

**Indiana's Dyslexia Policy and Perceptions of Early Literacy Educators**

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## Table of Contents

Table of Contents	i
List of Tables	iv
List of Figures	v
Abstract	vi
Chapter 1: Problem of Practice	1
Background	2
Dyslexia as a Reading Difficulty	2
Controversies in Reading Instruction	3
State Dyslexia Policies	4
Purpose of Study	5
Research Aim	6
Research Questions	7
Limitations, Delimitations, & Bias of the Study	8
Definition of Terms	9
Chapter 2: Literature Review	12
Introduction	12
Review of Known Literature	13
Complexities of Reading the English Language	13
Theories of Reading Acquisition and Development	15
Definition of Dyslexia as a Reading Difficulty	17
Neurobiological Implications of Dyslexia	18
Reading Skills	19
Effective Classroom Instruction	20
Reading Wars	21
Dyslexia Policy	22
Reading Policy	22
National Policy	23

Indiana's Dyslexia Policies	24
Screening and Identification	25
Intervention Requirements	27
Reading Intervention	28
Proposed Solution	29
Discussion of Measurable Improvement	30
Summary	30
Chapter 3: Methodology	32
Statement of Purpose and Introduction	32
Research Design	33
Instrumentation	33
Content Validity	36
Reliability	39
Demographics	45
Research Procedures	46
Participants	46
Data Collection	47
Data Analysis	49
Assumptions, Limitations, Scope, and Delimitations	50
Chapter 4: Findings	53
Participants	54
Current Grade Level and School Setting	55
Years of Experience	56
Licensure	58
Research Question 1	59
Research Question 1a	59
Research Question 1b	62
Research Question 2	63

Research Question 2a	64
Research Question 2b	67
Summary	69
Chapter 5: Conclusions	71
Problem Statement and Methodology	71
Summary of Results	72
Discussion	72
Interpretation	73
Research Question 1, Sub Question 1a	73
Research Question 1, Sub Question 1b	74
Research Question 2, Sub Question 2a	75
Research Question 2, Sub Question 2b	75
Relationship to Prior Research	76
Complexity of the English Language	76
Reading Acquisition and Development	77
Definition of Dyslexia	78
Reading Intervention	79
Implications for Practice and Policy	80
Implications for Future Research	81
Conclusion	83
References	85
Appendix A: Research Supporting Documents	98

**List of Tables**

Table 1 <i>Lawshe's Content Validity Calculations for Process Category Questions</i>	38
Table 2 <i>Lawshe's Content Validity Calculations for Outcome Category Questions</i>	39
Table 3 <i>Chronbach's Alpha for the Initial Analysis</i>	40
Table 4 <i>Item Level Analysis for Initial Reliability</i>	42
Table 5 <i>Chronbach's Alpha for the Revised Analysis</i>	43
Table 6 <i>Item Level Analysis for the Revised Analysis</i>	44
Table 7 <i>Chronbach's Alpha for the Final Analysis</i>	45
Table 8 <i>Demographic Breakdown of Study Participants: Grade Level and School Setting</i>	56
Table 9 <i>Demographic Breakdown of Study Participants: Years of Experience</i>	57
Table 10 <i>Demographic Breakdown of Study Participants: Current Licensure</i>	58
Table 11 <i>Median and Interquartile Ranges for Research Question 1a</i>	60
Table 12 <i>Frequency Distributions for Research Question 1a</i>	61
Table 13 <i>Median and Interquartile Ranges for Research Question 1b</i>	62
Table 14 <i>Frequency Distributions for Research Question 1b</i>	63
Table 15 <i>Median and Interquartile Ranges for Research Question 2a</i>	65
Table 16 <i>Frequency Distributions for Research Question 2a</i>	66
Table 17 <i>Median and Interquartile Ranges for Research Question 2b</i>	68
Table 18 <i>Frequency Distributions for Research Question 2b</i>	69

**List of Figures**

Figure 1 <i>July 2022 Approved Assessments from the Indiana Department of Education</i>	27
Figure 2 <i>Framework for Survey Category Development</i>	36

## Abstract

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### Indiana's Dyslexia Policy and Perceptions of Early Literacy Educators

Chair of Dissertation Committee: Dr. Tori Colson

Dyslexia policy has become prevalent across the United States in past years and influenced practices such as screening and intervention for reading difficulties, as well as professional awareness for current or prospective educators. At the time of the study, little research existed related to the influence Indiana's dyslexia policy has had on reading instruction and outcomes for students. This quantitative study sought to determine the extent to which kindergarten through second grade teachers serving in Indiana public schools perceived Indiana's dyslexia policy had influenced these elements.

The sample represented in this study included kindergarten through second grade teachers in Indiana with at least five years of in-state teaching experience ( $n = 84$ ). These participants responded to an 18 question Qualtrics survey with additional demographic questions. Results were analyzed using descriptive statistics which included tests of central tendency and frequency distributions. These findings indicated that most teachers perceived that students who participated in interventions based on the results of universal screening would likely have been identified to participate prior to the enactment of statute and believed the required instructional elements were either much or somewhat more likely to occur in reading interventions. Median outcomes indicated a perception that educators believed students who participated in these interventions were somewhat likely to meet grade level outcomes by the end of the year, and the instructional elements required by state statute were either very or somewhat likely to contribute



to students meeting these outcomes. The implications of the results included a recommendation for professional awareness in phonemic awareness. In addition, the researcher recommended a deeper investigation into the root causes for reading difficulty to determine barriers to reading acquisition and strengthen future iterations of policy.

## Chapter 1: Problem of Practice

### Problem of Practice

Reading mandates are not new to the landscape of educational policy (Council of Chief State School Officers, 2019). In response to literacy outcomes, states have enacted numerous policies to address reading instruction, such as 3<sup>rd</sup> grade reading initiatives and prioritization of early literacy (Council of Chief State School Officers, 2019). Within recent years, dyslexia legislation has become a fixture in 49 states across the United States, as well as appearing in policy around the globe (Fien et al., 2021; Gearin et al., 2020; Jones et al., 2019; National Center on Improving Literacy, 2022). These policies differ by locale, but some commonalities are noted. According to the National Center for Improving Literacy (2022), common themes within these policies include screening, intervention, and pre-service and in-service requirements.

Indiana is one of the 49 states which has introduced educational policy addressing dyslexia (National Center for Improving Literacy, 2022). One such policy, House Enrolled Act 1108 (2015), required professional awareness for prospective educators. The outcomes of this policy have been examined through a program efficacy study performed by an Indiana university (Jones et al., 2019). Another policy, Senate Enrolled Act 217 (2018), mandated specific actions including assessment and intervention for students who demonstrated risk of dyslexic characteristics. These requirements are outlined in Indiana Code 20-35-5 (2022). Though some studies have examined the reliability of assessment measures used in response to dyslexia policy to identify students who are at risk of characteristics commonly associated with dyslexia, Gearin et al.'s (2021) study indicated heterogeneous outcomes may occur across states in response to variance within dyslexia policies. Based on this implication, it is important to study outcomes related to policy within the context of the state's current dyslexia policy, or legislation.

While some research has occurred on outcomes related to educator professional awareness and testing validity, little research is available regarding the influence Indiana's dyslexia policy has had on reading outcomes for students (Fien et al., 2021; Jones et al., 2019; Phillips & Odegard, 2017). It should be noted, state policy does not dictate one specific reading intervention. Rather, it refers to components which should be present within interventions, such as explicit, systematic, and sequential phonics instruction, and this lack of specificity could result in variance across local educational agencies.

## **Background**

### ***Dyslexia as a Reading Difficulty***

Gough & Tunmer's (1986) seminal theory, the Simple View of Reading, postulates reading comprehension is the product of decoding and comprehension. Dyslexia may be broadly described as a neurobiological reading difficulty associated with a deficit in the phonological core which manifests as difficulty with decoding skills (Gearin et al., 2021; Indiana House Bill 1108, 2015; Shaywitz & Shaywitz, 2020; Torgesen, 2005/2007). This means an individual who has been diagnosed with dyslexia may have difficulty associating sounds with written letters, or orthography, which could in turn lead to a lack of comprehension of written text.

The orthography of a language may differ in transparency when both phonological and morphological elements are considered (Schmalz, 2015). Some languages are easier to decode with graphemes, or the written representation of a sound, only mapping to one sound in language. These are referred to as shallow orthographies and are representative of written languages such as Dutch or German (Schmalz, 2015). On the other side of the orthography continuum, one may explore the concept of deep orthographies. These are often difficult to

decode with one grapheme representing multiple sounds in language. The English language is an example of deep orthography (Schmalz, 2015).

The complexities of the English language make it difficult to decode. This may be especially difficult for a student who has been identified as having dyslexia. Some literature has suggested students with dyslexia would benefit from explicit, intensive reading instruction on phonemic awareness and corresponding decoding strategies (Torgesen, 2005/2007).

### ***Controversies in Reading Instruction***

To address these difficulties in reading, experts have varying opinions on what constitutes effective reading instruction. In past years, frameworks of reading acquisition with implications for instruction have evolved and changed. Many may cite the seminal work of Gough & Tunmer (1986), the Simple View of Reading. These researchers postulated reading was the product of two factors: decoding and comprehension (Gough & Tunmer, 1986). This required the interaction of understanding the meaning of language and decoding written language to make meaning of text (Gough & Tunmer, 1986). In a similar manner, Seidenberg & McClelland (1989) proposed a general framework for lexical processing which is referred to by some as the triangle model (Chang et al., 2020). In this model, the authors explore how phonology and orthography interacted with each other to create meaning at a semantic level (Seidenberg & McClelland, 1989).

Gough & Tunmer's (1986) model was later expanded by Hoover & Tunmer (2020) to create the Cognitive Foundations Framework. This framework expanded the Simple View of Reading to visually represent the hierarchy of skills found within the elements of word recognition and language comprehension (Hoover & Tunmer, 2020). A later model proposed by

Duke & Cartwright (2021), also expanded on the Simple View of Reading, and included processes related to self-regulation.

The aforementioned models are reflective of a literacy approach termed structured literacy which emphasizes the importance of code-based instruction to create meaning of text (Fallon & Katz, 2019). However, other models exist which emphasize social and environmental aspects of reading development associated with approaches such as whole language (David et al., 2020; Yaden et al., 2021). These conflicting models and approaches to reading instruction have contributed to opposing viewpoints; hence stakeholder input regarding the use of specific reading methods in classrooms has become prevalent (Cook et al., 2017; David et al., 2020; MacPhee et al., 2021; Yaden et al., 2021). This clash between ideas has been referred to as the reading wars (Yaden et al., 2021). Some suggest media and digital tools have also fueled the controversy related to reading instruction methods and may have increased stakeholder advocacy, as well as legislatively mandated practices enacted through state reading policy (Barnes, 2022; MacPhee et al., 2021).

### ***State Dyslexia Policies***

Kingdon's multiple streams approach describes policy development as the intersection between problem, practice, and policy (Gearin et al., 2020). One may theorize that the increased media exposure regarding scientifically based reading instruction and the reading wars, especially as it relates to instruction for students having a reading difficulty such as dyslexia, may have contributed to the intersection of Kingdon's streams and increasingly prevalent dyslexia policy reform in the United States (Gearin et al., 2020; MacPhee et al., 2021). To date, state-based dyslexia policy has been introduced in 49 states and addresses screening and

identification, intervention, and professional awareness for educators (Fien et al., 2021; Gearin et al., 2020; Jones et al., 2019; National Center on Improving Literacy, 2022)

Indiana has multiple state policies which address dyslexia. House Enrolled Act 1108 (2015) mandates prospective educators to participate in dyslexia professional awareness as a preservice requirement. A later policy, Senate Enrolled Act 217 (2018), addresses requirements for public schools in the state. This policy required universal screening for characteristics of dyslexia and intervention for identified students in kindergarten through second grade. Though there is research related to HEA 1108 (2015) and studies have examined universal screening and the influence of intervention within other states, outcomes may differ by state due to differences in the policies (Gearin et al., 2021; Jones et al., 2019; Odegard et al., 2020). Based on this implication, it is important to study assessment and intervention outcomes within the context of the state's current dyslexia policy, or legislation.

### **Purpose of Study**

Dyslexia policies across the nation have addressed common elements such as state definitions of dyslexia, preservice educator preparation, professional awareness, screening and identification, and intervention (Fien et al., 2021; Gearin et al., 2020). Components of these policies have been studied, though variance in wording and requirements could result in differing outcomes from state to state (Gearin et al., 2021). This makes it essential to examine outcomes within the context of the local policy. This quantitative research study explored the extent to which kindergarten through second grade teachers serving in Indiana public schools perceived Indiana's dyslexia policy had influenced reading instruction and outcomes for students.

## **Research Aim**

The goal of this study was to explore the perceptions educators had regarding the influence the state's dyslexia legislation had on reading instruction and outcomes for students who were identified as having risk of dyslexia, as defined by Senate Enrolled Act 217 (2018). Based on this state statute, individual school districts selected from a list of screeners which were approved by the state and had the autonomy to set local parameters for risk. These limitations within common data collection made it difficult to have a consistent measure by which to measure the quantitative outcomes of student performance across school districts. For this reason, perception data from educators was collected.

This data was collected through a survey developed by the researcher which was based on the intersection of two frameworks. The first of these frameworks was Hoover & Tunmer's (2020) Cognitive Foundations Framework, which represented the cognitive components and knowledge-based skills which make up language comprehension and word recognition. The components from the word recognition strand of this framework were aligned with a conceptual framework intended to be used to analyze the effects of educational policies through comparison (Vesely, 2012). Vesely's (2012) framework, highlighted six elements linked within educational policy analysis: policy creation, inputs from policy creation, process, outcomes, effects, and the context by which policy is influenced. For this study, the researcher examined how components of the word recognition strand of Hoover & Tunmer's (2020) framework were reflected in the processes and outcomes components reflected in Vesely's (2012) framework.

The results of this research are important to consider when developing future iterations of legislation and making local decisions regarding implementation of policy (Gearin et al., 2021).

To narrow the scope of the project and best support implications for practice, this project examined the perceptions of current Indiana public school primary teachers with five or more years of experience teaching kindergarten through second grades in a sample of Indiana public school districts. This delimitation is discussed further within the methods section of this dissertation.

### **Research Questions**

The research questions explored through this study were:

1. To what extent do elementary kindergarten through second grade teachers serving in Indiana public schools perceive the state's dyslexia legislation has influenced reading instruction for students?
  - a. How have outcomes from universal screening measures influenced the identification of students receiving intensive intervention?
  - b. How has intensive reading intervention been influenced by state statute requiring specific elements be present in the instruction?
2. To what extent do kindergarten through second grade teachers serving in Indiana public schools perceive the state's dyslexia legislation has influenced reading outcomes for students?
  - a. How has the use of an intensive reading intervention for students who have received a score of "At Risk" or "At Some Risk" influenced grade level reading outcomes?
  - b. To what extent do teachers perceive the instructional elements required by state statute have influenced these reading outcomes?



The exploration of these research questions allowed for further clarification of the influence Indiana's dyslexia legislation has had on reading outcomes for students who were identified as being "at risk" or "at some risk" as defined by the state's statute. Determining the current perceptions of Indiana educators as they related to reading instruction and outcomes provided a helpful baseline and clarity regarding the perceived influence of Indiana's dyslexia legislation. The study also provided an opportunity for future study of differing outcomes between states with contrasting statutory language.

### **Limitations/Delimitations/Bias of the Study**

There were some limitations to the study which could limit the generalizability of the results. These limitations were related to the individuals who were included in the study sample. Only participants who were current primary teachers in public schools located in Indiana were included, and only 68 school corporations across the state of Indiana were surveyed. The exclusion of participants from other areas limited the extent to which these results were generalizable across the state or to other states. The exclusion of participants who had less than five years of experience teaching students in grades kindergarten through second grade, though necessary to allow for comparison to pre- and post-legislation instruction, did not allow the viewpoints of beginning teachers to be reflected.

This study was limited to the examination of teacher's perceptions of the influence dyslexia policy has had on reading instruction and outcomes, with an emphasis on the word recognition component of Hoover & Tunmer's (2020) Cognitive Foundations of Reading Framework. The focus on word recognition was a delimitation of the study. Future study should

occur to examine the influence policy has had longitudinally on reading comprehension and overall long-term effects (Vesely, 2012).

It should be noted that some bias was likely to be present due to the professional role and experience of the researcher. The researcher had a background in primary literacy instruction, as well as experience with leading dyslexia screening in an administrative role within the context of Indiana. The researcher also served as a central office administrator in a school district located in Indiana and worked with assessment, such as dyslexia screening. This role and relationships with others could have influenced the lens through which results were interpreted.

### **Definition of Terms**

**Decoding:** The process used to identify and blend together the sounds represented by individual graphemes in written text to read words (Ehri, 2022).

**Dyslexia:**

A specific learning disability that: (1) is neurological in origin and characterized by: (A) difficulties with accurate or fluent word recognition; (B) poor spelling and decoding abilities; (2) typically results 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; (3) may include problems in reading comprehension and reduced reading experience that can impede the growth of vocabulary and background knowledge; and may require the provision of special education services after an eligibility determination is made (Indiana House Bill 1108, 2015).

**Fluency:** The rate at which one can read written language accurately and at an appropriate speed (Solari et al., 2018).

**Grapheme:** An individual or bound set of letters which represent a single sound, or phoneme, in language (Ehri, 2022).

**Orthographic Mapping:** The process by which individuals cognitively maintain knowledge of the written representation of words to facilitate instantaneous retrieval when later encountering text (Kilpatrick, 2020).

**Orthography:** A written representation of language based on the order of letters within a word (Kilpatrick, 2020).

**Phoneme:** The smallest unit of sound found within spoken language. These units of sound are used to differentiate spoken words (Ehri, 2022; Kilpatrick, 2020).

**Phonemic Awareness:** The ability to differentiate individual phonemes within words and then manipulate these sounds through the process of segmenting, blending, substituting, deleting, or adding sounds (Ehri, 2022).

**Phonics:** Instruction which involves the teaching of phoneme-grapheme correspondences to facilitate an individual's ability to translate graphemes to phonemes and blend the sounds into words (Ehri, 2022).

**Policy:** Formal reforms which may be statutory and top-down in nature. These may be regulated by federal or state government or designed and enacted by the local education agency (Wessel-Powell et al., 2019).

**Response to Intervention (RTI):** A model which is used to identify students who may be at risk for having a learning or reading disability and intervene through supplemental instruction to prevent further difficulty and/or consider the possibility of receiving special education services (Catts et al., 2015).

Screening: A process which includes using an identified assessment to determine a student's risk level for specific characteristics which are associated with dyslexia, or reading difficulty (Catts et al., 2015; Indiana Department of Education, 2022a).

Word Recognition: The quick and accurate mental retrieval of printed words and corresponding word meanings (Hoover & Tunmer, 2020).

## Chapter 2: Literature Review

### Introduction

This chapter provides a brief review of the literature related to dyslexia and corresponding policy existing across the nation at the time of the study, with a specific emphasis on Indiana's dyslexia policy. To provide background on the literature collected, this review begins with an introduction to the English language and the complexities which make it difficult to read and comprehend. This includes a brief overview of the orthography and structure of the English language (Schmalz, 2015; Torgesen, 2005/2007).

After reviewing elements of the English language, the researcher explored models of reading acquisition. Though the existing models of reading acquisition were numerous, this literature review presented four theories in chronological order (Duke & Cartwright, 2021; Gough & Tunmer, 1986; Hoover & Tunmer, 2020; Seidenberg & McClelland, 1989). These were selected to demonstrate common elements of reading acquisition theory which were shared among researchers and to highlight the way in which these had evolved over time.

After reviewing these models of reading acquisition, the researcher provided a codified definition of dyslexia for the state of Indiana (House Enrolled Act 1108, 2015). This included exploration of specific elements which were addressed in the definition, such as neurobiological implications and specific reading skills which individuals with dyslexia may have difficulty mastering (House Enrolled Act 1108, 2015). Since effective reading instruction was explicitly mentioned within the definition as a precursor to exploring dyslexia as a reading difficulty for individuals, controversy within viewpoints on what constitutes effective reading instruction was also examined through the lens of what has been coined, "The Reading Wars" (Yaden et al., 2021).

Dyslexia policy was next introduced through this review. To provide context to the development of this policy, historical reading policies were explored to demonstrate the priorities which were placed upon early literacy by state and federal government over the past twenty years (Council of Chief State of School Officers, 2018). This policy was then connected to current national reading policies which addressed supports for students who demonstrated risk of characteristics of dyslexia, and studies which have explored the outcomes of these policies. Indiana's dyslexia policies were then explained in detail, and studies related to each of the mandated components of these policies were reviewed (House Enrolled Act 1108, 2015; House Enrolled Act 1514, 2021; Senate Enrolled Act 217, 2018).

## **Review of Known Literature**

### ***Complexities of Reading the English Language***

Orthography has been described as shallow or deep, with shallow orthographies being easier to decode due to frequent consistency in phoneme-grapheme correspondence (Schmalz, 2015). The depth of an orthography is determined by the ease with which the orthography of the language can be decoded through the use of reliable phoneme-grapheme correspondences (Schmalz, 2015). For example, a shallow orthography may always use the same grapheme, or written representation of the sound, to reflect the phoneme, or sound. In a deep orthography, such as English, the phoneme may be represented by numerous graphemes.

The English language is also morphophonemic, meaning words may be spelled based on the morpheme, or unit of meaning, rather than simply the phonemes heard in the word (Schmalz, 2015; Wolf et al., 2009). For example, the words "heal" and "health" are spelled based on the morphological unit and have different phonological pronunciations (Schmalz, 2015, p. 1615).

These inconsistencies within deep orthography have had an impact on the reading development of individuals learning the orthography and can make it difficult to decode (Schmalz, 2015).

When examining the needs of students who are learning to read, it is important to consider the depth of the orthography (Antzaka et al., 2018; Desrochers et al., 2017). A study which examined the reading development and need for morphological awareness instruction across orthographies found a strong correlation between opaque, or deep, orthographies and morphological awareness instruction to increase future success in reading (Desrochers et al., 2017). Still another study showed that rapid automatized naming (RAN) and visual attention span (VAS) skills for more advanced readers were impacted by the depth of the orthography being read (Antzaka et al., 2018).

Another consideration is the extent to which educators understand the structure of the English orthography. Curricular resources teaching a phonics-based approach to orthography are available yet may not always be effective without educator expertise (Cohen et al., 2016). When comparing schools using a code-based approach as compared to an approach which did not explicitly teach the rules of the English orthography, researchers were unable to identify an increase in student achievement or educator knowledge of the content (Cohen et al., 2016). Some may question if this was due to a lack of professional development around concepts relating to orthography. Ehri & Flugman (2017) found the use of a year-long mentorship program coupled with instructional materials increased not only student achievement, but also teacher perception and ability. It is of critical importance that educators are provided with instruction on the basic constructs of the English language as a recent study demonstrated that students in preservice teaching programs may not have a basic understanding of these concepts (Washburn et al., 2015). Providing preservice teachers with this content early may be helpful as one study

demonstrated that teachers who had been taught using a whole language approach were still likely to use this approach when teaching constructs of the English language, even after receiving professional development in this area (Arrow et al., 2019).

### ***Theories of Reading Acquisitions and Development***

When researching best practice within early reading instruction, multiple frameworks or theories of reading acquisition and development were referenced. The most popular of these theories and frameworks were arguably the Simple View of Reading (Gough & Tunmer, 1986) and the triangle model (Chang et al., 2020; Harm & Seidenberg, 2004; Seidenberg & McClelland, 1989). Each of these concepts and their corresponding implications were discussed in the paragraphs below, as well as two more recent models (Duke & Cartwright, 2021; Gough & Tunmer, 1986; Hoover & Tunmer, 2020; Seidenberg & McClelland, 1989).

Gough and Tunmer's (1986) Simple View of Reading stated reading was the product of two factors: decoding and comprehension. Decoding was defined as the ability of a student to use knowledge of the connection between phonemes and graphemes to read written text (Gough & Tunmer, 1986). Word recognition, on the other hand, was considered to be automatic and related more to the concept of orthographic mapping (Kilpatrick, 2016; Miles, et al., 2017). Orthographic mapping incorporated the knowledge of phonemic awareness, sound-symbol correspondence, and an understanding of orthography to create a repository of words which could be accessed automatically as the reader encountered text (Moats, 2020). The comprehension component of this theory referred to listening comprehension (Gough & Tunmer, 1986). Without each of these components, reading was unable to take place (Gough & Tunmer, 1986). This model also provided guidance for typical patterns of reading difficulty (Gough & Tunmer, 1986). Reading difficulties consistent with dyslexia were associated with decoding



concerns and those consistent with hyperlexia, or strong word reading skills paired with poor comprehension, were associated with comprehension (Gough & Tunmer, 1986; Moats, 2020). The final category of reading difficulties was referred to as “garden variety” and was associated with difficulty in both decoding and comprehension (Gough & Tunmer, 1986, p. 8).

One popular model of reading acquisition was the triangle model (Chang et al., 2020; Harm & Seidenberg, 2004; Seidenberg & McClelland, 1989). In this model, four categories of processing were included: phonology, orthography, semantics, and context (Seidenberg & McClelland, 1989). These categories of processing were used to explore multiple pathways of processing print (Harm & Seidenberg, 2004; Seidenberg & McClelland, 1989). When processing phonologically, individuals attach sounds to print. Print is then orthographically processed by an individual (Harm & Seidenberg, 2004; Seidenberg & McClelland, 1989). The remaining processing categories used information taken from these lower categories to attach meaning to text (Harm & Seidenberg, 2004; Seidenberg & McClelland, 1989). The use of this model allowed for multiple pathways of processing print to be examined and used to predict reading difficulties (Harm & Seidenberg, 2004).

Hoover & Tunmer (2020) reflected the basic tenets of the Simple View of Reading in their Cognitive Foundations Framework. This framework built upon Gough and Tunmer’s (1986) initial work to provide clarity regarding the components which comprised language comprehension and word recognition. These word recognition components included an understanding of print, phonological awareness, and an understanding of orthographic knowledge (Hoover & Tunmer, 2020). Language comprehension components also included an understanding of how background knowledge could influence comprehension, as well as syntax and semantic knowledge (Hoover & Tunmer, 2020). This framework may be used to support

individuals who would benefit from additional support in reading or to evaluate curriculum for gaps in necessary skills (Hoover & Tunmer, 2020).

Duke and Cartwright (2021) expanded upon the Simple View of Reading by Gough and Tunmer (1986), to include processes associated with self-regulation and, “bridging processes,” in a model referred to as the Active View of Reading (Duke & Cartwright, 2021, p. S35). The processes of self-regulation included an individual’s motivation and engagement with the material, as well as executive functioning skills and the use of strategies (Duke & Cartwright, 2021). Critics of this model cited the empirical strengths of the Simple View of Reading and referred to the lack of such evidence for the use of the Active View of Reading (Hoover & Tunmer, 2021). Rather than replacing the Simple View of Reading with another model to reflect advances which may and must occur through the study of reading development, it was recommended practitioners supplement this model to reflect advances which occur (Hoover & Tunmer, 2021).

### ***Definition of Dyslexia as a Reading Difficulty***

The term ‘dyslexia’ has evolved over the past decade, which made it imperative to ensure a common understanding of the term when studying this concept (Adlof & Hogan, 2018; Shaywitz & Shaywitz, 2020; Vellutino et al., 2004; Vellutino & Fletcher, 2005). Historically, dyslexia was associated with visual deficits (Vellutino et al., 2004; Vellutino & Fletcher, 2005). At one point, dyslexia was attributed to the visual reversal of letters and words (Vellutino et al., 2004; Vellutino & Fletcher, 2005). Later scholars suggested dyslexia could be linked with visual tracking capabilities, though this theory was not supported through studies comparing the visual tracking capabilities of readers both with and without dyslexia (Vellutino et al., 2004; Vellutino & Fletcher, 2005). Indiana’s House Bill 1108 (2015) defined dyslexia as:

a specific learning disability that: (1) is neurological in origin and characterized by: (A) difficulties with accurate or fluent word recognition; (B) poor spelling and decoding abilities; (2) typically results 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; (3) may include problems in reading comprehension and reduced reading experience that can impede the growth of vocabulary and background knowledge; and may require the provision of special education services after an eligibility determination is made in accordance with 3 511 IAC 7-40.

This language was reflective of definitions of dyslexia which have been written into other policies as well. For example, U.S. Public Law 115-391 (2018) addressed dyslexia screening for individuals who were in the prison system at that time and stated the following:

The term “dyslexia” means an unexpected difficulty in reading for an individual who has the intelligence to be a much better reader, most commonly caused by a difficulty in the phonological processing (the appreciation of the individual sounds of spoken language), which affects the ability of an individual to speak, read, and spell.

**Neurobiological Implications of Dyslexia.** Some iterations of a definition of dyslexia departed from those which attributed dyslexia to deficits related to visual acuity. Rather, they explored the neurological components of dyslexia. This was important as research has suggested the brain does not naturally develop the process of reading the orthography of a given language without instruction (Dehaene, 2009; Dehaene-Lambertz et al., 2018; Wolf, 2007). Rather, literature has suggested the human brain naturally responds to and mimics phonemes within language (Moats, 2020; Poliva, 2016).

Multiple studies have explored the connection between reading and neurological development, some with a specific focus on the neurological development of readers with dyslexia (Dehaene-Lambertz et al., 2018; Price & Devlin, 2011; Raschle et al., 2012). The biological absence of an inherent system for identifying orthography was explored through Dehaene-Lambertz et al.'s (2018) study. This detailed the neurological development of the visual word form area (VWFA) in children prior to and after formal instruction (Dehaene-Lambertz et al., 2018). These researchers demonstrated a connection between reading development and neurological processes through the documentation of the migration of the VWFA to allow for orthographic identification (Dehaene-Lambertz et al., 2018).

Price & Devlin (2011) and Raschle et al. (2012) explored the role of the brain in reading and how this was impacted for individuals with dyslexia (Shaywitz & Shaywitz, 2020). Price and Devlin's (2011) Interactive Account specifically examined the role of the ventral occipitotemporal cortex in reading. They proposed a hierarchical relationship between phonological and semantic processing and orthographic input which would increase ventral occipitotemporal cortex activation in individuals who were learning to read. They also suggested activation in this area would be lower in individuals who had a diagnosis of developmental dyslexia due to a lack of automaticity in the predictions generated by the phonological and semantic processing areas. In a similar manner, Raschle et al. (2012) reiterated the neurobiological nature of dyslexia, stating that pre-readers with a familial history of developmental dyslexia presented with hypoactivation in the areas of the brain typically associated with phonological processing.

**Reading Skills.** Deficits within the phonological component, as well as word recognition, spelling, and decoding skills were addressed within Indiana's definition for dyslexia. For an

individual who is learning to read, phonological awareness, or the understanding of the sounds which make up spoken language, are crucially important, and dyslexia has been frequently attributed to a deficit in this area (Hoover & Tunmer, 2020; Snowling et al., 2020). This knowledge has supported the reader in the process of mapping these sounds to graphemes, or written symbols, in written language (Chambre et al., 2019; Ehri, 2020; Snowling et al., 2020). This process has allowed readers to develop word recognition skills, and explicit instruction with these skills may support early readers in developing a stronger understanding of language skills, such as vocabulary acquisition (Chambre et al., 2019).

Readers who have been diagnosed with dyslexia may also have secondary difficulties with skills commonly associated with comprehension, such as vocabulary and background knowledge, due to difficulty accessing text (Adlof & Hogan, 2018; Hoover & Tunmer, 2020). Individuals who have been diagnosed with dyslexia may be at risk for delayed language acquisition because of decreased exposure to text which makes it important to ensure these individuals have intentional, high-quality interactions with print materials (Adlof & Hogan, 2018). As readers have been exposed to text, they have used prior knowledge, often referred to as background knowledge, to comprehend and make meaning of text as they make inferences about what is read (Castle et al., 2018; Willingham, 2017). Lack of exposure and access to text may have ultimately led to difficulties with understanding the meaning of written materials.

**Effective Classroom Instruction.** Indiana's definition of dyslexia also noted the concerns with the phonological component are unexpected when compared to the individual's cognitive abilities and the provision of effective classroom instruction. This caveat was evident within multiple accounts referencing a researcher's very early experiences with a student who showed great capability across content areas and would likely have excelled in academics if the

content had been presented in an oral format (Adlof & Hogan, 2018; Shaywitz & Shaywitz, 2020; Vellutino & Fletcher, 2005). Likewise, many individuals with a diagnosis of dyslexia may show aptitude within academics outside of reading instruction (Shaywitz & Shaywitz, 2020).

It is important to note that Indiana's definition of dyslexia explicitly called out the role of effective classroom instruction and the imperativeness to not attribute poor reading outcomes to dyslexia when such instruction has not occurred. This required the consideration of what constituted effective reading instruction. This question has been raised among many in the literacy community and controversy around this subject resulted in what has commonly been referred to as "The Reading Wars" (Cook et al., 2017; David et al., 2020; MacPhee et al., 2021; Yaden et al., 2021). Within these reading wars, a term referred to as the "Science of Reading" has taken hold and spurred reform in reading instruction.

### ***Reading Wars***

The reading wars, described by Yaden et al. (2021) as a binary between nature and nurture, is a decades old controversy on best practice in reading instruction. One side of this binary has been reflective of the movement termed the science of reading (SoR), which has cited empirical research from multiple fields which have contributed to reading, such as neuroscience and cognitive psychology (The Reading League [TRL], 2022; Yaden et al., 2021). The opposite side of this binary explored social and environmental aspects of reading development and may be associated with approaches such as whole language (David et al., 2020; Yaden et al., 2021).

Some may find conflicting research in the field of reading has contributed to polarizing views, and stakeholders have become increasingly more vocal in their expectations for implementation of the evidence which is used to inform reading instruction (Cook et al., 2017; David et al., 2020; MacPhee et al., 2021; Yaden et al., 2021). In an article written to examine the

efficacy of a reading program grounded in whole language, Cook et al. (2017) made a suggestion on behalf of educators, parents, and taxpayers to discontinue the adoption of a specific program. As an alternative, it was suggested that revisions occur that make the materials more reflective of an approach grounded in the SoR (Cook et al., 2017).

In a similar manner, some have suggested media and digital tools have given fuel to the controversy (Barnes, 2022; MacPhee et al., 2021). MacPhee et al. (2021) cited a conceptual metaphor which refers to the media and parents as an “allied resistance,” in the war of reading education (p. S155). The quote this was sourced from originated from a parent dyslexia advocacy group (MacPhee et al., 2021). The media exposure of the reading wars and corresponding promulgation of the SoR may have contributed to stakeholder advocacy for a pervasive shift in reading instruction, as well as legislatively mandated practices enacted through state reading policy (MacPhee et al., 2021).

### ***Dyslexia Policy***

Policy development has been described as an intersection between problem, practice, and policy, as evidenced in Kingdon’s multiple streams approach (Gearin et al., 2020). As these streams have intersected, policy has been lifted as a potential solution to problems within the public realm. One may question if increased media exposure related to controversies in reading instruction and increased awareness of reading difficulties may have contributed to the intersection of these streams and the resulting prevalence of dyslexia policies across the nation (Gearin et al., 2020; MacPhee et al., 2021).

**Reading Policy.** Policy related to early literacy has influenced decisions made by schools for approximately 20 years (Council of Chief State of School Officers, 2018). With the onset of these policies, Reading First simultaneously entered schools on the heels of the National Reading

Panel Report (NRP). This initiative was tied to the No Child Left Behind (NCLB) policy put into place through President George W. Bush's administration and sought to implement the findings of the NRP. The findings from this meta-analysis highlighted a focus on early instruction of phonics, fluency, phonemic awareness, vocabulary, and comprehension skills (Council of Chief State of School Officers, 2018; National Reading Panel (U.S.) & National Institute of Child Health and Human Development (U.S.), 2000).

Soon after, research related to the importance of learning to read by third grade spurred a flurry of 3<sup>rd</sup> grade reading laws (Council of Chief State of School Officers, 2018). Reading laws differed by state with one common focus: ensuring all students could read by the time they exited third grade. Often these laws addressed the prevention of reading difficulties, intervening for students who needed additional support, and the retention of students not meeting expected outcomes (Council of Chief State of School Officers, 2018). Many third grade reading policies were also accompanied with assessments used to influence retention decisions, earning them the title "high stakes assessments" (Tavassolie & Winsler, 2019).

Criticisms of restrictive educational policies such as these were varied. Some raised concerns that these policies may widen achievement gaps (Tavassolie & Winsler, 2019). Concerns also emerged that systems-level accountability may decrease the likelihood that schools will initiate accountability measures locally (Scheerans et al., 2015). Regardless of the influence these policies have had on reading instruction and student outcomes, new iterations of policy have continued to be introduced. Among reading policies are those which directly address dyslexia and how this influences instruction in schools.

**National Policy.** Dyslexia policies span the globe and have quickly spread within the United States (Beck et al., 2017; Gabriel, 2020; Kirby, 2020; National Center on Improving



Literacy, 2022; Tiernan & Casserly, 2018; Youman & Mather, 2018). For example, within only three months of beginning the 2018 calendar year, 33 legislative bills addressing dyslexia were introduced across the nation (Youman & Mather, 2018). Policies have addressed a common definition for dyslexia, screening and identification, intervention, and professional awareness for educators (Fien et al., 2021; Gearin et al., 2020; Jones et al., 2019). The variance in these policies could have resulted in varied outcomes, which indicated the importance of studying outcomes within the context of the state's current dyslexia policy, or legislation (Gearin et al., 2021).

When studying the efficacy of dyslexia policies across the nation, some have examined the reliability of assessment measures in identifying students who are at risk of characteristics commonly associated with dyslexia (Odegard et al., 2020; Phillips & Odegard, 2017). Concerns with screening and identification included potential bias which could lead to under-identification for African American and Hispanic students, as well as decreased identification for students who attended schools where high numbers of students receive scores below mastery level (Odegard et al., 2020). Concerns with under-identification were echoed in Phillip's and Odegard's (2017) study which found two states had identified dyslexia in less than five percent of students.

**Indiana's Dyslexia Policies.** Indiana has introduced multiple educational policies which have addressed dyslexia (House Enrolled Act 1108, 2015; House Enrolled Act 1514, 2021; National Center on Improving Literacy, 2022; Senate Enrolled Act 217, 2018). One such policy, House Enrolled Act 1108 (2015), required professional awareness for prospective educators enrolled in undergraduate courses in higher education institutions and provided a state-wide definition for the term 'dyslexia'. The outcomes of the professional awareness required by this policy were examined through a university program efficacy study which found that participants in the preservice training increased their knowledge of dyslexia, though their belief in efficacy of

-serving this population of students showed little difference when compared to a control group (Jones et al., 2019).

In 2018, Senate Enrolled Act 217 was passed and mandated specific actions for public schools serving kindergarten through second grade students. This included professional awareness, as well as screening, identification, and intervention requirements for students who demonstrated risk of dyslexic characteristics (Senate Enrolled Act 217, 2018). In addition, each school district was required to employ an individual as a “reading specialist trained in dyslexia” (Indiana Code 20-35.5-6-1, 2022; Senate Enrolled Act 217, 2018). These requirements have been codified as Indiana Code 20-35.5 (2022) and were later modified through House Enrolled Act 1514 (2021) to require screening to occur within the first 90 school days of a student’s enrollment (House Enrolled Act 1514, 2021; Indiana Code 20-35.5-2-3, 2022).

***Screening and Identification.*** Indiana Code 20-35.5-2-6 (2022) stated school corporations and charter schools must complete universal screening for all students in grades kindergarten through second grade and may screen for students in third grade and above when specific difficulties in reading were observed. Students who demonstrated a score of “at risk” or “some risk” were required to then participate in an additional layer of screening which was referred to as a diagnostic or Level 1 screener (Indiana Code 20-35.5-2-3, 2022). School corporations were given local control to determine the parameters used to interpret student scores as demonstrating if the student was “at risk” or at “some risk” for characteristics which were associated with dyslexia, though they were encouraged to use the indicators provided by the assessment vendor (Indiana Department of Education, 2022a). The diagnostic screener was then used to determine if the student should participate in an intervention targeted to support students who demonstrated characteristics of dyslexia and informed the instructional decision-making

process (Indiana Department of Education, 2022a). If additional information was needed, schools could use a Level 2 screener (Indiana Code 20-35.5-2-4, 2022; Indiana Department of Education, 2022a).

One component required by Indiana's Code was for local education agencies to use screening tools which were approved by the state (Indiana Code 20-35.5-2-1, 2022). The Indiana Department of Education published an updated list of approved screeners to its website (see Figure 1). This list reflected a total of 12 assessments, seven of which were approved as universal screeners (Indiana Department of Education, 2022a). Of these seven assessments, three also had a component which could be utilized as diagnostic assessment (Indiana Department of Education, 2022a). The remaining five assessments were approved to be used only as a diagnostic assessment (Indiana Department of Education, 2022a). This was a decrease in the number of assessments approved by the state in July 2021, which reflected approximately 27 different screeners approved for universal screening with another 27 approved for Level 1 or diagnostic screening (Indiana Department of Education, 2021a; Indiana Department of Education, 2021b). The lists from 2021 and 2022 differed not only in the number of screeners represented but also differed by the way in which the assessments were listed as approved (Indiana Department of Education, 2021a; Indiana Department of Education, 2021b; Indiana Department of Education, 2022a). Prior to 2022, screeners were approved by the individual subsections which Indiana Code required to be assessed (Indiana Department of Education, 2021a; Indiana Department of Education, 2021b). This resulted in some assessments which were only approved in specific subsections and may not have been approved in another area. A school district using these assessments would have had to supplement with additional screeners to meet the requirements of the statute. The list approved in 2022 provided a list of comprehensively

approved assessments, meaning each assessment would encapsulate all required areas within the screener being approved (Indiana Department of Education, 2022a).

### Figure 1

#### *July 2022 Approved Assessments from the Indiana Department of Education*

Vendor	Assessment	Type of Assessment
Amplify	mClass with DIBELS 8 <sup>th</sup> Edition	Universal Screener
Houghton Mifflin Harcourt	Amira	Universal Screener, Diagnostic
Curriculum Associates	i-Ready Literacy Task	Universal Screener
Illuminate Education	PALS	Universal Screener, Diagnostic
Pearson Clinical Assessments	Aimsweb Plus	Universal Screener
Pearson Clinical Assessments	Wechsler Individual Achievement Test (Fourth Edition) (WIAT-4)	Diagnostic
M. A. Rooney Foundation	Reading Foundations for K-1	Diagnostic
M. A. Rooney Foundation	MARF Phonics Screener for 2-12	Diagnostic
MindPlay Educational, LLC	MindPlay Dyslexia Screener	Universal Screener, Diagnostic
NWEA	MAP Reading Fluency Dyslexia Screener	Universal Screener
SPIRE	SPIRE	Diagnostic
SPIRE	SPIRE Initial Placement Assessments	Diagnostic

(Indiana Department of Education, 2022a)

***Intervention Requirements.*** After completing the universal screening process, schools were required to address the needs of all students who demonstrated risk through the RTI/MTSS process (Indiana Department of Education, 2022a). Once diagnostic or Level 1 screening had occurred, students who had results which, “confirm if learning characteristics related to dyslexia are present,” would receive interventions addressing this need (Indiana Department of Education, 2022a, p. 6). Specific programs were not required to be approved by the state prior to use, though statute did outline specific elements which must be present in the intervention. As stated in state statute, interventions for these students may reflect:

- 1) explicit, direct instruction that is systematic, sequential, and cumulative and follows a logical plan of presenting the alphabetic principle that targets the specific needs of the student without presuming prior skills or knowledge of the student;
- (2) individualized instruction to meet the specific needs of the student in a setting that uses intensive, highly concentrated instruction methods and materials that maximize student engagement;
- (3) meaning based instruction directed at purposeful reading and writing with an emphasis on comprehension and composition;
- (4) instruction that incorporates the simultaneous use of two (2) or more sensory pathways during teacher presentations and student practice; and
- (5) other instructional approaches as determined appropriate by the school corporation or charter school (Indiana Code 20-35.5-4-1, 2022).

### ***Reading Intervention***

When students have demonstrated the need for further instruction or remediation, interventions were often used to support the needs of the student (Bogdanowicz et al., 2016; Murphy & Diehm, 2020; Schlesinger & Gray, 2017). According to the Simple View of Reading, students with reading difficulties typically displayed one of three patterns of reading difficulties: dyslexia, hyperlexia, or a combination of both (Gough & Tunmer, 1986). For the purposes of this review, intervention strategies used for students who displayed patterns of reading difficulty consistent with dyslexia were reviewed. This was characterized by a difficulty with decoding written text (Gough & Tunmer, 1986).

Students with decoding difficulties were said to benefit from an approach which addressed both phonological awareness and explicit phonics instruction (Bognaowicz et al.,

2016; Miles et al., 2019; Schlesinger & Gray, 2017). The direct application of spelling and reading during this instruction was shown to be effective for students with characteristics of dyslexia (Bognaowicz et al., 2016). A multisensory component, or instruction incorporating two or more senses, was also considered to be a positive support for students, though some evidence has contradicted this view (Miles et al., 2019; Schlesinger & Gray, 2017).

Instruction on morphology, or the understanding of how components of language within words contribute to the meaning of the word, was suggested to be an effective form of intervention for students with characteristics of dyslexia as this is a crucial element of the English language (Moats, 2020; Murphy & Diehm, 2020). Though there is a phonemic aspect to the English language, not all words can be read phonetically due to dominance of morphology in the language (Moats, 2020; Murphy & Diehm, 2020). One clinical study found success after teaching graphemes alongside words with a common base (Murphy & Diehm, 2020). Though this study took place for a short period of time in the summer, student spelling scores and perceptions showed an increase with this approach to morphological awareness (Murphy & Diehm, 2020).

### **Proposed Solution**

In response to Gearin et al.'s (2021) postulation that heterogeneous outcomes were likely to occur between states due to variance in policy, this study proposed to explore the perceptions of kindergarten through second grade teachers in Indiana regarding the influence Indiana's dyslexia policies have had on reading instruction and outcomes for students. This study explored these perceptions through a quantitative analysis of survey data which collected data related to identification of students in need of support through universal screening measures, as well as corresponding intensive reading instruction. The outcomes achieved through the use of

intervention and policy mandated instructional elements were also explored through perception data gathered through the survey.

### **Discussion of Measurable Improvement**

The survey instrument used for this study was created by the researcher and designed using an intersection of two frameworks. The word recognition component of Hoover and Tunmer's (2020) Cognitive Foundations Framework was aligned to a conceptual framework for policy evaluation which was proposed by Veselý (2012). This framework was utilized to review the educational process, outcomes, and effects of policy implementation of Indiana's dyslexia legislation. The intersection of these two frameworks resulted in the creation of 10 independent categories. The screener included up to three questions from each of the categories to allow for up to 30 screener questions.

Due to the original design of the screener, the survey instrument went through reliability and validity assessment. Content validity was evaluated using an expert panel of up to 10 individuals (Polit & Beck, 2006; Shrotryia & Dhanda, 2019). Lawshe's Content Validity Ratio (CVR), was used to determine the reliability of assessment items and necessary revisions occurred (Shrotryia & Dhanda, 2019, Wilson et al., 2012). Reliability was then assessed using Cronbach's alpha (Binks-Cantrell et al., 2012).

### **Summary**

This chapter explored multiple components which have contributed to the national phenomenon of the expansion of dyslexia policy in educational organizations. This included an overview of the complexities of the English language and orthography (Schmalz, 2015; Torgesen, 2005/2007). An explanation of how these complexities could result in reading

difficulties for an individual who had been diagnosed with or had characteristics of dyslexia, was further explored through the concept of word recognition or decoding and corresponding theories of reading acquisition (Duke & Cartwright, 2021; Gough & Tunmer, 1986; Hoover & Tunmer, 2020; Seidenberg & McClelland, 1989). Though there were some differences noted among scholars in proposed theories of reading acquisition, many had common elements which were important to consider when working with an individual who may have a reading difficulty such as dyslexia. Similarities included the interaction between the decoding and recognition of words, an understanding of oral language, and the influences these each have on reading comprehension (Duke & Cartwright, 2021; Gough & Tunmer, 1986; Hoover & Tunmer, 2020; Seidenberg & McClelland, 1989).

The definition of dyslexia was also reviewed through the literature. Indiana's House Enrolled Act 1108 (2015), defined dyslexia as a neurologically based reading difficulty which could be linked to a deficit related to the phonological component of language. This could impact an individual's ability to decode and access written text, and this lack of access to text could influence background knowledge, vocabulary, and ultimately comprehension (House Enrolled Act 1108, 2015). To support students who have experienced this difficulty, extensive efforts have taken place to increase effective reading instruction through a common understanding of what this entails and the implementation of nation-wide dyslexia policies (National Center on Improving Literacy, 2022; The Reading League [TRL], 2022). Though dyslexia policy was present in 49 out of 50 states across the nation, variance within each of the policies could have resulted in differing outcomes for students (Gearin et al., 2021; National Center on Improving Literacy, 2022).



## Chapter 3: Methodology

### Statement of Purpose and Introduction

As of September 2022, 49 states had dyslexia policies in place, which addressed common elements such as state definitions of dyslexia, preservice educator preparation, professional awareness, screening and identification, and intervention (National Center on Improving Literacy, 2022). Although studies examining common components of these policies have taken place in various states, Gearin et al's 2021 document analysis suggested heterogeneous outcomes were likely to occur between states due to variance in policy. This spoke to the necessity of examining outcomes within the context of the local policy. This quantitative research study explored the extent to which kindergarten through second grade teachers serving in Indiana public schools perceived Indiana's dyslexia policy had influenced reading instruction and outcomes for students.

The research questions used to guide this study were:

1. To what extent do elementary kindergarten through second grade teachers serving in Indiana public schools perceive the state's dyslexia legislation has influenced reading instruction for students?
  - a. How have outcomes from universal screening measures influenced the identification of students receiving intensive intervention?
  - b. How has intensive reading intervention been influenced by state statute requiring specific elements be present in the instruction?
2. To what extent do kindergarten through second grade teachers serving in Indiana public schools perceive the state's dyslexia legislation has influenced reading outcomes for students?

- a. How has the use of an intensive reading intervention for students who have received a score of “At Risk” or “At Some Risk” influenced grade level reading outcomes?
- b. To what extent do teachers perceive the instructional elements required by state statute have influenced these reading outcomes?

The exploration of these research questions allowed for further clarification of the influence Indiana’s dyslexia legislation has had on reading outcomes for students who have been identified as being “at risk” or “at some risk” as defined by the state’s statute.

### **Research Design**

This quantitative study followed a descriptive research design and collected information regarding primary teachers’ perceptions of the influence Indiana’s dyslexia policy has had on reading instruction and outcomes using a survey (Creswell & Creswell, 2018; Siedlecki, 2020). This allowed for the examination of a specific population of teachers in a geographic area (Siedlecki, 2020). The use of a survey with a Likert scale enabled the researcher to answer the descriptive research questions chosen for the study and examine the perceptions held by the participants through options which reflected a range of opinions (Creswell & Creswell, 2018; Gosavi, 2015).

### ***Instrumentation***

The survey tool used for the purpose of this study was based on the intersection of two frameworks. The first of these frameworks, Hoover and Tunmer’s (2020) Cognitive Foundations Framework was a content-based framework which was an expansion of Gough and Tunmer’s (1986) Simple View of Reading. This framework represented the cognitive components and knowledge-based skills which make up the broad categories of word recognition and language

comprehension. In a similar manner to Gough and Tunmer's (1986) Simple View of Reading, these two categories interacted with each other and influenced the development of reading comprehension. This framework was designed in a hierarchical manner with introductory or "lower-level" components or skills represented at the base of the framework (Hoover & Tunmer, 2020, p. 87; Tunmer & Hoover, 2019). Though these elements move from basic to more advanced components of reading, the authors clarified that students may access more advanced components of the framework prior to complete mastery of basic skills (Hoover & Tunmer, 2020; Tunmer & Hoover, 2019.) While some mastery level of basic skills are necessary to access more advanced components, this framework was not intended to preclude students from participating in more advanced components prior to full mastery of the skills represented in the lower tiers of the hierarchy (Hoover & Tunmer, 2020; Tunmer & Hoover, 2019). This spoke to the importance of teaching these skills in an integrated manner (Hoover & Tunmer, 2020; Tunmer & Hoover, 2019.)

The second framework used as a basis for the development of the survey was a conceptual framework formulated to analyze the effects of educational policies in a comparative manner. Proposed by Arnošt Veselý (2012), this framework highlighted six elements which were linked within educational policy analysis: policy creation, inputs from policy creation, process, outcomes, effects, and the context by which the policy is influenced. Although this framework may typically be viewed in an ordinal manner moving from policy-creation to effects, each element linked to other elements which did not always occur directly before or after being introduced in the framework (Veselý, 2012). For example, though effects were expected to occur after outcomes, these effects will be influenced by the context and link back to policy-creation (Veselý, 2012).

Some similarities were noted between Veselý's (2012) framework and frequently used logic models. Many logic models have examined inputs and activities and the relationship these have had on outputs, as well as short-term and long-term outcomes or effects (Government of Ireland Department of Children, Equality, Disability, Integration and Youth, 2021). Veselý's (2012) framework was selected as a conceptual framework to guide the development of the survey and analysis of the results based on its attention to distinct elements which may influence policy implementation and the inclusion of an examination of educational processes (Ozturk-Calikoglu & Osman, 2021; Veselý, 2012). Including the processes of the teaching and learning of students was imperative to consider when examining the influence of policy on reading instruction and intervention outcomes for students (Veselý, 2012).

To develop the survey instrument, Hoover and Tunmer's (2020) Cognitive Foundations Framework was used to guide the content of the questions as it related to elements of reading instruction. Since dyslexia has been classified as a disability within word recognition, the elements which comprised word recognition were used to guide the survey instrument development (Hoover & Tunmer, 2020). These elements included: alphabetic coding skill, print concepts, alphabetic principle, letter knowledge, and phonological awareness (Hoover & Tunmer, 2020; Tunmer & Hoover, 2019). These elements were aligned with those of Veselý's (2012) framework through the examination of educational processes and outcomes to create a category for questions. For example, alphabetic coding skill was examined in the context of processes and outcomes. Up to three questions were included in the survey for each category (see Figure 2).

**Figure 2***Framework for Survey Category Development*

	<b>Processes</b>	<b>Outcomes</b>
<b>Alphabetic Coding Skill</b>	<i>Process Category A</i>	<i>Outcomes Category A</i>
<b>Print Concepts</b>	<i>Process Category B</i>	<i>Outcomes Category B</i>
<b>Alphabetic Principle</b>	<i>Process Category C</i>	<i>Outcomes Category C</i>
<b>Letter Knowledge</b>	<i>Process Category D</i>	<i>Outcomes Category D</i>
<b>Phonological Awareness</b>	<i>Process Category E</i>	<i>Outcomes Category E</i>

(Hoover & Tunmer, 2020; Veselý, 2012)

Effects of educational policy have been typically considered in light of long-term outcomes such as economic impact or employment (Veselý, 2012). For this reason, effects were not considered as part of this study. Though policy-creation, inputs from policy creation, and context were important to consider, these weren't addressed during the survey creation process due to the nature of the research questions and their focus on reading instruction and outcomes (Veselý, 2012). In addition, Hoover & Tunmer (2020) identified reading comprehension as the ultimate outcome from word recognition and language comprehension. Though the end goal of word recognition instruction is to improve an individual's automaticity with reading and recognizing words to make meaning of text, reading comprehension was not studied within the context of this study.

**Content Validity.** Content validity of the survey instrument was evaluated using a panel of five individuals (Polit & Beck, 2006; Shrotryia & Dhanda, 2019). These individuals had varied experience with educational policy implementation, early literacy, and/or dyslexia

screening and intervention. Each panelist was asked to rate individual items using a three-point scale on the alignment each had to the level of data relevant to that section of the survey instrument (Shrotryia & Dhanda, 2019, Wilson et al., 2012). The points used were: 1 = essential, 2 = useful, but not essential, and 3 = not necessary (Shrotryia & Dhanda, 2019, Wilson et al., 2012). Lawshe's Content Validity Ratio (CVR), was used to determine the content validity of each item and necessary revisions took place after completing this study (Shrotryia & Dhanda, 2019, Wilson et al., 2012).

The initial survey instrument shared with panelists had 26 total questions. Ayre & Scally's (2014) study examined critical values using Lawshe's CVR. The implications of this study indicated a panel of five participants should have a proportion agreeing essential which equated to 1.0, which required all five participants to agree (Ayre & Scally, 2014). The results of the process category questions indicated that items two, five, and 24 should be removed from the survey (see Table 1).

**Table 1***Lawshe's Content Validity Calculations for Process Category Questions*

Item no.	Process Categories					Ne	CVR
	Expert 1	Expert 2	Expert 3	Expert 4	Expert 5		
1	1	1	1	1	1	5	1
2	1	1	1	2	2	3	.2
3	1	1	1	1	1	5	1
4	1	1	1	1	1	5	1
5	1	1	1	2	1	4	.6
6	1	1	1	1	1	5	1
7	1	1	1	1	1	5	1
21	1	1	1	1	1	5	1
22	1	1	1	1	1	5	1
23	1	1	1	1	1	5	1
24	1	1	1	2	1	4	.6
25	1	1	1	1	1	5	1
26	1	1	1	1	1	5	1

In the outcomes categories, questions nine, 12, and 18 received a CVR of below 1.00, which indicated they should be removed as well (see Table 2). Each of these six questions were related to print concepts or blending phonemes and they were removed from the survey

instrument. This resulted in both Process and Outcome Category B being removed from the framework used for the study.

**Table 2**

*Lawshe's Content Validity Calculations for Outcome Category Questions*

Outcome Categories							
Item no.	Expert 1	Expert 2	Expert 3	Expert 4	Expert 5	Ne	CVR
8	1	1	1	1	1	5	1
9	1	1	1	2	2	3	.2
10	1	1	1	1	1	5	1
11	1	1	1	1	1	5	1
12	1	1	1	2	1	4	.6
13	1	1	1	1	1	5	1
14	1	1	1	1	1	5	1
15	1	1	1	1	1	5	1
16	1	1	1	1	1	5	1
17	1	1	1	1	1	5	1
18	1	1	1	2	1	4	.6
19	1	1	1	1	1	5	1
20	1	1	1	1	1	5	1

**Reliability.** Reliability was assessed using Cronbach's alpha to determine if the survey had a score of .80 or higher (Binks-Cantrell et al., 2012). After the panel completed the initial



content validity phase, each participant was sent a copy of the survey in a digital format with guidance to complete it as if they were participating in the study. Three additional individuals were asked to participate in this study, and one individual from the original panel was unable to participate in the reliability phase. These panelists all had degrees ranging from a master's to doctoral level. They represented a wide range of expertise, which included experience with district-level administration, educational policy implementation, early literacy, and/or dyslexia screening and intervention.

Generally, a Cronbach's alpha of .80 or higher is recommended for research, with lower scores being used for exploratory purposes or not recommended for use (Binks-Cantrell et al., 2012). After participants completed the survey, each answer on the Likert scale was assigned a point value: Very Likely= 5, Somewhat Likely= 4, Neutral= 3, Somewhat Unlikely= 2, Very Unlikely= 1. These were then entered into SPSS and Cronbach's alpha was calculated using this statistical software. SPSS automatically excluded question 19 from analysis since it represented no level of variance. This initial analysis indicated  $\alpha = .70$  (see Table 3).

**Table 3**

*Cronbach's Alpha for the Initial Analysis*

Number	Threshold	Cronbach's Alpha
19	.80	.70

Though this level is considered appropriate for exploratory purposes, the threshold established for this study was  $\alpha = .80$ . Analysis of individual questions indicated a higher level of

reliability would be achieved through the removal of question 17 (see Table 4). Based on this analysis, question 20 was removed and the analysis was computed for the remaining items.

**Table 4***Item Level Analysis for Initial Reliability*

Question No.	Scale Mean if Item Deleted	Cronbach's Alpha if Item Deleted
Question 1	80.14	.66
Question 2	79.86	.61
Question 3	79.86	.64
Question 4	81.00	.68
Question 5	81.00	.68
Question 6	79.71	.72
Question 7	79.29	.71
Question 8	79.29	.71
Question 9	79.71	.66
Question 10	79.86	.68
Question 11	79.43	.71
Question 12	79.57	.69
Question 13	79.43	.67
Question 14	79.43	.67
Question 15	79.43	.67
Question 16	79.29	.73
Question 17	79.57	.77
Question 18	79.29	.73
Question 20	79.43	.75

The analysis of the remaining survey questions indicated a higher level of reliability (see Table 5). In this analysis, Cronbach's alpha for the 18 items was  $\alpha = .77$ . Since this was below the threshold of  $\alpha = .80$ , the remaining items were examined for potential removal.

**Table 5**

*Cronbach's Alpha for the Revised Analysis*

Number	Threshold	Cronbach's Alpha
18	.80	.77

The item analysis indicated the removal of question 20 would result in an increase in reliability (see Table 6). Removing this question would allow the survey to meet the threshold necessary for the study. Based on this calculation, the question was removed from those used for analysis.

**Table 6***Item Level Analysis for Revised Analysis*

Question No.	Scale Mean if Item Deleted	Cronbach's Alpha if Item Deleted
Question 1	75.57	.73
Question 2	75.29	.71
Question 3	75.29	.71
Question 4	76.43	.75
Question 5	76.43	.75
Question 6	75.14	.78
Question 7	74.71	.76
Question 8	74.71	.76
Question 9	75.14	.73
Question 10	75.29	.75
Question 11	74.86	.77
Question 12	75.00	.76
Question 13	74.86	.74
Question 14	74.86	.74
Question 15	74.86	.74
Question 16	74.71	.79
Question 18	74.71	.79
Question 20	74.86	.80

The final Cronbach's alpha for the survey instrument was  $\alpha = .80$  (see Table 7). A total of 17 questions were included in those which were selected for analysis. The final survey questions which were used in analysis, including demographic questions, can be found in Appendix A.

**Table 7**

*Cronbach's Alpha for the Revised Analysis*

Number	Threshold	Cronbach's Alpha
17	.80	.80

**Demographics.** Demographic questions included a self-report of the years of teaching experience each participant had, current grade level taught, type of school in which the individual taught (Title I or non-Title I), area of the school (rural, suburban, and urban), and information regarding the current licensure each participant held. An exclusion question was included at the beginning of the survey to determine if participants had been teaching kindergarten through second grade students within Indiana public schools for at least the past five years. Participants were asked to share the total years in which they had taught in public Indiana schools. Participants were then asked to indicate how many years they had spent teaching in classrooms with students in kindergarten through second grade and the grade level in which they currently taught.

Demographics related to the setting in which the participant taught were collected though specific school names were not to protect the anonymity of participants. Rather, participants indicated if their school was considered a Title I or non-Title I school. This categorization was based on the socioeconomic make-up of the student body as measured by the rate of students

who received free and reduced lunches. They were also asked to self-report as teaching in either a suburban, urban, rural, or other school setting.

Participants were asked to self-report any current area of licensure they held. They were also asked to indicate the grade levels in which they were licensed to teach as well as any areas of additional certification, such as special education or reading. A write-in option for 'other' was also provided. Multiple licensure types existed at the time of the survey administration under Bulletin 400, Rules 46-47, Rules 2002, and REPA/REPA 3 (Indiana Department of Education, 2022b). To have provided an exhaustive list of specific licensure types from these options would have been cumbersome and could have presented concerns with anonymity. For this reason, only categories of licensure, such as specific grade levels, were presented.

## **Research Procedures**

### ***Participants***

Dyslexia assessment and intervention were mandated by the state in 2018 and implemented in the school year of 2019-2020. For this reason, only those teachers who had spent the last five or more years teaching grades kindergarten through second grade in public schools within the state of Indiana were able to participate in the study. This allowed individuals who had experience with and without state dyslexia requirements to consider how legislation had influenced reading instruction and student outcomes. It is important to note that only public-school educators participated in this study, as private educators were not statutorily required to screen students in Indiana (Senate Enrolled Act 217, 2018).

The participants within this study were representative of a convenience sample. To recruit individuals for this study, the researcher requested a list of current emails for all kindergarten through second grade teachers and superintendents from the state of Indiana

through a data sharing request which was emailed to the Indiana Department of Education. Once this list was obtained, all superintendents who were associated with private schools were removed from the recruitment list to reflect the parameters established in the study. All superintendents of charter or traditional public schools who were represented on the list provided by the Indiana Department of Education received an email from the researcher which described the intent of the study and requested permission to send a recruitment email to kindergarten through second grade teachers in their school districts. This email was shared with 336 superintendents across the state of Indiana and 68 provided permission to proceed with emailing the survey.

The survey was sent through Qualtrics via email to 1,649 individuals who were identified by the Indiana Department of Education as kindergarten through second grade teachers who taught courses associated with reading. From this sample, 111 participants responded to and completed the survey, with 84 of these individuals being final participants in the study. Participants were not monetarily compensated for taking part in the project.

### ***Data Collection***

This study received IRB approval from the University of Southern Indiana on January 23, 2023. It had an anticipated start date of February 6, 2023. Due to technical difficulties, most of the emails scheduled to be sent on this date were not delivered to potential participants. Since some emails did arrive to participants on February 6<sup>th</sup>, this was determined to be the official start date. The remaining invitations were delivered to potential participants on the following day, February 7, 2023. All potential participants were sent a reminder email with an anonymous link to complete the survey on days seven and 14 of the study. The final day of the survey was February 28, 2023. This provided a study duration of three weeks and two days.



Several superintendents replied after the survey began to provide permission for their teachers to receive a recruitment email for the study. These teachers were sent the recruitment email to participate in the study after permission to send the recruitment email was provided to the researcher by the superintendent or the superintendent designee. This resulted in two groups of participants. The first group of potential participants included 1,207 individuals who received the survey early in the study window. The second group of potential participants consisted of 442 individuals who received their invitation later within the survey window. Since both groups were sent the survey and invitation to participate within the same study window and had the same end date, these results were collected and analyzed together.

The survey sent via Qualtrics utilized a five-point Likert scale and had participants anonymously rate the likelihood to which they perceived the statements aligned with their current understanding of instruction and outcomes. The survey also requested participants to self-report the number of years' experience each had, current grade level taught, licensure information, and demographic information regarding the school. This included classification as a Title 1 or non-Title 1 school and the type of geographic community in which the school was located. The estimated time commitment for each participant was approximately 10-15 total minutes. This allowed for the completion of the survey using the scale, multiple-choice, and multiple-select options. Once the end date of the study passed, this survey was closed to ensure responses were no longer collected.

### *Data Analysis*

To analyze the data collected from the survey instrument, descriptive statistics were explored for each question. This included tests of central tendency, which reported the median and interquartile range. In addition, frequency distributions were reviewed and analyzed. The first of these questions, and subset of questions, focused on the influence Indiana's dyslexia policy has had on reading instruction, while the second question and corresponding subsets focused on the perceived influence Indiana's dyslexia policy has had on reading outcomes for students.

The first research question with the corresponding subset of questions was:

1. To what extent do elementary kindergarten through second grade teachers serving in Indiana public schools perceive the state's dyslexia legislation has influenced reading instruction for students?
  - a. How have outcomes from universal screening measures influenced the identification of students receiving intensive reading intervention?
  - b. How has intensive reading intervention been influenced by state statute requiring specific elements be present in the instruction?

To analyze this question, the researcher provided descriptive statistics including the median and interquartile range for responses to process categories within the survey. The researcher also utilized frequency distributions to provide descriptive statistics related to the responses participants provided to each question.

The second research question with the corresponding subset of questions was:

2. To what extent do kindergarten through second grade teachers serving in Indiana public schools perceive the state's dyslexia legislation has influenced reading outcomes for students?

- a. How has the use of an intensive reading intervention for students who have received a score of “At Risk” or “At Some Risk” influenced grade level reading outcomes?
- b. To what extent do teachers perceive the instructional elements required by state statute have influenced these reading outcomes?

These questions were analyzed in a similar manner to the first set of questions. Only survey questions which related to reading outcomes for students were included in this analysis. Initially, the researcher examined descriptive statistics including the median and interquartile range for responses. Questions falling within the outcomes categories were examined using these descriptive statistics, as well as with frequency distributions to provide additional descriptive indicators for the evaluation of participant responses.

### **Assumptions, Limitations, Scope, and Delimitations**

This study assumed certain parameters to be true throughout the course of the study and did not seek to verify these assumptions. These included assumptions regarding implementation of state policy regarding dyslexia, such as educator awareness, and student screening, identification, and intervention. Participants were also asked to self-report their current role and years of experience. These reports were assumed to be true and were not verified by the researcher.

To avoid ethical concerns with the study, all participants were asked to provide informed consent prior to participating in the study. This informed consent included information on the content of the study, the estimated time commitment for each participant, and information on how to withdraw from the study. Participants were also informed of any risks which could occur because of participation, which included those beyond which the researcher was able to predict.

Steps were taken to ensure the confidentiality of participants. This included deidentifying all data and maintaining files in password protected files. Any individuals who would have access to these data files were named in the informed consent and IRB application. The researcher planned to destroy this data seven years after completion of the study.

There were some limitations to the study which could limit the generalizability of the results. These limitations were related to the individuals who were included in the study sample. Only participants who were currently primary teachers in public schools located in Indiana school districts were included. The exclusion of participants from other states limited the extent to which these results were generalizable across other states. The exclusion of participants who had had less than five years of experience teaching students in grades kindergarten through second, though necessary to allow for comparison to pre- and post-legislation instruction, did not allow the viewpoints of beginning teachers to be reflected. In addition, the final sample size was limited which had the potential to result in response bias, though studies have indicated scholarly value in using survey results with a low response rate (Hellevik, 2016, Hendra & Hill, 2019, Rindfuss et al., 2015).

As this study had a focus on perceptions of kindergarten through second grade teachers regarding the influence Indiana's dyslexia policy has had on reading instruction and outcomes for students in Indiana public schools, future research could include a similar study which included the perceptions of intermediate and secondary teachers. It would also be beneficial to examine the influence of this policy through a state-wide longitudinal study examining student outcomes after this policy has been in place for a longer period of time. This could include an

examination of third grade reading proficiency and later graduation rates, which would address the effects component of Vesely's (2012) conceptual framework.

## Chapter 4: Findings

The intent of this quantitative research study was to explore the extent to which kindergarten through second grade teachers serving in Indiana public schools perceived Indiana's dyslexia policy had influenced reading instruction and outcomes for students. To gather information related to this purpose, primary teachers from across the state were asked to participate in a survey with questions related to the instruction and outcomes associated with dyslexia screening and intervention. The research questions used to guide this study were:

1. To what extent do elementary kindergarten through second grade teachers serving in Indiana public schools perceive the state's dyslexia legislation has influenced reading instruction for students?
  - a. How have outcomes from universal screening measures influenced the identification of students receiving intensive reading intervention?
  - b. How has intensive reading intervention been influenced by state statute requiring specific elements be present in the instruction?
2. To what extent do kindergarten through second grade teachers serving in Indiana public schools perceive the state's dyslexia legislation has influenced reading outcomes for students?
  - a. How has the use of an intensive reading intervention for students who have received a score of "At Risk" or "At Some Risk" influenced grade level reading outcomes?
  - b. To what extent do teachers perceive the instructional elements required by state statute have influenced these reading outcomes?

## Participants

The researcher obtained a list of current emails for all kindergarten through second grade teachers and superintendents in the state of Indiana via a data sharing request which was submitted to the Indiana Department of Education. After receiving this list, all superintendents who worked in public school corporations were sent an email requesting permission to survey the kindergarten through second grade teachers in their school corporation. Of the 336 superintendents who were emailed, 68 provided permission for the researcher to proceed with emailing the survey to teachers. This allowed for representation of both traditional public school corporations and public charter schools.

The list of emails provided by the state included a subject identifier to indicate the subjects which each teacher taught. Only individuals who had a subject identifier associated with reading, as defined by Language Arts or Reading and Literature courses, were sent the survey. This survey was delivered to 1,649 individuals who were identified by the state of Indiana as kindergarten through 2<sup>nd</sup> grade teachers who taught subjects associated with reading. Of these individuals, 111 responded to and completed the survey, which resulted in a survey completion rate of 6.73%. Of the 111 individuals who completed the survey, three did not provide consent and were removed from the study. Another 24 individuals indicated they had taught in kindergarten through second grade classrooms for less than five years, which excluded them from participating in the study. The final sample of individuals participating in the study was comprised of 84 kindergarten through second grade reading teachers across the state of Indiana.

Low survey response rates have become an area of concern in the field of social science research (Hellevik, 2016, Hendra & Hill, 2019, Rindfuss et al., 2015). Some may question the validity and reliability of those studies which cite low response numbers (Hellevik, 2016).

However, some research supports the use of survey results which have low response rates (Hellevik, 2016, Hendra & Hill, 2019, Rindfuss et al., 2015). Hendra & Hill (2019) performed a recent analysis which indicated little relationship existed between the response rate one achieves on a survey and nonresponse bias. In addition, another study found that while high response rates were desirable, a survey response rate of 4% may provide non-biased data (Hellevik, 2016).

### ***Current Grade Level and School Setting***

The participants in the study were comprised of individuals who taught in varied grade levels and school settings, such as Title I or non-Title I schools and/or geographically diverse locations. As shown in Table 8, many participants ( $n = 27$ ) were currently teaching in first grade, and the suburban school setting had the most participants represented ( $n = 36$ ). The socioeconomic indicator used for the school setting, Title I or non-Title I, had nearly even representation across the sample.



**Table 8***Demographic Breakdown of Study Participants: Grade Level and School Setting*

Demographic Information	<i>n</i>	%
Current Grade Level		
Kindergarten	20	23.8%
First Grade	27	32.1%
Second Grade	18	21.4%
Other	18	21.4%
Missing Value	1	1.2%
School Setting: SES		
Title I	43	51.2%
Non-Title I	41	48.8%
School Setting: Location		
Rural	26	31.0%
Suburban	36	42.9%
Urban	20	23.8%
Other	1	1.2%
Missing	1	1.2%

***Years of Experience***

Years of experience were collected and analyzed in two different ways. One way in which this data was collected was through the self-reporting of the total number of years of experience each participant had teaching in Indiana public schools. Participants also reported the total number of years in which they had taught students in kindergarten through second grade. Participants indicated their total number of years as a range of years.

As displayed on Table 9, over half ( $n = 43$ ) of the participants self-reported more than 15 years of teaching experience in Indiana public schools. Few teachers ( $n = 9$ ) reported between zero to five years of teaching experience. Similar distributions were noted in the years of experience teaching in classrooms with students who were in grades kindergarten through second grade. When the years of teaching experience in kindergarten to second grade classrooms were compared to those of teaching in Indiana public schools, the frequency of individuals selecting these ranges did not increase or decrease by more than three in each category.

**Table 9**

*Demographic Breakdown of Study Participants: Years of Experience*

Demographic Information	<i>n</i>	%
Years of Experience: Indiana Public Schools		
0-5	9	10.7%
6-10	19	22.6%
11-15	13	15.5%
16-20	18	21.4%
21-25	10	11.9%
26-30	8	9.5%
31+	7	8.3%
Years of Experience: Kindergarten through Second Grade		
0-5	10	11.9%
6-10	19	22.6%
11-15	16	19%
16-20	19	22.6%
21-25	8	9.5%
26-30	8	9.5%
31+	4	4.8%

### *Licensure*

Individuals were asked to self-report the areas which reflected their current licensure in the state of Indiana. This was presented as a multiple select option on the survey. To analyze this information, these categories of licensure were broken into separate variables. Each licensure area was coded as either selected, not selected, or missing. Only one value was coded as missing in each category of licensure.

As expected, based on the parameters of the study, most individuals held licensure to teach primary grades (see Table 10). Few participants indicated additional licensure in areas such as grade levels traditionally associated with junior highs or specialized areas such as reading. Other representation, such as licensure to teach special education courses, were included within the sample.

**Table 10**

*Demographic Breakdown of Study Participants: Current Licensure*

Current Licensure	Selected		Not Selected		Missing	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Kindergarten	62	73.8%	21	25.0%	1	1.2%
1 <sup>st</sup> -2 <sup>nd</sup>	77	91.7%	6	7.1%	1	1.2%
3 <sup>rd</sup> -5 <sup>th</sup>	64	76.2%	19	22.6%	1	1.2%
6 <sup>th</sup>	47	56.0%	36	42.9%	1	1.2%
7 <sup>th</sup> -8 <sup>th</sup>	10	11.9%	73	86.9%	1	1.2%
Reading	10	11.9%	73	86.9%	1	1.2%
Special Education	21	25%	62	73.8%	1	1.2%
Other	11	13.1%	72	85.7%	1	1.2%

## **Research Question 1**

The first research question asked the extent to which elementary kindergarten through second grade teachers serving in Indiana public schools perceived the state's dyslexia legislation had influenced reading instruction for students. The first of the survey questions specifically questioned the likelihood that students would be identified for interventions prior to the legislation being in place. The second question asked participants to rate the likelihood that specific elements would have occurred in intervention which occurred prior to the enactment of dyslexia statute. As these questions were written in a descriptive nature, descriptive statistics were used to answer each question. This included tests of central tendency and frequency distributions. The skewed nature of the ordinal data collected resulted in the reporting of median and interquartile ranges rather than mean and standard deviation (Manikandan, 2011; Tai et al., 2022).

### ***Research Question 1a***

Research question 1a posed the query: How have outcomes from universal screening measures influenced the identification of students receiving intensive reading intervention? To measure this question, participants were given the following prompt:

Consider the students in your classroom(s) who have received a score of 'at risk' or 'at some risk' on a universal screener and participate in reading intervention. What is the likelihood that students who demonstrate the need for support in the following areas would have been identified to participate in interventions prior to the enactment of state statute related to dyslexia?

The areas provided for participants to rate included specific areas related to reading development which included sounding out or decoding words seen in print, connecting the sounds in words to

the letters which represent them, recognizing letters seen in print, and segmenting and manipulating sounds heard in spoken language.

The valid number, median, and interquartile range were reported for the responses to this prompt. As shown in Table 11, participants indicated a perception that it was likely that students who were identified to participate in interventions based on the results of universal screening would have been identified to participate in intervention prior to enactment of state statute related to dyslexia. The area of phonological awareness differed from other areas of reading development in the perceptions held by participants. This table illustrates the lesser certainty with which individuals believed students who could benefit from supports in the areas of phonemic segmentation and manipulation would have been identified to receive interventions prior to the enactment of statute.

**Table 11**

*Median and Interquartile Ranges for Research Question 1a*

Areas of Reading Development	n	Median	Interquartile Range
Sounding out or decoding words they see in print	81	1.00	1.00
Connecting the sounds in words to the letters which represent them	81	1.00	1.00
Recognizing letters they see in print	81	1.00	1.00
Segmenting sounds heard in spoken language	81	2.00	1.00
Manipulating sounds heard in spoken language	81	2.00	1.00

An examination of frequency distributions for the answers of participants provided further insight into the perceptions of teachers in kindergarten through second grade (see Table 12). As indicated through the median score, most participants responded affirmatively that students who demonstrated need in varied areas of reading development and currently participated in interventions as the result of universal screening would have been identified to participate prior to the enactment of state statute. Participants indicated that the students who could have benefited from additional support with phonemic segmentation had the greatest risk of not being identified to participate in interventions prior to the enactment of state statute.

**Table 12**

*Frequency Distributions for Research Question 1a*

Areas of Reading Development	Very Likely		Somewhat Likely		Neutral		Somewhat Unlikely		Very Unlikely	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Sounding out or decoding words they see in print	48	57.1%	26	31.0%	4	4.8%	3	3.6%	3	3.6%
Connecting the sounds in words to the letters which represent them	48	57.1%	27	32.1%	3	3.6%	4	4.8%	2	2.4%
Recognizing letters they see in print	53	63.1%	17	20.2%	4	4.8%	5	6.0%	5	6.0%
Segmenting sounds heard in spoken language	36	42.9%	31	36.9%	4	4.8%	11	13.1%	2	2.4%
Manipulating sounds heard in spoken language	34	40.5%	35	41.7%	5	6.0%	8	9.5%	2	2.4%

### ***Research Question 1b***

The second question related to the extent to which Indiana public educators perceived state statute related to dyslexia had influenced reading instruction examined how intensive reading intervention had been influenced by state statute requiring specific elements be present in the instruction. Participants were given the following prompt:

How much more or less likely are the following elements to occur in reading interventions which occur in today's K-2 classrooms as compared to those prior to the enactment of state statute related to dyslexia?

As indicated by the results in Table 13, participants perceived the elements which were required to be present in intervention for students identified by the results of universal screening were somewhat more likely to occur in current interventions than those which took place prior to the enactment of state statute.

**Table 13**

*Median and Interquartile Ranges for Research Question 1b*

Areas of Reading Instruction	n	Median	Interquartile Range
Instruction on phonics skills that follows a specific scope and sequence that is systematic and sequential in nature	81	2.00	2.00
Instruction on the connection between written letters and the rules of the sounds they make	81	2.00	2.00
Instruction on understanding how to segment individual sounds in spoken language	81	2.00	2.00

An analysis of frequency distributions indicated most participants believed all areas of reading instruction were either much more or somewhat more likely to occur in current reading

interventions (see Table 14). Many participants in the sample responded by selecting a neutral option. This prompt did not include a write-in response, so further data was not collected to explore the reason for the selection of a neutral response.

**Table 14**

*Frequency Distributions for Research Question 1b*

Areas of Reading Instruction	Much More Likely		Somewhat More Likely		Neutral		Somewhat Less Likely		Much Less Likely	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Instruction on phonics skills that follows a specific scope and sequence that is systematic and sequential in nature	32	38.1%	28	33.3%	22	26.2%	2	2.4%	0	0.0%
Instruction on the connection between written letters and the rules of the sounds they make	29	34.5%	30	35.7%	23	27.4%	2	2.4%	0	0.0%
Instruction on understanding how to segment individual sounds in spoken language	26	31%	31	36.9%	24	28.6%	3	3.6%	0	0.0%

**Research Question 2**

The second research question examined student outcomes associated with dyslexia statute in the state of Indiana, rather than the processes which were associated with this legislation. The



question queried the extent to which kindergarten through second grade teachers serving in Indiana public schools perceived the state's dyslexia legislation had influenced reading outcomes for students. This question had two sub questions which contributed to the overall question. The first of these sub questions asked how the use of an intensive reading intervention for students who have received a score of "At Risk" or "At Some Risk" had influenced grade level reading outcomes. The second sub question inquired as to the extent to which teachers perceived the instructional elements required by state statute had influenced student reading outcomes.

In a similar manner to the process used for the first set of research questions, these questions were written in a descriptive nature. Descriptive statistics were employed to answer each question. These descriptive statistics included tests of central tendency and frequency distributions. As with the first research questions, the skewed nature of the ordinal data collected resulted in the reporting of median and interquartile ranges rather than mean and standard deviation (Manikandan, S., 2011; Tai et al., 2022).

### ***Research Question 2a***

The first sub question sought to answer how the use of an intensive reading intervention for students who have received a score of "At Risk" or "At Some Risk" had influenced grade level reading outcomes for students. To study this question, participants were asked to consider the following prompt:

What is the likelihood that students who receive a score of 'at risk' or 'at some risk' on the universal screener and have received interventions which address learning characteristics related to dyslexia will reach grade level outcomes in the following areas by the end of the school year in which they participate in the intervention?

Participants then rated specific areas related to reading development which included sounding out or decoding words seen in print, connecting the sounds in words to the letters which represent them, recognizing letters seen in print, and segmenting and manipulating sounds heard in spoken language.

The valid number, median, and interquartile range were reported for the responses to this question (see Table 15). The results indicated a median perception that students who participated in these interventions were somewhat likely to reach grade level outcomes by the end of the school year. The greatest range was noted in the responses provided regarding the area of reading development in phonemic segmentation.

**Table 15**

*Median and Interquartile Ranges for Research Question 2a*

Areas of Reading Development	n	Median	Interquartile Range
Sounding out or decoding words they see in print	81	2.00	1.00
Connecting the sounds in words to the letters which represent them	81	2.00	1.00
Recognizing letters they see in print	81	2.00	1.00
Segmenting sounds heard in spoken language	81	2.00	2.00
Manipulating sounds heard in spoken language	81	2.00	1.00

A deeper investigation into frequency distributions was conducted and reported in Table 16. These distributions indicated that participants believed it was very likely or somewhat likely that students who participated in interventions which addressed characteristics related to dyslexia

would reach grade level outcomes by the end of the school year. The greatest number of responses which indicated a low degree of likelihood that students in these interventions would meet grade level outcomes by the end of the year were present in the areas of reading development related to sounding out or decoding printed words and phonemic manipulation.

**Table 16**

*Frequency Distributions for Research Question 2a*

Areas of Reading Development	Very Likely		Somewhat Likely		Neutral		Somewhat Unlikely		Very Unlikely		Missing	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Sounding out or decoding words they see in print	15	17.9%	41	48.8%	9	10.7%	13	15.5%	5	6.0%	1	1.2%
Connecting the sounds in words to the letters which represent them	21	25.0%	44	52.4%	6	7.1%	7	8.3%	5	6.0%	1	1.2%
Recognizing letters they see in print	40	47.6%	28	33.3%	5	6.0%	1	1.2%	8	9.5%	2	2.4%
Segmenting sounds heard in spoken language	20	23.8%	40	47.6%	11	13.1%	9	10.7%	3	3.6%	1	1.2%
Manipulating sounds heard in spoken language	14	16.7%	44	52.4%	8	9.5%	13	15.5%	4	4.8%	1	1.2%

***Research Question 2b***

The second sub question related to student outcomes inquired as to the extent to which teachers perceived the instructional elements required by state statute have influenced reading outcomes for students. To explore this question, participants were given the following prompt:

What is the likelihood that including the following elements in intervention for students who receive a score of ‘at risk’ or ‘at some risk’ on the universal screener will support students in meeting grade level outcomes in reading?

Participants were asked to rate categories which reflected components addressed through the IDOE’s Dyslexia Programming Guidance which was shared via their website (Indiana Department of Education, 2022a). These components referenced the use of, “systematic, sequential, and cumulative,” instruction and, “components of the science of reading,” such as phonemic awareness, graphophonemic understanding, and, “strategies for decoding, encoding, (and) word recognition...” (Indiana Department of Education, 2022a, p. 6).

The reports of valid number, median, and interquartile range, as shown in Table 17, illustrate the perceptions held by participants regarding the likelihood that inclusion of various instructional elements would support students in reaching grade level outcomes in reading. These results indicated that participants believed many of these instructional elements would support students in meeting grade level outcomes by the end of the year. Instructional elements related to phonemic segmentation and manipulation were more likely to receive a negative or neutral rating.

**Table 17***Median and Interquartile Ranges for Research Question 2b*

Instructional Elements	n	Median	Interquartile Range
Instruction on phonics skills that follows a specific scope and sequence that is systematic and sequential in nature	81	1.00	1.00
Instruction on strategies for decoding words based on an understanding of letter-sound correspondence	81	1.00	1.00
Instruction on the connection between written letters and the rules of the sounds they make	81	1.00	1.00
Instruction on understanding how to segment individual sounds in spoken language	81	2.00	1.00
Instruction on understanding how to manipulate individual sounds in spoken language	81	2.00	1.00

Frequency distributions of participant responses to these questions were also examined (see Table 18). Participant responses demonstrated lower likelihood that the inclusion of instruction related to phonemic segmentation and manipulation would contribute to students reaching grade level outcomes by the end of the year when compared to other required areas. Phonemic manipulation reflected the largest number of participants ( $n = 12$ ) who indicated neutrality or a lower likelihood that students would reach grade level outcomes, though the majority ( $n = 71$ ) still indicated the inclusion of this instructional element was very or somewhat likely to contribute to students meeting grade level outcomes.

**Table 18***Frequency Distributions for Research Question 2b*

Instructional Elements	Very Likely		Somewhat Likely		Neutral		Somewhat Unlikely		Very Unlikely		Missing	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Instruction on phonics skills that follows a specific scope and sequence that is systematic and sequential in nature	46	54.8%	29	34.5%	5	6.0%	3	3.6%	0	0.0%	1	1.2%
Instruction on strategies for decoding words based on an understanding of letter-sound correspondence	47	56.0%	28	33.3%	4	4.8%	4	4.8%	0	0.0%	1	1.2%
Instruction on the connection between written letters and the rules of the sounds they make	47	56.0%	29	34.5%	4	4.8%	3	3.6%	0	0.0%	1	1.2%
Instruction on understanding how to segment individual sounds in spoken language	39	46.4%	34	40.5%	6	7.1%	4	4.8%	0	0.0%	1	1.2%
Instruction on understanding how to manipulate individual sounds in spoken language	41	48.8%	30	35.7%	6	7.1%	6	7.1%	0	0.0%	1	1.2%

***Summary***

This chapter provided an overview of the results which were obtained through the administration of a survey which was distributed to kindergarten through second grade teachers

across the state of Indiana. The use of descriptive statistics, including central tendency and frequency distributions, were used to determine the extent to which participants perceived the enactment of Indiana's statute had influenced instruction and outcomes for students. Results indicated participants believed students who were identified through required universal screening would likely have been identified to participate in interventions prior to the enactment of statute. Participants also perceived that the instructional elements required by the state were somewhat more likely to occur in current interventions and the use of these required elements would support students in meeting grade level outcomes by the end of the school year. Overall, participants in the sample perceived that students who were identified as being "at risk" or "at some risk" on universal screening would be somewhat likely to meet grade level outcomes by the end of the school year.

## **Conclusions**

The purpose of this study was to explore the extent to which kindergarten through second grade teachers serving in Indiana public schools perceived Indiana's dyslexia policy had influenced reading instruction and outcomes for students. These perceptions were studied using a state-wide survey shared with kindergarten through second grade reading teachers. This final chapter summarizes the results and discusses the implications for current practitioners as well as suggestions for future research.

### **Problem Statement and Methodology**

In recent years, dyslexia legislation has become increasingly more frequent across the United States (Fien et al., 2021; Gearin et al., 2020; Jones et al., 2019; National Center on Improving Literacy, 2022). These policies hold some similarities though variance is noted between statute from state to state (National Center for Improving Literacy, 2022). This has led to suggestions that this variance could potentially lead to heterogeneous outcomes across state lines (Gearin et al., 2021). For this reason, it is important to study state policy, or legislation, within the local context. Little research currently exists regarding the influence Indiana's dyslexia policies have had on reading instruction and outcomes for students.

This quantitative, descriptive research study sought to examine the perceptions current kindergarten through second grade reading teachers in Indiana public schools held regarding the influence Indiana's dyslexia policy has had on interventions and outcomes for students. Participants across the state were recruited via email and sent a link to an anonymous Qualtrics survey. Willing participants completed the Qualtrics survey by rating their perceptions to multiple prompts using a five-point Likert scale. Demographic characteristics of participants were collected using multiple choice and multiple select style survey questions.



## **Summary of Results**

Kindergarten through second grade reading teachers in 68 school corporations across Indiana were invited to participate in this study. Of the 1,649 individuals who were sent a recruitment email with a link to the anonymous survey, 111 responded to and completed the survey. After removing responses from individuals who did not provide consent or indicated exclusionary criteria, 84 participants were included in the study. The data collected from survey respondents was analyzed using descriptive statistics, including central tendency and frequency distributions, to determine the extent to which participants perceived the enactment of Indiana's statute had influenced instruction and outcomes for students.

The analysis of the responses from participants led to several findings. Most participants indicated they believed students who were currently participating in interventions after being identified from the results of universal screening would likely have been identified to take part in these interventions prior to statute being enacted. The sample of participants who were surveyed also indicated a perception that the instructional elements required by the state were somewhat more likely to occur in current interventions. They also perceived that the use of these required elements would support students in meeting grade level outcomes by the end of the school year. In regard to student outcomes, the sample of participants perceived that students who were identified as being "at risk" or "at some risk" on universal screening would be somewhat likely to master grade level outcomes by the end of the school year.

## **Discussion**

The results were considered through the lens of research which had occurred prior to the completion of the study. This included an interpretation of the results and the potential implications these could have for both instruction and future policies. Results were compared to

the existing research in the field of literacy studies and suggestions for future research were provided to extend the scope of this study.

### *Interpretation*

**Research Question 1, Sub Question 1a.** This question sought to seek insight into the influence that outcomes from universal screening have had on the identification of students who have received intensive reading intervention. The data indicated that students who were identified to participate in intervention based on the results of universal screening were likely to have been identified to participate in intervention prior to the enactment of state statute related to dyslexia. However, less certainty was noted in the responses of participants when the areas of phonemic segmentation and manipulation were examined. Overall, participants indicated that students who could benefit from support in alphabetic coding skill, print concepts, alphabetic principle, and letter knowledge were more likely to have been identified to participate in interventions prior to the enactment of statute related to dyslexia when compared to students who demonstrated a need for support in phonological awareness.

Skills related to phonological awareness have been associated with the process of phoneme-grapheme mapping (Chambre et al., 2019; Ehri, 2020; Snowling et al., 2020). Dyslexia has also been associated with a deficit in the phonological core (Indiana House Bill 1108, 2015). The lesser degree of certainty with which teachers expressed likelihood that students with need for additional support in phonemic skills would have been identified to participate in interventions prior to enactment of statute may suggest that some students who had characteristics of dyslexia may not have received interventions prior to the enactment of statute. However, students who demonstrate a need for support in other areas of word recognition, such as the alphabetic principle and coding skills, were likely to also demonstrate need for support in

phonemic segmentation and manipulation (Hoover & Tunmer, 2020). This suggests that students who could benefit from support with phonemic segmentation and manipulation may have been identified to participate in interventions based on a need for additional instruction in alphabetic coding skill, print concepts, alphabetic principle, and/or letter knowledge.

**Research Question 1, Sub Question 1b.** The intent of this question was to examine how reading intervention had been influenced by state statute which required certain instructional elements to be present during the intervention. Participants rated the likelihood that these elements would be present in current interventions as compared to those which occurred prior to the enactment of state statute related to dyslexia. The median response from participants indicated it was somewhat more likely that a systematic and sequential scope and sequence for phonics skills and instruction on phoneme-grapheme correspondence and phonemic segmentation would be present in current interventions. Frequency distributions displayed similar results across all instructional components which were presented to survey respondents, with phonemic segmentation having received slightly higher “neutral” or “somewhat less likely” responses.

The responses submitted by participants indicated that instructional elements associated with state statute related to dyslexia were somewhat more likely to occur in current interventions than they were prior to the enactment of statute. It was also noted that this survey question received a greater number of individuals who responded in a neutral fashion than other questions, with over 25% of participants having responded neutrally to each instructional element. This may have indicated that a quarter of the participants in the sample saw no change in instructional elements which occurred after the enactment of statute. Further research is

needed to determine the extent to which statute influenced the inclusion of certain instructional elements.

**Research Question 2, Sub Question 2a.** This question asked participants to indicate the likelihood that students who participated in intervention after being identified as “at risk” or “at some risk” through universal screening would meet grade level reading outcomes by the end of the year. The median response indicated that students would be somewhat likely to reach grade level outcomes. Frequency distributions showed that the responses of participants indicated a strong likelihood that students would meet grade level expectations in recognizing letters seen in print. Respondents reported a lesser certainty that students would become proficient with decoding words by the end of the year. Over 20% of participants in the sample reported that students were “somewhat unlikely” or “very unlikely” to meet grade level outcomes in the areas of decoding and phonemic manipulation.

These results suggested that students were more likely to reach grade level outcomes in less complex skills, such as letter knowledge (Hoover & Tunmer, 2020). However, more complex skills, such as a decoding, were less likely to have been mastered by students by the end of the year in which they participated in the intervention. To make meaning of print, it is imperative that students can decode print proficiently (Gough & Tunmer, 1986; Hoover & Tunmer, 2020; Seidenberg & McClelland, 1989). It would be advisable to look more deeply into factors which resulted in participants providing a rating of “very likely” in decoding to determine those which could be replicable in the classroom setting.

**Research Question 2, Sub Question 2b.** The final question asked participants to rate the likelihood that the inclusion of pre-identified, required instructional elements within intervention would result in students meeting grade level outcomes by the end of the year. The median score

in areas related to alphabetic coding skill, alphabetic principle, and letter knowledge indicated students were very likely to meet expectations by the end of the year. Areas related to phonological awareness, such as phonemic segmentation and manipulation, received a median score of “somewhat likely” to reach grade level outcomes by the end of the school year.

The results of this question followed a similar trend to other questions in relation to phonemic segmentation and manipulation. Though the median response still reflected a result of “somewhat likely”, it showed a lower degree of certainty than areas related to alphabetic coding skill, alphabetic principle, and letter knowledge. Deficits in the phonological core are explicitly stated within definitions for dyslexia and an awareness of phonological components of language support students with literacy acquisition (Chambre et al., 2019; Ehri, 2020; Hoover & Tunmer, 2020; Indiana House Bill 1108, 2015; Snowling et al., 2020). The trend of lower scores in the areas of phonemic segmentation and manipulation across all research questions may warrant further exploration in future research.

### ***Relationship to Prior Research***

The study which was completed had some relationship to prior research which has occurred in the field of literacy studies. Overlap was noted between the findings of the study and research related to orthographic complexity, theories of reading acquisition and development, and intervention for reading skills. In addition, findings from the study were considered through the lens of Indiana’s definition of dyslexia.

**Complexity of the English Language.** The English language is a deep orthography, which means it lacks reliable phoneme-grapheme correspondences and is difficult to learn to decode (Schmalz, 2015). Based on this complexity, the responses of participants are not surprising. Schmalz’s (2015) description of English’s complex nature may explain why many

participants indicated students who could benefit from support with decoding would have been identified for intervention prior to the enactment of statute related to dyslexia, and why the area of decoding had the least number of participants who indicated it was very or somewhat likely that students would meet grade level outcomes in decoding prior to the end of the school year.

Student acquisition of decoding skills has also been linked to educator expertise (Cohen et al., 2016; Ehri & Flugman, 2017). Concerns regarding student outcomes in decoding, which were evidenced through the responses of participants, may potentially be addressed through building educator knowledge of the English orthography (Cohen et al., 2016). Additional supports, such as mentorships coupled with quality instructional materials, may also be considered by those who develop state and local policies (Ehri & Flugman, 2017).

**Reading Acquisition and Development.** The categories which were created to guide the development of the survey questionnaire were based on Hoover & Tunmer's (2020) Cognitive Foundations Framework. This framework further delineated the decoding and comprehension components of Gough and Tunmer's (1986) Simple View of Reading to detail the hierarchical components which comprise the elements of word recognition and language comprehension (Hoover & Tunmer, 2020). Based on the topic of the research being done within this study, word recognition components were used to develop the survey used with participants.

Hoover & Tunmer's (2020) framework suggested that skills within print concepts, phonological awareness, and orthographic knowledge affect word recognition development. This framework could be used in application to support students with necessary skills (Hoover & Tunmer, 2020). The areas of phonemic segmentation and manipulation tended to receive differing scores from other aspects of word recognition throughout the data collection process. The median score of participants suggested students who needed additional support with

phonemic segmentation and manipulation were somewhat likely to have participated in interventions prior to the enactment of state statute, while other reading elements received a median score of very likely. Over 20% of participants also indicated students were either very or somewhat unlikely to meet grade level outcomes in phonemic awareness prior to the end of the school year.

Hoover & Tunmer (2020) refer to the link between phonemic awareness and other components of reading, such as the alphabetic principle and alphabetic coding skills. They state the lack of phonemic awareness skills can create a barrier to acquisition of these components (Hoover & Tunmer, 2020). Phonemic segmentation and manipulation are especially important as students, “without the ability to isolate and manipulate phonemic representations,” may experience difficulty with the development of word recognition skills (Hoover & Tunmer, p. 110, 2020). When the results of the survey were considered through the lens of Hoover & Tunmer’s (2020) framework, word recognition progress for students may potentially be influenced by a need for additional support with phonemic awareness. This was noted in the responses provided for research question 2a, as the only areas in which over 20% of participants indicated students were very or somewhat unlikely to meet grade level expectations by the end of the year were phonemic manipulation and decoding words.

**Definition of Dyslexia.** The definition for dyslexia has changed over the course of past years (Adlof & Hogan, 2018; Shaywitz & Shaywitz, 2020; Vellutino et al., 2004; Vellutino & Fletcher, 2005). Indiana’s definition for dyslexia states that dyslexia is:

a specific learning disability that: (1) is neurological in origin and characterized by: (A) difficulties with accurate or fluent word recognition; (B) poor spelling and decoding abilities; (2) typically results 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; (3) may include problems in reading comprehension and reduced reading experience that can impede the growth of vocabulary and background knowledge; and may require the provision of special education services after an eligibility determination is made in accordance with 3 511 IAC 7-40 (Indiana House Bill 1108, 2015).

While reading comprehension and related components, such as background knowledge, were not addressed through this study, decoding and the phonological component of language were directly addressed through the categories used to guide survey development. The responses of participants regarding students who were identified to participate in reading interventions before and after the enactment of statute were reflective of this definition as were responses which indicated the likelihood of students meeting grade level outcomes. These responses indicated that students who participated in interventions were likely to have difficulty with decoding and the phonological components of reading, as suggested in Indiana's definition of dyslexia. However, there was evidence to support that students needing additional instruction in the areas of phonemic segmentation and manipulation may not have been as likely to have been identified to participate in interventions as students who needed support with other skills related to word recognition. This is of concern since dyslexia is associated with a deficit in the phonological core and supports students with mapping sounds to graphemes in language (Chambre et al., 2019; Ehri, 2020; Hoover & Tunmer, 2020; Snowling et al., 2020).

**Reading Intervention.** The study explored instructional components and outcomes for students who receive a universal screening score of “at risk” or “at some risk” and participated in reading interventions. Research has suggested that students who present with decoding



difficulties could benefit from an intervention which includes both phonological awareness and explicit phonics instruction (Boganaowicz et al., 2016; Miles et al., 2019; Schlesinger & Gray, 2017). The results from participants in this study aligned with this sentiment. Over 80% of educators indicated that instructional components including instruction on phonics skills which follow a systematic and sequential scope and sequence, strategies for decoding words, phoneme-grapheme correspondence, and phonemic segmentation and manipulation were either very likely or somewhat likely to contribute to students reaching grade level outcomes by the end of the year. While other components of reading acquisition, such as morphological awareness, may support students with characteristics of dyslexia, these elements were not explored through the scope of this study (Murphy & Diehm, 2020).

### ***Implications for Practice and Policy***

The study provided several implications for schools and those who are developing policies. The results showed less likelihood indicated across processes for instruction and outcomes for students when the areas of phonemic segmentation and manipulation were examined. Based on these results, it may be beneficial to consider professional awareness on the need for phonemic skills and relationship between these skills and reading acquisition (Hoover & Tunmer, 2020). This professional awareness may include mentorships and should consider the need for quality instructional materials (Ehri & Flugman, 2017). Another avenue for consideration of professional awareness would be teacher preparatory programs at the collegiate level (Washburn et al., 2015).

Policymakers should consider these results when preparing for future iterations of local and state policy. The survey respondents indicated a perception that most students who were currently participating in interventions based on the results of universal screening would have

been identified to participate in these interventions prior to the enactment of statute. Many others indicated a belief that certain instructional elements required by the state were somewhat more likely to occur after the enactment of statute or expressed a neutral response. However, the median participant response indicated that it was somewhat likely, rather than very likely, that students would meet grade level outcomes by the end of the school year in which they participated in the intervention.

Based on the responses provided by survey participants, it is possible many students were receiving intervention services with identified instructional elements prior to the enactment of statute. Yet, even after the enactment of statute, concern was still present that some students would not meet grade level outcomes. It may be beneficial to further probe for the root causes which are contributing to this reading difficulty for students (Byrk et al., 2017). This will support those who are building policies to address these root causes through future drafts of policy.

### ***Implications for Future Research***

There are multiple areas within the scope of this study which would benefit from additional research in the future. The first of these recommendations for further study are a deeper exploration of the views of primary reading teachers regarding the need for phonemic awareness instruction. Multiple questions related to phonemic segmentation and manipulation received a median score expressing less likelihood of the elements being present in instruction or mastered by students. More information is needed to determine if this is reflective of a belief held regarding the importance of phonemic awareness or if it is related to other elements, such as time available for instruction, district materials, scheduling, or prioritization. The exploration of this topic is important to consider when developing local and state policy related to phonemic awareness, as it may help to illuminate barriers to instruction in this area.

The perceptions explored through this study were those of kindergarten through second grade reading teachers in Indiana. To further address barriers to implementation of policy, and to gather more perspective, further research is recommended to collect the perceptions of elementary and district-level administrators regarding Indiana's dyslexia policies. These perceptions could support current policies by exploring potential barriers to implementation, such as funding. They may also help to structure future policies as these perceptions can provide a basis for the current state of reading instruction and intervention in schools and may help to highlight crucial areas of need.

When participants were asked to indicate if elements of reading instruction were more likely to occur in current interventions as compared to those which occurred prior to the enactment of statute, many neutral responses were present. It would also be helpful to have further information on the reason this neutrality was expressed. Future research could explore a comparison of reading interventions which occurred prior to the enactment of statute related to dyslexia and those which occurred after this statute was put in place. This may support in illuminating major similarities or differences, which could contribute to a deeper understanding of why participants provided a neutral response. The use of qualitative methods may also provide deeper insight into these responses.

As the focus for this study was on word recognition components, it would also be beneficial to complete a longitudinal study which followed students who received a score of "at risk" or "at some risk" and received interventions. This study could potentially look at the effects of the enactment of statute by exploring the influence it had on student reading comprehension outcomes through IREAD-3 and later ILEARN results. This study could also incorporate the perceptions of intermediate teachers to determine if they perceived a shift in student reading

outcomes over the course of time. The implications of this study may support the iteration of future policy as it is refined to best support long-term student outcomes in reading comprehension.

Lastly, Gearin et al.'s (2021) research indicated that states were likely to have heterogeneous outcomes based on variance within statute. It is important to consider replicating this research across state lines to gather further evidence to support if heterogeneous outcomes are present. This may support policy makers in determining elements of policy which resulted in strong outcomes and could be used as a potential model for future policy. In addition, gathering evidence of student outcomes to use within this inter-state study may help to support evidence of the degree of variance which occurs across state lines.

## **Conclusion**

This quantitative research study explored the extent to which kindergarten through second grade teachers serving in Indiana public schools perceived Indiana's dyslexia policy had influenced reading instruction and outcomes for students. The perceptions of these participants were collected through a state-wide survey and analyzed using descriptive statistics, including central tendencies and frequency distributions. The analysis of these results indicated that most participants in the sample believed students who were currently participating in interventions after being identified from the results of universal screening would likely have been identified to take part in these interventions prior to statute being enacted, the instructional elements required by the state were somewhat more likely to occur in current interventions, and the use of these required elements would support students in meeting grade level outcomes by the end of the school year. Participants also reported that students who received a score of "at risk" or "at some

risk” on universal screening would be somewhat likely to master grade level outcomes by the end of the school year after participating in reading intervention.

The findings of the study related to other research which has been done in the field of literacy acquisition, particularly studies related to orthographic complexity, theories of reading acquisition and development, and intervention for reading skills. Indiana’s definition of dyslexia was also connected to the results of the study. These results, coupled with other research which has been done in the past, provided several implications for practice and policy. These included educator professional awareness and further inquiry into barriers which may keep students from meeting expected grade level outcomes.

Suggestions for future research included a deeper exploration of the views of primary reading teachers regarding the need for phonemic awareness instruction as well as the collection of administrative perceptions to identify potential barriers to implementation. Qualitative research which examined interventions prior to and after the enactment of statute, as well as a longitudinal study of student outcomes related to reading comprehension may help to inform future policy. Lastly, Gearin et al.’s (2021) research was used to inform the problem addressed through this study and indicated that states were likely to have heterogeneous outcomes based on variance within statute. The results of this study build a base from which future research can begin to compare the outcomes of Indiana’s dyslexia policy to that of other states.

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## Appendix A

### Research Supporting Documents

#### *Survey Instrument*

<b>Demographic Questions</b>	
1	Have you been teaching students in kindergarten, 1st, and/or 2nd grade classrooms in an Indiana public school(s) for the past five years? (Yes/No)
2	Choose the category which best describes the years of teaching experience you have (only include those years which have been spent in Indiana public schools). (0-5/6-10/11-15/16-20/21-25/26-30/31+)
3	Choose the category which best describes the total years of teaching experience you have (including out-of-state and private school experience). (0-5/6-10/11-15/16-20/21-25/26-30/31+)
4	How many years have you taught in classrooms with kindergarten through 2nd grade students? (0-5/6-10/11-15/16-20/21-25/26-30/31+)
5	What grade level do you currently teach? (K/1st/2nd/Other)
6	Which setting best describes the school in which you currently teach? (Title I/Non-Title)
7	Which setting best describes the school in which you currently teach? (Rural/Suburban/Urban/Other)
8	Select the options which reflect your current licensure in the state of Indiana (select all that apply). (Grade Level and Subject Specific)

Survey Questions	
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<b>Rating Scale: Very Likely, Somewhat Likely, Neutral, Somewhat Unlikely, Very Unlikely</b>	
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Questions 1-5: Consider the students in your classroom(s) who have received a score of ‘at risk’ or ‘at some risk’ on a universal screener and participate in reading intervention. What is the likelihood that students who demonstrate the need for support in the following areas would have been identified to participate in interventions prior to the enactment of state statute related to dyslexia?	
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1	Sounding out or decoding words they see in print
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2	Connecting the sounds in words to the letters which represent them
---	--

3	Recognizing letters they see in print
---	---------------------------------------

4	Segmenting sounds heard in spoken language
---	--

5	Manipulating sounds heard in spoken language
---	--

<b>Rating Scale: Very Likely, Somewhat Likely, Neutral, Somewhat Unlikely, Very Unlikely</b>	
--	--

Questions 6-10: What is the likelihood that students who receive a score of ‘at risk’ or ‘at some risk’ on the universal screener and have received interventions which address learning characteristics related to dyslexia will reach grade level outcomes in the following areas by the end of the school year in which they participate in the intervention?	
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6	Sounding out or decoding words they see in print
---	--

7	Connecting the sounds in words to the letters which represent them
---	--

8	Recognizing letters they see in print
---	---------------------------------------

9	Segmenting sounds heard in spoken language
---	--

10	Manipulating sounds heard in spoken language
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**Rating Scale: Very Likely, Somewhat Likely, Neutral, Somewhat Unlikely, Very Unlikely**

Questions 11-15: What is the likelihood that including the following elements in intervention for students who receive a score of ‘at risk’ or ‘at some risk’ on the universal screener will support students in meeting grade level outcomes in reading?

11	Instruction on phonics skills that follows a specific scope and sequence that is systematic and sequential in nature
12	Instruction on strategies for decoding words based on an understanding of letter-sound correspondence (i.e. ‘sounding out words’)
13	Instruction on the connection between written letters and the rules of the sounds they make
14	Instruction on understanding how to segment individual sounds in spoken language
15	Instruction on understanding how to manipulate individual sounds in spoken language

**Rating Scale: Much More Likely, Somewhat More Likely, Neutral, Somewhat Less Likely,**

**Much Less Likely**

Questions 16-18: How much more or less likely are the following elements to occur in reading interventions which occur in today’s K-2 classrooms as compared to those prior to the enactment of state statute related to dyslexia?

16	Instruction on phonics skills that follows a specific scope and sequence that is systematic and sequential in nature
17	Instruction on the connection between written letters and the rules of the sounds they make
18	Instruction on understanding how to segment individual sounds in spoken language

