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## **The effects of dyslexia in college-aged students studying special education**

Kailah Hardy

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# The effects of dyslexia in college-aged students studying special education

## Abstract

This project focused on the disadvantages students with dyslexia face in college as a result of the still present deficits in reading and writing. One-to-one interviews revealed gathered participant information such as demographic information, their history with dyslexia (such as the social, academic, and personal struggles each individual experiences and how they cope with these struggles), and their present challenges/difficulties related to dyslexia, but also with college-level writing. The findings of this study detailed the lingering effects of three college students who still struggle with dyslexia and in what ways it has affected their life.

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dyslexia, college, students, reading, writing, advocate, disadvantage

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THE EFFECTS OF DYSLEXIA IN COLLEGE-AGED STUDENTS  
STUDYING SPECIAL EDUCATION

By

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A Senior Thesis Submitted to the

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# **The Lingering Effects of Dyslexia in College-Aged Students Studying Special Education**

*Kailah Hardy*  
*Rhonda V. Kraai, Ed.D., Mentor*

## **ABSTRACT**

This project focused on the disadvantages students with dyslexia face in college as a result of the still present deficits in reading and writing. One-to-one interviews revealed gathered participant information such as demographic information, their history with dyslexia (such as the social, academic, and personal struggles each individual experiences and how they cope with these struggles), and their present challenges/difficulties related to dyslexia, but also with college-level writing. The findings of this study detailed the lingering effects of three college students who still struggle with dyslexia and in what ways it has affected their life.

*Keywords: dyslexia, college, students, reading, writing, advocate, disadvantage*

## INTRODUCTION

The purpose of this study was to explore the lingering effects of dyslexia in college age students who are studying special education. As the Learning Disabilities Association (LDA) of Minnesota (2004) confirms, dyslexia is more than the reversal of letters, numbers, or directions. Dyslexia is complex and affects many aspects of an individual's life, including academically and socio-emotionally. It is important that both the preservice teachers as well as teacher preparation institutions can identify these challenges in order to accommodate and modify the effects. Though these students may have struggled in the K-12 system, are they still struggling with academic, social or emotional issues related to their dyslexia diagnosis? Overcoming these dyslexic challenges becomes crucial when a student wants to become a teacher who will help others with dyslexia overcome their challenges. Lambert et al., (2019) emphasized that perspectives are what make each individual with dyslexia different. Some differences are seen as strengths, while others are seen as challenges. It is hoped that colleges will become advocates for students with dyslexia and will support the creation of a universal system of interpreting dyslexia at the college level to fairly support and accommodate all students with dyslexia. In doing this, overall dyslexia awareness and post-secondary institution's understanding and acceptance of dyslexia will increase. Following this study, it is hoped that there will be a new and enlightened understanding of how dyslexia affects college age students studying to become special education teachers. It is also hoped that students with dyslexia become advocates for themselves not only during their education, but in the future as well.

## LITERATURE REVIEW

### Defining Dyslexia

To understand the main concept of this thesis, a definition of dyslexia is provided by The International Dyslexia Association (2002) provides a definition of dyslexia that serves as a universal yet credible definition for educators and professionals to go by. Dyslexia is defined as the following:

*“Dyslexia is a specific learning disability that is neurobiological in origin. It is characterized by difficulties with accurate and/or fluent word recognition and by poor spelling and decoding abilities. These difficulties typically result from a deficit in the phonological component of language that is often unexpected in relation to other cognitive abilities and the provision of effective classroom instruction. Secondary consequences may include problems in reading comprehension and reduced reading experience that can impede growth of vocabulary and background knowledge” (International Dyslexia Association, 2002).*

In summary, the above definition describes some of the overall difficulties that students who have been diagnosed struggle. Researchers have found dyslexia to be the most common neurobiological disorder that interferes with the development of decoding (ability to pronounce written content) and encoding (spelling) skills, which can affect literacy development in both children and adults (Youman, & Mather, 2013). Dyslexia is deemed a lifelong disability, meaning that significant reading and writing related difficulties persist through adulthood (Kirby, Silvestri, R, Allingham, Parrila, & La Fave, 2008). Adlof & Hogan (2018), who authored a scholarly article focusing on the language basis of dyslexia in the context of developmental language disorders, state that dyslexia is merely a “language-based” disorder. to Lyon, Shaywitz, & Shaywitz (2003), who authored a scholarly article elaborating on the components continuously

changing definition of developmental dyslexia, also defined dyslexia as specific language-based disorder. However, other authors challenge this. According to Lyon et al., (2003), dyslexia is considered a specific learning disability. Lyon et al., (2003) is supported in this claim by Lambert, Chun, Davis, Ceja, Aguilar, Moran, & Manset (2019), who examined narratives pertaining to schooling from published memoirs and/or interviews with 30 insiders with learning disabilities, who stated “In most U.S. contexts, dyslexia is synonymous with a reading learning disability. The IDEA 2004 and the DSM-5 include dyslexia as part of the learning disabilities definition” (pp. 2). Researchers Ward-Lonergan & Duthie (2018), who authored an overview of recent dyslexia legislation and guidelines pertaining to services for students with dyslexia, also have their own definition of dyslexia , stating it “involves a specific deficit in single word decoding that is based on a weakness in the phonological aspect of language and has only a secondary impact on reading comprehension, which distinguishes it from other types of reading disabilities” (pp. 810).

### **Challenges**

Deficits and challenges of dyslexia vary among individuals. Adlof & Hogan (2018) stated that the deficits are unexpected, while D’Mello & Gabrieli (2018), who authored a scholarly article summarizing what is known about the structural and functional brain bases of dyslexia, argued that the deficits are persistent. D’Mello & Gabrieli (2018, pp. 798-809) supported the previous claim with the statistic that “75% students diagnosed in 3<sup>rd</sup> grade still read poorly in high school...reading fluency challenges that can get worse with age as reading becomes more complex.” According to D’Mello & Gabrieli (2018), other deficits may include higher rates of anxiety, increased chances of dropping out of school, and decreased chances of pursuing higher education/college. Colenbrander, Ricketts, and Breadmore (2018), who authored a scholarly article providing an overview of the benefits and challenges associated with the early

identification of dyslexia, also predicts poor educational outcomes, self-esteem, and physical health. Lyon et al., (2003, pp. 1-14) also stated that “Many individuals have other deficits in cognitive or academic areas: attention, mathematics.” Ward et al., (2018), Lyon (2003), Adlof & Hogan (2018), Colenbrander et al., (2018), D’Mello & Gabrieli (2018), and the LDA of Minnesota (2004) all mentioned one or more of the following as possible deficits: decoding (letters to sounds or sounds to words), inaccurate word recognition, spelling and written language difficulties, and word retrieval.

Adlof & Hogan (2018), D’Mello & Gabrieli (2018), and Fostick & Revah (2018), who conducted a study where they tested the contribution of working memory and auditory temporal processing to different types of reading performance and phonological awareness in dyslexia, all claim that phonological deficits may also be present with dyslexia. Phonological difficulties are difficulties in identifying the different sounds within a language and using various sounds to create words. The LDA of Minnesota (2004) and Lyon et al., (2003) also support the idea of secondary deficits and challenges in reading comprehension and vocabulary growth. The LDA of Minnesota (2004) also provided an extensive list of possible deficits: common mispronunciations, confusion, limited vocabulary, history of reading and spelling difficulties, lack of fluency, slow reading rate, and preference for picture books and fewer words. In a study conducted by Lambert et al., (2019), the three most common reported challenges were related to literacy (decoding and comprehension), memorization (sounds and spelling), and needing extra time. These difficulties resulted in feelings of anxiety among the individuals, especially in public (Lambert et al., 2019).

### **Causes**

There were many contrasting views regarding the cause(s) of dyslexia. The LDA of Minnesota (2004), Colenbrander et al., (2018) and Lyon et al., (2003) all agreed that the

difficulties are due to one or more of the following: neurological, biological, genetic, etc.

Colenbrander et al., (2018) and the LDA of Minnesota (2004) both agree that individuals with a family history of reading difficulties are at higher risk of developing reading difficulties.

According to Colenbrander et al., (2018, pp. 817-828), 40% - 66% individuals with first degree relatives that have reading difficulties will develop difficulties themselves. However, The International Dyslexia Association (2002) partnered with the LDA of Minnesota (2004) in saying that dyslexia is the result of different or faulty wiring of the brain. Colenbrander et al., (2018) believes that a mixture of genetic, environmental, cognitive, and non-cognitive risk factors plays a huge part in the cause of dyslexia. Adlof & Hogan (2018) also added that dyslexia is not a result of hearing/visual impairments, head injuries, or poor instruction. However, Fostick & Revah (2018) suggested that dyslexia may be caused from poor visual processing. The LDA of Minnesota (2004) challenged this by saying that dyslexia is influenced by the delivery of classroom instruction. Ward-Lonergan & Duthie (2018, pp. 810) stated that “dyslexia involves a specific deficit in single-word decoding that is based on a weakness in the phonological aspect of language, therefore, difficulties typically result from a deficit in the phonological component of language.” Lyon et al., (2003) supported this by reporting that dyslexia is often a result of a phonological deficit. Fostick & Revah (2018) take a different spin on dyslexia with what is called the phonological theory. This theory argues that dyslexia “stems from deficits in the ability to identify, store and retrieve the sounds of the language...the ability to read is based on phonological awareness” (Fostick & Revah, 2018, pp. 19-28). Along with the phonological theory, Habib (2000) discussed three other popular theories: 1) the magnosystem theory, which involves a visual processing defici), 2) the temporal (rate)-processing theory which stated that impairments result in a processing deficit, and 3) The interhemispheric deficit theory of dyslexia

which suggests that the brain's hemispheres collaborate abnormally (Habib, 2000, p. 2380-2383). Researchers have not come to a universal conclusion of the cause of dyslexia, and therefore remains a heavily studied area among researchers.

## **Diagnosis**

Adlof & Hogan (2018) stated that there are not any precise diagnostic criteria for dyslexia. In the past, IQ tests were used to diagnose individuals with dyslexia, assuming the score to be an indicator of potential. Currently, an alternative approach is used: IQ cutoff. Adlof & Hogan (2018, pp. 762-773) explain that this approach “provides a greater opportunity for children with language deficits to be identified as having dyslexia because it does not require that a child have a high verbal IQ.” According to D’Mello & Gabrieli (2018), a dyslexia diagnosis takes both phonology and reading abilities into account. A diagnosis of dyslexia can only be made if “difficulties have persisted for at least 6 months despite adequate intervention and cannot be accounted for by a range of related factors, such as intellectual disabilities, psychosocial adversity, or inadequate instruction” (Colenbrander et al., 2018, pp. 817-828). D’Mello & Gabrieli (2018) also suggested that difficulties cannot be explained by sensory or cognitive deficits, lack of motivation, or poor reading instruction. D’Mello & Gabrieli (2018) and the LDA of Minnesota (2004) were in agreement that the difficulties must be continually present/persistent for an extended period of time. Lyon (2003), D’Mello & Gabrieli (2018), Colenbrander et al., (2018) and the LDA of Minnesota (2004) all mentioned and support the characteristics of dyslexia being any/all of the following: impairments in decoding (word reading/identification), difficulties with phonological awareness and processing, and poor reading fluency. However, Fostick & Revah (2018, pp. 19-28) took a stand-by attributing

dyslexia to “a combination of auditory and visual processing deficits,” and the difficulty acquiring reading skills despite appropriate intelligence and reading opportunities.

During the diagnostic period, the LDA of Minnesota (2004) stressed the importance of being familiar with individual’s history (i.e. specific difficulties), however, the actual diagnosis requires comprehensive assessments by professionals who are knowledgeable of the reading process. Colenbrander et al., (2018) supported this by confirming measurements of one’s reading skills should be obtained. Lyon et al., (2003) and the LDA of Minnesota (2004) agreed that documenting an individual’s instructional history is crucial in determining and understanding the child’s difficulty. The following are possible approaches that can be used to gather individual history: self-reports, teacher reports, parent reports, interviews, observations, formal and informal assessments focusing on decoding (word reading), encoding (word spelling), fluency (rate and accuracy), comprehension (understanding meaning), and phonological awareness (the ability to recognize and manipulate spoken sounds) (LDA of Minnesota, 2004).

D’Mello & Gabrieli (2018) discussed Response to Intervention (RTI), an official approach that is often used in identifying and supporting individuals with learning difficulties. RTI consists of three instructional tiers in which progress is monitored:

- **Tier 1:** evidence-based initial reading instruction is delivered to all students in a classroom;
- **Tier 2:** additional, more frequent support is given to those who need it (i.e. in small groups); more explicit or frequent instruction, possibly in smaller groups;
- **Tier 3:** the struggling student is referred for an in depth-assessment(s) and/or special education services (D’Mello & Gabrieli, 2018).

In Michigan, RTI is one way to diagnose a learning disability (which dyslexia falls under in the State of Michigan). However, there is also the option of Multi-Tiered System of Supports

(MTSS) which is “is a comprehensive framework comprised of a collection of research-based strategies designed to meet the individual needs and assets of the whole child” (Michigan Department of Education, 2020). According to the Michigan Department of Education (2020), this system “provides schools and districts with an efficient way to organize resources to support educators in the implementation of effective practices.” The MDE considers the following Essential Components of MTSS:

- Team-Based Leadership
- Tiered Delivery System
- Selection and Implementation of Instruction, Interventions and Supports
- Comprehensive Screening & Assessment System
- Continuous Data-Based Decision Making

## **Impacts**

It is important to establish that dyslexia is not related with one’s intelligence, meaning that “individuals with dyslexia are neither more nor less intelligent than the general population” (The International Dyslexia Association, 2002). Growing up, children may be able to compensate for the difficulties faced because of dyslexia, and as an adult, these difficulties may become less evident. However, both Lambert et al., (2019) and Lyon et al., (2003) stated that individuals with dyslexia often struggle with reading fluency through adulthood, resulting in the stereotypical slow, effortful reading. In fact, many students with dyslexia enter college “with reading skills that lack proficiency” (Nelson, Lindstrom, Foels, Lamkin & Dwyer, 2019, p. 297). Bruck (1993, p. 171), who examined the spelling skills of adults who had childhood diagnoses of dyslexia, also supported that dyslexia persists into adulthood, stated that “adults continue to

exhibit significant reading and spelling disabilities, and word-recognition difficulties.” Kirby et al., (2008), who described the self-reported learning strategies and study approaches of college and university students with and without dyslexia, further elaborated on two of Bruck’s findings and how each relates to one’s comprehension abilities: “Slow word reading interferes with comprehension because it requires that the material to be comprehended be present simultaneously in working memory, while inaccurate word reading interferes with comprehension by degrading the quality of the information that is being integrated ” (p. 94).

Additionally, Willoughby & Evans (2019), whose study investigated the relations among social–emotional factors in university students with a learning disability, Ward-Lonergan & Duthie (2018), Bruck (1993), and Kirby et al., (2008) were all in agreement that dyslexics have evident phonological awareness weaknesses. As adults, individuals with dyslexia often have trouble adjusting to postsecondary materials and curriculums, including notetaking processes, writing essays, comprehending large quantities, etc. Kirby et al., (2008) and Lyon et al., (2003) noted that although students with dyslexia may be able to improve and compensate for their deficits, “results suggest that they still have significant difficulties with implementing learning strategies concerning identifying main ideas in text and preparing for tests” (Kirby et al., 2008, p. 93). Research has discovered that dyslexics are more at risk for high levels of anxiety, dropping out of school, and are less likely to pursue postsecondary education (Lambert, et al., 2019). Ward-Lonergan & Duthie (2018) supported this by offering additional undesirable outcomes: adolescent homelessness, suicide, depression, substance use/abuse and juvenile delinquency.

### **Different Learning Styles/Coping**

Little is known about whether college students with and without learning disabilities struggle with reading and writing. Most of the known information has been obtained through

“college students’ performances on commercially available, norm-referenced, standardized tests” (Nelson et al., 2019, p. 296).

Similarly, there is not a substantial amount of research that describes methods used by students with dyslexia to help them cope with their academic and functional responsibilities (Kirby et al., 2008). However, Lambert et al., (2019) challenged this by identifying the following coping/learning strategies: resistance, avoidance, memorization of material prior to being tested, and taking more time to familiarize with and complete assigned tasks. Insiders (participants) from Lambert’s study elaborated by emphasizing that they could complete the work, however, it took them longer and required more effort than it did their peers. Despite these challenges, insiders also reported having areas of strength, such as: memorization, persistence, creativity, increased visual, auditory, and multisensory engagement, problem solving skills, and increased motivation (Lambert et al., 2019).

The International Dyslexia Association (2002) confidently notes that the way dyslexic individuals think can serve as an asset in achieving success. Shaywitz (1996), who authored an explanation of dyslexia as a result of defects in language processing, took an interesting approach by claiming that some individuals with dyslexia are able to learn how to read and flourish academically. Throughout the study, these individuals were referred to as “compensated dyslexics” that can perform as well as those without dyslexia on word accuracy tests. However, timed tests revealed that decoding remained difficult for compensated dyslexics as they were neither automatic nor fluent. Shaywitz (1996) also found that despite knowing the information, dyslexics struggle with rapid word retrieval and vocalization of the word. Instead, dyslexics often use hesitations like “um” and “ah”, may recall a related but incorrect phone, and/or incorrectly order the recalled phonemes. Similarly, while non-dyslexic readers are able to decode

words automatically, dyslexic readers often resort to the use context to help identify words. In turn, this takes dyslexics longer periods of time to truly demonstrate what they know (Shaywitz, 1996).

## **Interventions and Accommodations**

The LDA of Minnesota (2004) and The International Dyslexia Association (2002) stood out among all of the contrasting sources by boldly stating that there is no cure for dyslexia. However, they partnered with Colenbrander et al., (2018) stressing the importance of specialized, yet appropriate, interventions should be available. The International Dyslexia Association (2002) also adds that it is essential for individuals with dyslexia to learn coping strategies. The LDA of Minnesota (2004) provided a solid list of possible accommodations that encourage improvement for a dyslexic individual, including extended or extra time, a private testing room, and taped/recorded texts. Research showed that “dyslexic readers deal with significant phonological processing difficulties and often rely on strong thinking or reasoning skills to supplement their weaker decoding skills in order to comprehend words and meaning. Consequently, dyslexic readers read more slowly and with great effort” (LDA of Minnesota, 2004, PG) and often benefit from various accommodations. Private testing areas aim to minimize noise and distractions which helps the individual to focus. Audiobooks and other taped academic material are reasonable for those with severe dyslexia as these individuals may acquire knowledge more effectively this way (LDA of Minnesota, 2004)

Colenbrander et al., (2018, pp. 817-828) pointed out that success relies on both the selected instruction and the “choice of appropriate criteria for growth and achievement in reading abilities,” which is supported by D’Mello & Gabrieli (2018, pp. 798-809) who stated that the “success of early intervention relies heavily on the methods of identifying the children who are at

risk of literacy difficulties.” They also stressed that intervention methods need to be both specific and sensitive in order to prevent misdiagnosis and to detect the underlying risk factors related to reading difficulties. Lyon et al., (2003) discussed the concept of effective classroom instruction and is supported by Ward-Lonergan & Duthie (2018), who warns about the risks for students who do not receive services. Lyon et al., (2003) also encouraged early interventions but specifies that the interventions are more effective when implemented by “well-prepared” teachers. When discussing interventions, Fostick & Revah (2018) reminded us that even though there are many ways of intervening with dyslexia, some individuals may benefit while others may not.

Fostick & Revah (2018, pp. 19-28) stood alone in saying that dyslexic individuals learn to compensate for the deficits, stating that “when they are adults, their difficulties are no longer evident on reading tests.... (but) their phonological awareness is still deficient,” while Lyon et al., (2003, pp. 1-14) countered by providing data that indicated “dyslexic readers can improve in reading words more accurately as they mature but continue to lack fluency in their reading that results in slow but effortful reading.” This can be problematic for students pursuing post-secondary education because students who do not receive special education are expected to provide standardized test scores as part of the application process. Institutions that recognize dyslexia as a disability may waive the requirement for standardized test scores, but often higher education institutions fail to consider the impacts of dyslexia and tend to base admission decisions on test scores (Youman & Mather, 2013). Dyslexia as a disability is often overlooked in many states, and test scores weigh heavily on the college’s admission decision. It is important to note that even though dyslexic students (may) receive supports during their K-12 education, their diagnosis and supports do not simply follow them to postsecondary institutions because these institutions are not required to provide FAPE (Free and Appropriate Public Education). In

effort to receive supports, college students must advocate for themselves. However, institutions are required to provide accommodations for students who have documentation of a recognized disability (i.e. IEP from high school). Although IEPs are no longer valid in college, Section 504 is applicable.

## **Statistics**

In 1977, learning disabilities became an official category under IDEA special education services and are currently the largest of all categories in the U.S. Today, there are more students with documented disabilities in higher education than ever before. Thomas (2020) provided the following statistics: In 1996, 9% of freshmen reported having a disability which was a dramatic difference compared to the 2.6% who reported having a disability in 1978 (this represents over 9% of all freshmen). Of this 9%, 35% (an increase from 24.9 % in 1991) of these freshmen reported having a learning disability (Thomas, 2020). More currently, the U.S. Department of Education, Office of Special Education Program (2017), reported that “2.35 million students (aged 6-21) were identified as having a specific learning disability under IDEA, which was 38.8% of the total student population aged 6-21” (Lambert et al., 2019, p. 2).

Lyon et al., (2003) claimed that early interventions have the potential to reduce reading failure from 18 percent to 1.4-5.4%. Nelson et al., (2019, p. 297), who exercised two studies to explore how college students with and without disabilities read within their actual college curriculum, stated that nearly all 2-year post-secondary institutions and nearly half of 4-year public institutions offer at least one remedial reading course, in which 1 in 10 four-year college students are required to take a remedial reading course. Additionally, study results determined by Nelson et al., (2019) claimed that dyslexic college students read college-level material at a 30% slower rate than their non-dyslexic peers. However, it is important to note that students with

dyslexia may struggle with more than just reading. D'Mello & Gabrieli (2018, pp. 798-809) supported this by stating that over 70% of dyslexic individuals in postsecondary institutions reported having difficulty in notetaking, organizing their writing, and expressing ideas through writing.

## **Legal Stances on Dyslexia**

Although IDEA considers dyslexia a specific learning disability, it does not set explicit rules as to how states should address students with dyslexia. In other words, states are allowed to “interpret” these laws as long as the basic standards of IDEA are met. In Michigan, Public Act 451 functions as a Mandatory Special Education Act, which provides educational services to students with disabilities up to the age of 26, which is a higher age than IDEA’s age of 21. In addition to children diagnosed at birth, Michigan also serves infants and toddlers under the age of 3 who are at risk for a disability (The University of Michigan, 2020). While Michigan does not have legislation that addresses dyslexia, comprehensive screenings for student K-3, interventions, remediation for at-risk students, and professional development are required of schools (Bates, 2020). Bates (2020) went as far as saying that these requirements serve individuals with dyslexia well. The following guidelines were retrieved from the Michigan Administrative Rules for Special Education (MARSE, 2018) are as follows:

### **“MARSE R 340.1713 Specific learning disability defined; determination. Rule 13.**

(a) "Specific learning disability" means a disorder in 1 or more of the basic psychological processes involved in understanding or in using language, spoken or written, that may manifest itself in the imperfect ability to listen, think, speak, read, write, spell, or to do mathematical calculations, including conditions such as perceptual disabilities, brain injury, minimal

brain dysfunction, dyslexia, and developmental aphasia. Specific learning disability does not include learning problems that are primarily the result of visual, hearing, or motor disabilities, of cognitive impairment, of emotional impairment, of autism spectrum disorder, or of environmental, cultural, or economic disadvantage.

(b) In determining whether a student has a learning disability, the state shall:

- Not require the use of a severe discrepancy between intellectual disability and achievement.
- Permit the use of a process based on the child's response to scientific, research-based intervention.
- Permit the use of other alternative research-based procedures.

(3) A determination of learning disability shall be based upon a full and individual evaluation by a multidisciplinary evaluation team, which shall include at least both of the following:

- The student's general education teacher or, if the student does not have a general education teacher, a general education teacher qualified to teach a student of his or her age or, for a child of less than school age, an individual qualified by the state educational agency to teach a child of his or her age.
- At least 1 person qualified to conduct individual diagnostic examinations of children and who can interpret the instructional implications of evaluation results, such as a school psychologist, an authorized provider of speech and language under R 340.1745(d), or a teacher consultant” (MARSE, 2018).

Students with learning disabilities are entering postsecondary institutions in greater numbers today than in the past. However, many of these students do not disclose their disability upon admission to postsecondary institutions (Kirby et al., 2008). Unfortunately, many states do

not have guidelines regarding how to “identify, help, and accommodate students with dyslexia within the requirements of federal law” (Youman & Mather, 2013, p. 133). However, some states have recognized the need for early services and have taken steps to implement regulations in an attempt to create a universal process of identifying and supporting dyslexia. As of 2012, Youman & Mather (2013), who authored a scholarly article reviewing and comparing current dyslexia laws, reported that only 22 states had statewide dyslexia laws, 3 additional states had drafted a dyslexia handbook for school personnel and parents; and of the remaining states, six had laws making their way through legislature. The laws focused heavily on dyslexia definition, early screenings, identifications, interventions/accommodations, and eligibility criteria.

The term *dyslexia* is not used to label individuals (in schools) who fit the diagnostic criteria – instead, the term *specific learning disability* is used (Youman & Mather, 2013). SLD is a large umbrella term in which many individuals are placed, resulting in inadequate intervention and support for individuals with dyslexia. While many states have not, some states (like Texas) have mandated universal screening for dyslexia and other reading disorders as part of reading progress monitoring in grades k-12 (Youman & Mather, 2013). Additional states (Louisiana, Washington, Mississippi, South Carolina, Virginia, and Ohio) have created laws that require experimental programs and the dedication of funds to establish universal screening for dyslexia in the early years of school. Additional states (Kansas and Oklahoma) had pending legislation on universal screening for dyslexia in public schools, while others (Arkansas, Kentucky, Kansas, Wisconsin, Colorado, and Louisiana), had drafted universal screening legislature proposals that failed to pass but held potential for future revisions and modifications (Youman & Mather, 2013). A few states (Idaho and Oregon) progressed toward the implementation of a research-based approach – documenting patterns of strengths and weaknesses. The South Dakota

department of education suggested that students who are thought to have dyslexia be evaluated in oral language skills, word recognition, decoding, spelling, phonological processing, automaticity/fluency skills, and reading comprehension. However, in Mississippi, evaluation components included auditory perception, oral expression, letter identification, word attack, oral reading comprehension, silent reading comprehension, spelling, written expression, handwriting, math calculation, and math reasoning (Youman & Mather, 2013).

Policies regarding interventions and accommodations also vary from state to state. In some states, children with dyslexia may receive interventions and accommodations within the public school setting, while in other states, children may not receive any additional classroom supports because they are ineligible for services under the IDEA 2004 (Youman & Mather, 2013). Youman & Mather (2013) elaborated by explaining that only those identified with dyslexia under the IDEA 2004 will receive accommodations that are outlined in their IEP. However, there are a few states that implement intervention programs for students with dyslexia: New Mexico, Louisiana, Texas, Minnesota, Colorado, and South Dakota. Such intervention approaches often target specific areas such as phonemic awareness, phonics, spelling, fluency, and vocabulary (Youman & Mather, 2013). Some states (Mississippi, Texas, South Dakota, Louisiana, Washington, Arkansas, and Minnesota), however, use the specifications of Section 504 to provide students with dyslexia supports who do not otherwise qualify for SLD under the IDEA 2004 (Youman & Mather, 2013). Although individuals with dyslexia may not need the same type of supports, they should all receive the same level of support. Without state laws and handbooks to guide educators and protect the rights of those with dyslexia, individuals often do not receive necessary supports.

## **METHODOLOGY**

First and foremost, this case study project was approved by EMU/IRB, and an extensive literature review about dyslexia and college aged students was created. The 26 interview questions for this study were drafted to reflect questions that would assist the researcher in answering the questions:

1. What areas do students who struggle with dyslexia continue to struggle with in college?
2. What lingering effects of dyslexia are present in college-aged students?

The interview questionnaire was first piloted by five peers outside of this study to assess the adequacy of the questions in relation to the study's purpose. Three subjects who volunteered for this study participated in a face to face interview with the researcher. This study looked closely at the following research question: What areas do students who struggle with dyslexia continue to struggle with in college? It is hypothesized that students will continue to struggle with college level reading but will be challenged more with college level writing.

### **Subject Recruitment**

In order to participate, participants needed to have a dyslexia diagnosis (verified via documentation) and be enrolled in at least ONE college course through EMU (verified via transcript, by my faculty mentor, or by registration with the Disability Resource Center). Participants were (though not required) fellow peers pursuing degrees within the Special Education field who felt comfortable sharing their diagnosis of dyslexia and characteristics with others, in other words, they regularly self-disclosed their challenges in special education

### **Participation**

Each participant signed the IRB consent form to participate in the interview. This study looked at three students who attend EMU and had been diagnosed with dyslexia when admitted to EMU. Participant 1 was a 19-year-old female who was currently in her sophomore year at EMU studying Elementary Special Education and Learning Disabilities. Participant 2 was a 24-year-old male who was currently in his junior year at EMU also studying Elementary Special Education Learning Disabilities. He reports that his dyslexia has given him the passion to pursue a career in special education. Outside of school, participant 2 is a department head at a Home Depot store and has worked for his town's skating rink since the 8<sup>th</sup> grade. Participant 3 was slightly different but still met the criteria for this study. Participant 3 was a 28-year-old male and a 3<sup>rd</sup> year graduate student at EMU studying Special Education. Prior to his time at EMU, he obtained an undergraduate degree in Criminal Justice. Outside of school, participant 3 works as a paraprofessional and enjoys spending time with his wife and daughter. Participants agreed to ONE face-to-face interview with the researcher, which lasted between 30 minutes to an hour as each participant provided various feedback to the set of standard interview questions designed and piloted by the researcher.

## DATA COLLECTION

This chart contains the interview dialogue of three (3) participants.

<p style="text-align: center;"><b>Questions</b></p>	<p style="text-align: center;"><b>Participant 1</b></p> <p style="text-align: center;">Age: 19 Sex: Female College Year: Sophomore Major: Elementary Special Education and Learning Disabilities</p>	<p style="text-align: center;"><b>Participant 2</b></p> <p style="text-align: center;">Age: 24 Sex: Male College Year: Junior Major: Elementary Special Education Learning Disabilities</p>	<p style="text-align: center;"><b>Participant 3</b></p> <p style="text-align: center;">Age: 28 Sex: Male College Year: 3 Major: Special Education</p>
<p style="text-align: center;"><b>When were you diagnosed with dyslexia?</b></p>	<p>In elementary school, P1 was given accommodations, but was not given the dyslexia label until high school.</p>	<p style="text-align: center;">3<sup>rd</sup> grade.</p>	<p>P3 was diagnosed in 3<sup>rd</sup> grade. Spelling tests became difficult and he had a harder time reading. Up until now (college), he memorized words/spelling.</p>
<p style="text-align: center;"><b>Were you ever bullied/made fun of for your difficulties in reading? If so, how?</b></p>	<p>No. P1 kept her struggles quiet.</p>	<p>Yes - peers often teased him because he read slow out loud.</p>	<p>No. P3 was never bullied for his inability to read. For the most part, no one really knew that he struggled with reading.</p>
<p style="text-align: center;"><b>Were you given an IEP during your K-12 education?</b></p>	<p>Yes, in elementary school.</p>	<p>Not until 4<sup>th</sup> grade, but P2 was given accommodations until Junior year of high school when he was switched to a 504 plan (because he wasn't using all of the IEP accommodations).</p>	<p>Yes, P3 received an IEP following his diagnosis in 3<sup>rd</sup> grade.</p>
			<p>Struggles with math word problems/formulas.  Frustrated when he gets something and others don't</p>

<p><b>How did/does dyslexia affect your academics?</b></p>	<p>P1 has to work slower and harder than others.</p>	<p>Dyslexia affects his education when he is doing homework, taking notes, and taking tests and exams.</p>	<p>(feels like if he gets it with his disability then others should get it no problem); but also gets frustrated when others get it and he doesn't.</p> <p>Understands final project/end result – getting started/ dealing with the little details is difficult.</p> <p>Ongoing struggle of balance.</p> <p><b>ONLINE CLASSES:</b></p> <ul style="list-style-type: none"> <li>- Depends on the subject, but P3 is a very physical-copy person.</li> <li>- Difficult to a point because if he has an issue he can't talk to instructor.</li> <li>- Struggles to convey message – often asks instructors to explain something (through email) as if an outsider could understand.</li> </ul>
<p><b>How did/does dyslexia affect your home life?</b></p>	<p>N/A</p>	<p>Dyslexia affects P2 at home when he tries to read directions on things that he is cooking or putting together things that require directions.</p>	<p>P3's frustration increases and he has trouble seeing past little things/challenges.</p> <p>Unable to get a screw undone or something isn't lining up right – thinks he should be able to do it easily. Ends up quitting, forgetting, and/or frustrated.</p> <p>Little things would set him off when frustrated – take it out on others (ie snapping at a family member)</p>
			<p>P3 says that dyslexia doesn't have a huge social impact because reading isn't required. Unless P3 is</p>

<p><b>How did/does dyslexia affect your social life?</b></p>	<p>N/A</p>	<p>Dyslexia affects P2's social life when he has to read things out loud when playing games or when he is talking P2 tends to lose track of what he is saying.</p>	<p>playing a game involving reading, but all of his friends are willing to help when needed.</p> <p>BUT</p> <p>Sometimes becomes frustrated when people don't help him – but frustrated when they do because they don't do it right/his way. Likes being in control of things, leads to issues.</p>
<p><b>Are you comfortable sharing that you have dyslexia with others?</b></p>	<p>P1 didn't share during her K-12 years. Now, she is comfortable sharing with her Learning Disabilities class peers. P1 feels that they are familiar with and are understanding of dyslexia.</p>	<p>Yes. P2 is willing to share this with anyone.</p>	<p>P3 likes to share his dyslexia with others as “a warning so that I don't scare them when I get frustrated and upset”. When P3 was younger he did not like sharing his dyslexia with others because he feared being labeled as weird. For the most part, P3 does not share his dyslexia with others unless he needs to; an exception being that he shares his dyslexia with the students he works with to show them that they are not alone.</p>
<p><b>Are there any challenges you face while being employed outside of college that are caused by your dyslexia?</b></p>	<p>N/A</p>	<p>Takes him longer to read things and difficulty spelling when writing up associate reviews. He is a department head (garden) at Home Depot.</p>	<p>Currently, no because P3's job only requires him to collect data on student behavior.</p>
<p><b>Are you registered with the Disability</b></p>	<p>Yes</p>	<p>No. P2 transferred to EMU from Washtenaw Community College (where he had supports). EMU said</p>	<p>P3 can request accommodations when he goes to take the teaching test.</p> <p>At age 20 took a (retest) norm-referenced adult test</p>

<b>Resource Center at EMU?</b>		he didn't qualify for services.	to qualify for "adult services" at Madonna University. Submitted this to EMU as proof
<b>Do you have an accommodation letter that you give to your professors?</b>	Yes	No.	Yes, but sometimes P3 forgets to give it to the professor right away.
<b>What supports (if any) are given to you by EMU? Do you use them? Why or why not?</b>	P1 is provided use of the CATE lab for quizzes and exams and is given 100% extra time. P1 also uses apps – notetaking app that records the instructor and allows you to type and insert pictures.	P2 does not receive any supports from EMU because, because when he transferred, EMU denied P2 accommodations when he went to see if he was eligible for services.	Uses app SunSonet (as he wants) for notetaking, which records audio, allows P3 to highlight important points, and can go back and make notes/review what he may have missed.  Extended time on tests  Alternative media (audiobooks)  Maybe Alternative color forms (for tests)
<b>Are most professors accommodating to your academic needs?</b>	Yes. Professors have never given her issues.	P2 tells all of his teachers about his dyslexia. P2 says that the professors try to help him out as much as they can because he doesn't receive services.	Yes, because he is in the Special Education program. It is on the student to submit LOA to the teacher.  Most are very accommodating and modify teaching strategy. On the student to advocate for themselves.  P3's favorite teacher offers video lecture, PowerPoint slides, and book resource. Can get information in different ways – i.e. listen to lecture and then look through book; things may stand out/make comprehension easier.  Teaches lessons simply – as if students aren't familiar with special education

			Appreciates teachers who teach what they NEED to know, not extra stuff
<b>(If at all) How does dyslexia affect your mental state/self-image?</b>	Not a huge issue – P1 just has to work harder and stay organized to avoid frustration.	P2 sometimes thinks to himself “I am not good enough” and that “I will never pass”. However, this just fuels P2 to do better.	<p>Fears of judgement:</p> <ul style="list-style-type: none"> <li>- “If I don’t do this perfect, this person will think...”,</li> <li>- “I need to be perfect for both of them” (his wife/child).</li> <li>- When others ask why he did something a certain way, he gets frustrated and feels the need to do it again because it wasn’t perfect. Trying to be accepting of okay/good work and NOT perfect.</li> </ul> <p>Negative thoughts when he becomes frustrated:</p> <ul style="list-style-type: none"> <li>- “I’m dumb, I can’t even do simple things like”.</li> <li>- “why don’t I get it?”,</li> <li>- “I don’t know where to go from here”,</li> <li>- “Am I going to mess students up more because I struggle”, etc</li> </ul>
		P2 copes with having dyslexia by giving himself “brain	<p>To offset the “bad area” (what he was struggling with) of an assignment, he aims to make all other areas perfect to make him feel slightly better about the bad area.</p> <p>Feels more confident when things come easy.</p>

<p><b>How do you cope with the challenges of having dyslexia?</b></p>	<p>P1 works out when feeling stressed.</p>	<p>breaks”, going for walks, or just driving around (either in a car or riding a motorcycle).</p>	<p>In high school he was in swimming and track – frustrations from the day drove him to work hard to relieve stress/frustrations.</p> <ul style="list-style-type: none"> <li>- Hard to do this now with a family, full time job, and school.</li> </ul> <p>Currently, P3 tries to take naps, but it doesn’t always help because he feels that his time is wasted sleeping and becomes frustrated again</p> <p>Removes himself from task/environment.</p> <p>Takes breaks (ie walk, new task) to cool off (may return to challenge later).</p> <p>Tries to schedule a break every 1.5-2 hours.</p> <ul style="list-style-type: none"> <li>- Finishes early=break is then longer</li> </ul> <p>Taking breaks (lays down to reset) and going back to task.</p>
<p><b>How have you adapted academically to your dyslexia? Can you explain what strategies work best for you?</b></p>	<p>P1 writes all of her assignments down and works hard to complete assignments at least a week before hand.</p>	<p>P2 uses a transparent paper when reading. And when he goes through his notes, P2 tends to re-write the notes in a color pen or fine tip sharpie.</p>	<p>Group projects are very helpful for him</p> <ul style="list-style-type: none"> <li>- likes hearing other perspectives and bouncing ideas back and forth.</li> <li>- Collaboration is important to him</li> <li>- Listening to an unknown word he is more likely to understand it and use it in context</li> </ul> <p>Think of new/alternative approaches to tasks.</p> <ul style="list-style-type: none"> <li>- “In education, you are not the only teacher”</li> </ul> <p>Schedules every moment:</p>

			<p>-Example: 9-10 work on one thing, STOP, do something new. - Works in breaks.</p> <p>Schedules are very helpful for him in staying organized.</p> <p>Visualizations are important and help him stay on task.</p> <ul style="list-style-type: none"> <li>- Writes on yellow paper with red pen, white paper blue pen, etc.</li> <li>- Helps him store mental image of it.</li> <li>- Schedules are very helpful for him in staying organized.</li> </ul>
<b>Do you prefer reading independently or with others?</b>	P1 prefers reading independently but feels okay with reading in a group if she's comfortable with the reading material.	P2 prefers to read independently so he can take his time and not feel rushed.	For P3, it depends on if he has to read or if he can listen to someone else read aloud.
<b>How do you feel about reading out loud to others?</b>	P1 gets nervous and often looks ahead to get comfortable with the material.	P2 hates reading aloud but will do it if he is called on. Often P2 will read ahead if he knows that he will need to read aloud after someone else.	P3 does not like reading aloud because he becomes nervous that he will either mess up or will be unable to read a word. He has tried reading to his daughter, but sometimes the words become messed up because he read too fast and then he has to reread them. P3 gives an example of his brain "putting in words" that are not on the page.
<b>Do you like to read in your free time?</b>	P1 doesn't really have free time but likes to read during the summer. She likes reading now more than she did in K-12.	No. P2 only really reads from his phone (Facebook/twitter, etc).	<p>"Uhh ain't happening". Listens to a lot more books than he would have ever read.</p> <p>Lower reading level – middle school (6-8<sup>th</sup> grade) –</p>

			he will typically read through this
<b>Do you complete reading assignments for classes?</b>	Yes. When she was younger, she used to just skim, but now she likes to know the material.	Yes	Would often not read chapters necessary – tried audio books and still struggled to grasp content, often became distracted/not interested.
<b>Does dyslexia affect your writing/spelling? If so, in what ways? K-12? College?</b>	<b>College:</b> P1 has trouble with comprehension and writing out words. She has to sound it out or needs to ask for help. <b>Example:</b> the word <i>hippopotamus</i> : P1 can say it out loud but struggles to write it out. Eventually, P1 memorizes the spellings of difficult words.	P2 sometimes forgets how to spell words that he usually knows how to spell. Or knows letters and sees it in his head but accidentally skips it on paper (i.e.: binder=bindr).	<b>In College:</b> Uses voice to text – uses a lot of similes because he couldn't spell a more advanced version of the word. Memorization. When typing, P3 uses either dark blue or red ink on white paper. When writing on paper, he often uses yellow paper (like a legal pad).  In K-12, P3 doesn't remember doing a lot of writing because he was in many direct study classes. However, when he did write, P3 used smaller words that he was comfortable with spelling.
<b>What are some challenges/obstacles you face because of dyslexia?</b>	More challenging to read. Games are sometimes difficult too as it takes her a bit longer to process what it says.	Problems with word finding. When P2 is writing or typing, he will think of the word he wants to include but either misses it completely or misspells it. For instance: the word <i>because</i> : when P2 is writing or typing, he will think of the word " <i>because</i> " in his mind and will then type it and miss a letter.	Confidence – assumes everyone else smarter than him (even his high school students). Writing something wrong on the board and students thinking he is dumb. "How can I teach students something that I struggle with?"  Assumes students know he has a disability and struggles sometimes (even though they might not). Confident in some things, others not so much. Eye/brain fatigue from trying (reading)  Processing is difficult. Some things are easier to

			process, while others may take longer depends on situation/context of task)
<b>How do you see letters and words on a paper?</b>	P1 has issues with the end of the word. Often, she may miss the ending while reading or speaking (i.e may forget the <i>s</i> in <i>cats</i> ).	P2 says that when he is reading the letters and words on the page, he sees that the letters have slight movement and are close together.	Letters typed or handwritten squish together (if white paper/black ink). Sometimes look like lines. Reads more effectively when following along with his finger.  White is blinding to him, changing contrast/ color. Uses yellow overlay (looks like binder divider)  Handwriting isn't difficult; spelling is the struggle.
<b>What strengths (if any) does dyslexia give you?</b>	It makes her more motivated and encourages her to work harder.	P2 says that dyslexia has given him a good work ethic in school. He was raised a hard worker too.	Visualization! Tries to see himself doing a task, or watches others do it. Then attempts to do it himself.  Relatability  Social butterfly
<b>Would you say that your dyslexia has symptoms? If so, what?</b>	Trouble reading in elementary school was the first indicator.	P2 says a major symptom of dyslexia is when a student is struggling with reading and writing and the teacher tries different approaches and they are not working.	Not really; thinks it is more of a mental state for him (confidence wise)  Can work to get better at something; adapt  Signs to look for; hidden disabilities  "Unless you are looking for signs of LD/dyslexia, you don't see them"  Affects people differently!
<b>Do you think dyslexia will interfere with your future career? How so?</b>	No, because P1 is going into the Special Education profession where people will be more open to it and feels that she will be an inspiration to her students.	Yes, because writing IEPs will be difficult. P2 says that he will need to go through and double/triple check his work.	Yes because P3 will eventually need to write on a whiteboard for students to see and copy and is worried he may not spell word(s) correctly. P3 is also worried that he may not have time to familiarize himself with all of the text he will be presenting in class,

			therefore he won't be able to teach effectively and both he and the students will fall behind.
<b>Is there anything else that you want us to know about dyslexia?</b>	<p>Thinks dyslexia is really cool! People view it as flipping of letters but there is more to it:</p> <p>Comprehension, direction (up/down, left/right) may flip them. Shapes can also be confusing</p>	<p>Dyslexia has been challenging in school and in work. It has made P2 have to work harder and to leave everything out there and do the best that he can. One thing that has helped P2 is knowing that his mom always supports him. She has always told him to do his best and that has been the one constant and has helped him the most.</p>	<p>Working with students, figure out which teaching styles work best for them. Reword things, give real world examples (approach it differently). Struggles to understand things not put into real world context/something that relates to him</p>

## FINDINGS

When participants were asked what symptoms dyslexia has, they each reported reading and writing difficulties as the main symptoms. These symptoms were strong indicators for the participants of this study; each received supportive services beginning in elementary school. However, one participant was not officially given the *dyslexia* label until high school. 66% of participants reported that dyslexia currently affects them academically (notetaking, reading course material, test taking, homework, etc.), at home (reading directions, cooking, etc.) and when socializing (playing board games). In addition, 66% anticipate that dyslexia will continue to impact them during their careers. However, one participant stood out by saying, “Unless you are looking for signs of dyslexia, you don’t see them. It affects people differently.”

Many lingering reading fluency deficits were found in this study. Participants (66%) reported that letters either move or squish together on paper, in turn making reading more difficult. Errors resulting from this include frequently omitting letters from a word, more specifically word endings. Despite these difficulties, however, 33% of participants report enjoying reading and do so in their free time. Participants (33%) reported that they read most effectively when using a finger to follow along. Lingering writing and spelling deficits were also found. Common errors among participants included accidental letter omissions when writing and the use of simple words in order to avoid more difficult words. Responses have brought to light how heavily individuals relied on memorization; 66% of participants reported memorizing words that they find challenging. These (challenging) words varied among participants.

High levels of anxiety became evident among participants. Many participants (66%) reported similar struggles with their self-image and self-confidence. Common thoughts were “I am not good enough”, “If I can’t do this, others will think...”, and “I’m dumb”. Participants

shared their coping strategies, which varied among individuals. Common coping strategies were working out, going for walks, driving around, taking naps, and of course, taking breaks and stepping away from tasks (reported by 66%). Participants indicated that anxiety tends to heighten when they are asked to perform in front of others; for example, reading out loud. Many reported feeling nervous and/or fearful of making mistakes in front of others. In anticipation of public involvement, 66% reported reading ahead to familiarize themselves with the material they will have to read and discuss. The majority of participants (66%) indicated a preference for reading independently.

Participants also reported having difficulty with both comprehension and word retrieval/finding. One participant in particular stressed that he knows the word in his head but struggles getting it on paper effectively. 66% also reported needing more time to process input, which serves as a challenge for the participant who does not receive accommodations. Abstract comprehension is difficult for 33% of participants who claim that comprehension and learning are easier when material is put into real world context.

## DISCUSSION

When interpreting the results of this study it is important to note that this discussion reflects the response of only three dyslexic individuals and cannot be generalized and applied to the entire dyslexic population. Also, participant responses to open-ended questions were personal as each participant could choose what questions to answer and to what extent. Despite this, there were many instances in which participant responses correlated with current research, while there were instances in which the responses differed, such as how the participants have adapted to their dyslexia.

All participants mentioned the phonological deficits originally proposed by Adlof & Hogan (2018): difficulties manipulating sounds, connecting sounds from letter to word, and word retrieval). Lyon et al., (2003), LDA of Minnesota (2004), (Bruck, 1993), Kirby et al., (2008), and Lambert et al., (2019) all agreed that dyslexic individuals struggle with spelling and are supported by participant responses. When tasked with spelling, participant 3 explained that he uses a lot of similes because he couldn't spell a more advanced versions of words and relied heavily on memorization. Participant 1 also reported trouble with writing out certain words despite knowing how to pronounce them and also relies on memorization for the words she cannot spell. This supports Ward-Lonergan and Duthie's (2018) claim that language comprehension is strong because participant 3 is able to think the words in his head but struggles to write them on paper. In turn, this also supports the LDA of Minnesota (2004) who said vocabulary growth can be halted due to their receptive vocabulary being stronger than their expressive vocabulary. Participant 2 discussed that writing reviews at work is often difficult because of spelling, and also shared having difficulty with word retrieval. The LDA of Minnesota (2004) also suggested that not only is spelling difficult but word reading (decoding) is

as well. Each participant addressed the challenges of decoding; participant 3 said that letters typed or handwritten squish together or may look like lines (if on white paper with black ink). Participant 2 agreed that letters squish together and/or have a slight movement. Participant 1, however, differed by reporting that she has issues with the end of the word. Often, she may miss the ending while reading or speaking (i.e may forget the *s* in *cats*). It can be concluded that yes, decoding does serve as a challenge for those with dyslexia, however, it challenges individuals in different ways.

All participants had a childhood history of reading and spelling difficulties (suspicions were raised due to academic struggles in elementary school) and reported that reading requires great effort and takes more time and results in a slow reading and work ethic. (Bruck, 1993) explained that adults with childhood diagnoses of dyslexia continue to exhibit significant reading and spelling disabilities, and Lambert et al., (2019) said that reading fluency difficulties can get worse with age and as reading becomes more complex. Participant 3 preferred to read at a lower reading level - middle school (6-8<sup>th</sup> grade); he struggled to grasp the content of academic material. On the other hand, Participant 1 reports reading more now that she is older than she did in her childhood years. Lambert et al., (2019) and the LDA of Minnesota (2004) point out that individuals with dyslexia have overall higher rates of anxiety. This assumption is evident in this study as participants reported the feeling of nervousness when reading aloud. Kirby et al., (2008) indicated that students with dyslexia reported greater use of time management strategies and study aids, which holds true in regard to this study. Participant 3 explained his use of notetaking apps (such as SunSonet) and establishing a schedule with breaks. Participant 1 also relies of the use of planners to help her stay organized and also takes breaks. This study partnered with the LDA of Minnesota (2004) who claimed that the most critical accommodation for a dyslexic

reader is extra time. Participants 1 and 3 receive extended time, however, Participant 2 does not. Other reasonable accommodations used by participants include private testing rooms (used by participant 1) and alternative media/ audiobooks (used by participant 3). However, participant 3 reflected on his use of audiobooks and claimed that he often becomes distracted or uninterested.

This study also supported Youman and Mather (2013, 149-151) who said “Although students with dyslexia may have been identified and received services for their disability in their K-12 education, their diagnosis and services do not continue into their postsecondary education because colleges and universities are not required to provide a free, appropriate public education”. Participant 2 was determined ineligible of accommodations at his second college despite receiving them at his first college. The specific reasoning for his lack of eligibility is unknown. Lambert et al., (2019) study reported that participants identified memorization and persistence as strengths of dyslexia. This holds true for this study as both participants 1 and 3 considered memorization a strength, and that participant 2 considered motivation (persistence) a strength. However, Lambert et al., (2019) study also found that while some participants thought of memorization as a strength, others considered it a weakness. Memorization as a weakness was not evident in the results of this study.

## IMPLICATIONS

This study aimed to determine the lingering effects of dyslexia within the college population and looked further into the struggles (academically, emotionally, and socially) students face. It is important to note however, that advocacy of both colleges and students with dyslexia play a key role in the success of students. There is a dire need for colleges to become advocates for students with dyslexia and work to provide fair accommodations. However, students often need to take the first step in order to advocate for their accommodations: approaching their postsecondary institution and providing documentation of their disability.

### **College Advocacy for Dyslexia**

First, attention needs to be drawn to postsecondary recognition of dyslexia and the disadvantages to students because of the varying eligibility criteria. It is crucial for postsecondary institutions to have a universal recognition of dyslexia and to have appropriate guidelines for accommodation implementation. Currently, each postsecondary institution determines student eligibility for accommodations. Nelson, Lindstrom, Foels, Lamkin & Dwyer (2019, p. 298) argued that “reading proficiency cannot be assumed at college entrance, necessitating postsecondary institution to identify and provide services to students with reading needs (in order to improve retention and graduation rates).” This, however, raises a few concerns: 1) are colleges equipped with the resources to accurately diagnose; 2) do they put in the time and effort; 3) do they take into account various student backgrounds; and 4) are they familiar with the laws and policies that hold colleges accountable to these accommodations? While this study cannot provide answers to these questions, some potential (and simple) supports may include but are not limited to: offering study supports for students with dyslexia (i.e. centers that not only assist with writing, but also with reading), establish advocates ( university staff/

faculty) who can ensure that students with dyslexia are appropriately accommodated, reach out to students who indicate a disability upon admission to the institution, and give all students with dyslexia the accommodation of extended time. A second significant component that could contribute to college advocacy is teacher/professor preparation. Postsecondary education varies greatly from K-12 education, no doubt. Although the responsibility of intervention does not fall on teachers at the college level, it is crucial for them to have a dyslexia awareness as they are often expected to provide accommodations for students with dyslexia. Unfortunately, many postsecondary education teachers are unaware of how dyslexia affects students and therefore do not know how to appropriately accommodate students.

### **Student Advocacy**

As previously stressed, it is critical that students advocate for themselves. Students should be proactive and ensure that their documentation is as current as possible for the transition from high school to college. Students are encouraged to both seek assistance from their university's disability resource center upon admission, and to reach out to each of their professors to disclose their disability. However, many students within the college-aged population keep their disability to themselves and end up not receiving accommodations from their university. Youman, and Mather (2013, p. 151) detail what student advocacy would look like in a perfect world: "Upon entering a college or university, it is the student's responsibility to inform the higher education institution of an existing disability and the necessary accommodations that are needed for equal access to academic material. In most states, this means that students with dyslexia must pay for an evaluation to be completed by an approved provider since the documents that determined their diagnosis of dyslexia in K-12 settings maybe too old or incomplete. After completion of a comprehensive evaluation, students must also

ensure that results are submitted and that accommodations are granted for each class in which they enroll.”

## CONCLUSION

There are many aspects of dyslexia that remain mysterious and controversial, yet intensive research is ongoing. This research project attempted to discover the lingering effects of dyslexia for college-aged students who study special education. As a result of this study, the original hypothesis, *students will continue to struggle with college level reading but will be challenged more with college level writing*, was proven accurate. However, this study also found that individuals with dyslexia also struggle with spelling, word retrieval, self-confidence, and more. This study also directed attention towards college advocacy in hopes that colleges will become advocates for students with dyslexia and will support the creation of a universal system of accepting and interpreting dyslexia at the college level. It is also hoped that students with dyslexia become advocates for themselves as well; not only during their education, but in the future as well.

## **LIMITATIONS**

As with the majority of research, this study is subject to several limitations. First, this study had a small sample size which means that the study's findings cannot be generalized and applied to the entire dyslexic population. Not only was the sample size small, one of the participants may be classified as an outlier because he was in a graduate program. Although the interview method initially seemed like the best course of action for this study, take caution when viewing the participant responses. As showcased, participant 3 was very enlightening and detailed with his responses. However, Participant 1 didn't provide a response for some questions, which may indicate participant discomfort during the interview. In regard to the writing of this study, time also served as a significant limitation. Both the researcher and the participants were active college students which made recruiting participants and scheduling interviews challenging. The researcher also faced multiple obstacles of the various deadlines regarding this study and waiting to begin interviews until IRB permission was given – this accounts for the poor recruitment advertising. Lastly, this study encountered a lack of published resources regarding dyslexia in postsecondary institutions.

## **FUTURE RESEARCH**

Future research should aim to increase the sample size by adapting the study to involve participants who are majoring in different fields, from different universities, and obtain quantitative data using surveys. Research involving a control group of individuals without dyslexia compared to individuals with dyslexia could be conducted. Now that lingering effects of dyslexia have been recognized, future research could focus on (and factors contributing to) the college success rate of individuals with dyslexia.

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## **APPENDIX A: Interview Questionnaire**

### **The Effects of Dyslexia in College-Aged Students**

**Research question:** What areas do students who struggle with dyslexia continue to struggle with in college?

**Hypothesis:** Students will may continue to struggle with college level reading but will be challenged more with college level writing.

### **Interview Questions**

#### **Demographics**

**Age?**

**Sex?**

**College Year?**

**Major?**

**When were you diagnosed with dyslexia?**

**Were you ever bullied/made fun of for your difficulties in reading?  
If so, how?**

**Were you ever given an IEP during your K-12 education?**

**How did dyslexia affect your academics?  
Does it affect your academics currently?**

**How did dyslexia affect your home life?  
Does it affect your home life currently?**

**How did dyslexia affect your social life?  
Does it affect your social life currently?**

**Are you comfortable sharing that you have dyslexia with others?**

**Are there any challenges you face while being employed outside of college that are caused from your dyslexia?**

**Are you registered with the Disability Resource Center at EMU?**

**Do you have an accommodation letter that you give to your professors?**

**What supports (if any) are given to you by EMU? Do you use them? Why/why not?**

**Are most professors accommodating to your academic needs?**

**(If at all) How does dyslexia affect your mental state/self-image?**

**How do you cope with the challenges of having dyslexia? (i.e. with exercise, breaks, audio books, etc).**

**How have you adapted academically to your dyslexia? Can you explain what strategies work best for you?**

**Do you prefer reading independently or with others?**

**How do you feel about reading out loud to others?**

**Do you like to read in your free time?**

**Do you complete reading assignments for classes?**

**Does dyslexia affect your writing/spelling?**

**In K-12?**

**In College?**

**If so, in what way(s)?**

**How do you see letters and words on a paper?**

**What are some challenges/obstacles you face because of dyslexia?**

**What strengths (if any) does dyslexia give you?**

**Would you say that your dyslexia has symptoms? If so, what?**

**Do you think dyslexia will interfere with your future career? How so?**

**Is there anything else that you want us to know about your dyslexia?**

## **APPENDIX B: Informed Consent Form**

### **Informed Consent Form**

**Project Title:** The Effects of Dyslexia in College-Aged Students

**Principal Investigator:** Kailah Hardy, Eastern Michigan University

**Faculty Advisor:** Dr. Rhonda V. Kraai, Ed.D., CCC-SLP, Eastern Michigan University

#### **Invitation to participate in research**

You are invited to participate in a research study. In order to participate, you must have a dyslexia diagnosis and be enrolled in at least ONE college course through EMU. Participation in research is voluntary. Please ask any questions you have about participation in this study.

#### **Important information about this study**

- The purpose of the study is to explore how dyslexia affects college-aged students.
- Participation in this study involves answering interview questions that relate to your dyslexia.
- There are no expected physical or psychological risks to participation except that it may cause you to think about your past difficulties with dyslexia.
- The investigator will protect your confidentiality by assigning your name a number – during interviews and in the finished work. Only the principal investigator and faculty advisor will know the participant names and numbers. Your age will be used only if you consent.
- Participation in this research is voluntary. You do not have to participate, and if you decide to participate, you can stop at any time.

#### **What is this study about?**

This project will focus on students who have dyslexia at the college level and the areas in which students with dyslexia continue to struggle in college. Participant information collected and used include each participant's demographic information, their history with dyslexia (such as the social, academic, and personal struggles each individual experiences and how they cope with these struggles), and their present challenges/difficulties related to dyslexia. Focusing on these topics will provide great insight, or possibly even answer, the question, "What areas do students who struggle with dyslexia continue to struggle with in college?" It is my prediction that college students will not have outgrown their dyslexia and will struggle not only with college-level reading but also with college-level writing. The findings of this study will then be compared to current dyslexia research.

#### **What will happen if I participate in this study?**

- Participation in this study involves answering interview questions that relate to your dyslexia.
- Contact the investigator to set up a time to conduct the interview.

- Overall, participation will consist of ONE face-to-face meeting with the investigator. This will last 20 minutes to an hour depending on how detailed you wish to be. This will be held on EMU's campus at a place of your choosing.

### **What types of data will be collected?**

- We will collect specific data about your age, sex, college year, and major. All other data will then consist of your experiences with dyslexia.

### **What are the expected risks for participation?**

- There are no expected physical or psychological risks to participation.

### **Are there any benefits to participating?**

- You will not directly benefit from participating in this research.

**Benefit to society:** After this study is conducted, it is hoped that there will be a enlightened understanding of how dyslexia affects college age students while in college.

### **How will my information be kept confidential?**

- We will keep your information confidential by assigning a number to your identity (name). Only the principal investigator and faculty advisor will know the participant names and numbers. Other than your name and age, no further identifiable information will be collected. Your information (demographics and interview responses) will be kept on the principal investigator's password-locked computer in a "hidden" folder. Only the principal investigator will have primary access to the information BUT may share it with the faculty advisor. We plan to publish the results of this study. We will not publish any information that can identify you.

### **Storing study information for future use:**

- We **WILL NOT** store your information to study in the future. Your information will be labeled with a number and not your name. Your information will be stored in a password-protected computer in a "hidden" file.

### **What are the alternatives to participation?**

- The alternative is not to participate.

### **Are there any costs to participation?**

- Participation will not cost you anything.

### **Will I be paid for participation?**

- You will not be paid to participate in this research study.

### **Study contact information**

If you have any questions about the research, you can contact the Principal Investigator, Kailah Hardy at [khardy11@emich.edu](mailto:khardy11@emich.edu) or by phone at 517-662-0047. You can also contact the researcher's advisor, Dr. Rhonda Kraai at [rkraai@emich.edu](mailto:rkraai@emich.edu) or by phone at 734-487-2740.

For questions about your rights as a research subject, contact the Eastern Michigan University Human Subjects Review Committee at [human.subjects@emich.edu](mailto:human.subjects@emich.edu) or by phone at 734-487-3090.

### **Voluntary participation**

Participation in this research study is your choice. You may refuse to participate at any time, even after signing this form, without repercussion. You may choose to leave the study at any time without repercussion. If you leave the study, the information you provided will be kept confidential. You may request, in writing, that your identifiable information be destroyed. However, we cannot destroy any information that has already been published.

### **Statement of Consent**

I have read this form. I have had an opportunity to ask questions and am satisfied with the answers I received. I give my consent to participate in this research study.

## APPENDIX C: IRB Approval

Date: 4-9-2020

IRB #: UHSRC-FY19-20-200

Title: Dyslexia in College-Aged Students

Creation Date: 12-20-2019

End Date:

Status: **Approved**

Principal Investigator: Kailah Hardy

Review Board: University Human Subjects Review Committee

Sponsor:

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### Study History

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Submission Type	Initial	Review Type	Limited	Decision	<b>Exempt - Limited IRB</b>
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### Key Study Contacts

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Member	Rhonda Kraai	Role	Co-Principal Investigator	Contact	rkraai@emich.edu
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Member	Kailah Hardy	Role	Principal Investigator	Contact	khardy11@emich.edu
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Member	Kailah Hardy	Role	Primary Contact	Contact	khardy11@emich.edu
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