THE EFFECTS OF BILINGUALISM ON STUDENTS WITH DYSLEXIA

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Abstract

Can bilingualism (i.e., knowledge of more than one language) positively influence reading ability in a dyslexic? As things stand, to be able to read at a grade-appropriate level, it is necessary to have special training. However, an interesting recent study (Kovelman, Bisconti and Hoeft, 2016) suggests that study of a foreign language that is more phonologically transparent than one's native language can allow a dyslexic student to improved reading skills in their native language. In that study, it was found that dyslexic students learning a phonologically transparent language (such as Italian or Spanish) began to experience improved literacy rates in their first language, English (Kovelman, Bisconti and Hoeft, 2016). I noted however that this study concerned instructed second language learners of a Romance language that was more phonologically transparent than their native language, which was a Germanic language. This led to the question of whether similar benefits to those found by Kovelman and colleagues could arise for a native English speaker through learning another Germanic language (e.g., German) that was more phonologically transparent than their *native* language (English), or whether the benefit would only emerge through learning a more phonologically transparent Romance language. To address this question, a hypothetical experiment will be proposed, and the implications of its possible outcomes will be discussed in light of the original research question. The results of such an experiment could have potentially broad implications for native English speaking students currently struggling with dyslexia.

Learning Another Language as a Treatment for Dyslexia

Dyslexia is a learning disability that makes it incredibly difficult for a student to maintain grade level reading skills without having to remove the student from his or her regular class time for special reading training. Learning a more phonologically transparent language, such as Spanish or Italian, may help a young dyslexic student to read better their native English, a phonologically opaque language. Additionally, learning another language can allow a child the opportunity to communicate with speakers of that second language, a useful skill in a world that is becoming increasingly globalized.

Definitions of Dyslexia

Before further explaining how dyslexia can be positively impacted by bilingualism (meaning instructed second language for the purposes of this essay), it is important to define what exactly dyslexia is. Various definitions of dyslexia exist, given here are two very commonly accepted ones: According to both the International Dyslexia Association and the National Institute of Child Health and Human Development, "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). The second definition is that of the Diagnostic and

Statistical Manual of Mental Disorders 5th Edition (the DSM 5) and is as follows, "Specific Learning Disorder - Dyslexia is an alternative term used to refer to a pattern of learning difficulties characterized by problems with accurate or fluent word recognition, poor decoding, and poor spelling abilities. If dyslexia is used to specify this particular pattern of difficulties, it is important also to specify any additional difficulties that are present, such as difficulties with reading comprehension or math reasoning" (American Psychiatric Association).

The exact causes of dyslexia are unknown. In a study done by Johannes Schumacher et al. at the Yale School of Medicine, it was determined that the gene inherited in those that have dyslexia is the defective DCDC2 gene. In this study, it was found that the DCDC2 gene causes "abnormal neural migration and maturation" in individuals with dyslexia, furthering the investigation into what exactly causes dyslexia (Schumacher et al.). However, in unique and very rare cases, it is possible to acquire dyslexia after birth – usually from a head injury or some kind of trauma to the brain, or stroke (Nordqvist).

It is important to note that dyslexia does not at all affect the IQ of a person. In a study done by E. Ferrer et al. at the Yale Center for Dyslexia and Creativity, it was found that the ability of dyslexics to read is completely separate within the brain from their IQ while ability to read and IQ are directly related in the brain of a person who is not dyslexic. Below is a graphic from E. Ferrer et al. illustrating how IQ and reading ability are directly linked in individuals unimpaired by dyslexia, increasing at the same rate while in dyslexic individuals IQ and reading ability develop completely independent from one another.

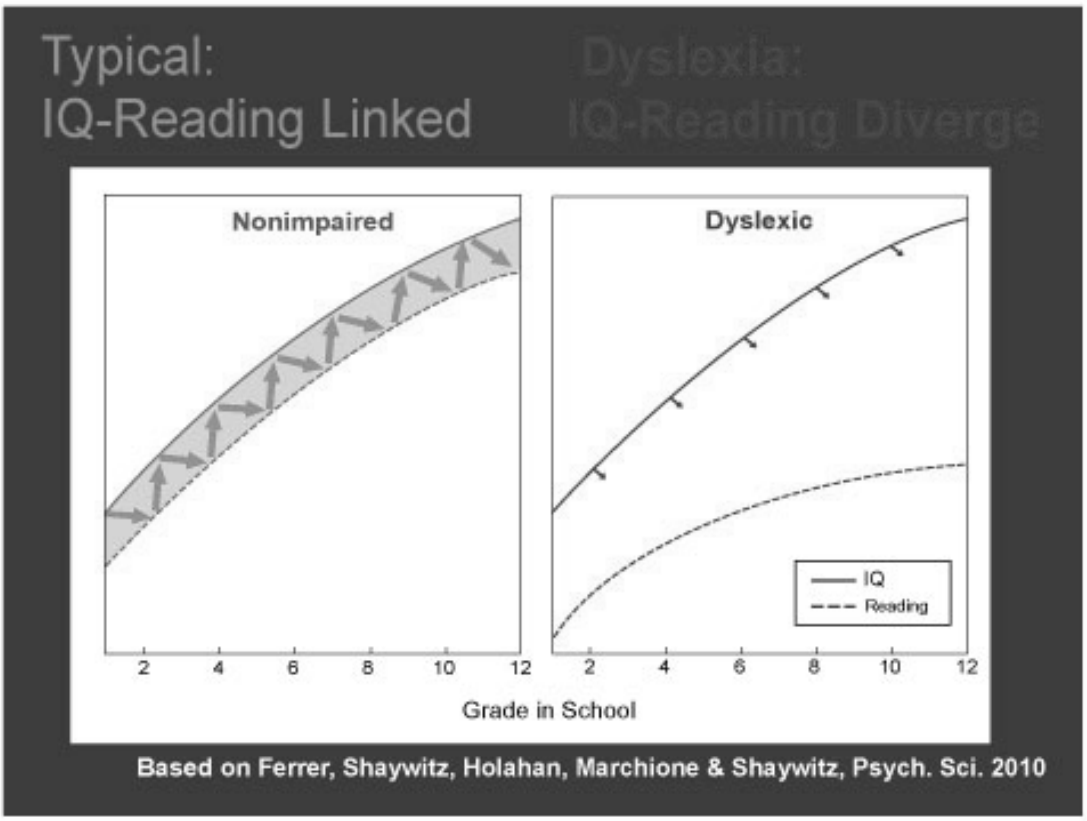

Fig. 1. Chart contrasting the relationship in reading and IQ in individuals without dyslexia and dyslexics.

Additionally, children diagnosed with dyslexia cannot be cured, only treated. No medication exists to treat the symptoms of dyslexia, however medication does exist to treat issues that dyslexics commonly experience like Attention Deficit Disorder (ADD) and Attention Deficit Hyperactivity Disorder (ADHD) (Morin, "Treatment Options for Dyslexia").

A Brief History of Dyslexia, Treatments & Coping Strategies

Dyslexia was first identified by German physician Oswald Berkhan in 1881, but speculation surrounding dyslexia had started in 1877 with German neurologist Adolph Kussmaul, who coined the phase “word blindness”. In 1905, W.E. Bruner published the first account of issues with childhood literacy. It was not until the 1930s that the American public became at all aware of the condition of dyslexia.

Various efforts were made in the past to help people cope with dyslexia in the classroom with what information was available on the disability. In 1943, Fernald wrote a text for educators describing various methods, phonics included among these methods, on how to teach dyslexics. Three years later in 1946, Anna Gillingham, researcher, and Bessie Stillman, teacher, wrote a book of “remedial techniques for dyslexics” (Guardiola, 12)

Today, there are various coping strategies currently used by professionals to treat dyslexia. Common forms of treatment for dyslexia include speech therapy and educational therapy. One kind of therapy is known as speech therapy and includes working with the student on what is known as “phonemic awareness,” which is the ability to hear, understand and manipulate letter sounds and combinations (Morin, "Treatment Options for Dyslexia”).

The second commonly implemented therapy is known as educational therapy, which is therapy implemented in the school setting, with the teacher, school, student and the parent working in cooperation with one another to help the student reach their literacy and comprehension goals. This particular kind of therapy helps students to develop

coping skills in order to work around the issues they face with reading and comprehension and to help overcome any frustration they may feel along the way. These coping skills include associating arm movements to various letters that dyslexics commonly flip, such as p, q, b and d and associating sensations like that of sandpaper with a coordinating sound (Morin, "Treatment Options for Dyslexia").

Personal Experience

At the age of seven, I was diagnosed with dyslexia. At the time, I did not understand what that meant and I had no idea that I was any different from my peers. I remember to this day the night my mother sat with me in my room, trying to explain what dyslexia was and that it was something that I had. "You just learn a little differently," she told me. As a child (a dramatic one, at that) I did not understand it that way, I thought this meant I was stupid. I ran off as I teared up. The situation was not helped when I had to start leaving my homeroom and take classes every day with the school's reading specialist. We did mental gymnastics in the form of dictionary drills (the specialist would give the small group a list of words and we had to find them in the dictionary) and forming different groups of words with those colorful magnetic fridge letters (I find them distasteful to this very day). These were just a couple of the exercises we did. While they did help, I still felt as though I had to work a little harder than my classmates to reach the same end. In my teens, I started to learn French and Spanish. After about 10 years of this study, I realized I displayed hardly any traits of dyslexia.

This personal experience prompted further research, presented here in this essay. While there are effective therapies for coping with dyslexia today, why had learning a

language not been proposed as a treatment, especially if it could prove more beneficial than the current, aforementioned therapies for a student? The idea of bilingualism, meaning instructed second language, has to this day not yet been considered as a treatment for dyslexia. A feature of curricula, starting as early as elementary school and as late as high school, studies in various second languages are offered. In an instructed second language course, everyone must learn the letters of the language and their corresponding sounds. Not all languages have the same degree of transparency as there is an unequal correspondence between sounds and letters, this inequality varying from language to language.

A Study of Bilingualism

In an April 2016 study done by Ioulia Kovelman, Silvia Bisconti, and Fumiko Hoeft, it was found that bilingualism could help dyslexics as an alternate to traditionally taught coping mechanisms. However, they did not specify the age, socio-economic standing of the students or the number of participants in the study, thus leaving the study to be accepted at face value. Kovelman, Bisconti, and Hoeft determined that dyslexic, native English (a phonologically opaque language) speaking students studying Italian (a phonologically transparent language) were able to take reading skills they learned to use in Italian and successfully apply those skills to English, thus improving their ability to read in their native English. Kovelman, Bisconti, and Hoeft explain further by saying, “In sum, accumulating evidence with bilingual learners of two alphabetic languages suggests that learning in a phonologically-transparent orthography (e.g., Spanish) might improve children’s phonological reading skills and increase the strength of left superior temporal

activation in their phonologically-opaque language (e.g., English)" (Kovelman, Bisconti, and Hoeft).

In another study done by Ioulia Kovelman, Stephanie A. Baker and Laura Ann Petitto in July 2008, "[the three] studied children (grades 2-3, ages 7-9) in bilingual Spanish-English schools who were either from Spanish-speaking homes (new to English) or English-speaking homes (new to Spanish), as compared with English-speaking children in monolingual English schools. An early age of first bilingual language exposure had a positive effect on reading, phonological awareness, and language competence in both languages: early bilinguals (age of first exposure 0-3 years) outperformed other bilingual groups (age of first exposure 3-6 years)" (Kovelman, Baker, and Petitto, 203). Not only can a second language help a dyslexic to overcome their reading struggles, but Kovelman, Baker, and Petitto's findings suggest that they can generally do better in school than the average monolingual.

In three separate but related studies done by Linda Siegel et al. in 2016, three groups of dyslexic native speakers of Portuguese, Arabic and Italian with little to no exposure to English prior to starting school at around the age of five years old were later studied after having attended an English speaking school for a number of years. All the students had their word reading, decoding (pseudo-word reading), and spelling skills tested after they had been in an English speaking school for at least five years. All were between nine and twelve years old and mainly from lower socioeconomic backgrounds except those in the third study of Italian who were largely from the middle class.

In word recognition, both the Italian-English and Portuguese-English speaking students tested higher than the English monolingual students (also dyslexic). The Arabic-English students scored the same as the English speaking monolinguals.

In decoding, all three groups of bilinguals scored considerably higher than the monolingual dyslexics.

In spelling, each of the three groups scored higher than the monolingual dyslexics.

In the studies conducted by Linda Siegel et al., there is incredible support for not only a foreign language being able to help a dyslexic student but also for the bilingual advantage (discussed later in the essay). In this case, being able to master the incredible irregular and difficult spelling system of English was able to greatly benefit them in their native languages.

Interestingly, Kovelman, Bisconti, Hoeft documented in their publication of their April 2016 study the implications of character-based languages on dyslexia. Chinese-English bilinguals proved to also use reading skills learned from the second language to help them with the first, much like the English-Italian bilinguals. Chinese-English bilinguals showed much lower rates of dyslexia, Kovelman, Bisconti, and Hoeft citing that only 30 to 40% of Chinese youth displaying symptoms of dyslexia in both Chinese and English (Kalindi et al.; McBride et al. qtd. in Kovelman, Bisconti and Hoeft). In the children with reading impairments in only Chinese, the major reason for this had seemingly little to do with phonological transparency and was caused instead by the issue of morphological awareness as Chinese is a character based language and these characters often link together to create morphemic units (McBride et al., 2012 qtd. in

Kovelman, Bisconti and Hoeft). Morphemes are a type of spelling that focuses on word meaning in the smallest form possible (School A to Z). As there are more than a billion Chinese speakers worldwide, the relationship between dyslexia and character-based languages could definitely be an area worth studying the future.

In a study led by Li Hai Tan, it was discovered that brain and function and even the brain's structure is formed over time through experience (Tan qtd. in Butterworth and Tang). Going off of this logic, one could assume that the very different experiences of either English or Chinese would then affect the formation of the brain differently. There are two major differences in English: The first main difference is that learning a regular spelling system like Italian creates a vastly different brain organization than the organization afforded by a highly irregular English spelling system. "Italian has 26 rules to learn, which takes about six months (Tan qtd. in Butterworth and Tang);" whereas English has hundreds of rules. "In Chinese 3,500 characters are needed to read the equivalent of the Daily Mail and about 6,000 characters to read books" (Tan qtd. in Butterworth and Tang). The second major difference is that in the English language, every phoneme links back to one letter. "For example, the three phonemes in "bat" map on to three letters. If one letter is changed it makes a new word. A Chinese character maps to a whole syllable. In Putonghua, the national language of China, there are about 1,800 distinguishable syllables; each syllable can have several meanings and each meaning is typically represented by a distinct character" (Tan qtd. in Butterworth and Tang).

Interestingly, a case study that was part of the study done by Li Hai Tan that could possibly have quite interesting implications on the April 2016 study done by Ioulia

Kovelman, Silvia Bisconti and Fumiko Hoeft, is the story of Alan. Alan illustrates perfectly that it is entirely possible to be fluently bilingual and display signs of dyslexia in only one of the bilingual's languages. Alan was born to an English mother and father who raised him in Japan. His mother, a teacher, homeschooled him and taught him English while he then started to learn Japanese at the same time, yet only began to show signs of dyslexia in only English (Connor). According to Li Hai Tan's findings, "…the affected language [is] English, [because] Japanese does not require analysis into phonemes" (Tan qtd. in Butterworth and Tang).

What is Phonological Transparency?

Before continuing, the terms "phonological transparency" and "phonological opaqueness" will be defined. According to Marslen-Wilson et al., phonological transparency refers to the degree to which processes of phonological alternation lead to a change in the phonetic [realization] of a [language]" (Marslen-Wilson et al.). As a consequence of phonological transparency, children that are learning to read in that language, the language being native to them, will make relatively few errors while reading a given set of words if the the language was phonologically transparent. If they make more errors, then that is indicative of a phonologically opaque language. For example, a phonologically opaque language like English has sets of letters that do not always make the same sound such as the letter set "-ough-." The pronunciation of this set of letters sounds different in words like "bough," "thought," and "through," thus making it incredibly easy for a child to make a mistake in the pronunciation of various words in English. On the other hand, in a phonologically transparent language such as Italian or

Spanish, individual letters more often than not only have one corresponding sound, sometimes two sounds, which is much less difficult to pronounce for a child who is just learning to read.

Examples of Phonological Transparency Using IPA

Provided below are four examples of differing degrees of phonological transparency. These examples include the International Phonetic Alphabet. Created in 1888 by the *Association Phonétique Internationale*, or the International Phonetic Association, the International Phonetic Alphabet (IPA) is a special alphabet that has one symbol per sound. The IPA furthermore represents distinct qualities of speech including intonation (i.e., changes in perceived frequency), phonemes (i.e., abstract units of sound), and can also represent boundaries between phonemes, words and syllables (Voices.com).

The first example is of the phonologically opaque Germanic language, English:

Pronunciation examples of the letter sequence "-ough"

- thought – θɔt
- through – θru
- thorough – ˈθʌroʊ
- rough – rʌf

They are all pronounced differently, as evidenced by the IPA.

The second example is that of Spanish, a phonologically transparent Romance language.

Pronunciation examples of the letter sequence "-osa"

- *dolorosa* "painful" – do.lo.ro.sa
- *poderosa* "powerful" – po.de.ro.sa
- *mentirosa* "liar" (feminine) – mɛn.ti.ro.sa

While irregularities do exist in Spanish, they are very few in number and far rarer

The third example is that of French, which has evolved further from Latin than any other Romance language (Harris and Vincent). French is an interesting language because while it is more transparent than English, it is more opaque than Spanish or Italian thus giving it plenty of both irregularities in sound to letter sequence correspondence and regularities in sound to letter sequence correspondence.

Listed here are examples of irregularity in in sound to letter sequence correspondence.

Pronunciation examples of the sound vɛʀ

- *vers* "towards" – vɛʀ
- *verre* "glass" – vɛʀ
- *vert* "green" – vɛʀ
- *vair* "gray/green color" or "nordic squirrel" – vɛʀ
- *ver* "worm" – vɛʀ

Here, examples of a regular sequence of letters.

Pronunciation examples of the letter sequence "-ère"

- *mère* "mother" – mɛʀ
- *père* "father"– pɛʀ
- *frère* "brother" – fʀɛʀ

The fourth and final example is from German, a Germanic language like English.

Pronunciation examples of the letter sequence "auto"

- *Autobahn* "highway" – ɑʷ.to.ban
- *Auto* "car" – ɑʷ.to
- *Autoreifen* "tire" – ɑʷ.to.raj.fɛn
- *Polizeiauto* "police car" – po.li.tsaj.ɑʷ.to

Impact of Phonological Transparency on Learning to Spell

To help further understand phonological transparency and opaqueness, included below is a table with data from Stanislas Dehaene's graph in his book, *Reading in the Brain*. In *Reading in the Brain*, Dehaene details the history of human language as we know it and discusses at length what he believes to be the most accurate theory regarding the human brain's ability to process letters into meaningful language, an idea created by Noam Chomsky called innateness. This theory suggests that the human brain is nearly the same as it was when our ancestors were still hunting and gathering and that our brains will not evolve beyond this (Dehaene). "Specifically, Dehaene's idea is that there is a 'fringe of variability' tolerated by the otherwise genetically predetermined visual object recognition system; this gives the degrees of freedom needed for culture to grab hold and turn the visual cortex into, as he puts it, 'a text comprehension system.' As a result, far from culture being the agent that sculpts our brains, the brain is a prior constraint on what culture can hope to achieve" (Dehaene qtd. in Noë).

Below are Dehaene's data regarding phonological transparency and opaqueness, specifically Dehaene's data mapping "errors in word reading at the end of first grade" (Seymour et al., qtd. in Dehaene) in table format. The data presented in the table show percentage of error rates in spelling by first graders in a number of European countries. The differences in error rates are thought to be due to the differences in phonological transparency rates. By this measure, English is considerably more difficult to learn to spell. Looking at these results, English is staggeringly opaque, in that by the end of 1st grade, children are reading correctly only 33% of their words.

Fig. 2. Map of errors in word reading by the end of first grade in various European countries.

Also from Dehaene's book is the graph depicted below. Displayed in the graph is the evolution of error rates in pseudo-word reading in English, French and Spanish speakers from ages seven to nine years old (Goswami et al. 1998, qtd. in Dehaene). Pseudo-word reading is a test wherein a false, never-before-seen word that is created to sound like it could be a word in the test language, is used to determine how a speaker might try to pronounce it. Looking at the graphic, we can see that at seven years of age, the speakers of the more phonologically transparent Spanish and French languages are making less errors in pseudo-word reading (Spanish at a roughly 5-7% error rate and French at an approximately 35% error rate) and get progressively better after two years (Spanish keeping a consistently low error rate at about 7% and French at an approximately 20% error rate) whereas English speakers start at age seven with a much higher approximate error rate of almost 80%, and by age nine only improving to just under a 40% rate of error.

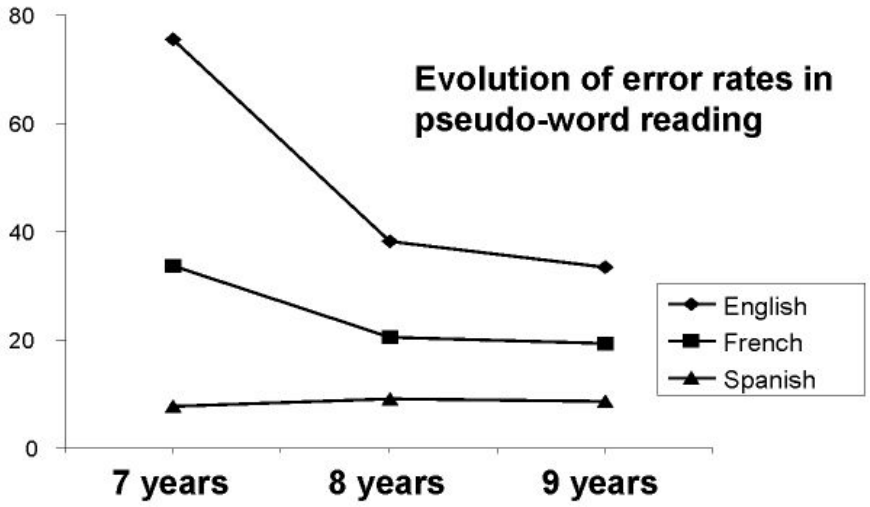

Fig. 3. Rate of errors in pseudo-word reading in speakers of Spanish, French and English, ages seven to nine.

Foreign Language Study Can Help Dyslexia in the Native Language; A Hypothetical Survey

In the Kovelman, Bisconti and Hoeft study, as previously discussed, it was determined that studying a phonologically transparent language (in their study, this language happened to be Italian) enabled native English speakers to take reading skills they had acquired in Italian and apply them to their phonologically opaque English. Each of the subsequent articles provided evidence, with all of the evidence taken into consideration together, that learning another language may indeed offer an alternate treatment for dyslexia. However, there seems to be evidence that this may not hold for all second languages. More specifically, it may be that either phonological transparency, or language family, or both, may be factors in determining whether learning a second language is beneficial to a dyslexic learner who speaks a given first language.

What is unclear from the previous studies is whether the second language must be relatively more phonologically transparent to aid the dyslexic student in reading in their native English, or if it simply must be a Romance language (meaning a language descended from Latin) rather than another Germanic language (meaning a language descended from proto-germanic). In the Kovelman, Bisconti, and Hoeft study, the second languages in question were from the Romance language family, while the native language of the dyslexics was English. More specifically, what is in question is whether the same benefit would be observed if the second language were relatively more (or less) phonologically transparent than the native language, and/or if the second language were from the same language family, or if these two variables interact.

In order to investigate this, a hypothetical experiment will be proposed. This experiment would involve a survey which would be sent to groups of native English speakers with dyslexia and who are studying Spanish and Italian. The survey itself would consist of a series of questions in which participants would rate their perceived degree of severity of dyslexia both before, and after their experience learning a second language. All ratings would be made on 10-point Likert scales, with 1 meaning not at all helpful and 10 meaning that a participant no long notices signs of dyslexia.. The purpose of this would be to seek quantitative confirmation of Kovelman, Bisconti and Hoeft's study.

The next portion of the investigation would seek to address whether transparency or language family is the more important of the two factors. To investigate this, a second survey would be sent to a group of native English speakers with dyslexia who are studying German to determine if language family is the more important factor. The third and final survey would be sent to groups of native English speakers with dyslexia who are studying French, to see if transparency is what matters most. Statistical comparisons between the three surveys would allow for a substantive answer to the questions posed in this investigation.

Since Italian was already determined by Kovelman, Bisconti and Hoeft to successfully help dyslexic English speaking students, it would be useful to find evidence as to whether a Romance language that is less phonologically transparent, such as French, would offer the same reading benefits as Italian. If French did offer such benefits, this would show that the most important factor was holding constant language family, meaning only Romance languages would offer these reading benefits. However, if French

were to not offer the literacy benefits that Italian did, this would then indicate that the manipulation of phonological transparency was the most important of the two components, transparency and language family.

Should transparency be the most important factor in whether an English speaking dyslexic student would develop useful reading skills in their first language as a consequence of second language study, this would mean that learning a language more closely related to English, such as another Germanic language like German, could be just as useful, if not more useful.

Unfortunately, the survey is limited in that it is not a true experimental study. In order for it to be a true experimental study, I would need a Germanic second language that was more transparent and one that was less transparent than English, thus comparing transparency in a language family. By the same logic, I would also need a Romance second language that was more transparent and one that was less transparent than English. With this design, it would be possible to know whether language family was the most important of the factors, whether it was transparency, or whether it was both factors that matter.

The Bilingual Advantage

Clearly, bilingualism could be a positive and impactful experience for a student with dyslexia. But the benefits of dyslexia do not end at improving a dyslexic's ability to read; they would of course also be able to communicate with people who speak their second language, something especially helpful in an increasingly global society. In Ellen Bialystok's paper, *Bilingualism: Consequences for Mind and Brain* (Bialystok, Craik,

and Luk), she details the many benefits of what is referred to as the bilingual advantage. Bialystok explains that bilinguals experience improved cognitive ability compared to monolinguals, which she attributes to their constantly switching between languages and suppressing one language while they are using another. Additionally, the benefits of the bilingual advantage extend into adulthood as well. Bialystok explains that bilinguals often outperform monolinguals in activities that involve working memory (such as remembering directions) and attentional allocation (successfully focusing attention to a task (Bialystok, Craik, and Luk).

While all these are benefits are useful, the greatest benefit is perhaps the benefit of bilingualism to potentially protect an individual from neurological diseases like Alzheimer's. "The finding that bilingualism enhances cognitive control raises the possibility that lifelong bilingualism protects against age-related cognitive decline, and may even postpone the onset of symptoms of dementia" (Bialystok, Craik, and Luk). The combination of improved attentional allocation, better working memory and protection from neurological degeneration is known as the "cognitive advantage" (Bialystok, Craik, and Luk).

Bialystok does admit there is a downside to the bilingual advantage. She explains that a bilingual must spend their time between two languages, whereas a monolingual by definition dedicates all of their time to their one language, thus giving the monolingual a stronger vocabulary in their one language. The bilingual would have access to two vocabularies but neither language would be as strong as the monolingual's single vocabulary. Bialystok explains this further by detailing what joint activation is, meaning that at least two languages (more if the person is multilingual) are active at all times in

the bilingual brain, putting the bilingual individual through what is much like constant mental gymnastics. About this Bialystok explains, "… a fluent French–English bilingual ordering coffee in a Parisian café has no reason to consider how to form the request in English, and a Cantonese–English bilingual studying psychology in Boston does not need to recast the material through Chinese. Yet, substantial evidence shows that this is not how the bilingual mind is organized. Instead, fluent bilinguals show some measure of activation of both languages and some interaction between them at all times, even in contexts that are entirely driven by only one of the languages" (Bialystok, Craik, and Luk).

Summary and Conclusion

In summary, in the Kovelman, Bisconti and Hoeft study, bilingualism was shown to help dyslexic children by improving reading and comprehension skills in their native English by taking reading skills learned in their more phonologically transparent instructed second language (Spanish and Italian in the study) and applying them to English. As Kovelman, Bisconti and Hoeft also pointed out, learning another language could even prove useful to speakers of character based languages, such as Chinese, which could prove to be a point of further research in the future. In order to better determine whether transparency or language family is the most important factor in bilingualism (an instructed second language) being useful in helping dyslexics overcome their issues in literacy and reading comprehension, it was proposed that three hypothetical surveys be sent to three groups of dyslexic English speaking students learning either French, Spanish or Italian, or German. The study done by Kovelman, Bisconti and Hoeft was shown to offer dyslexic students not only the benefit of improved literacy skills in English by

learning Italian or Spanish. Beyond this, however, bilingualism could be a viable option as a coping mechanism for dyslexia. Additionally, it allows for communication with speakers of other languages and potentially offers many cognitive advantages including an increased ability to focus, better working memory, and protection against degenerative neurological diseases.

While bilingualism seems to have proven itself an excellent potential treatment for dyslexia, this may not work for all dyslexics. Well known now is the fact that dyslexia can present itself differently from individual to individual in terms of its severity. As a result, it may be discovered that cases of more severe dyslexia are unable to be treated by learning a second language. In these instances of severe dyslexia, learning a spoken second language maybe next to impossible, though a manual language like American Sign Language may be a more viable second language choice. However, it still stands that instructed second language learning could be an effective alternative or additional treatment for individuals suffering from mild to moderate dyslexia.

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