.								
Disagree	311	84.05%	106	89.83%	28	90.32%	51	91.07%
Neither	18	4.86%	1	0.85%	1	3.23%	0	0.00%
Agree	41	11.08%	11	9.32%	2	6.45%	5	8.93%
Individuals with dyslexia have less potential to succeed academically than their peers.								
Disagree	323	87.30%	111	94.07%	26	83.87%	49	87.50%
Neither	22	5.95%	3	2.54%	4	12.90%	2	3.57%
Agree	25	6.76%	4	3.39%	1	3.23%	5	8.93%
Being identified as dyslexic in order to receive special services causes more problems than struggling with dyslexia without identification and the resulting special services.								
Disagree	333	90.00%	112	94.92%	28	90.32%	49	87.50%
Neither	28	7.57%	3	2.54%	1	3.23%	2	3.57%
Agree	9	2.43%	3	2.54%	2	6.45%	5	8.93%
My formal education has prepared me to work with individuals with dyslexia.								
Disagree	238	64.32%	54	45.76%	22	70.97%	32	57.14%
Neither	52	14.05%	13	11.02%	2	6.45%	10	17.86%
Agree	80	21.62%	51	43.22%	7	22.58%	14	25.00%
My informal education and/or life experiences have prepared me to work with individuals with dyslexia.								
Disagree	119	32.16%	33	27.97%	9	29.03%	14	25.00%
Neither	69	18.65%	16	13.56%	3	9.68%	12	21.43%
Agree	182	49.19%	69	58.47%	19	61.29%	30	53.57%
I teach, counsel, and/or provide other services to one or more individuals with dyslexia.								
Disagree	91	24.59%	19	16.10%	11	35.48%	10	17.86%
Neither	82	22.16%	20	16.95%	6	19.35%	13	23.21%
Agree	197	53.24%	79	66.95%	14	45.16%	33	58.93%
Special education teachers receive sufficient training to work with students with dyslexia.								
Disagree	147	39.73%	82	69.49%	21	67.74%	35	62.50%
Neither	170	45.95%	21	17.80%	5	16.13%	11	19.64%
Agree	53	14.32%	15	12.71%	5	16.13%	10	17.86%
Regular education teachers receive sufficient training to work with students with dyslexia.								
Disagree	325	87.84%	99	83.90%	26	83.87%	51	91.07%
Neither	29	7.84%	14	11.86%	2	6.45%	3	5.36%
Agree	16	4.32%	5	4.24%	3	9.68%	2	3.57%
After three to five hours of instruction, most educators can work competently with students with dyslexia.								
Disagree	183	49.46%	83	70.34%	14	45.16%	36	64.29%
Neither	124	33.51%	22	18.64%	10	32.26%	12	21.43%
Agree	63	17.03%	13	11.02%	7	22.58%	8	14.29%
Struggling readers who have been provided with adequate reading instruction should be evaluated for dyslexia.								
Disagree	41	11.08%	17	14.41%	4	12.90%	7	12.50%
Neither	57	15.41%	29	24.58%	9	29.03%	8	14.29%
Agree	272	73.51%	72	61.02%	18	58.06%	41	73.21%
Accommodations are necessary for individuals with dyslexia.								

Disagree	18	4.86%	8	6.78%	1	3.23%	1	1.79%
Neither	28	7.57%	9	7.63%	4	12.90%	4	7.14%
Agree	324	87.57%	101	85.59%	26	83.87%	51	91.07%

The statistical relationships between respondent job classification and level of agreement with statements related to attitudes and dyslexia are listed in Table 4. Statistically significant differences in levels of agreements between groups were present for the statements, “My formal education has prepared me to work with individuals with dyslexia” (small effect size), “Special education teachers receive sufficient training to work with students with dyslexia” (medium effect size), and “After 3 to 5 hours of instruction, most educators can work competently with students with dyslexia” (small effect size). All other comparisons generated statistically nonsignificant findings and small effect sizes.

Table 4
Job Classification by Attitudes: Chi Square (X^2) and Cramer's V (ϕ_c)

Variables of Interest	X^2	df	p	ϕ_c	Effect size
Giving students with dyslexia accommodations, such as extra time on tests, shorter spelling lists, special seating, and such is unfair to other students.	7.819	6	0.231	0.082	Small
Individuals with dyslexia have less potential to succeed academically than their peers.	8.974	6	0.168	0.088	Small
Being identified as dyslexic in order to receive special services causes more problems than struggling with dyslexia without identification and the resulting special services.	12.541	6	0.057	0.104	Small
My formal education has prepared me to work with individuals with dyslexia.	24.422	6	<0.001	0.146	Small
My informal education and/or life experiences have prepared me to work with individuals with dyslexia.	6.125	6	0.408	0.073	Small
I teach, counsel, and/or provide other services to one or more individuals with dyslexia.	10.713	6	0.098	0.097	Small
Special education teachers receive sufficient training to work with students with dyslexia.	49.983	6	0.000	0.208	Medium
Regular education teachers receive sufficient training to work with students with dyslexia.	4.884	6	0.554	0.065	Small
After three to five hours of instruction, most educators can work competently with students with dyslexia.	19.696	6	0.004	0.131	Small
Struggling readers who have been provided with adequate reading instruction should be evaluated for dyslexia.	10.360	6	0.111	0.095	Small

Accommodations are necessary for individuals with dyslexia.	3.417	6	0.762	0.055	Small
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Aim #2. Job Classification and Knowledge

Behavior. For information on knowledge of behavior related to dyslexia, see Table 5. Respondents demonstrated varying levels of agreement/disagreement with the statement, “Dyslexia often causes social problems,” with general education teachers and other educators mostly agreeing, and administrators mostly split between agreeing and neither agreeing nor disagreeing. Respondents also demonstrated varying levels of agreement/disagreement with the statement, “Dyslexia often causes family problems,” with general education teachers and other educators mostly agreeing, and administrators split evenly between mostly agreeing and neither agreeing nor disagreeing. Regardless of job classification, the majority of respondents agreed with the statement, “Dyslexia often causes emotional problems” (greatest difference of opinion being 14.42% between other educators and administrators).

Table 5
Job Classification and Knowledge (Behavior)

Level of Agreement	Job Classification							
	General Education Teachers (n = 376)		Other Educators (n = 117)		Administrators (n = 32)		Other (n=56)	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
	Dyslexia often causes social problems.							
Disagree	44	11.70%	14	11.97%	5	15.63%	8	14.29%
Neither	115	30.59%	25	21.37%	12	37.50%	7	12.50%
Agree	217	57.71%	78	66.67%	15	46.88%	41	73.21%
Level of Agreement	Dyslexia often causes emotional problems.							
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
	Dyslexia often causes emotional problems.							
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Disagree	18	4.79%	5	4.27%	3	9.38%	3	5.36%
Neither	90	23.94%	22	18.80%	9	28.13%	7	12.50%
Agree	268	71.28%	90	76.92%	20	62.50%	46	82.14%
Level of Agreement	Dyslexia often causes family problems.							
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
	Dyslexia often causes family problems.							
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Disagree	41	10.90%	12	10.26%	6	18.75%	8	14.29%
Neither	140	37.23%	39	33.33%	13	40.63%	15	26.79%
Agree	195	51.86%	66	56.41%	13	40.63%	33	58.93%

The statistical relationships between respondent job classification and level of agreement with statements related to knowledge of behavior and dyslexia are listed in Table 6. There was a statistically significant difference in level of agreement between groups for the statement, “Dyslexia often causes social problems” (small effect size). All other comparisons generated statistically nonsignificant findings and small effect sizes.

Table 6
Job Classification by Knowledge (Behavior): Chi Square (X^2) and Cramer's V (ϕ_c)

Variables of Interest	X^2	df	p	ϕ_c	Effect size
Dyslexia often causes social problems.	12.974	6	.042	0.106	Small
Dyslexia often causes emotional problems.	6.945	6	.323	0.077	Small
Dyslexia often causes family problems.	5.653	6	.471	0.070	Small

Language and Literacy. For information on knowledge of language and literacy related to dyslexia, see Table 7. Regardless of job classification, the majority of respondents agreed with the following statements, “Dyslexia is a learning disability that affects language processing” (greatest difference of opinion being 5.18% between other educators and administrators), “Individuals with dyslexia have trouble understanding the structure of language, especially phonics” (greatest difference of opinion being 13.26% between general education teachers and other educators), “Dyslexia often affects writing and/or speaking abilities” (greatest difference of opinion being 3.08% between general education teachers and administrators), “Some students with mild dyslexia may not demonstrate difficulty reading, or side effects from difficulty reading until middle school or later” (greatest difference of opinion being 9.98% between general education teachers and administrators), “Individuals with dyslexia are usually extremely poor spellers” (greatest difference of opinion being 15.68% between other educators and administrators), “Individuals with dyslexia may comprehend a passage read to them very well, but be unable to read the words independently” (greatest difference of opinion being 1.79% between other educators and administrators), “Accuracy is a more important component of

reading fluency than rate” (greatest difference of opinion being 14.08% between other educators and administrators), “Dyslexia may impact vocabulary growth” (greatest difference of opinion being 5.21% between other educators and administrators), “Readers with dyslexia experience deficits in their ability to break words down, resulting in difficulty identifying printed words” (greatest difference of opinion being 8.5% between other educators and administrators), “Some indirect impacts of dyslexia include reduced reading comprehension and reduced reading experience” (greatest difference of opinion being 6.87% between other educators and administrators), “Dyslexia is primarily characterized by phonologically based language deficits, poor spelling, and difficulty reading and writing” (greatest difference of opinion being 13.43% between general education teachers and other educators), “Children learn to read better, and retain their reading abilities long-term, if they have been provided explicit grapheme-phoneme instruction over word-level instruction” (greatest difference of opinion being 18.83% between other educators and administrators), “In the simple view of reading, reading comprehension develops from a combination of word identification and language comprehension” (greatest difference of opinion being 6.22% between other educators and administrators), “When schools embrace the scientific literature of reading development, there are measurable benefits for children with respect to earlier and more accurate word reading” (greatest difference of opinion being 4.27% between other educators and administrators), “When schools embrace the scientific literature of reading development, there are measurable benefits for children with respect to better reading fluency” (greatest difference of opinion being 4.46% between general education teachers and other educators), “When schools embrace the scientific literature of reading development, there are measurable benefits for children with respect to vocabulary growth” (greatest difference of opinion being 2.44% between other educators and administrators), “When

schools embrace the scientific literature of reading development, there are measurable benefits for children with respect to reading comprehension” (greatest difference of opinion being 2.44% between other educators and administrators), “When schools embrace the scientific literature of reading development, there are measurable benefits for children with respect to more independent reading” (greatest difference of opinion being 1.62% between general education teachers and other educators), “When schools embrace the scientific literature of reading development, there are measurable benefits for children with respect to more enjoyment from reading” (greatest difference of opinion being 6.31% between general education teachers and administrators), and “When schools embrace the scientific literature of reading development, there are measurable benefits for children with respect to fewer children needing intervention” (greatest difference of opinion being 6.31% between general education teachers and administrators).

Varied responses were observed for the remaining statements. Respondents demonstrated varying levels of agreement/disagreement with the statement, “Most poor readers have dyslexia,” with the majority of general educators and administrators disagreeing, and other educators mostly split between disagreeing and neither agreeing nor disagreeing. The majority of other educators agreed with the statement, “Children with dyslexia are more consistently impaired in phonemic awareness (the ability to hear and manipulate speech sounds) than any other ability,” while general education teachers and administrators were mostly split between agreeing and neither agreeing nor disagreeing. Finally, the majority of other educators agreed with the statement, “Children will not learn phoneme-grapheme correspondence without direct instruction,” while general education teachers and administrators were mostly split between agreeing and neither agreeing nor disagreeing.

Table 7
Job Classification and Knowledge (Language and Literacy)

Level of Agreement	Job Classification							
	General Education Teachers (n = 328)		Other Educators (n = 99)		Administrators (n = 31)		Other (n = 48)	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Dyslexia is a learning disability that affects language processing.								
Disagree	30	9.15%	5	5.05%	4	12.90%	4	8.33%
Neither	78	23.78%	25	25.25%	7	22.58%	8	16.67%
Agree	220	67.07%	69	69.70%	20	64.52%	36	75.00%
Individuals with dyslexia have trouble understanding the structure of language, especially phonics.								
Disagree	28	8.54%	6	6.06%	3	9.68%	3	6.25%
Neither	95	28.96%	18	18.18%	5	16.13%	7	14.58%
Agree	205	62.50%	75	75.76%	23	74.19%	38	79.17%
Dyslexia often affects writing and/or speaking abilities.								
Disagree	18	5.49%	6	6.06%	1	3.23%	1	2.08%
Neither	45	13.72%	13	13.13%	4	12.90%	6	12.50%
Agree	265	80.79%	80	80.81%	26	83.87%	41	85.42%
Most poor readers have dyslexia.								
Disagree	187	57.01%	49	49.49%	18	58.06%	24	50.00%
Neither	114	34.76%	37	37.37%	10	32.26%	16	33.33%
Agree	27	8.23%	13	13.13%	3	9.68%	8	16.67%
Some students with mild dyslexia may not demonstrate difficulty reading, or side effects from difficulty reading until middle school or later.								
Disagree	25	7.62%	12	12.12%	3	9.68%	5	10.42%
Neither	101	30.79%	29	29.29%	12	38.71%	15	31.25%
Agree	202	61.59%	58	58.59%	16	51.61%	28	58.33%
Children with dyslexia are more consistently impaired in phonemic awareness (the ability to hear and manipulate speech sounds) than any other ability.								
Disagree	54	16.46%	14	14.14%	2	6.45%	12	25.00%
Neither	163	49.70%	31	31.31%	14	45.16%	14	29.17%
Agree	111	33.84%	54	54.55%	15	48.39%	22	45.83%
Individuals with dyslexia are usually extremely poor spellers.								
Disagree	29	8.84%	5	5.05%	1	3.23%	4	8.33%
Neither	93	28.35%	21	21.21%	12	38.71%	8	16.67%
Agree	206	62.80%	73	73.74%	18	58.06%	36	75.00%
Individuals with dyslexia may comprehend a passage read to them very well, but be unable to read the words independently.								
Disagree	6	1.83%	2	2.02%	0	0.00%	3	6.25%
Neither	35	10.67%	9	9.09%	4	12.90%	3	6.25%
Agree	287	87.50%	88	88.89%	27	87.10%	42	87.50%
Accuracy is a more important component of reading fluency than rate.								
Disagree	25	7.62%	6	6.06%	5	16.13%	6	12.50%
Neither	48	14.63%	12	12.12%	5	16.13%	4	8.33%
Agree	255	77.74%	81	81.82%	21	67.74%	38	79.17%
Dyslexia may impact vocabulary growth.								
Disagree	18	5.49%	5	5.05%	4	12.90%	5	10.42%
Neither	43	13.11%	9	9.09%	2	6.45%	5	10.42%
Agree	267	81.40%	85	85.86%	25	80.65%	38	79.17%
Readers with dyslexia experience deficits in their ability to break words down, resulting in difficulty identifying printed words.								

Disagree	5	1.52%	4	4.04%	0	0.00%	1	2.08%
Neither	44	13.41%	14	14.14%	3	9.68%	5	10.42%
Agree	279	85.06%	81	81.82%	28	90.32%	42	87.50%
Some indirect impacts of dyslexia include reduced reading comprehension and reduced reading experience.								
Disagree	4	1.22%	4	4.04%	0	0.00%	2	4.17%
Neither	21	6.40%	6	6.06%	1	3.23%	2	4.17%
Agree	303	92.38%	89	89.90%	30	96.77%	44	91.67%
Dyslexia is primarily characterized by phonologically based language deficits, poor spelling, and difficulty reading and writing.								
Disagree	16	4.88%	2	2.02%	1	3.23%	2	4.17%
Neither	91	27.74%	17	17.17%	5	16.13%	8	16.67%
Agree	221	67.38%	80	80.81%	25	80.65%	38	79.17%
Children learn to read better, and retain their reading abilities long-term, if they have been provided explicit grapheme-phoneme instruction over word-level instruction.								
Disagree	10	3.05%	2	2.02%	0	0.00%	1	2.08%
Neither	124	37.80%	39	39.39%	7	22.58%	14	29.17%
Agree	194	59.15%	58	58.59%	24	77.42%	33	68.75%
Children will not learn phoneme-grapheme correspondence without direct instruction.								
Disagree	66	20.12%	18	18.18%	8	25.81%	8	16.67%
Neither	110	33.54%	31	31.31%	8	25.81%	11	22.92%
Agree	152	46.34%	50	50.51%	15	48.39%	29	60.42%
In the simple view of reading, reading comprehension develops from a combination of word identification and language comprehension.								
Disagree	8	2.44%	1	1.01%	3	9.68%	1	2.08%
Neither	55	16.77%	12	12.12%	3	9.68%	5	10.42%
Agree	265	80.79%	86	86.87%	25	80.65%	42	87.50%
When schools embrace the scientific literature on reading development, there are measurable benefits for children with respect to earlier and more accurate word reading.								
Disagree	9	2.74%	4	4.04%	1	3.23%	3	6.25%
Neither	44	13.41%	13	13.13%	3	9.68%	7	14.58%
Agree	275	83.84%	82	82.83%	27	87.10%	38	79.17%
When schools embrace the scientific literature on reading development, there are measurable benefits for children with respect to better reading fluency.								
Disagree	10	3.05%	3	3.03%	1	3.23%	5	10.42%
Neither	35	10.67%	15	15.15%	4	12.90%	4	8.33%
Agree	283	86.28%	81	81.82%	26	83.87%	39	81.25%
When schools embrace the scientific literature on reading development, there are measurable benefits for children with respect to vocabulary growth.								
Disagree	4	1.22%	1	1.01%	1	3.23%	3	6.25%
Neither	31	9.45%	11	11.11%	2	6.45%	4	8.33%
Agree	293	89.33%	87	87.88%	28	90.32%	41	85.42%
When schools embrace the scientific literature on reading development, there are measurable benefits for children with respect to reading comprehension.								
Disagree	6	1.83%	2	2.02%	1	3.23%	2	4.17%
Neither	28	8.54%	10	10.10%	2	6.45%	4	8.33%
Agree	294	89.63%	87	87.88%	28	90.32%	42	87.50%
When schools embrace the scientific literature on reading development, there are measurable benefits for children with respect to more independent reading.								
Disagree	9	2.74%	3	3.03%	0	0.00%	5	10.42%
Neither	42	12.80%	14	14.14%	5	16.13%	5	10.42%
Agree	277	84.45%	82	82.83%	26	83.87%	38	79.17%
When schools embrace the scientific literature on reading development, there are measurable benefits for children with respect to more enjoyment from reading.								
Disagree	11	3.35%	2	2.02%	0	0.00%	2	4.17%

Neither	52	15.85%	16	16.16%	4	12.90%	4	8.33%
Agree	265	80.79%	81	81.82%	27	87.10%	42	87.50%
When schools embrace the scientific literature on reading development, there are measurable benefits for children with respect to from fewer children needing intervention.								
Disagree	29	8.84%	10	10.10%	2	6.45%	7	14.58%
Neither	76	23.17%	21	21.21%	4	12.90%	9	18.75%
Agree	223	67.99%	68	68.69%	25	80.65%	32	66.67%

The statistical relationships between respondent job classification and level of agreement with statements related to knowledge of language and literacy and dyslexia are listed in Table 8. There was a statistically significant difference in level of agreement between groups for the statement, “Children with dyslexia are more consistently impaired in phonemic awareness (the ability to hear and manipulate speech sounds) than any other ability,” with a small effect size observed. All other comparisons generated statistically nonsignificant findings and small effect sizes.

Table 8

Job Classification by Knowledge (Language and Literacy): Chi Square (X^2) and Cramer's V (ϕ_c)

Variables of Interest	X^2	df	p	ϕ_c	Effect size
Dyslexia is a learning disability that affects language processing.	3.844	6	0.701	0.062	Small
Individuals with dyslexia have trouble understanding the structure of language, especially phonics.	11.301	6	0.080	0.106	Small
Dyslexia often affects writing and/or speaking abilities.	1.536	6	0.962	0.039	Small
Most poor readers have dyslexia.	5.426	6	0.498	0.073	Small
Some students with mild dyslexia may not demonstrate difficulty reading, or side effects from difficulty reading until middle school or later.	3.150	6	0.790	0.056	Small
Children with dyslexia are more consistently impaired in phonemic awareness (the ability to hear and manipulate speech sounds) than any other ability.	22.174	6	0.001	0.148	Small
Individuals with dyslexia are usually extremely poor spellers.	9.549	6	0.149	0.097	Small
Individuals with dyslexia may comprehend a passage read to them very well, but be unable to read the words independently.	5.705	6	0.452	0.075	Small
Accuracy is a more important component of reading fluency than rate.	6.240	6	0.402	0.079	Small
Dyslexia may impact vocabulary growth.	6.194	6	0.408	0.078	Small
Readers with dyslexia experience deficits in their ability to break words down, resulting in difficulty identifying printed words.	3.995	6	0.677	0.063	Small

Some indirect impacts of dyslexia include reduced reading comprehension and reduced reading experience.	5.753	6	0.440	0.075	Small
Dyslexia is primarily characterized by phonologically based language deficits, poor spelling, and difficulty reading and writing.	10.005	6	0.126	0.099	Small
Children learn to read better, and retain their reading abilities long-term, if they have been provided explicit grapheme-phoneme instruction over word-level instruction.	6.110	6	0.398	0.078	Small
Children will not learn phoneme-grapheme correspondence without direct instruction.	4.614	6	0.601	0.068	Small
In the simple view of reading, reading comprehension develops from a combination of word identification and language comprehension.	10.108	6	0.121	0.100	Small
When schools embrace the scientific literature on reading development, there are measurable benefits for children with respect to earlier and more accurate word reading.	2.238	6	0.899	0.047	Small
When schools embrace the scientific literature on reading development, there are measurable benefits for children with respect to better reading fluency.	8.354	6	0.211	0.091	Small
When schools embrace the scientific literature on reading development, there are measurable benefits for children with respect to vocabulary growth.	7.399	6	0.271	0.086	Small
When schools embrace the scientific literature on reading development, there are measurable benefits for children with respect to reading comprehension.	1.692	6	0.954	0.041	Small
When schools embrace the scientific literature on reading development, there are measurable benefits for children with respect to more independent reading.	9.293	6	0.157	0.096	Small
When schools embrace the scientific literature on reading development, there are measurable benefits for children with respect to more enjoyment from reading.	3.711	6	0.719	0.061	Small
When schools embrace the scientific literature on reading development, there are measurable benefits for children with respect to fewer children needing intervention.	4.127	6	0.667	0.064	Small

Cognition. For information on knowledge of cognition related to dyslexia, see Table 9.

Regardless of job classification, the majority of respondents agreed with the following statements, “Multisensory instruction is absolutely necessary for students with dyslexia to learn”

(greatest difference of opinion being 7.00% between general education teachers and other educators), and “Students with dyslexia need structured, sequential, direct instruction in basic skills and learning strategies” (greatest difference of opinion being 17.49% between general education teachers and other educators). Again, regardless of job classification, the majority of respondents disagreed with the statement, “In school, dyslexia only affects a student’s performance in reading (not math, social studies, etc.),” with the greatest difference of opinion being 2.68% between other educators and administrators. Varied responses were observed for the statement, “People with dyslexia often excel in science, music, art, and/or technical fields,” with the majority of general education teachers neither agreeing nor disagreeing with the statement, and other educators and administrators mostly split between agreeing and neither agreeing nor disagreeing.

Table 9
Job Classification and Knowledge (Cognition)

Level of Agreement	Job Classification							
	General Education Teachers (n = 365)		Other Educators (n = 112)		Administrators (n = 32)		Other (n=55)	
	n	%	n	%	n	%	n	%
Multisensory instruction is absolutely necessary for students with dyslexia to learn.								
Disagree	16	4.38%	2	1.79%	2	6.25%	1	1.82%
Neither	78	21.37%	19	16.96%	5	15.63%	9	16.36%
Agree	271	74.25%	91	81.25%	25	78.13%	45	81.82%
In school, dyslexia only affects a student’s performance in reading (not math, social studies, etc.).								
Disagree	348	95.34%	108	96.43%	30	93.75%	50	90.91%
Neither	11	3.01%	1	0.89%	1	3.13%	0	0.00%
Agree	6	1.64%	3	2.68%	1	3.13%	5	9.09%
People with dyslexia often excel in science, music, art, and/or technical fields.								
Disagree	17	4.66%	7	6.25%	2	6.25%	4	7.27%
Neither	209	57.26%	56	50.00%	15	46.88%	19	34.55%
Agree	139	38.08%	49	43.75%	15	46.88%	32	58.18%
Students with dyslexia need structured, sequential, direct instruction in basic skills and learning strategies.								
Disagree	14	3.84%	3	2.68%	1	3.13%	0	0.00%
Neither	102	27.95%	13	11.61%	6	18.75%	12	21.82%
Agree	249	68.22%	96	85.71%	25	78.13%	43	78.18%

The statistical relationships between respondent job classification and level of agreement with statements related to knowledge of cognition and dyslexia are listed in Table 10. There was a statistically significant difference in level of agreement between groups for the statements, “In school, dyslexia only affects a student’s performance in reading (not math, social studies, etc.),” (small effect size) and “Students with dyslexia need structured, sequential, direct instruction in basic skills and learning strategies,” with small effect sizes observed. All other comparisons generated statistically nonsignificant findings and small effect sizes.

Table 10
Job Classification by Knowledge (Cognition): Chi Square (X^2) and Cramer’s V (ϕ_c)

Variables of Interest	X^2	df	p	ϕ_c	Effect size
Multisensory instruction is absolutely necessary for students with dyslexia to learn.	4.951	6	.549	0.066	Small
In school, dyslexia only affects a student’s performance in reading (not math, social studies, etc.).	13.252	6	.045	0.108	Small
People with dyslexia often excel in science, music, art, and/or technical fields.	11.180	6	.075	0.100	Small
Students with dyslexia need structured, sequential, direct instruction in basic skills and learning strategies.	16.394	6	.013	0.121	Small

Misconceptions. For information on misconceptions related to dyslexia, see Table 11. Regardless of job classification, the majority of respondents neither agreed nor disagreed with the statement, “More boys than girls have dyslexia,” with the greatest difference of opinion being 13.58% between general education teachers and other educators. Again, regardless of job classification, the majority of respondents disagreed with the statements “People with dyslexia have below average intelligence” (greatest difference of opinion being 6.79% between other educators and administrators), “Dyslexia can be managed by diet and/or exercise” (greatest difference of opinion being 4.92% between general education teachers and administrators), “Physicians can prescribe medication to help dyslexia” (greatest difference of opinion being

15.12% between general education teachers and administrators), “Dyslexia is caused by a poor home environment and/or poor reading instruction” (greatest difference of opinion being 4.44% between general education teachers and administrators), “College students with dyslexia seldom do well in graduate school” (greatest difference of opinion being 7.70% between other educators and administrators), “Dyslexia cannot be identified prior to a child being in 3rd grade” (greatest difference of opinion being 10.91% between general education teachers and other educators), and “There is a single standardized assessment that identifies individuals with dyslexia” (greatest difference of opinion being 3.85% between general education teachers and other educators). The majority of respondents agreed with the statement, “An individual can be dyslexic and gifted,” with the greatest difference of opinion being 2.59% between other educators and administrators.

Varied responses were observed for the remaining statements. Respondents demonstrated varying levels of agreement/disagreement with the statement, “Dyslexia is hereditary,” with respondents across job classifications split between agreeing and neither agreeing nor disagreeing. More general education teachers and administrators selected neither agree nor disagree, while more other educators selected agree. The majority of other educators and administrators agreed with the statement “The brains of individuals with dyslexia are different from those of people without dyslexia” (difference of 3.87%), while general education teachers were mostly split between agreeing and neither agreeing nor disagreeing. The majority of general education teachers and other educators disagreed with the statement, “Dyslexia can be cured with intervention” (difference of 2.88%), while administrators demonstrated varying levels of agreement/disagreement with this statement. The majority of general education teachers agreed with the statement, “Word and letter reversal are major criteria in identification of dyslexia,” while other educators were split nearly evenly between all three answer options (disagree,

neither, agree). Administrators were split evenly between selecting agree or neither agree nor disagree with this statement.

Table 11
Job Classification and Knowledge (Misconceptions)

Level of Agreement	Job Classification							
	General Education Teachers (n = 333)		Other Educators (n = 105)		Administrators (n = 32)		Other (n= 48)	
	n	%	n	%	n	%	n	%
More boys than girls have dyslexia.								
Disagree	36	10.81%	13	12.38%	5	15.63%	9	18.75%
Neither	226	67.87%	57	54.29%	18	56.25%	22	45.83%
Agree	71	21.32%	35	33.33%	9	28.13%	17	35.42%
People with dyslexia have below average intelligence.								
Disagree	306	91.89%	99	94.29%	28	87.50%	43	89.58%
Neither	18	5.41%	1	0.95%	2	6.25%	3	6.25%
Agree	9	2.70%	5	4.76%	2	6.25%	2	4.17%
Dyslexia can be managed by diet and/or exercise.								
Disagree	275	82.58%	90	85.71%	28	87.50%	40	83.33%
Neither	57	17.12%	13	12.38%	4	12.50%	8	16.67%
Agree	1	0.30%	2	1.90%	0	0.00%	0	0.00%
An individual can be dyslexic and gifted.								
Disagree	6	1.80%	2	1.90%	1	3.13%	2	4.17%
Neither	7	2.10%	4	3.81%	0	0.00%	3	6.25%
Agree	320	96.10%	99	94.29%	31	96.88%	43	89.58%
Physicians can prescribe medication to help dyslexia.								
Disagree	189	56.76%	70	66.67%	23	71.88%	33	68.75%
Neither	138	41.44%	33	31.43%	9	28.13%	15	31.25%
Agree	6	1.80%	2	1.90%	0	0.00%	0	0.00%
Dyslexia is hereditary.								
Disagree	40	12.01%	9	8.57%	4	12.50%	3	6.25%
Neither	168	50.45%	45	42.86%	15	46.88%	15	31.25%
Agree	125	37.54%	51	48.57%	13	40.63%	30	62.50%
Dyslexia is caused by a poor home environment and/or poor reading instruction.								
Disagree	287	86.19%	94	89.52%	29	90.63%	38	79.17%
Neither	40	12.01%	5	4.76%	1	3.13%	7	14.58%
Agree	6	1.80%	6	5.71%	2	6.25%	3	6.25%
College students with dyslexia seldom do well in graduate school.								
Disagree	223	66.97%	77	73.33%	21	65.63%	38	79.17%
Neither	93	27.93%	27	25.71%	7	21.88%	9	18.75%
Agree	17	5.11%	1	0.95%	4	12.50%	1	2.08%
The brains of individuals with dyslexia are different from those of people without dyslexia.								
Disagree	42	12.61%	16	15.24%	4	12.50%	5	10.42%
Neither	141	42.34%	34	32.38%	10	31.25%	10	20.83%
Agree	150	45.05%	55	52.38%	18	56.25%	33	68.75%
Dyslexia can be cured with intervention.								
Disagree	168	50.45%	56	53.33%	14	43.75%	22	45.83%
Neither	105	31.53%	35	33.33%	9	28.13%	14	29.17%
Agree	60	18.02%	14	13.33%	9	28.13%	12	25.00%
Dyslexia cannot be identified prior to a child being in 3rd grade.								
Disagree	173	51.95%	66	62.86%	20	62.50%	31	64.58%

Neither	128	38.44%	30	28.57%	6	18.75%	14	29.17%
Agree	32	9.61%	9	8.57%	6	18.75%	3	6.25%
Word and letter reversal are major criteria in identification of dyslexia.								
Disagree	71	21.32%	40	38.10%	6	18.75%	15	31.25%
Neither	78	23.42%	27	25.71%	13	40.63%	10	20.83%
Agree	184	55.26%	38	36.19%	13	40.63%	23	47.92%
There is a single standardized assessment that identifies individuals with dyslexia.								
Disagree	206	61.86%	69	65.71%	20	62.50%	34	70.83%
Neither	122	36.64%	32	30.48%	8	25.00%	14	29.17%
Agree	5	1.50%	4	3.81%	4	12.50%	0	0.00%

The statistical relationships between respondent job classification and level of agreement with statements related to knowledge of cognition and dyslexia are listed in Table 12. There was a statistically significant difference in level of agreement between groups for the statements, “More boys than girls have dyslexia,” (small effect size), “Dyslexia is hereditary,” (small effect size), “Dyslexia is caused by a poor home environment and/or poor reading instruction,” (small effect size), “The brains of individuals with dyslexia are different from those of people without dyslexia,” (small effect size), “Word and letter reversal are major criteria in identification of dyslexia,” (small effect size), and “There is a single standardized assessment that identifies individuals with dyslexia,” (small effect size). All other comparisons generated statistically nonsignificant findings and small effect sizes.

Table 12

Job Classification by Knowledge (Misconceptions): Chi Square (X^2) and Cramer's V (ϕ_c)

Variables of Interest	X^2	df	p	ϕ_c	Effect size
More boys than girls have dyslexia.	14.293	6	.027	0.177	Small
People with dyslexia have below average intelligence.	5.958	6	.417	0.076	Small
Dyslexia can be managed by diet and/or exercise.	5.635	6	.433	0.074	Small
An individual can be dyslexic and gifted.	5.507	6	.455	0.073	Small
Physicians can prescribe medication to help dyslexia.	7.745	6	.246	0.086	Small
Dyslexia is hereditary.	13.123	6	.041	0.159	Small
Dyslexia is caused by a poor home environment and/or poor reading instruction.	13.309	6	.043	0.113	Small
College students with dyslexia seldom do well in graduate school.	11.365	6	.077	0.105	Small

The brains of individuals with dyslexia are different from those of people without dyslexia.	12.781	6	.047	0.111	Small
Dyslexia can be cured with intervention.	5.254	6	.520	0.071	Small
Dyslexia cannot be identified prior to a child being in 3rd grade.	11.459	6	.074	0.105	Small
Word and letter reversal are major criteria in identification of dyslexia.	20.321	6	.002	0.140	Small
There is a single standardized assessment that identifies individuals with dyslexia.	18.777	6	.008	0.135	Small

Other. For information on other knowledge related to dyslexia, see Table 13. The majority of respondents, regardless of job classification, neither agreed nor disagreed with the statement, “As many as 20% of children have dyslexia,” (greatest difference of opinion being 16.76% between general education teachers and other educators). The majority of general education teachers and administrators neither agreed nor disagreed with the statement, “Dyslexia is the most common learning disorder among school-age children,” (difference of 3.40%). Other educators were mostly split between agreeing and neither agreeing nor disagreeing with this statement.

Table 13
Job Classification and Knowledge (Other)

Level of Agreement	Job Classification							
	General Education Teachers (n = 343)		Other Educators (n = 107)		Administrators (n = 32)		Other (n=50)	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
As many as 20% of children have dyslexia.								
Disagree	17	4.96%	9	8.41%	2	6.25%	2	4.00%
Neither	237	69.10%	56	52.34%	17	53.13%	28	56.00%
Agree	89	25.95%	42	39.25%	13	40.63%	20	40.00%
Dyslexia is the most common learning disorder among school-age children.								
Disagree	57	16.62%	22	20.56%	10	31.25%	3	6.00%
Neither	192	55.98%	46	42.99%	19	59.38%	24	48.00%
Agree	94	27.41%	39	36.45%	3	9.38%	23	46.00%

The statistical relationships between respondent job classification and level of agreement with statements related to knowledge of cognition and dyslexia are listed in Table 14. There was

a statistically significant difference in level of agreement between groups for both of the statements, and both statements generated small effect sizes.

Table 14

Job Classification by Knowledge (Other): Chi Square (X^2) and Cramer's V (ϕ_c)

Variables of Interest	X^2	df	p	ϕ_c	Effect size
As many as 20% of children have dyslexia.	14.250	6	.029	0.116	Small
Dyslexia is the most common learning disorder among school-age children.	22.224	6	<.001	0.145	Small

Discussion

The purpose of this project was to explore the attitudes toward and knowledge of dyslexia in general education teachers, other educators, and administrators. We specifically explored differences in demographics, attitudes toward dyslexia, and knowledge of dyslexia (behavior, language and literacy, cognition, misconceptions, and other categories of the knowledge variable) across these groups.

Characteristics of Educators

Demographics/Job Classification

Respondents varied significantly in their highest level of education, with the majority of general education teachers stating that their highest level of education was a bachelor's degree, while the majority of other educators and administrators stated that their highest level of education was a master's degree. This is consistent with the fact that a bachelor's degree is the entry level degree for teaching in a general education classroom and a master's degree is the entry level degree for most of the other professions examined. Respondents also varied significantly in majors for their highest level of education. As one would expect, most general education teachers studied K-12 education or another unspecified area; while other educators studied special education, counseling, SLP, or another unspecified area; and most administrators studied educational administration. The majority of all respondents indicated that they had

obtained their highest level of education within the Mountain region, which includes Idaho among several other neighboring states, indicating that Idaho and the surrounding areas retain many of the pre-service educators that attend universities in the Mountain region.

Overall, other educators expressed the least experience in their current job classification compared to other survey respondents. However, nearly one quarter of respondents had 5 years or less of experience within their current job classification. From a practical standpoint, it is essential to consider the implications of these demographics. As mentioned earlier, many universities which prepare pre-service educators do not adequately address all necessary components of reading instruction. It follows that pre-service teacher education programs are lacking in literacy curriculum to sufficiently prepare teachers, which has negative implications for educators regardless of years of job experience. However, less experienced educators may be relying more heavily on their inadequate literacy education because they have had less time in the field to attend continuing education seminars and explore the research on the science of reading.

Aim #1. Job Classification and Attitudes

Overall, most respondents had positive attitudes toward individuals with dyslexia, agreeing that providing accommodations to those who need them is appropriate and that individuals with dyslexia have the potential to succeed. While the majority of respondents indicated that general education teachers do not receive sufficient training to work with individuals with dyslexia, there was a significant difference in opinion across job classification with regard to whether special education teachers receive sufficient training to work with individuals with dyslexia. Specifically, the majority of other educators (which included special education teachers) and administrators did not agree that special education teachers were

sufficiently equipped to provide services to those with dyslexia, while nearly half of general education teachers neither agreed nor disagreed, indicating that they likely were unsure of the level of preparedness of special education teachers. Additionally, while the majority of general education teachers and administrators responded that their formal education had not prepared them to work with individuals with dyslexia, other educators were split fairly evenly in responding either that they were prepared appropriately during their formal education or that their formal education had not prepared them appropriately. When considering the makeup of the other educator category (special education, SLP, school psychology, social work, and counseling), reason would tell us that more of these individuals should respond that their university education had prepared them, as reading instruction and literacy are likely specialized areas of focus for many SLP, psychology, and special education programs of study. Also, given the nature of the specialties of other educators, it is logical that more would disagree with the misconception that “After three to five hours of instruction, most educators can work competently with students with dyslexia,” while this trend was not observed in responses from general education teachers and administrators.

Aim #2. Job Classification and Knowledge

Behavior. Trends of knowledge of behavior were similar between groups, with the majority of general education teachers and other educators indicating that dyslexia may cause social, emotional, and family problems. Administrators were less sure about what kinds of problems dyslexia can cause, but overall trended toward responding that dyslexia does cause problems for struggling readers.

Language and Literacy. Knowledge of the relationship between dyslexia and phonemic awareness varied significantly between job classifications, with other educators demonstrating

the best understanding of this topic. Although the responses to all other statements in the “Language and Literacy” category generated statistically nonsignificant differences between groups, the results are still valuable and worth discussing to understand the general knowledge base of educators in Eastern Idaho. The majority of educators, regardless of job classification, agreed with many of the statements provided, including that dyslexia affects language processing, writing/speaking abilities, and vocabulary growth. Additionally, polarized responses were observed for several statements. Polarized responses existed when the majority of educators across job classifications selected the same response category, but the difference between groups was ten percent or greater (for example, if 65% of general education teachers “agreed” with a statement, 75% of other educators “agreed” with the same statement, and 70% of administrators “agreed” with the same statement). Such polarized responses were observed for these statements: grapheme-phoneme instruction is more effective than word-level instruction, accuracy is a more crucial part of reading fluency than rate, individuals with dyslexia have trouble understanding the structure of language, individuals with dyslexia may not start to demonstrate difficulty reading until later on in their schooling, and these individuals are usually very poor spellers. Specifically, overall, higher percentages of general education teachers answered “neither” to these more polarizing statements than the other groups did, indicating potential uncertainty in the correct answer. Additionally, overall, other educators demonstrated higher percentages of accurate agreement on four out of the six most polarized statements in which the majority of respondents agreed. This indicates that although the majority of educators across groups demonstrated accurate knowledge of language and literacy, other educators demonstrated higher rates of accurate knowledge than other groups.

Cognition. There were statistically significant differences in responses between groups to the statement, “Students with dyslexia need structured, sequential, direct instruction in basic skills and learning strategies.” Other educators agreed at the highest rate, while general education teachers selected “neither” at the highest rate, potentially indicating that they were unsure of the correct response to the statement, which was true.

Misconceptions. Knowledge of the frequency of occurrence of dyslexia in boys versus girls varied significantly between job classifications. A higher percentage of general education teachers answered “neither.” Overall, this statement represented a misconception that is held by many educators in Eastern Idaho, as most respondents answered either “neither” or “agree,” because we know no such gender bias exists for incidence of dyslexia. There was also a statistically significant difference in responses between groups with regard to whether dyslexia is caused by a poor home environment or inappropriate reading instruction (which it is not), with a higher percentage of general education teachers answering “neither,” indicating that they likely were more unsure than the other job classification. Interestingly, fewer general educators agreed with this statement than other educators and administrators, which ultimately caused levels of disagreement to be fairly even between job classifications. Additionally, a statistically significant difference in responses between groups was observed in regard to the misconception that word and letter reversal are major criteria in identifying dyslexia, with a higher percentage of general education teachers inaccurately agreeing with this statement. Other educators demonstrated the highest percentage of disagreement with the statement, however all job classifications varied in their responses, indicating an overall lack of knowledge in this area.

Other. There was a statistically significant difference between job classifications in knowledge of the incidence of dyslexia in school-age children (as many as 20% of the population

has dyslexia). Specifically, a higher percentage of general education teachers responded “neither”, again indicating a potential gap in their knowledge of the incidence of dyslexia. Additionally, significantly more administrators disagreed with the statement that dyslexia is the most common learning disorder among school age children. Overall, most respondents did not know whether or not to agree/disagree with this statement and instead responded with “neither.” Dyslexia represents 80% of all diagnosed learning disorders, but respondents were unsure about the prevalence of dyslexia.

Educational Implications

Considering the amount of time that children spend in schools throughout their formative educational years, it is essential to consider the knowledge base of their teachers and other educators who provide services to them when determining how to better serve their literacy needs. Overall, general education teachers more commonly responded “neither agree nor disagree” to statements (that should have been agreed or disagreed with) throughout the survey than the other professionals. This response may speak to either a lack of knowledge, or a lack of confidence in their knowledge. In order to capitalize on the contact time that these teachers have with their students, and improve students’ literacy outcomes, we need to work on increasing their knowledge of the signs and symptoms of dyslexia, imparting what dyslexia is and what dyslexia is not. Additionally, across job classifications, no one group strongly agreed that their formal education had prepared them adequately to serve students with dyslexia (although other educators did agree that their formal education had prepared them at higher rates than the other job classification categories did), highlighting the need to examine the reading curriculum in teacher-preparation programs.

Study Limitations

Examination of the methods used in the study reveals several potential flaws which could have impacted the results. First of all, survey studies by definition require volunteerism, which may incorporate response bias into the results. Specifically, those who feel strongly about the topic being surveyed may have felt more compelled than others to respond, which could have affected the results. Educators who feel strongly about dyslexia may be more knowledgeable about the topic than those who did not volunteer to respond. Further, while we do not know the true proportions of individuals in each job classification category within the population of educators in Eastern Idaho, we did not accrue an even distribution of respondents (volunteers) across job classification categories. We would expect there to be more general education teachers in the population than other educators and administrators, but we had almost too few respondents that were not general education teachers to conduct our analyses. Accordingly, in order to analyze the data using chi-square analysis, we chose to collapse across job classification categories to fill the necessary cells (given that a minimum of five data points are required in 20% of the category cells to conduct a chi-square). Variability in responses between groups may have been reduced due to this collapse of categories. Collapsing the data in this way also prevented comparisons between specific professions within the “other educator” category, which was part of our original study aims. In the future, this could be addressed by obtaining a larger sample, stratifying the sample to accurately represent the proportions of each job classification category in the population, weighting responses from job classification categories with fewer respondents than proportions in the population, or reducing the number of categories prior to distribution of the survey.

Question formulation may have also impacted respondent answers. The wording of statements may have swayed respondents to reply in a certain way. In the future, in order to mitigate this limitation, these statements may be made in multiple different ways throughout the survey to determine the consistency of respondents' answers. Additionally, we did not have an "I don't know" response option among our Likert responses. Some respondents may have answered "neither agree nor disagree" in instances when they did not know how to respond to the statement, which may not have accurately represented their knowledge of said statements.

One other limitation of the study was ambiguity in defining the "other" job classification category. We listed out all of the specific job classifications of interest as options to select, however, many respondents stated that their job classification was "other," indicating that their current job was not listed as an option. Therefore, we do not know precisely which job classifications make up this group. Due to this ambiguity, we did not discuss the responses of "other" within the results or the discussion. Based on the job classification categories that were not specified, we presume that many of the individuals who comprised this category were teacher aides. This limitation could have been mitigated by including "classroom aide" and "special education aide" categories as response options for current job classifications. Perhaps even including a space to indicate what "other" job classification they belong to would facilitate interpretation of results in the future. Aides often have a lot of contact with students, especially those struggling with class content, thus knowing more about their knowledge of dyslexia would be valuable.

Future Directions

In the future, researchers may examine reading curriculum taught in universities in the Mountain region to determine the adequacy of these programs. The reading curriculum taught in

universities in Idaho and the surrounding states directly impacts how students in our area are taught because the majority of the educators working in Eastern Idaho schools receive their education in the Mountain region. Further, it would benefit our understanding to explore what literacy curriculum is being implemented in the schools in Eastern Idaho, so that supplemental instruction can be provided to facilitate alignment with the science of reading. Additionally, in order to more specifically compare the knowledge of the professions who were collapsed into the “other educator” job classification (i.e., special education teachers, SLPs, school psychologists, social workers, and counselors), a larger sample size may be obtained in future studies. Options would be to survey educators throughout the state of Idaho or survey each of these job classifications independently. The knowledge gained through this study may be used to improve the reading outcomes of children in Eastern Idaho through development of in-service programs focusing specifically on basic knowledge of the prevalence of dyslexia; overt signs and symptoms of dyslexia; and dispelling relevant misconceptions related to dyslexia, including that more boys than girls have dyslexia, and that word and letter reversal is a major criterion in the diagnosis of dyslexia.

Conclusions

Through this study, we aimed to identify the relationship between (a) attitudes towards dyslexia, and (b) knowledge of dyslexia, across educator job classifications. Overall, attitudes towards dyslexia were considered to be positive across groups. General education teachers were more likely than other educators and administrators to not know whether agree or disagree with statements about dyslexia should have been agreed or disagreed with. Although misconceptions and gaps in knowledge were demonstrated by individuals across job classifications, in general, the knowledge of other educators was the most accurate, supporting our initial hypothesis. Future

research could explore dyslexia attitudes and knowledge in educators throughout the state of Idaho, as well as investigating the reading curriculum taught in teacher preparation programs in the Mountain region, and literacy curriculum implemented in primary and secondary schools in this region. This information could further improve advocacy for children with dyslexia, as well as the knowledge base of the educators who teach these children to read.

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Appendix A: Dyslexia Knowledge and Attitudes Survey (adapted from Wadlington & Wadlington, 2005)

Note: The following statements were presented in a Likert format, in which the respondent must rate the extent to which they agree or disagree with the statement.

Demographics

1. How many years of higher education did you receive?
 - a. Answer options between <1 to >15 years
2. What is your highest level of education?
 - a. Associate's degree
 - b. Bachelor's degree
 - c. Master's degree
 - d. Doctor of philosophy
 - e. Other doctoral degree (e.g., of Medicine, Audiology, Speech-Language Pathology, Education, etc.)
 - f. Other
3. What did you major in for your highest level of education?
 - a. Kindergarten through 12th grade
 - b. Special education
 - c. English
 - d. Math
 - e. Science
 - f. History
 - g. Literacy and reading

- h. Foreign language
 - i. Art
 - j. Music
 - k. Physical education
 - l. English as a second language
 - m. Counseling
 - n. Psychology
 - o. Speech-language pathology
 - p. Social work
 - q. Education administration
 - r. Other
4. In what geographic region did you obtain your highest level of education?
- a. New England (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont)
 - b. Middle Atlantic (New Jersey, New York, Pennsylvania)
 - c. East North Central (Indiana, Illinois, Michigan, Ohio, Wisconsin)
 - d. West North Central (Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, South Dakota)
 - e. South Atlantic (Delaware, District of Columbia, Florida, Georgia, Maryland, North Carolina, South Carolina, Virginia, West Virginia)
 - f. East South Central (Alabama, Kentucky, Mississippi, Tennessee)
 - g. West South Central (Arkansas, Louisiana, Oklahoma, Texas)

- h. Mountain (Arizona, Colorado, Idaho, New Mexico, Montana, Utah, Nevada, Wyoming)
 - i. Pacific (Alaska, California, Hawaii, Oregon, Washington)
5. What is your current job classification?
- a. Elementary school teacher
 - i. Grade
 - b. Middle school teacher
 - i. Grade
 - c. High school teacher
 - i. Grade
 - d. Elementary school special education teacher
 - e. Middle school special education teacher
 - f. High school special education teacher
 - g. Elementary school counselor
 - h. Middle school counselor
 - i. High school counselor
 - j. School psychologist
 - k. Speech-language pathologist
 - l. Social worker
 - m. Principal
 - n. Superintendent
 - o. Other
6. How many years of experience do you have in this current job classification?

- a. 5 years or less
- b. 5;1 to 10 years
- c. 10;1 to 15 years
- d. 15;1 to 20 years
- e. 20;1 to 25 years
- f. 25;1 years or more

All remaining responses will be reported on a “level of agreement” Likert scale such that 1 = strongly disagree, 2 = disagree, 3 = somewhat disagree, 4 = neither disagree nor agree, 5 = somewhat agree, 6 = agree, and 7 = strongly agree.

Aim 1: Attitudes

1. Giving students with dyslexia accommodations such as extra time on tests, shorter spelling lists, special seating, and such is unfair to other students.
2. Individuals with dyslexia have less potential to succeed academically than their peers.
3. Being identified as dyslexic in order to receive special services causes more problems than struggling with dyslexia without identification and the resulting special services.
4. My formal education has prepared me to work with individuals with dyslexia.
5. My informal education and/or life experiences have prepared me to work with individuals with dyslexia.
6. I teach, counsel, and/or provide other services to one or more individuals with dyslexia.
7. Special education teachers receive sufficient training to work with students with dyslexia.

8. Regular education teachers receive sufficient training to work with students with dyslexia.
9. After 3 to 5 hours of instruction, most educators can work competently with students with dyslexia.
10. Struggling readers who have been provided adequate reading instruction should be evaluated for dyslexia.
11. Accommodations are necessary for individuals with dyslexia.

Aim 2: Knowledge

Behavior

1. Dyslexia often causes social problems
2. Dyslexia often causes emotional problems.
3. Dyslexia often causes family problems.

Cognition

1. Multisensory instruction (including visual, auditory, and tactile modalities) is absolutely necessary for students with dyslexia to learn.
2. In school, dyslexia only affects a student's performance in reading (not in math, social studies, etc.).
3. People with dyslexia often excel in science, music, art, and/or technical fields.
4. Students with dyslexia need structured, sequential, direct instruction in basic skills and learning strategies.

Language and Literacy

1. Dyslexia is a learning disability that affects language processing.
2. Individuals with dyslexia have trouble understanding the structure of language, especially phonics.
3. Dyslexia often affects writing and/or speaking abilities.
4. Most poor readers have dyslexia.
5. Some students with mild dyslexia may not demonstrate difficulty reading, or side effects from difficulty reading until middle school or later.
6. Children with dyslexia are more consistently impaired in phonemic awareness (the ability to hear and manipulate speech sounds) than any other ability.
7. Individuals with dyslexia are usually extremely poor spellers.
8. Individuals with dyslexia may comprehend a passage read to them very well, but be unable to read the words independently.
9. Accuracy is a more important component of reading fluency than rate.
10. Dyslexia may impact vocabulary growth.
11. Readers with dyslexia experience deficits in their ability to break words down, resulting in difficulty identifying printed words.
12. Some indirect impacts of dyslexia include reduced reading comprehension and reduced reading experience.
13. Dyslexia is primarily characterized by phonologically based language deficits, poor spelling, and difficulty reading and writing.

14. Children learn to read better, and retain their reading abilities long-term, if they have been provided explicit grapheme-phoneme instruction over word-level instruction.
15. Children will not learn phoneme-grapheme correspondence without direct instruction.
16. When schools embrace the scientific literature on reading development, there are measurable benefits for children with respect to:
 - a. earlier and more accurate word reading.
 - b. better reading fluency.
 - c. vocabulary growth.
 - d. reading comprehension.
 - e. more independent reading.
 - f. more enjoyment from reading.
 - g. fewer children needing intervention.
17. In the simple view of reading, reading comprehension develops from a combination of word identification and language comprehension.

Misconceptions

1. More boys than girls have dyslexia.
2. People with dyslexia have below average intelligence.
3. Dyslexia can be managed by diet and/or exercise.
4. An individual can be dyslexic and gifted.
5. Physicians can prescribe medication to help dyslexia.
6. Dyslexia is hereditary.
7. Dyslexia is caused by a poor home environment and/or poor reading instruction.

8. College students with dyslexia seldom do well in graduate school.
9. The brains of individuals with dyslexia are different from those of people without dyslexia.
10. Dyslexia can be cured with intervention.
11. Dyslexia cannot be identified prior to a child being in 3rd grade.
12. Word and letter reversal are major criteria in identification of dyslexia.
13. There is a single standardized assessment that identifies individuals with dyslexia.

Other

1. As many as 20% of children have dyslexia.
2. Dyslexia is the most common learning disorder among school-age children.