

Experiences of Dyslexic Students Learning a Second Language: A Review of the Literature

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Abstract

A systematic review of the literature was conducted to explore the experiences that college students with dyslexia face learning a second language in the classroom setting while studying at a private institution in Central Virginia. This literature review offers an analysis of the scholarly research related to this topic. The processability theory is discussed in the first section, followed by a review of recent literature on how dyslexia affects the brain's processing, specific experiences of students, and how to best support these students in second language acquisition (SLA). Lastly, the literature surrounds phonological processing, working memory, specific struggles in the classroom, and motivation. Finally, a gap in the literature is identified regarding the need for more research concerning the experiences of college students with dyslexia within a second language classroom.

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Theoretical Framework

Learning a language is a difficult task for anyone, but students with dyslexia may find this to be an even greater challenge. These learners struggle with phonological and working memory disorders, which lead to barriers in the second language acquisition (SLA) process (Lockiewicz & Jaskulska, 2019). Manfred Pienemann's (1998) processability theory, which suggests that students can only produce what they can process, offers insight into the challenges dyslexic students face in the college classroom. Pienemann created the processability theory for teaching language, which soon became very popular within the field of SLA. Educators became interested in the principles that this theory introduced to the field because they help in understanding the needs of students with dyslexia as they are learning their second language. Furthermore, the theory offers an explanation as to how learners begin to process a new language and develop a new structure in their minds. This leads to fluency and consistent output which are key elements in the acquisition process.

Historical Context

The processability theory uses elements from universal grammar to fully explain its hierarchical structure. In the 1960s, the linguist and professor Noam Chomsky (1957) developed this hypothesis. Universal grammar suggests the idea that every human mind has some overlapping knowledge of language and how it functions. The human brain was created with this systematic structure (Pienemann, 1998). Once an L1 (first language) structure is established, learning the L2 (second language) structure (depending on the family of languages it is from) is not too hard. For instance, in the case of English to Spanish, there are many structural similarities which allow for a quicker hierarchical development process. Universal grammar is like a

programming system that the brain has for acquiring language. Once the brain understands a specific pattern, it can then build off it according to the hierarchical structure (Pienemann, 1998). The processability theory uses this idea to fully understand how the student begins the hierarchical process (Pienemann, 1998). Universal grammar is the way students acquire a basic language foundation and are able to learn a second language.

Major Principles

The processability theory's important principles guide its construction. The theory's main assumption is that learners can only produce what they can process and that they are constrained to a hierarchical order of processing (Pienemann, 1998). Once a learner understands a beginning concept, they are then able to build off their previous knowledge to understand more advanced concepts. This hierarchical order can be imagined as a staircase of language building which follows specific rules and is predictable. From word order to grammatical structure, English as a second language (ESL) students can pick up on these patterns through the lens of the processability theory.

The hierarchical structure that the theory discusses relies heavily on lexical-functional grammar. This system offers the prediction of any second language (L2) development path (Pienemann, 1998). However, the trajectory is not a cookie cutter process and is unique for each individual learner. When it comes to students with dyslexia, this path may be different. Once learners understand how to create a basic noun phrase, they then learn how to attach a conjugated verb phrase to that structure (Pienemann, 1998). With this information, they may begin to add other syntactical elements to their sentence, which only come from the built upon, hierarchical knowledge that they carry with them from their first language (L1) (Pienemann, 1998). Hierarchical structure places the learner at the level they are at in the SLA process. Through the

process of learning a second language, the learner gathers up rules. The sum of the rules that a learner has acquired at a given time can be referred to as the given intermediate language (Pienemann, 1998). The rules that the learner can understand dictates the level to which they can understand the output. Therefore, this hierarchical structure is one of the most important principles of this theory.

Another main principle that the processability theory is built upon is knowing the amount of information a learner can process at a specific time (Pienemann, 1998). Since all learners are at different cognitive processing levels, this can be challenging specifically for ESL teachers. Students are not able to speak in their L2 unless they acquire the skills they need to do so (Awanda & Plana, 2018). For a student to form a question in their second language, they need to know the rules that govern those specific situations. For example, when learning to form questions in another language, there is a leap of knowledge and developmental observation needed to form a one-constituent question to a WH-question, such as “What’s your name?” and “When did you meet her?” (VanPatten et al., 2020). The learner must begin with simplistic sentence structure and then build their way to more advanced formations. Therefore, assessing the student’s level within the processing stages of SLA is important. These assessments are essential because a learner is only able to produce what they can process at a given time.

Processability Theory and Dyslexia

The processability theory plays an important role when understanding the experiences that college students with dyslexia have within their second language classroom. This theory is based upon cognitive processing and the amount a learner produces at a set time. Students with dyslexia are not able to process as much as the average student (Lama, 2019). Therefore, this creates slower output. Since dyslexia delays reading levels, affects verbal speech

communication, and creates mental blocks within spelling and vocabulary, these students will face challenges acquiring their second language because they cannot process words as quickly (Johnston, 2019). Furthermore, the processability theory offers insight into how much students with dyslexia can comprehend at a given time. The hierarchical structure of the processability theory helps to explore the experiences of students learning a second language and what specific insight can be gained from that understanding.

Related Literature

This review analyzes the experiences that college students with dyslexia face learning a second language in the classroom setting while studying at a private institution in Southwest Virginia. The results of their language learning journey identify the specific issues dyslexia creates in the mind, such as slower comprehension of phonetic sounds, difficulties in reading, and the challenge of committing vocabulary to long-term memory (Vender & Melloni, 2021; Johnston, 2019). This has a great significance on their ability to successfully acquire a second language at the same rate as their non-dyslexic peers. So, educators are being trained how to properly aid students with dyslexia in their language classrooms. With the previous research conducted on the cognitive learning disorder, a baseline of information is known. Students with dyslexia struggle learning both their first and their second language because of this linguistic disorder (Toffalini et al., 2018). The literature review will discuss what dyslexia is, university students' experiences in the language classroom, and how educators are supporting these learners. The focus will be to determine whether the processability theory provides a useful framework to further understand these students' experiences. Students with dyslexia are found within almost every language classroom and their experiences provide helpful information on this cognitive processing disorder and how they learn best (Dimililer & Istek, 2018). Dyslexia

obstructs many students in their second language acquisition journey (Lama, 2019). Therefore, it is important to understand their experiences within the language classroom and to guide educators on which methods approach them best.

Dyslexia Explained

In 1887, Rudolf Berlin, a German ophthalmologist, first created the term *dyslexia* to refer to the problems certain individuals encounter while decoding a text (Lopes, 2020). Back then, terms that correlated with dyslexia were *word blindness* and *visual agnosia*. Today, *learning disability*, *reading disorder*, and *reading difficulty* are common terms referring to dyslexia (Lopes, 2020). Even so, a vast majority of people are unaware of how to define dyslexia and, therefore, they tend to create assumptions as to what they believe to be true about the learning disorder. A vast majority of people, as well as educators in school systems, hold misconceptions that obstruct their understanding of important concepts of the disorder (Peltier et al., 2022). They believe that dyslexia is associated with an individual's intelligence, but in reality this disorder is a neurological disability that affects language-based learning (Johnston, 2019). One universal definition of dyslexia is difficult to find since there are many cases on a spectrum (Lopes, 2020). Even so, from a phonological standpoint, dyslexia can be defined as "the difficulty connecting letters and letter sequences to their normal sounds" (Ottosen et al., 2022, para. 2). The European Journal of Special Needs Education also defines dyslexia as "a term widely used to describe reading characterized by problems with the fluent and accurate letter or word recognition" (Lopes, 2020, para. 1). These baseline definitions create a simple structure to assess the different aspects and variations of dyslexia.

Before dyslexia was properly diagnosed and identified worldwide, it was described using the Greek term "word blindness" (Roitsch & Watson, 2019, p. 81). The term transformed in

name since then, but it still carries the same idea. Dyslexia creates a deficit in reading comprehension, detecting certain letter sounds, and thought processing and organization (Johnston, 2019). Since this disorder specifically affects reading, spelling, and visualizing words, these individuals have trouble learning a first or even a second language fluently in the full capacity of oral output. In comparison to the average student, the dyslexic student sees written words entirely different. Depending on the level of dyslexia, the individual may see flipped letters on a page, have a warped phonetic pronunciation capability, or have a hard time conveying the meaning of a written text (Johnston, 2019). The mainstream difficulty that seems to appear in most cases of dyslexia is spelling difficulties. Dyslexia is not an intellectual issue, but rather a ‘blindness’ that some brains are diagnosed with. Dyslexia becomes a major obstacle for students learning a second language. This review addresses the major effects dyslexia has on writing, reading, and speaking.

Forms of Dyslexia

Basic observations about dyslexia can be addressed based on what is already known from previous studies. Dyslexia can be labeled into many different categories with three being, *surface dyslexia*, *double deficit dyslexia*, and *phonological dyslexia* (Verhoeven et al., 2019). The main form of the language disorder that this review will cover is phonological dyslexia. However, it is important to examine the difference between these connected subtypes.

Surface Dyslexia

For instance, one of the most common classifications of dyslexia is surface dyslexia. This type of reading and word processing disorder often causes a deficit within the lexical route of word recognition and causes individuals to read words by a way of sublexical route (Güven & Friedmann, 2022). Therefore, in certain languages that carry a predictable pattern structure,

students with surface dyslexia often find it easier to read. Whereas languages that have numerous irregular word structures and freedom within their sublexicon reading system, these students are more prone to reading deficits. The most common errors found with surface dyslexia are found when students are reading out loud and comprehending homophones (Güven & Friedmann, 2022).

Double Deficit Dyslexia

In the same way, double deficit dyslexia is diagnosed in students who struggle with word processing. However, the two main issues that the double deficit theory associates with dyslexia are phonological processing and rapid automatized naming (RAN), the ability to quickly name familiar terms. When students struggle with both aspects of reading comprehension, it is common to describe the learning disability as double deficit dyslexia (Kuerten et al., 2020). The reason for this being that some students with dyslexia have a setback in one area and not the other, and vice versa. This is classified as single deficit. In languages such as Italian and German, phonological processing is less helpful in reading comprehension as is rapid naming, thus students with single deficit dyslexia are prone to perform better in reading tasks in these languages (Kuerten et al., 2020). With both phonological processing and rapid automatized naming difficulties, double deficit students with dyslexia have a greater set back (Kuerten et al., 2020).

Phonological Dyslexia

The main subtype that this review will focus on, however, is phonological dyslexia, which is very common among students with the general diagnosis of dyslexia. Within this category of dyslexia, students often can read regular and irregular word forms, but have difficulty reading nonwords and are considered an impairment of phonological units (Uema et

al., 2022). Furthermore, phonological dyslexia assumably is caused by brain deficiency with the grapheme-to-morpheme conversion rule system (GPC) (Uema et al., 2022). This applies to the sublexical route in reading comprehension. Students with phonological dyslexia cannot easily identify letters with their corresponding sounds to form word structures (Uema et al., 2022). This makes reading comprehension, spelling, and any other language activity an immense challenge for these students.

Cognitive Struggles from Dyslexia

Adolescents who have dyslexia have certain struggles from the disorder that set them back from their peers in many language activities. These challenges present themselves in a child's first language (L1) and will later carry over to their second (L2) (Chung et al., 2020; Łockiewicz & Jaskulska, 2019). They are due to the poor phonological processing capabilities that these students possess (Roitsch & Watson, 2019). The increase of difficulty and the relationship between the L1 and L2 is analyzed in numerous studies (Dimililer & Istek, 2018; Łockiewicz & Jaskulska, 2019; Tribushinina et al., 2021; Vender et al., 2020). The setbacks that students with dyslexia face within their language classrooms are lower syntactic processing skills, poor oral language comprehension, and making inferences (Kormos, 2017). The struggles are not due to intelligence or effort, but rather stem from a cognitive disorder that needs to be addressed and supported through intervention (Johnston, 2019).

Phonological and Phonetic Difficulties

In second language acquisition, phonological and phonetic deficits create a setback to language learning. Students with dyslexia first show phonological issues when acquiring their native language. As a result, when these students begin to learn their second language, these setbacks and struggles often carry over into the L2 acquisition process (Łockiewicz & Jaskulska,

2019). The level of processing and reading abilities in the student's L1 is likely shown in the learning process of their L2. These learners seem to have less benefit when it comes to their previously learned reading skills compared to their non-dyslexic peers due to the set back that appeared in their L1 (Łockiewicz & Jaskulska, 2019).

The difference within language phonemes and their consistency greatly impacts the language acquisition process for students with dyslexia as well. For example, most European languages have consistent phoneme-grapheme correspondence compared to English (Łockiewicz & Jaskulska, 2019; Ottosen et al., 2022). This inconsistency in English presents challenges for the average second language learner, but even more so for students with dyslexia. Because of this, they often score lower on testing within the realm of phoneme segmentation and blending, reading fluency, and even verbal short-term memory (Łockiewicz & Jaskulska, 2019). Numerous studies have proven the deficit of students with dyslexia and phoneme segmentation, but suprasegmental phonology, referring to stress sounds and intonation in words, is also a key aspect within the language fluency process (Calet et al., 2019). Not all languages have studies done on their students with dyslexia to such an itemized level, but English speakers with dyslexia seem to have demonstrated challenges with suprasegmental phonology. Testing for this deficit is beneficial to assess the level of phonological processing within the language student. Assessments such as word-stress awareness, phrase-level processing, and non-linguistic rhythm tasks can be used to helpfully predict the deficit within suprasegmental phonology (Calet et al., 2019). The phonological and phonetic struggles that stem from dyslexia create setbacks for these students learning a second language and they need to be addressed to obtain fluency.

Phonology and phonetics construct the core of language and reading skills (Roitsch & Watson, 2019). Although there are many different forms of dyslexia, phonological difficulties

are seen in almost all cases. This is because dyslexia is a cognitive disorder that affects reading and spelling. It seems that to properly diagnose dyslexia in a student, there must be phonological assessments administered and scores that are below a certain limit to be considered 'dyslexic' (Ottosen et al., 2022). Furthermore, these students have a difficult time connecting meaning to words and decoding new language vocabulary (Roitsch & Watson, 2019). This is often because phonological awareness is not present in students with dyslexia. The neurological disorder prevents the recognition of phonemes and other language sounds causing a lack in spelling and reading fluency (Roitsch & Watson, 2019). Results shown by the Aouette test, display that the amount of accuracy and speed that these college students produce while reading is not as sufficient as their peers (Cavalli et al., 2016). Throughout all the testing done around the world in all languages to properly diagnose dyslexia cases, phonological processing assessments are universal testing procedures that are almost always implemented (Mather et al., 2020).

Working Memory Difficulties

While solving a math problem mentally or executing other tasks that require receiving and organizing information cognitively, working memory is being implemented. This process is a key element of short-term memory and is used often simultaneously in the learning process (Kızılaslan & Tunagür, 2021). The orthographic and morphological loops of working memory of a student with dyslexia create many errors and setbacks in their language learning process (Roitsch & Watson, 2019). Since many studies have proven that learners with dyslexia struggle with a poor working memory (Kızılaslan & Tunagür, 2021), it is essential for educators, specifically in Virginia university classrooms, to understand the effects working memory issues have on their students. This knowledge can help identify the gaps between these students and their non-dyslexic peers. Certain signs signal for a reading and language difficulty diagnosis.

Phonological working memory and word recall challenges are some indications that the student has dyslexia and will progress more slowly in the language classroom. These signs are almost always present in learners with dyslexia, allowing for a seamless diagnosis. Although, phonological processing difficulties is not to be confused with non-phonological language skills. The difference results in challenges within syntax and morphology versus phonological processing (Kızılaslan & Tunagür, 2021). No matter the task within the realm of phonology, students with dyslexia struggle with “rhyme identification, word recalling, sequencing sounds, and text reading comprehension” (Kızılaslan & Tunagür, 2021; Vender & Melloni, 2020, p. 949). These struggles often appear in the L2 learning process. Executive functioning is directly related to reading comprehension and thus contributes to the laborious process of learning an L1 and L2 (Chung et al., 2020).

The problems students with dyslexia face while learning their L1 seem to be transferred into their L2 as well (Łockiewicz & Jaskulska, 2019). Due to a lack of vocabulary knowledge in both languages because of poor working memory, these learners more than likely will have the same issues learning their L2 as they did their L1. For the most part this proves to be the case, although, dyslexia in both languages does not always occur. Some students may struggle with dyslexia in English but not in their L2 and vice versa (Chung et al., 2020). It is important for university educators to evaluate the students with dyslexia in their classroom and identify if they are struggling with the L1, the L2, or both.

Supporting Students with Dyslexia

Supporting students with certain strategies accelerates their language growth and allows them to gain confidence with themselves. Previous studies validated that dyslexic students’ language learning abilities are far worse compared to their non-dyslexic peers (Cavalli et al.,

2016). In university foreign language classrooms, educators must address this issue and accommodate for them. Foreign language teachers confess that they have limited knowledge on how to properly work with these students in their classroom (Nijakowska, 2019). The support that these students need is not being properly provided to them. Fortunately, educators have different methods available to help to aid their dyslexic students within the language classroom. While there are, of course, pros and cons with each of the strategies, teachers have found significant progress using these methods (Awada & Plana, 2018). Graphic organizers, main idea identification, and visual displays are just a few of these strategies.

Bilingualism and Dyslexia

The linguistic disorder of dyslexia is not solely bound to English language speakers but is found in other languages as well (Peltier et al., 2022). This makes understanding dyslexia an even greater importance because it can inform teachers and professors of all languages across the world. It creates the connection between second language acquisition and dyslexia, as well as the relationship between an individual's first and second language. For instance, linguistic abilities in students with dyslexia who speak another language are not shown proficiently in their speech and knowledge of the language. Adolescents who struggle with the disorder of dyslexia statistically perform lower on word related assessments (Vender et al., 2020; Vender & Melloni, 2021). Being bilingual does not help the student manage dyslexia in a way that exceeds a monolingual student (Vender & Melloni, 2021). In a second language that has a simple phonotactic system, like Italian, bilingual students with dyslexia underperform their non-dyslexic bilingual peers in tasks such as nonword repetition, rhyme detection, and spoonerisms. From a language structure standpoint, the similarity of the L1 and L2 have no major effect in whether the student with dyslexia appears to struggle with learning language. Even though these students

have two separate language structures in their brains, they still seem to struggle with phonetic patterns and language structure (Vender et al., 2020; Vender & Melloni, 2021). Interestingly, bilingualism and dyslexia interact in similar ways within all three assessment types causing the individual to underperform their non-dyslexic peers. Phonological memory plays a large role in how well these bilingual students execute these tasks as well (Vender & Melloni, 2021). For example, proficient phonological memory is necessary for spoonerism tasks. These tasks require the abstract idea of visualizing morphemes and the conducting correct order to verbalize it into an identifiable word or phrase. Students with dyslexia have lower phonological capabilities (Johnston, 2019), causing them to score on the lower side of tests like these. Therefore, bilingualism does not necessarily help students with dyslexia with second language acquisition.

Dyslexia in English Language Learners

With 195 countries in the world and over seven billion people speaking nearly 6,500 different languages, dyslexia is not a disorder strictly related to the English language. It is a worldwide disorder that is prevalent in all languages (Chung et al., 2020; Mather et al., 2020). Any language that has sound structure or a written alphabet, individuals with dyslexia are sure to be found. No matter the form of words, such as characters, letters, or lines, dyslexia affects all languages (Mather et al., 2020). In a world that is becoming smaller culturally, studying the outcomes of dyslexia is becoming increasingly important. Many countries have assessments and practices used to properly diagnose students with dyslexia. Because there isn't just one determined cause of the disorder, it is important to test multiple factors that can contribute to it. Unfortunately, due to lack resources and funding, some countries cannot properly test adolescents resulting in some inaccuracy and potential misdiagnoses. But almost every country can verify many dyslexia cases within their language (Mather et al., 2020). This proves that

dyslexia is a worldwide language issue and not just one found within English speaking students in the United States, leading to an even greater goal to help language students around the world to feel supported and seen.

Chinese

Even with languages that consist of characters, such as Chinese, students with dyslexia who speak or are trying to learn these types of languages have difficulty (Kuester-Gruber et al., 2023). Chinese being a morpho-syllabic language, allowing for one character to represent one spoken sound, is a completely different language than English (Chung et al., 2020). Dyslexia presents itself in Chinese students throughout reading comprehension tasks. Assessments such as rapid naming (reading and associating written words on a page) play a large role in the Chinese language. This task is often more difficult for Chinese students with dyslexia due to large role of linking orthography and phonology during reading comprehension (Chung et al., 2020). Unlike alphabetic languages, such as English or German, which connect strings of sounds in an analytic manner, Chinese uses visual knowledge and morphological awareness to achieve reading success. This makes morphological awareness a key component to read Chinese (Kuester-Gruber et al., 2023). Even though Chinese is more of a visual and creative language in appearance, this does not mean its speakers are excluded from the effects of the disorder of dyslexia.

Spanish

For native Spanish speakers learning English as their second language, the problems they have from dyslexia are similar and unique to the other languages. There are many differences linguistically between Spanish and English, especially within the orthographic system creating numerous challenges in becoming bilingual for these students (Álvarez-Cañizo et al., 2023; Suárez-Coalla et al., 2020). The complex and irregular graphemes in the English language are

difficult for Spanish students with dyslexia to learn. Lexical strategies for decoding English words are often helpful for Spanish speaking language students with dyslexia due to their struggle with orthography (Suárez-Coalla et al., 2020). Since Spanish and English learners both share the same alphabet, there is some sense of security within the language acquisition process unlike languages such as Chinese, Arabic, or Korean. This security can aid in orthographic rule learning (Hevia-Tuero et al., 2022). Nevertheless, native Spanish speakers with dyslexia still struggle to learn English as their second language.

Motivation in Language Learning

In general, the average college student learning a second language struggles with self-confidence and motivation, but their classmates with dyslexia feel more pressure and self-consciousness when it comes to language learning (Dwijayanti & Sihombing, 2021). This is due to the fact of their slower processing and fear of failure. It is possible to stimulate the dyslexic learner's intrinsic motivation through various techniques that have proven to be beneficial such as digital based reading and cultural exposure to the language they are learning; whether that be their ethnic background or one they are choosing to because of interest in the culture (Dwijayanti & Sihombing, 2021; Shaalan et al., 2023). Whatever reason the student has for learning the second language, there must be some motivating factor involved in the process to keep them going. College students' key to learning anything, especially foreign languages, is their mindset (Von et al., 2020). The mindset of learning and motivation might look different depending on the demographic of the university and what country the students grew up in. For example, in southwest Virginia, students are more likely to have an individualistic mindset rather than a collectivist one. This could lead to differences in how the student learns and effectively pursues their L2 (Von et al., 2020). Motivation is an individual process (Von et al., 2020); therefore, it

must come from within the student; however, the instructor must implement certain strategies and tools to help the student get there.

Identity

One of the main roots that motivation in second language acquisition stems from is identity. The identity the student has or creates within the culture of the language they are studying will help them to be eager to learn more (Łockiewicz, 2019). A deeper sense of culture and proficient language ability are like fruit produced from the tree of high motivation in the SLA process. Within the Arab community, specifically, the impact of motivation occurs from knowing their background. The influence their heritage has on them makes them, such as Arab, Muslim, and Middle Eastern identity, makes them want to learn their native language (Shaalán et al., 2023). The sense of belonging and feeling connected to their ethnicity helps motivate these students to learn a second language. Students develop an intercultural experience that only comes from knowing another language (Łockiewicz, 2019). For instance, Chinese students who study English in New Zealand prove to be more proficient in their English speaking abilities than those who took classes in China (Łockiewicz, 2019). Other situations in which students may be more motivated to learn a second language can include growing up in the United States but they were adopted or immigrating to America when they were only an infant. These situations help students want to learn a foreign language and to increase their motivation.

Another branch of identity is personal identity and self-confidence. This coincides with the student's mindset. Students with dyslexia, specifically, struggle with this the most (Liqaa & Iddagoda, 2022). Increasing self-esteem and possessing personal control over desired outcomes allows for higher motivation. This type of motivation can be defined as an implemental mindset, and it statistically has been proven higher quality over a deliberative mindset. Through an

implemental mindset, the learner's mind is closed to thoughts unrelated to the goal. This results in narrow focus, quality goals, and ultimate achievement. Whereas, in a deliberative mindset the language student feels the need to filter through the feasibility of the lesson set before them which can lead to the feeling of being overwhelmed and not good enough to complete the task. Motivational research points toward an implemental mindset rather than a deliberative mindset due to the (Von et al., 2020). Educators can use this mentality when approaching their students with dyslexia in their university language classrooms.

Teaching Strategies

For students learning languages, teachers must display patience, kindness, and offer positive responses to encourage and motivate their students. Speaking a second language is often scary because you have the potential to say the wrong thing, offend someone from that culture, or freeze up from fear of rejection. In the language classroom, the teacher must create a safe space for mistakes and have a positive mindset to reflect onto the students (Łockiewicz, 2019). Teachers' methods for increasing motivation in their classroom, especially with their dyslexic students, have proven effect on the overall ranking of language classes. Unfortunately, most teachers have expressed their feeling of lack of preparation and understanding when it comes to students with dyslexia in their classroom (Mather et al., 2020). Educators need strategies and support themselves, before they can offer that to their students. They have attempted to implement methods in their classroom such as digital reading and student-centered strategies (Łockiewicz, 2019; Liqaa & Iddagoda, 2022).

The method of digital reading is used by an average of 60% of students with dyslexia (Liqaa & Iddagoda, 2022). This type of digital learning has shown to positively affect the academics of these students (Liqaa & Iddagoda, 2022). Digital reading and activities via

interactive e-readers allow students with dyslexia to be more engaged in reading and create an enjoyment that they previously did not have. This type of catered learning refreshes the intrinsic motivation that these students need and allows them to fully embrace learning a new language (Liqaa & Iddagoda, 2022).

In student-centered methods, students with dyslexia seem to be highly motivated due to the collaborative environment where they can freely express their ideas and learn from others. Within these approaches, working in small teams is quite common, though, the smaller the better the group the better for students with dyslexia to break out of their shell and contribute to the lesson. Games, speaking with peers, and group work are all found within student-centered methods (Łockiewicz, 2019). Learning to communicate in group settings has shown to help dyslexic students' oracy skills, literacy, and communication which all play a crucial role in their intrinsic motivation (Łockiewicz, 2019). In the end, this is the desired outcome in the second language classroom.

Unlike student-centered, innovative strategies, teacher-centered approaches, such as the IRE model, which includes initiation, response, and evaluation, do not offer students with dyslexia the proper motivation that they need and do not allow them to fully express their thoughts to converse in a natural setting (Łockiewicz, 2019). In this model teachers merely express their lecture in closed questions to students who then respond with correct or incorrect statements. After this, the teacher evaluates the student's response and gives them a grade of some sort. This type of traditional language learning method does not get students to fully understand how to use the language, but rather memorize rules and vocabulary words (Łockiewicz, 2019). Motivating students with dyslexia who are learning a second language comes from a more innovative learning style full of digital activities in a safe, collaborative

settings. Thus, through valuable lessons, updated curriculum, and a positive mindset, teachers possess all the tools they need to create a space for motivated second language dyslexic learners.

Visual and Organizational Strategies

With visual methods such as graphic organizers, positive results in reading comprehension are found among dyslexic students who are learning English as a second language (Awada & Plana, 2018). This is because it helps them to associate prior knowledge with newly learned information. In a recent study, this strategy was proven effective with Iranian English foreign language (EFL) learners as well (Awada & Plana, 2018). There are different types of organization methods for dyslexic learners to have a visual display such as T-charts, tree diagrams, and maps. Each of these graphic organizers have their own methods of laying out information but approach the material in different ways. T-charts, being the simplest form of content organizers allow students to pile their information within two columns. Whereas tree diagrams and maps offer a more creative approach to laying out information with nodes and links connecting thoughts together in the form of branches. These two approaches may be more pleasing to the dyslexic eye since they are largely visual and creative (Jeon, et al., 2022). Graphic organizers help to identify main content and reading comprehension (Awada & Plana, 2018). These strategies are tools for students with dyslexia to further their language acquisition progress.

Another approach implemented in the language classroom for these students is main idea identification strategy. This technique provides students with the skills necessary for them to deeply understand the main topic of the piece of literature that they are reading. Learners can create a semantic model of a text once they arrive at a clear understanding as to what the text is trying to say (Agius & Zammit, 2021). Through main idea identification and text structured

strategies, dyslexic students are more capable of acquiring language, whether that be their first or their second. Dyslexic learners do not have good oral language abilities, causing them to miss main ideas of texts or struggle with decoding meaning (Awanda & Plana, 2018). This presents a lot of challenges in language learning because oral speech is a large part of fluency. Language is not just defined through speech, but also reading, writing, and listening, therefore, these students need extra help when acquiring a language.

Visual displays are another key resource in the language learning journey of the dyslexic student. Most dyslexics are visual learners; therefore, they need more visual instruction to further understand a topic (Awanda & Plana, 2018). Visual displays prove to be effective to majority of teachers (87.5%) because they capture dyslexic students' attention, allow them to retain more information, and help store images in their long-term memory (Awanda & Plana, 2018). Visual displays in the university language classroom can look like anything from photographs to venn diagrams. From a second language acquisition standpoint, seeing that the learner's L1 directly affects the lexical knowledge of their L2, visual displays and imagery seem to be useful in the L2 vocabulary process. This proves to be true even with languages that are completely different from English, such as Japanese (Sato et al., 2022). Visual aids can be helpful resources for students with dyslexia in university language classes.

Without extra support from these types of strategies, SLA is a challenge for dyslexic students. Educators are becoming aware of this need and dyslexia is even being written into U.S. laws to accommodate these students through interventions. Teachers are being trained to create a multi-sensory approach to language and incorporate more auditory and visual elements (Johnston, 2019). These new ideas promote progress in reading, speaking, and writing, which are the major elements of language learning. Of course, since all students have different learning

styles and needs, they must not be put into one category when it comes to these strategies. What works for one student with dyslexia in a language classroom may not work for another. Trained educators must be aware that these strategies are only helpful tools, not miraculous procedures. Most evidence from these types of strategies, however, do point to a positive outcome when students with dyslexia are learning a second language.

College Students and Second Language Acquisition

Various reasons for learning a second language appear within different demographics. The age of an individual plays a role in the motivation of that learner (Łockiewicz, 2019). Older learners, such as college students, seem to find their motivation through the feeling of autonomy and traveling to meet peers in other countries. Since this age group can connect to deeper abstract thinking, they are able to more fully understand their L2 compared to a child. College students also seem to pick up languages quicker than adults (Łockiewicz, 2019). Although, if the student in the L2 classroom has dyslexia, the outcome of their language processing will be further delayed, and their motivation more than likely will be lower (Vender & Melloni, 2021; Dwijayanti & Sihombing, 2021). The reason for this lower motivation within these learners is due to the number of failed attempts and the social pressure they receive from authorities and peers (Dwijayanti & Sihombing, 2021). In these adolescent years of life, students are self-conscious and more aware of their mistakes. Especially when it comes to learning a second language, these learners are going to feel behind and unprepared when trying to speak. College classrooms are safe spaces for students to practice their new language and educators need to make these students feel that it true.

College students in rural Central Virginia are specifically a demographic that is under researched and overlooked when it comes to ESL and dyslexia. There is not much research to

further this region in second language education. The city schools and younger demographics compile lots of research, but these students seem to get forgotten. Studies done on college students provide further data on this demographic that is essential for thoroughly investigating the effects of dyslexia on second language acquisition. Looking at the research provided, improvement to the way educators teach foreign languages to students with dyslexia should be made in these universities.

The Experiences of Students with Dyslexia

Students with dyslexia struggle within second language classes because of their processing disorder (Johnston, 2019). These students may appear to blend in with their peers, but they struggle to understand the content and they work at a far slower pace (Toffalini et al., 2018). Cases have proved the lack of speed reading and accuracy during reading comprehension (Toffalini et al., 2018). The average student manages to use their short-term memory along with their cognitive processing skills to achieve full reading comprehension, but students with dyslexia struggle to do so. These students have low phonological awareness, making it more difficult for them to acquire another language (Cavalli, et al., 2016). They lack the basic skills to fully begin learning a second language and are prone to fall behind the learning rate of their peers (Toffalini et al., 2018). When students are put in support groups or intervention workshops, they are proven to do better in their language processing abilities (Tribushinina et al., 2021). Group work has a positive effect on students with dyslexia because of their need for further intervention (Tribushinina et al., 2021). Within the right setting and structure, these students can thrive linguistically in their L2.

The experiences of these students within the language classroom at the university level are often negative because of their cognitive disorder. The research done on this topic within

higher education has shown that dyslexia is an issue for students not just in the United States, but abroad. For instance, dyslexia is seen throughout France and within the French language with the University of Lyon having 42% of their disability population struggling with dyslexia (Mazur-Palandre et al., 2021). Just like English speakers with dyslexia, French students in high education seem to have issues correcting their own spelling, punctuation, or reading errors (Mazur & Chenu, 2023; Mazur & Quignard, 2023). Words such as determiners and short, frequent words like: très, peut, à, ils, après, ont, c'est, ce, au, est are difficult for these students to identify errors in (Mazur-Palandre et al., 2021). Compared to their peers, when assessed, these students' handwriting and spelling score low, creating a block within their brain to identify errors in their own written work and reading comprehension (Mazur & Chenu, 2023). Within the French language, specifically, there are conjugations and gender agreements within the grammar of the language. French often uses morphemes to indicate syntactical differences within the language such as plurality or tense. French higher education students with dyslexia often confuse these morphemes and cannot immediately identify this kind of mistake (Mazur & Quignard, 2023). Dyslexia in France does not look entirely different compared to dyslexia in the United States because phonological processing deficits overlap in all languages.

Aside from the academic struggles students with dyslexia learning a second language can face, the emotional well-being in the classroom is largely impacted as well (Soğancı & Kulesza, 2023). Although this may be more of the secluded side of these students' issues, it is a large part of their experiences within the language classroom. Moreover, school counselors have stated that students with this learning disability need support to increase their language learning, academic success (Soğancı & Kulesza, 2023). This support looks different depending on the individual's needs, but common characteristics of ESL students with dyslexia can include low

self-esteem in academia as well as for psycho-social cohesion because of it (Soğancı & Kulesza, 2023). Therefore, these students can be discouraged or unmotivated when it comes to language learning. Since second language acquisition requires the brain to be in a relaxed, comfortable, and confident state, students like this may not be able to learn a second language to their full ability (Nilsson et al., 2021). Thus, the emotional well-being of the student is tightly woven together with their academic outcome in language success.

Summary

The processability theory relates to how dyslexia affects the way students learn language. It introduces hierarchical structure as the basis for how the brain learns and develops language (Pienemann, 1998). The theory relies on principles from universal grammar and claims that language knowledge stems from the learner's L1, which is then transferred into the learner's L2 (Pienemann, 1998). Students with dyslexia struggle in their L1, therefore, leading to similar struggles in their L2. Previous research has discovered that dyslexia creates gaps within an individual's cognitive processing and second language acquisition (Lockiewicz & Jaskulska, 2019). The way these students perceive and learn language is different from the average student since they have trouble reading, writing, spelling, and listening (Johnston, 2019). Dyslexia obstructs the hierarchical structure needed to speak a language fluently.

Research shows dyslexic students' experiences in language classes, but a further study conducted would bridge the gap between the literature and the understanding of the struggles behind their challenges within the SLA process along with the relationship between the L1 and the L2. Likewise, many of the studies performed survey a younger population, thus collecting data only from a certain age range where the brain is not as developed. With new research done on higher education students, further information can be available to analyze if these students

have a harder time acquiring a second language than their peers. Numerous research and studies have been conducted on the topic of second language acquisition and dyslexia in general (Tribushinina et al., (2021), Mazur & Chenu (2023), Shaalan et al. (2023), and (Dimililer & Istek (2018)), but this research study looks to focus on students with dyslexia specifically within private institutions in rural Central Virginia. These students have different needs due to their location and specific research has not been addressed. Furthermore, universities need more research done on their students due to the exceeding number of studies done within grade schools. This study will investigate the experiences of college students in Central Virginia who have dyslexia and are acquiring a second language. The experiences they have within the classroom will further develop the research questions this review was founded upon.

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