

THE INFLUENCE OF SUCCESSFUL COMPLETION OF A SPANISH COURSE ON
MIDDLE SCHOOL STUDENTS' READING COMPREHENSION

by

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Liberty University

A Dissertation Presented in Partial Fulfillment

of the Requirements for the Degree

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ABSTRACT

This quantitative, causal-comparative study investigated the effect of foreign language education on reading comprehension by students' biological sex. The theoretical framework for this study is Piaget and Barlett's Schema Theory. Participants in this study consisted of middle school students within a PK-8 school. A convenience sample of 200 students was selected, 100 males and 100 females. All students were given a pretest and posttest using the Scholastic Reading Inventory (SRI). Independent variables consisted of enrollment in a Spanish course and biological sex while the dependent variable was reading comprehension skills as determined by assessment results on the SRI. An analysis of covariance, ANCOVA, was used in analyzing the data collected in this study. When controlling for pretest scores, there was a significant difference in Lexile scores of students who took a Spanish course and those who did not, a significant difference in the Lexile scores of female students who took Spanish and those who did not, and a significant difference in the Lexile scores of male students who took Spanish and those who did not. However, there was not a significant difference in the Lexile scores based on biological sex of students taking Spanish after controlling for the pretest Lexile scores. For future studies, the following are recommended: using data from schools in different settings, such as in an urban environment, analyzing data from students of different grade levels, such as elementary or high school students, analyzing data from students who completed a foreign language course other than Spanish, and comparing results from students who completed different foreign language courses.

Keywords: reading comprehension, sex, foreign language, Lexile, middle school

Dedication

This manuscript is dedicated to my parents, Johnny and Cecilia Cheek. My parents have had a huge influence on me finishing this degree. I am blessed to have them standing behind me, supporting me, and encouraging me through all of my education endeavors. Without their support, I would not have had the ability accomplish such a feat. I will never be able to thank them enough for all they have done for me.

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List of Abbreviations

American College Testing (ACT)

American Sign Language (ASL)

Analysis of Covariance (ANCOVA)

English Language Learner (ELL)

English as a Second Language (ESL)

Medical College Admissions Test (MCAT)

Scholastic Aptitude Test (SAT)

Scholastic Reading Inventory (SRI)

CHAPTER ONE: INTRODUCTION

Overview

This chapter provides a background in reading comprehension, as well as the effects the students' biological sex, foreign language participation, and prior knowledge may have on student reading comprehension skills. Evidence of the existence of learning gaps in the area of reading comprehension among students who are monolingual and multilingual will also be presented.

Background

Julià (2016) pointed out the difference in reading achievement scores of male and female students. While there are various theories that attempt to explain the gap between biological sexes in this area, there is yet to be a definitive explanation that applies in all instances. Clinton et al. (2014) opined that males and females utilize different cognitive processes when comprehending text. This difference in cognitive processing could be a reason for the gap between biological sexes in reading comprehension, likely due to the retrieval of information from episodic memory. The differing in male and females' use of cognitive processing may be a key factor in identifying the reason for a gap between biological sexes in reading comprehension. Additionally, Xin (2008) identified factors that contribute to gaps between biological sexes in education achievement including: gender inequality; student-teacher ratio; school climate; and participation in courses and activities based on biological sex. There is evidence of gender inequalities in the classroom through teaching strategies used, teacher-student interaction, school management, and in the planning and designing of the physical infrastructure of the learning environment (Karan, 2017).

Neman, Inamullah, and Ullah (2013) define comprehension as a “process of establishing purposeful meaning from incoming information” (p. 221) while reading comprehension is defined as making meaning at the word, sentence, and text levels (van Kraayenoord, Beinicke, Schlagmuller, & Schneider, 2012). Xin (2008) noticed that male students who were more encouraged to participate showed evidence of higher levels of reading comprehension when compared to those males in classrooms where there was inequality or where encouragement of participation was lacking. Mateju and Smith (2015) found that girls outperform boys in elementary school level reading, possibly due to gender bias playing a role. There has been a bias among society in expectations that boys should perform better in mathematics, sciences, and technology while girls should perform better in the arts, literature, and fashion (Smith, 2015). This bias has led to the gaps between biological sexes that are present in the various disciplines.

Attitude toward various disciplines, and learning in general, have been shown to contribute to gaps in several areas, including reading comprehension and language. Students with negative school-related attitudes, primarily boys, have been discovered to be underachievers in language (Van de gaer, Pustjens, Van Damme, & De Munter, 2007). Van de gaer et al. (2007) also found that boys are influenced more by the attitudes of their peers in classes than girls. If a boy found that a particular discipline was viewed as negative by their peers, he would likely develop a negative attitude toward that particular discipline as well. The attitude of a student plays a role in learning and reading comprehension. Having a positive attitude toward reading and literature may allow for a student to have better reading comprehension skills.

Various factors have been considered to influence reading comprehension gaps between the biological sexes, namely assessment. One in particular is the format of assessment that is used to derive the results used in studies. Lafontaine and Monseur (2009) found that achievement

in groups of students, including biological sex, is affected by the type of questions used in assessments. They discovered that when completing open-ended questions, females performed better than males. Various question types and styles of assessments yielded different results, showing various narrow and wide gaps in comprehension skills between groups of students when provided the same selection of reading.

Student-teacher ratio impacts achievement in reading comprehension skills (Xin, 2008). The lower the ratio, the more attention that can be provided for students to acquire the skills needed for success, including reading comprehension. Male students in a lower student-teacher ratio learning environment had higher levels of reading comprehension when compared to their female peers. Among larger student-to-teacher ratios, the social factor and attitude appeared to have prevented boys from performing up to their abilities (Xin, 2008).

Along with the negative attitudes that have contributed to boys underachieving in various school disciplines, boys' level of underachievement in literacy may also be due to the lack of motivation toward "feminine subjects" (Skelton & Francis, 2011). This idea goes back to gender bias playing a role within achievement and acquisition among the various disciplines. However, Skelton and Francis (2011) have created the term renaissance masculinity in order to repackaging hegemonic masculinity. This term was derived from the educational movement during the Renaissance Period when men were expected to be well-skilled in all areas of learning. This repackaging of hegemonic masculinity was accomplished through a humanist education perspective; whereas, the focus shifted away from mathematics and natural sciences to having a more authentic outlook and contribute more broadly to society (Skelton & Francis, 2011). In today's society, literature and literacy are often viewed as feminine subjects, whereas

mathematics and sciences are considered masculine subjects (Smith, 2015). These biases and beliefs also continue through to careers in these particular fields.

Poor reading comprehension skills contribute to frustration in learning which leads to learned helplessness, behavioral problems, and lower motivation to work toward a goal (Nenty, Moeti, & Kgosidialwa, 2017). A link exists between vocabulary acquisition and level of reading comprehension skills among students (Sparapani et al., 2018). Some findings suggest that students who are bilingual or who participate in foreign language education will acquire a higher level of ability or achieve higher scores in reading comprehension than their peers who are monolingual or do not participate in foreign language education. Comparing English monolingual and Spanish-English bilingual children in grades 2 through 5, bilingual students were found to have a more receptive vocabulary breadth, in addition to morphosyntactic skills, or skills that require proficiency in morphology and syntax (Zelinke et al., 2015). Students who are bilingual demonstrate a breadth of vocabulary that in turn leads to a higher level of reading comprehension as they have a larger base of vocabulary to use during reading for learning or information.

There may also be a reading comprehension skills gap between the biological sexes with regard to students who are working toward learning a foreign language. Week and Ferraro (2011) discovered that males have lower aptitude and more negative views toward learning a foreign language than their female counterparts, possibly stemming from the presence of Foreign Language Anxiety that can occur due to the cognitive and emotional efforts that result from the demands of learning a foreign language (Week & Ferraro, 2011). Achievement in foreign language education has been shown to be higher in students who perform more strongly in syntax and semantics, often being higher in females than males (Week & Ferraro, 2011). These

negative attitudes may also be apparent when discussing males and reading as well. There is the possibility that the negative attitudes contribute to lower reading comprehension in English.

These attitudes derive from the expectations of significant others; the child's environment playing a role in the amount of encouragement, modeling, and reinforcement of reading affecting the attitude children have toward reading (Kolić-Vehovec, Zubković, & Pahljina-Reinić, 2014).

However, van der Slik, van Hout, and Schepens (2015) discovered no gap between biological sexes in reading and listening skills in their study of participants learning Dutch as a second language. This study included 27,119 learners across 88 countries of origin. While female learners outperformed male learners in speaking and writing proficiency, reading and listening achievement levels were equal between the biological sexes.

The Schema Theory

The Schema Theory is thus appropriate to this study reading comprehension skills and foreign language learning (Barr, Kamil, Mosenthal, & Pearson, 2002). According to the Schema Theory, students will learn and reason by using abstract knowledge structures as induced from their ordinary life experiences (Oura, 2014). Therefore, there is the need for students to pull from experiences and situations of their past and present in order to have higher levels of learning and reasoning skills that can be used during reading instruction. Reading comprehension requires retrieving prior knowledge from memory (Yanmei, 2015). Pulling from background experiences and knowledge is very important in order for students to read fluently and comprehend the material with little to no struggles in relating to the text. Where the Schema Theory describes the processes by which readers will combine their own background knowledge with information in the text to comprehend that text, all readers carry different schemata (Khanam, Zahid, & Mondol, 2014). Cummins (2017) notes that evidence shows that languages interact in various

ways through the learning process, since literacy and reading skills transfer across languages as learning progresses. Furthermore, Cummins (2017) suggests that multilingual instructional strategies will provide a wider variety of learning opportunities to emerge among second language learners through cross-language transferring.

Bilingual learners may carry different schemata than someone who is monolingual, possibly having more experiences and background knowledge to retrieve during reading (Welie, Schoonen, Kuiken, & Bergh, 2017). The same consideration can be applied when discussing biological sex. Jalilehvand and Samuel (2014) found that background knowledge of males and females differ, and this difference in schemata can affect each student's reading comprehension skills and language development. Putting these two considerations together, a person's biological sex as well as whether they are monolingual or multilingual may have a significant influence on their reading comprehension.

Problem Statement

Reading comprehension ability has been linked to success in the workplace (Hua, Cromwell, & McClarty, 2016). Hua et al. (2016) further note that poor readers are often linked to the inability and incapability to learn job-specific skills as well as meet job-specific challenges that are presented in order to be successful in the workplace. A considerable number of students do not encounter favorable academic and long-term outcomes because of reading difficulties (Ciullo, Ortiz, Al Otaiba, & Lane, 2016). Juliá (2016) stated that an achievement gap exists between boys and girls in reading comprehension. Boys generally have higher dropout rates, obtain lower grades, and show lower levels of classroom engagement due to having lower reading comprehension skills when compared to girls (Lietaert, Roorda, Laevers, Verschueren, & De Fraine, 2015). Furthermore, there have been statistical differences identified between

males and females when attempting to meet Scholastic Aptitude Test (SAT) and American College Test (ACT) criterion for being college ready (Coyle, Snyder, & Richmond, 2015). On these assessments, girls have shown higher scores in written and verbal sections, while boys have shown higher scores in mathematics. Because of the biological sex gap of males having lower measured reading comprehension skills than females, boys also have higher dropout rates, obtain lower grades, and show lower levels of engagement within the classroom (Lietaert et al., 2015).

Research involving children who are bilingual shows that there may be a higher level of developing phonological memory skills when compared to monolingual children; thus, reading comprehension will be affected as a result (Kaushanskaya, 2017). Bilingual skills, when in constant practice in the homes and classrooms, are skills that value, reinforce, and support bidirectional acquisition of both languages; furthermore, these skills provide a strong foundation for literacy (Mouny, Pucci, & Harmon, 2014). In a study of 27,119 learners of Dutch as a second language across 88 countries of origin and 49 mother tongues and language families, van der Slik et al. (2015) found female learners consistently outperformed male learners in speaking and writing proficiency; however, no gap was found between the biological sexes for reading and listening skills.

There is evidence of a reading comprehension gap between males and females. Schwabe, McElvany, and Trendtel (2015) noted that there is a strong need to understand the gap between biological sexes in reading and language achievement. One way to explore this achievement and biological sex gap in reading comprehension is to study whether participation in foreign language courses in middle school impacts reading comprehension, particularly examining whether the influence is different for students based on their biological sex. The

problem is that studies are needed to determine if participation in middle school foreign language courses improves reading comprehension.

Purpose Statement

The purpose of this quantitative causal-comparative study was to determine if foreign language education influences reading comprehension skills by student biological sex.

Participants in this study consisted of middle school students within a K-8 school where some students completed a Spanish course. All students were given a pretest and posttest using the Scholastic Reading Inventory (SRI). Independent variables consisted of Spanish course enrollment and biological sex while the dependent variable was reading comprehension skills as determined by assessment results on the SRI. For this study, enrollment in this study included students who have completed a year of foreign language study in a Spanish class.

Significance of the Study

Reading comprehension is an important tool for students to achieve not only academic success but also successful participation in many activities in school and beyond (Hagaman, Casey, & Reid, 2016). There is a strong need to understand the gap between sexes in reading and language achievement (Schwabe et al., 2015). The need to support student literacy goes beyond academic achievement. This support includes the need to understand the gap between biological sexes in reading comprehension. Poor reading comprehension skills will have an effect on a student in multiple areas of his or her life. For example, Fitzhugh (2011) discovered that an increase in dropout rates can be attributed to poor reading comprehension skills. Identifying strategies that will reduce the dropout rate of high school students can influence the level of academic achievement and success for those students wishing to continue into higher education or into the workforce. The number of low-level and non-readers are on the rise in the United

States, and the potential negative effects on the individual can be devastating to their growth and success (Lipp & Helfrich, 2016). With respect to biological sex, boys generally have higher dropout rates, obtain lower grades, and show lower levels of classroom engagement due to having lower reading comprehension skills when compared to girls (Lietaert et al., 2015). Therefore, understanding the gap between sexes with reading comprehension and with foreign language participation may have a positive influence on reducing the number of dropouts as well as lead to a narrower biological sex gap in reading comprehension. The instruction and practice of multilingualism leads students to activate prior knowledge through accessing background experiences and schema (Pancheco & Goodwin, 2013). Foreign language instruction can provide students with the chance to investigate their own native language and culture, comparing their own language with additional languages, and acquire strengthened communication skills (Wight, 2015). This study will add to the literature by exploring the impact of studying a foreign language in middle school on reading comprehension in males and females. This study will address the gap in the literature regarding how to improve reading comprehension.

Students who lack critical reading comprehension and writing skills result in inferior academic success in higher education and reduced career opportunities (Gruenbaum, 2012). Gruenbaum (2012) notes that interventions need to occur so that these critical skills are strengthened and improved. The proposed study will add to the literature by examining the impact of participation in foreign language education on reading comprehension.

Research Questions

The research questions for this study were:

RQ1: Is there a difference in reading comprehension scores between middle school students who successfully complete a Spanish course and those who do not when controlling for pretest scores?

RQ2: Is there a difference between reading comprehension scores of male and female middle school students who successfully complete a Spanish course and those who do not when controlling for pretest scores?

Definitions

1. *Lexile* – the semantic difficulty and syntactic complexity to estimate the theoretical complexity of professionally-edited text (Swartz et al., 2014).
2. *Metacognition* – knowledge about cognition and control of cognition (Flavell, 1979).
3. *Metacomprehension* – an individual’s own conscious knowledge of their level of comprehension (Thomas, Antonenko, & Davis, 2016).
4. *Reading acquisition* – the process of acquiring the skills necessary for reading, or the ability to acquire meaning from print (Rayner, Foorman, Perfetti, Pesetsky, & Seidenberg, 2001).
5. *Reading Comprehension* – a set of print-based decoding and thinking skills necessary for understanding text (Kocaarslan, 2016).
6. *Reading Fluency* – the ability to read quickly, accurately and with a natural intonation (Veenendaal, Groen, & Verhoeven, 2015).
7. *Schema* – a general idea, a person’s background knowledge from experiences (Walker, 2013).

CHAPTER TWO: LITERATURE REVIEW

Overview

This study investigated the effect of foreign language education on reading comprehension. The theoretical framework for this study is Piaget and Barlett's Schema Theory. Research on prior knowledge retrieval will be included, as well as prior experiences, knowledge, and actions as pieces that go with developing a person's schema. Also, research will be included discussing reading comprehension skills, including the importance and impact reading comprehension has on a student's success and career opportunities. Furthermore, research discussing foreign language education, bilingualism and reading skills, and biological sex differences among students concerning reading comprehension skills will be included.

Theoretical Framework

The Schema Theory was proposed by Piaget and Barlett in 1932, asserting that learning involves a process of assimilating preexisting knowledge and experiences with new experiences (McKenzie, Robison, Herrera, Churchill, & Eichenbaum, 2013). The Schema Theory describes the process by which readers will combine their own background knowledge with the information in the text to comprehend that text. All readers carry different schemata (Khanam (a) et al., 2014). A person's schemata are ones that are influenced by experiences, actions, reactions, and skills acquired during their lifetime. Their schemata can be influenced by one's biological sex, culture, talents, and values. Pre-existing schema have been shown to influence memory and retrieval (van Kesteren, Rijphema, Ruiters, Morris, & Fernandez, 2014).

Within the Schema Theory of Learning, the concept of schema is one of an active organization of past reactions and experiences that are mixed or blended together with what is

happening currently (Walker, 2013). Therefore, according to this theory, students will learn and comprehend based upon their personal past experiences and how each reacted to those experiences. During new learning, various neurons in the individual's brain will begin to fire as new experiences and goals are approached (McKenzie et al., 2013). McKenzie et al. further notes that once the learning of new material and new goals are achieved, these new and preexisting patterns and experiences are gradually assimilated and converge into new schema that will be used in future situations requiring retrieval of prior knowledge. Through mobilization, or moving prior knowledge into active use, learners begin to bridge this gap between prior knowledge and new information to produce beneficial effects, especially for students with lower levels of prior knowledge (Kostons & Werf, 2015). Moving this knowledge into active use allows students to establish relationships between the prior knowledge and the information being provided to them. According to Kostons and Werf (2015), mobilization is a suitable method for influencing learners into activating prior knowledge in areas where there is little experience with the topic being studied. Students need to be able to recall past experiences within their personal and classroom experiences to progress on to more challenging tasks. Each student's unique experiences, reactions, and consequences of life's events affect his or her learning in a manner unique to him or her.

According to the Schema Theory, people reason by using abstract knowledge retrieved from their life experiences (Oura, 2014). It is suggested that preexisting schema facilitate memory consolidation by enabling relevant new information to be more rapidly assimilated into activated schema (van Kesteren et al., 2014). Through facilitated memory consolidation and mobilization, students have a greater ability to problem solve.

Using the schema during decision making processes will also influence the outcome based upon previous experiences and knowledge. Oura (2014) discovered that the performance of various tasks by children ages 4 to 10 were highly influenced by their knowledge base and prior experiences as opposed to using pragmatic reasoning. The children used their past experiences to determine how to act and react to current tasks. This action differed from adults where background knowledge was combined with pragmatic reasoning when expected to complete tasks. Through this learning process, the assimilation of new memories leads to the accommodation of new information, requiring an update to current schema (McKenzie et al., 2013). In this case, the children used prior experience to guide them and then allowed for the assimilation of the new experiences to form new schema that could be used in future problems.

Schemata are known to demonstrate various features as new knowledge is obtained. For example, Walker (2013) identifies in research that schemata are transformative. Transformation occurs when schema are reorganized in the presence of new information and experiences, allowing for older experiences to be restructured with the new experiences. According to Walker (2013), in addition to being transformative, schemata are known to be integrated, meaning that schema are embedded within other schemata. Also, schema are constantly evolving and changing, showing they are malleable with new experiences. Schema constantly change moment-by moment as information is received (Walker, 2013). In reading development, the amount of change in a student's schema will have an effect upon the level of reading comprehension that occurs.

Schema Theory and Reading Comprehension

Neman et al. (2013) define comprehension as a “process of establishing purposeful meaning from incoming information” (p. 221) while reading comprehension is defined as

making meaning at the word, sentence, and text levels (van Kraayenoord et al., 2012). In order to find purposeful meaning in a reading selection or text through comprehension, students need to be able to access prior knowledge and experiences. This access of prior knowledge and experiences allows them to relate the new content with older content, synthesizing the two together. Making connections can facilitate learning in several ways, one of which involves linking new ideas to existing schema or cueing the use of available skills for use in different contexts (Parr & McNaughton, 2014). Because schema concerning various ideas, topics, contents, and situations will vary from person to person depending upon the previous knowledge, comprehension of a given passage differs among readers (Neman et al., 2013). Reading comprehension depends on the individual retrieving prior knowledge and experiences from their schemata that relate to a particular text. Access to pertinent schema in reading greatly facilitates meaning extraction and meaning retention (Yanmei, 2015). Students who are able to retrieve information and prior knowledge during reading and instruction are those students who will have a broader base of information to use to relate prior experiences and vocabulary with new content.

The Schema Theory was considered when Paul (2014) studied the significance of schema and their role in reading comprehension of students completing the Medical College Admissions Test (MCAT). This study concluded that building schema is important for developing reading skills. Students in the treatment group of the study were provided with prior knowledge about humanities and social science topics. This prior knowledge could then be accessed when needed by these students, which resulted in higher scores on the assessment than students who were not provided with the prior knowledge. In this case, the students who were entering the exam with prior knowledge and experiences to use during the examination, were able to pull from schema built when compared to those students who did not have the extra experiences that gave the

treatment group the advantage. Beneficial effects will occur during the learning process for learners who have the prior knowledge base to activate during reading (Kostons & Werf, 2015). Students will use prior knowledge and experiences in order to synthesize new and existing knowledge, forming new ideas or lines of thinking (Keith & Pridemore, 2014). These experiences become archived, ready to be used when seeing or learning new material that students can relate to prior experiences. The lack of a broad prior knowledge base for students could lead to lower levels of academic achievement, including reading comprehension. The more background knowledge a reader brings to the text, the more he or she will comprehend (Keene & Zimmerman, 2013). Students with a broader base of schemata tend to have higher levels of academic achievement.

Students who are provided reading instruction also have different outcomes and experiences based upon schemata. Students with greater prior knowledge of words and phrases develop a higher level of reading comprehension when compared to those students without the same or higher levels of schema. Pancheco and Goodwin (2013) found that students had improved acquisition in their vocabulary, spelling, and reading comprehension when they were able to activate prior knowledge of familiar words, root words, and morphological awareness in order to determine the new, similar, or related meanings of words and phrases being introduced within a new concept.

Reading is a process that requires interaction for the reader to develop and construct a meaning of the text using their own schemata (Khanam, Zahid, & Mondol, 2014; Neman et al., 2013). Having a lack of schemata may impede the comprehension of a selected text when compared to students who have a broader pool of schema to use. When reading is an interactive process, the reader is able to make contributions to the text from information already processed

as a supplement. The Schema Theory is identified in this concept with a type of schema-matching technique known as intertextuality (Chia & Kee, 2013). Zengin (2016) defines intertextuality as a set of relations which a text has with other texts or connecting similar texts that can have an influence on the reader's interpretation of the text based on the reader's prior knowledge and understanding.

Background knowledge and schema help to enable readers to choose between multiple meanings of words (Neuman, Kaefer, & Pinkham, 2014). Within languages, words that have multiple meanings are used within writings and readings. Students need to be able to determine the correct usage of words within their text in order to comprehend what is intended. Students with greater background knowledge and experiences tend to be able to better determine the proper meanings of words based upon their schema.

Keith and Pridemore (2014) discuss inferencing as a process that involves taking information from a particular passage or text while merging and assimilating the content with an individual's own thinking, experiences, and background, or schema, in order to produce unique ideas. This merging within a person's thinking, experiences, and background allows the individual to grow intellectually each time a new experience is approached. This process can be applied to students who are reading new materials and text where there may be unfamiliar vocabulary. As students gain experience with various vocabulary and experiences, students will retrieve information from their schema and relate new material with material archived.

Schema Theory and Biological Sex

A person's schema is also affected by an individual's biological sex, further having an influence upon a person's learning, interest, and career. Schema Theory research has found that the background knowledge of males and females differ (Fa-Kaji, Nguyen, Hebl, & Skorinko,

2016). The difference in background knowledge can then affect a student's reading comprehension skills and language development (Jalilehvand & Samuel, 2014). Schwabe et al. (2015) noted a strong need to understand biological sex gap in reading and language achievement. Compared equally with boys, both 10 and 15-year-old girls perform better on reading comprehension constructed response items. Van Kraayenoord et al. (2012) note that studying the differences in the two biological sexes has shown evidence that females are better at reading comprehension than males through higher reading levels and scores showing academic achievement. Schools have a direct influence on a student's reading achievement (Juliá, 2016). Knowing what is leading to gaps between males and females can provide a foundation in planning intervention necessary based on the cause.

Biological sex differences in cognitive schemas can result in men and women interpreting the same information differently (Fa-Kaji et al., 2016). Background knowledge will differ between males and females. In their study, students were given various words and were instructed to select an associated word. Based on personal experiences, the students often selected associated words that also corresponded to their biological sex (e.g. when given the word bow, men were more likely to respond with arrow, and woman were more likely to respond with hair) (Fa-Kaji et al., 2016). These differences can be created through each person's personal experiences that are archived within their memories, added to by additional experiences, and shaped as each person continues to grow and experience and learn new things. Typically, males and females will have differing experiences throughout their growth and development that will lead to each having difference schemata to use during instruction, further leading to each experience reading and learning differently.

Related Literature

Current Research in Reading Comprehension

Reading comprehension is an important tool for students to achieve not only academic success but also successful participation in many activities in school and beyond (Hagaman et al., 2016). Each content area within an academic setting requires students to have strong reading comprehension skills in order to be successful. Furthermore, the success within other content areas can lead students to achieving post-secondary goals (Hua et al., 2016). Reading comprehension skills need to be taught beginning at an early age with interventions applied as soon as possible once a deficiency in reading comprehension skills has been identified. Extensive reading makes it possible for learners to immerse themselves in “tension-free” learning environments where they can read large number of materials that are of interest to them, increasing their motivation for learning (Liu & Young, 2017, p. 48). Students having a functional level of reading comprehension and fluency skills is necessary in order for learning to become less of a struggle. As reading skills increase, so will the motivation and availability for learning to continue (McGeown, Duncan, Griffiths & Stothard, 2015).

Reading comprehension occurs when a reader simultaneously extracts and constructs meaning through interaction and involvement with written language (Rønberg & Petersen, 2016). To achieve this task, students must be able to understand words within a text, and more importantly, have word reading skills. Students need to be conscious and thoughtful about how they pull meaning and build background knowledge (Keene & Zimmerman, 2013). The process of deciphering the meaning of written words is complex because it is influenced by a number of important factors including the person who is reading, the text being read, the task the reader is trying to accomplish, and the context in which the reading is done (Sencibaugh & Sencibaugh,

2015). This process is one that is complex for students to master, requiring students to prepare before reading, to constantly use critical thinking skills during reading, and to reflect on the material or content that was just read. For most students, the upper elementary grades represent a period within their educational journey where they will need to successfully transition from learning to read to reading to learn (Toste & Ciullo, 2017). The expectations for the student's reading skills and comprehension ability continue to grow with each grade level. This growth comes with the expectation that students are able to read more complex materials in order to learn and as a result, comprehend more complex content.

Neuma et al. (2014) found that, in addition to expository and narrative texts, informational text requires background knowledge as well. Informational texts in the classroom can include materials used in social studies, science, and mathematics courses that intend to inform the reader about the natural or social world without the use of characters. Within informational text, there tends to be a greater density of vocabulary and concepts presented compared to narrative texts. Narrative texts tend to tell a story, often through a succession of events in a given chronological order with the purpose of entertainment (Botsas, 2017). In early grades, the focus tends to be on students learning to read often through narrative texts. As students transition to middle school, curricular demands increase dramatically as students are expected to be proficient silent readers in both informational and expository texts (Dickens & Meisinger, 2017). As children mature into more advanced readers, there also is the expectation that they should be able to read silently with equivalent comprehension. Expository texts tend to be more challenging than narrative texts in terms of students' understanding.

Many educators use narrative texts to teach reading because this genre is widely available (Dickens & Meisinger, 2017). This use of narrative text over expository texts leads to fewer

opportunities to receive instruction from material and text from an informational text for students in the middle school grade levels. Middle school students, in particular, have minimal instruction in comprehending nonfiction, leading to lower academic achievement on assessments relating to the nonfictional material (Wolff, Isecke, Rhoads, & Madura, 2013). Students need to be able to pull from background knowledge and schema in order to progress through the information and be able to read, discuss, and apply topics that tend to be more difficult. Unlike what is found in more narrative texts, the word structure is complex and is often missing cohesive connections and are without a continuous flow of information and time sequence (Botsas, 2017). The vocabulary found in expository text, or informational texts, are often words that are of higher density, abstract, and technical. Botsas (2017) uses the term “comprehension disaster,” or, in other words, extraction being limited to explicit information, when describing what will occur when a student without prior knowledge attempts to create the needed complex inferences (p. 141). Hooley and Thorpe (2017) found that in response to the issue with the level of reading comprehension required for understanding informational texts, teachers in these content areas have been encouraged to integrate reading skills instruction within their subject matters. These have included reading guides and summative reading assessments, resulting in reading comprehension gains for the students who were provided the integrated reading skills instruction (Hooley & Thorpe, 2017).

There is also the belief that stereotyping has an influence on students’ reading abilities as well. According to Retelsdorf, Schwartz, and Asbrock (2015), the biological sex stereotypes of significant others, such as parents, peers, or teachers affect students’ competence beliefs, values, and achievement-related behavior. Stereotypically, biological sex beliefs about reading favor girls. For example, girls may develop a positive verbal self-concept due in part to their

knowledge of the social belief that females excel at language-related tasks while males are believed to have higher mathematics and related self-concepts (Retelsdorf et al., 2015).

Reading comprehension and Lexile levels. While various scales are used to measure text difficulty, such as the Flesch-Kincaid, many teachers use Lexile levels due to the ability to easily calculate and interpret them (Swanson & Wexler, 2017). Metametrics, Inc. (2019), the creator of the Lexile Framework for Reading, explains the Lexile reader measures and Lexile text measures as follows:

Test publishers and ed tech developers partner with us so their products can report student ability and progress in Lexile measures. More than 200 companies have products and resources that report Lexile measures. More than 100 million books, articles and websites have Lexile text measures. These texts have been analyzed using our algorithm that evaluates semantic and syntactic characteristics. Once reading content has received a Lexile text measure, educators can match the content to students who've received a Lexile reader measure in the appropriate range.

Lexile score bands are used by teachers to determine the targeted reading levels for students at each grade level and to document the present gap between the achieved and goal reading levels (Swanson & Wexler, 2017). A Lexile score can be used in the classroom by teachers when preparing reading selections to use to align the level of complexity of the reading selections with the Lexile levels where the student is currently reading. This task is accomplished through determining the quantitative level of complexity of various selections as well as comparing these levels to what is required at that particular grade (Fisher & Frey, 2013). Using a Lexile measure can provide appropriate selections to use for instruction that are neither below nor above the levels that are needed.

Using a student's Lexile level allows teachers to determine if a provided text is at an independent, instructional, or frustration level. Teachers will be able to provide instructional materials and texts that are within the student's Lexile band. These levels can be increased in difficulty as the student shows progress in their reading comprehension and fluency. Knowing the Lexile level of a particular text for a student is important in providing appropriate instruction and intervention services. There are three levels that are typically recognized: frustration level, instructional level, and independent level (Burns et al., 2015). When using fluency as a measure, if the accuracy level of the text being read is less than 90%, then the student is reading at a frustration level. Texts at a frustration level can be used when extensive support and instruction are provided by a teacher or interventionist during one-on-one instruction. If the accuracy level is between 90% to 94%, this data may be an indicator that the student is reading a selection at an instructional level. Texts at an instructional level are appropriate for small-group or whole group instruction for a teacher or interventionist to teach and provide support as the students read. If the accuracy level of the text being read is between 95% to 100%, the student is reading a selection that is at an independent level. Often used to build fluency, texts at an independent level are most appropriate for students reading the selection with little to no instructional or intervention support.

Reading comprehension and learning disabilities. Many students with learning disabilities struggle to develop reading fluency (Stevens, Walker, & Vaughn, 2017). Reading fluency levels and abilities have a direct effect on reading comprehension for students; therefore, students with learning disabilities potentially will further struggle to acquire the reading comprehension skills needed to become successful academically and beyond high school. Botsas (2017) notes that reading comprehension problems occur when students exhibit difficulties and

deficits in decoding, word recognition, and fluency. Even as students become proficient word readers, they often continue to struggle with making meaning from text (Toste & Ciullo, 2017). Some students are achieving the ability to learn to pronounce words but are not given the instruction or have the experience necessary in order to know the meaning and use of the words. Early interventions are needed for students with reading learning disabilities so that reading achievement gaps can be closed earlier and easier than if these learning disabilities are left either undiagnosed or without intervention. Solís, Scammacca, Barth, and Roberts (2017) found that students with low reading comprehension skills can improve their reading and vocabulary through early intervention services, compared to students who made little to no improvement when not provided these services. Students with learning disabilities can make improvements toward achieving academic success in reading comprehension through early intervention if these disabilities are identified and treated immediately.

Strong readers activate prior knowledge to organize and develop inferences to assist them in connecting with the text (Narkon & Wells, 2013). The National Reading Panel argues that reading comprehension goes beyond decoding words and word meaning into vocabulary knowledge, interaction with the text, and application of reading comprehension strategies (as cited in Narkon & Wells, 2013, p. 231). Students with learning disabilities often will struggle accessing content due to deficits in a working memory, transfer of knowledge, and information processing, all of which are necessary in order for the student to comprehend and fluently read given materials and texts inside and outside of the classroom.

Poor reading skills may be attributed to what is available to the child. A lack of reading experiences along with a lack of fluent word reading are important factors when understanding a child's reading comprehension difficulties (Rønberg & Petersen, 2016). While a large population

of students may have reading difficulties, not all of the students with difficulties are a result of having a learning disability. Rønberg and Petersen (2016) continue to add that a lack of experience can be a relevant factor in a child's reading ability even when the child shows signs of at least average word reading with poor comprehension skills. This experience can be from exposure and access to different types of text, amount of reading completed, and exposure to quality reading instruction (Rønberg & Petersen, 2016). Elbro and Buch-Iverson (2013) found that the failure to activate relevant, existing background knowledge has the possibility to lead to poor reading comprehension. Reading comprehension depends heavily on activating prior knowledge and experiences to fill in the gaps with inferences.

Fitzhugh (2011) discovered that an increase in dropout rates can be attributed to poor reading comprehension skills. A person who is a low-level reader continuing his or her education through a post-secondary institution may often find him or herself struggling to perform as well academically as their peers who do not have learning gaps or struggles with reading fluency and comprehension. Shaeo and Purpur (2016) found that post-secondary students' information literacy skills were positively correlated with student writing scores and final grade scores for courses. Informational literacy and critical thinking skills are intellectual skills necessary for academic, professional, and personal development and success. Without these skills, students will often find themselves struggling to perform successfully when compared to students who do not have literacy deficits.

Reading comprehension interventions. Students with reading difficulties and learning disabilities in one or more areas of reading require specific types of reading interventions in order to narrow and close learning gaps (Ritchey, Palombo, Silberman, & Speece, 2017). School-based reading interventions may be effective at developing the reading comprehension necessary

for individuals with disabilities or gaps in comprehension skills (Turner, Remington, & Hill, 2017). Interventions for reading comprehension include using explicit instruction in reading strategies, such as main idea identification, summarization, and question answering strategies. Ritchey et al. (2017) have also found that reading interventions that include attention to self-regulation and self-questioning have been linked to moderate to large gains in comprehension for students. Using the reading strategy of questioning during reading has shown to improve the reading comprehension and fluency of middle school students, with and without reading deficits (Sencibaugh & Sencibaugh, 2015). Questioning the material being read allows students to open up discussion and go beyond the printed material so that more in-depth understanding of the vocabulary and content can take place; furthermore, questioning also opens the door to students learning and experiencing ideas differing from their own after reading a particular selection or text, providing more opportunities to store information that can be retrieved later when additional new information is presented. Material being read must make sense to the reader in order for comprehension to take place.

Toste and Ciullo (2017) identified that effective inference instruction practices need to include instruction and intervention of identifying key words, activation of background knowledge, and generation and answering of inferential questions. Different schemata among students will lead to various perspectives and levels of inferencing to be present. Accessing prior knowledge and schema is necessary in order to identify what is known and what is experienced before instruction and learning should take place; furthermore, with an understanding of a student's schemata, teachers can assist students in accessing this prior knowledge during reading instruction (Miller, 2016). Reading comprehension interventions benefit from specific

questioning that requires the use of inferencing in which the student uses available schemata (Desmarais, Nadeau, Trudeau, Filiatrault-Veilleux, & Maxès-Fournier, 2013).

Struggling readers benefit from step-by-step guides that provide instruction and intervention for inferencing. Inferencing can be thought of as reading with comprehension involving the building and continuously revising of a mental model of the text in memory (Hall & Barnes, 2017). Making inferences during reading is a critical skill and is important for reading comprehension. Providing interventions to students who lack the skills of inferencing will advance their reading comprehension and fluency levels as they read various texts in different subjects and content (Hall & Barnes, 2017). Hall and Barnes (2017) also noted that effective inferencing instruction helps students to identify clues or key words in the text, activate background knowledge, interweave this knowledge with information in the text during reading, and answer questions as a way of identifying gaps within the text. Because students with learning disabilities may not have the skills necessary for reading beyond the printed words through inferencing, they must receive intervention to acquire this skill. Also, for students with learning disabilities in reading, Toste and Ciullo (2017) found that supplemental instruction and continued practice opportunities in affix learning, word-building games, word-reading fluency, and connected text reading has shown to increase students' word reading fluency and inferencing skills.

One approach to reading intervention focuses on morphemes, the smallest meaningful units within words (Bangs & Binder, 2016). Providing intervention services that focus on morphemes allows struggling readers to break apart larger words in order to ascertain the meaning of new words. The relation between morphological awareness and reading comprehension is one that needs to remain tied together (Levesque, Kieffer, & Deacon, 2017).

Students will often use morphological awareness and morphological knowledge to determine the meaning of unknown words, allowing the students to improve upon their vocabulary, spelling, and reading comprehension (Pancheco & Goodwin, 2013). Morphological awareness further allows students to gain an understanding and knowledge of how roots and affixes within a language and their interactions with one another create multitudes of words, leading students to be able to dissect unfamiliar words into parts in order to have a better understanding of their meaning and use (Hendrix & Griffin, 2017).

The timing of the types of interventions is also relevant to student success. Ribeiro, Cadime, Freitas, and Viana (2016) found there should be an emphasis on accurate and fluent reading placed within the lower grades where the higher grades need to emphasize promoting reasoning abilities in order to provide the best instruction and intervention for students. Within the lower grades, promoting fluency encourages the student to provide the cognition and attention necessary for stronger reading comprehension skills. Furthermore, students in higher grades are expected to go beyond decoding individual words to using skills that actively construct meaning in complex texts (Ribeiro et al., 2016). Each grade level benefits from a multicomponent reading comprehension intervention, whereas students are provided interventions through various teacher-directed and student-led practices (Fogarty et al., 2014). Word recognition, fluency, vocabulary, and working memory are noted as well-established predictors of reading comprehension, along with the role of reasoning, both verbal and nonverbal, included within reading instruction (Ribeiro et al. , 2016). Students need to be able to effectively use inferencing and reasoning in order to close learning gaps that exist in reading comprehension skills.

Keene and Zimmerman (2013) found that students who are given a safe environment for exchanging ideas tend to become more engaged with the content and will comprehend more than students who are not in an environment conducive to the exchanging of ideas. In their study, a safe environment was a situation where teachers put thinking and sharing as a priority during interaction. This safe environment was accomplished through large and small groups consisting of individualized conferencing with the student and the teacher to foster sophisticated vocabulary instruction and practice in order to enhance the complexity of the student's language. When providing reading skills interventions, word recognition skills must be the start, leading to using the text to understand the content, use inferencing skills to determine meaning, and then developing comfort with discussing the material with others in order to create a system of exchanging ideas based on knowledge and research. To encourage safe spaces, educational professionals should put a premium on thinking and sharing through large and small groups, as well as one-on-one conferences to provide a "venue" for teaching sophisticated vocabulary and enhancing the complexity of spoken and written language (Keene & Zimmerman, 2013, p. 605). The level of reading fluency and comprehension skills a student builds within safe spaces provided by instructors can be affected by the student's strength of vocabulary depth (Binder, Cote, Lee, Bessette, & Vu, 2017). The student may be able to identify and define a larger set of words, but vocabulary depth will allow the student to be able to use complex vocabulary in more settings as well as use inferencing skills when certain complex words are used outside of their typical use.

Reading comprehension in mathematics. Reading comprehension skills are needed in most every area within a child's education. In mathematics, word problems are provided so that students apply learned mathematics concepts to real-life situations. Identifying key words is a

frequent strategy taught when students struggle with problem solving and show low success rates in mathematics (Flores, Hinton, & Burton, 2016). Students who lack the ability or skills to separate necessary and extra information will often struggle with identifying the process needed to work toward finding the result even with an understanding of the mathematics concepts necessary to perform the operations. General reasoning ability takes into account both inductive and deductive types of reasoning, as well as divergent and convergent thinking skills, all of which are essential for applying mathematical concepts to real world situations described in word problems (Vista, 2013). Students need to have the reading comprehension skills necessary to be able to determine what is needed and what is being asked within the problem if they are to solve them with their mathematical understanding.

Life Outcomes for Non-Readers or Lower-Level Readers

A considerable number of students do not encounter favorable academic and long-term outcomes because of reading difficulties (Ciullo et al., 2016). Goals and expectations vary among individual students, but the difficulty of achieving these goals greatly increases when the student has a low reading level or is a non-reader. The number of low-level and non-readers are on the rise in the United States, and the potential negative effects on the individual can be devastating to their growth and success (Lipp & Helfrich, 2016). These effects, if the person does not receive instruction and intervention to close this learning gap, will carry into the student's adulthood when seeking employment, processing legal functions and necessities, and attempting to live comfortably within society. One purpose for learning and achieving within the school setting is to succeed in life after high school and to be career ready. The students' ability to read and comprehend written language is "critical" to success in college and careers (Hua et al., 2016). The implementation of college and career readiness learning standards in schools has

shown an emphasis on preparing students to successfully function in the adult world (Evans & Clark, 2015). Children need to be taught the literacy and reading comprehension skills necessary to be able to achieve their chosen career goals (Turner & Danridge, 2014). Without them, students will have difficulty preparing for what is expected within a working society.

Level of education is positively linked to both employment rate and income level (Diaconu, 2014). Reading skills, or the lack thereof, have an effect upon a person's employability. Steele, Bozick, and Davis (2016) found that using computer-assisted instruction in order to raise juvenile offenders' reading comprehension skills also improved their chances at receiving a diploma and post-release employment. Teachers and professionals helping students achieve a sufficient level of reading comprehension will in turn to allow children to become ready for post-secondary aspirations and employment, where once these goals would have been considered too high or out of reach. Diaconu (2014) noted in his study that approximately 41% of adults without a high school level of education are employed; whereas, among adults who are high school graduates, approximately 63% have jobs. Furthermore, approximately 81% who have continued education beyond a high school diploma have jobs (Diaconu, 2014).

Hayat Qamar (2017) regards illiteracy as a social evil. Illiteracy and low-level reading often cause individuals to be unaware of their rights and duties, failing to fully understand the laws and policies encountered in various places and entities. Lipp and Helfrich (2016) noted that students who are low-level or non-readers have a higher likelihood of being retained in school, being incarcerated, and living in poverty. The median grade level of inmates in Florida in 2008 was only 6.9, which is being at a six-grade level in the ninth month of the school year (Brown & Rios, 2014). Studies of adult inmates in United States prisons have shown that approximately 50% read at or above a sixth-grade reading level, with only 25% reading at or above a twelfth-

grade reading level (Disabato et al., 2016). Hayat Qamar (2017) found that without the necessary reading fluency and comprehension skills expected by a society, low-level and non-readers often find themselves struggling to integrate and progress within a fast-paced world often leading to unemployment and poverty. Grove (2014) revealed that children who arrive at secondary school incapable of reading properly were not able to follow curriculum, were disruptive, and were more likely to drop out of school, drift into the gang culture, and end up within the justice system. High school dropouts will earn less income over their lifetime, have more health problems, and are more likely to be institutionalized (Winding & Andersen, 2015). Reading fluency and comprehension are vital for children to acquire at an early age, or with intervention, gain later in life. Without these skills, people often find themselves in less desirable situations when compared to people who are fluent, higher-level readers.

Additionally, receiving instruction and intervention to improve a person's literacy and reading skills have shown to improve the livelihood of individuals. Akello, Lutwama-Rukundo, and Musiimenta (2017) found in their study of 45 participants that functional adult literacy instruction helped to improve the livelihood of the individuals. It can be argued that improved literacy skills would reduce human insecurity, improve opportunities for employment, and increase empowerment to those who were formerly low-level to non-readers. Providing the interventions needed for people to improve their reading and literacy skills allowed them to overcome living in poverty and be able to provide a better life for themselves and their families.

Biological Sex Differences in Reading Comprehension

Gaps in reading comprehension exist between the different sexes (Juliá, 2016). These differences could stem from the different biological sexes having different schemata within their background knowledge and experiences affecting reading comprehension (Juliá, 2016). Hannon

(2014) found that there are various gaps between the different biological sexes that exist in different areas. For example, Hannon (2014) found that there was a small gap for text inferencing and low-knowledge integration with males having the higher results with text inferencing. However, females were shown to have higher knowledge integration with text memory and an epistemic belief of learning being more predictive of reading comprehension performance above the results of males (Hannon, 2014).

It should also be noted that in societies with higher levels of biological sex equality, girls often show evidence of higher scores in reading comprehension when compared to boys of the same age group (Juliá, 2016). Liu and Young (2017) found motivational differences between the biological sexes with regard to reading, with females outperforming males on the assessment of reading comprehension. Their findings suggest that females have stronger intrinsic motivation, such as gratification and enjoyment; therefore, females were more participative in reading due to internal rewards, such as personal gratification and enjoyment. On the other hand, males display a higher interpersonal motivation for reading; the reading was directed toward other people as their motivation (Liu & Young, 2017). Therefore, there is an existence of schema built from their motivations that could have an effect upon a student's interest, talents, and experiences toward reading comprehension and problem-solving situations. Motivation for reading tends to decline over the school years, but evidence shows girls being more motivated to read than boys (Wingfield, Gladstone, & Turci, 2016). There exists the possibility that children's schema based on their biological sex could have an influence upon their interest and motivation toward reading, further affecting their reading comprehension during instruction. Chipere (2014) found a significant difference between the sexes in achievement for phonological awareness and reading ability among early primary school children, where females score higher than males in phoneme

segmentation fluency, letter sound fluency, and whole word reading fluency of non-words. These differences also increased between kindergarten and grade 2 among the population.

When given the opportunity for students to perform think-aloud tasks while reading, Clinton et al. (2014) discovered a gap with the results in inferences among males and females, where females generated a larger number and greater proportion of reinstatement inferences, or inferences the student uses to connect to schema in their long-term memory. This discovery presents another situation in which the schemata of female students and male students were different and could have an influence upon the outcome of the assessment and activity results. Duncan, McGeown, Griffiths, Stothard, and Dobai (2016) discovered that reading habits between the biological sexes also differed, with reading comprehension of females being higher in fiction selections and reading comprehension of males being higher for non-fiction selections. This difference could be the result of interest and motivation developed through the students' background experiences and schemata. Furthermore, Duncan et al. (2016) noted that children with a higher interest in a particular genre may develop stronger comprehension skills while reading texts and selections in that genre as opposed to readings that have little to no interest to the reader.

Motivation and interest in reading are thought to play a large role in reading comprehension with both stemming from prior knowledge and experiences, or available schema, for an individual, where students' interest in reading, either negative or positive, influences reading comprehension (van Kraayenoord et al., 2012). Furthermore, interest in reading will influence students' engagement with the text, with high interest reading leading to higher levels of engagement and lower interest leading to lower levels of engagement. McGeown, Goodwin, Henderson, and Wright (2012) found that girls aged 8 to 11 had significantly higher intrinsic

reading motivation when compared to boys of the same age range. However, this level of underachievement in reading comprehension may be due to the lack of motivation toward what could be perceived as feminine subjects if this interest level is a perception from a student's schema development during their childhood (Skelton & Francis, 2011). Motivation toward various topics could be affected by stereotypes and biases students have been exposed to, allowing for schemata to form during thought processes (Kossowska, Dragon, & Bukowski, 2015). The same type of schema could explain the lack of females in science, mathematics, and technical fields, where experiences may have led to a biased belief that science, mathematics, and technical fields are masculine areas.

Mano, Jastrowski, Denton, Epstein, and Tamm (2017) suggested that emotional expression may have an influence on text and reading comprehension for students, where girls tend toward internalizing emotions, e.g. sadness and anxiety, and boys tend toward externalizing emotions, e.g. anger and combativeness. Their study found that girls with relatively higher externalizing emotions when faced with problems have significantly lower text and reading comprehension compared to girls demonstrating more internalizing emotions.

Benefits of Studying a Language

As one of the outcomes of globalization, learning a foreign language has gained importance for adolescents and adults, leading many countries to lowering the age at which students begin learning a foreign language (Gürsoy & Akin, 2013). Foreign language education allows students to become more familiar with other cultures while exploring the relationship of the learned culture with their own, further encouraging students to expand their thinking in relationship of themselves to the world. Students with a broader base of experiences and vocabulary will have greater prior knowledge to use when inferencing during reading and

listening. The possibility exists that students who participate in foreign language education are receiving instruction and being exposed to a larger selection of vocabulary and word origins that will better allow them to activate prior knowledge and use reading comprehension skills for given texts and passages (Bisson, van Heuven, Conklin, & Tunney, 2013). In addition, foreign language learning is a complex process that involves both cognitive and affective factors (Gürsoy & Akin, 2013).

The instruction and practice of multilingualism leads students to activate prior knowledge through accessing background experiences and schema (Pancheco & Goodwin, 2013). Pancheco and Goodwin (2013) noted that bilingual learners may carry different schema than someone who is monolingual; furthermore, students who are multilingual have a broader schema to use when accessing prior knowledge with vocabulary including knowledge of various roots and morphological awareness to relate to a word's meaning. Readers will often construct meaning from clues found in a text which is related to the use of background knowledge in understanding the content (Khanam (b) et al., 2014). Comparing English monolingual and Spanish-English bilingual children in grades 2 through 5, the bilingual students were found to have a more receptive vocabulary breadth in addition to greater morphosyntactic skills (Zelinke et al., 2015). These skills identified in multilingual students can contribute to a student having a higher level of reading comprehension when compared to monolingual students. Menijivar and Akhtar (2017) found that bilingual four-year-old English speakers had learned more vocabulary than monolingual children of the same age when provided the same instruction in a classroom setting. The findings from their study also noted that the word learning advantage seen in bilingual adults may begin as early as during a person's preschool years. Students who are bilingual show that they have greater vocabulary breadth that will lead to higher reading comprehension because

they are not distracted by needing to learn and understand new words during the process of reading for learning or information. Because word identification has a positive influence upon reading comprehension (van Kraayenoord et al., 2012), the increased word identification obtained through multilingualism allows students to have more schema to access for reading comprehension than monolingual students at the same age and grade level. Linking vocabulary acquisition with word knowledge is a good tool to use when aiming to improve reading comprehension for students, especially for English language learners (Braker, 2014). Sadeghi Benis and Afsharrad (2017) found that when comparing females and males as well as monolinguals and bilinguals in reading comprehension skills, females and people who are bilingual will generally outperform males and monolingual people.

Multilingual education and knowledge also include students who are capable of communicating through American Sign Language. Evidence of the rich metalinguistic knowledge children with developing phonological skills bring to the acquisition of reading skills may have practical implications for the education of bilingual deaf children (McQuarrie & Abbott, 2013). A person with a hearing loss uses a different language for reading (written English) than they do to communicate in real time with others (American Sign Language) (Andrew, Hoshoooley, & Joannis, 2014). Students who are learning to read and communicate in both English and American Sign Language are building a schema where broader vocabulary and different modalities are being used in order to develop communication skills.

A broader schema develops for students with a hearing loss who use American Sign Language as a form of communication, in addition to learning reading skills and comprehension within written English. McQuarrie and Abbott (2013) contended that learning to navigate different languages using different modalities represents a unique bilingual circumstance. Within

this situation, students are using different styles of learning in order to acquire the needed communication skills to communicate with others and with written material. Andrew et al. (2014) investigated the connection between American Sign Language and English reading comprehension with their findings supporting the statement that increased ASL instruction is linked to improved English sentence comprehension. With reading comprehension instruction, children with developing first-language phonological knowledge display skills that may have practical implications for the education second-language of children with a hearing loss (McQuarrie & Abbott, 2013). These higher levels of reading comprehension have the potential to benefit students in their post-secondary studies, providing a wealth of schemata to use when needing to relate and connect prior knowledge and experiences with new concepts.

Returning to the Schema Theory, students using different modalities of language learning are building a larger background of knowledge to use when needing to acquire new skills, such as reading comprehension. Mounity et al. (2014) reported that in homes where there is bilingualism and ASL being a constant practice in the homes and classrooms, these skills also reinforce, value, and support bidirectional acquisition, learning and strengthening of both languages, and furthermore provides a strong foundation for literacy. This stronger foundation for literacy can also be a contributor to a student having a greater level of reading comprehension within the classroom; furthermore, students will have a larger base of prior knowledge to use within their schemata.

Knowledge of a second language is widely believed to be essential for workers to succeed in an increasingly interconnected business world (Anghel, Cabrales, & Carro, 2016). As our world continues to become more interconnected through the growing availability of technology, there also grows the need for people to become more familiar with other languages

and cultures so that communication can occur. The United States is becoming increasingly multilingual, with approximately 20% of children in U.S. homes speaking another language in the home (Lee, Shetgiri, Barina, Tillitski, & Flores, 2015). The need for individuals to learn other ways of communicating with people of different languages will allow them to become more marketable when compared to people who are monolingual within a multilingual society.

Studying Another Language to Build First Language Skills

Because English is a language that borrows from many words in other languages, having experience, instruction, and practice with foreign language education or multilingualism is one way to help figure out the meanings of English words which, in turn, will assist with reading comprehension (Pancheco & Goodwin, 2013). Foreign language instruction can provide students with the chance to investigate their own native language and culture, comparing their own language with additional languages, and acquire strengthened communication skills (Wight, 2015). This skill can be particularly helpful when encountering vocabulary in specific content area reading, such as vocabulary used in the mathematics and sciences. Identifying the root words, along with meanings of given affixes, as well as how to use morphological problem solving can be strengthened through using a multilingual approach to vocabulary instruction, leading into reading comprehension. Pancheco and Goodwin (2013) discovered that both struggling and proficient readers who are multilingual used morphological problem-solving strategies that showed sophisticated metalinguistic awareness. An example presented within this study was a student struggling with the term *vivacious*; however, the student remembered the phrase *viva la France* allowing the root word *viva* to be recognized. The student provided an example of accessing a piece of knowledge that was learned prior to this reading activity, then

was able to tie together this prior knowledge to what was currently being read in order to determine the meaning of the new vocabulary word.

People who learn a foreign language not only improve their native language skills, but they also learn about a new culture, improve cross-cultural and intercultural communication, strengthen public speaking skills, and boost confidence. This access to new cultures and new experiences helps students build a larger base of knowledge to use when needing to access prior knowledge to learn new things. The learning of a foreign language improves a student's ability within their own primary language skills and usage (Biasetti, 2016).

Lockley and Yoshida (2016) discovered that students who learn a foreign language experienced multiple linguistic and motivation benefits including a heightened sense of their own abilities in their primary language. Lockley and Yoshida (2016) further found that students who learn another language are more connected and open to other ways of thinking, feel a greater sense of their own place in the world, recognize the importance of knowing about their and others' cultures, and understand more about the etymology of the English language. This second language acquisition leads to strengthened schemata; students have more information to retrieve when presented with unfamiliar words, allowing them to piece information together in order to determine a pronunciation, meaning, and use of new vocabulary. With learning a foreign language, metacognitive gains become apparent through increased awareness of one's own language, improvement in critical thinking, greater mental discipline, flexibility, creativity, memory, executive function, and improved cognitive functioning (Wight, 2015). Wight (2015) also noted that foreign language instruction allows students to be exposed to discussions on acceptance, develop critical language awareness, and be exposed to more opportunities to problem solve. In acquiring reading comprehension skills and strengthening one's own language,

these skills are necessary for success. When a student approaches new materials and words, they must use experience and prior knowledge in order to determine meaning and context.

Summary

Students make use of their schema to relate prior knowledge and experiences when working to comprehend and problem solve situations provided to them. The Schema Theory proposes that people assimilate this prior knowledge with new experiences in order to make certain decisions (McKenzie et al., 2013). Each student develops different schema from their own personal experiences, traits, and characteristics. Students of different biological sexes will have different schema leading to male and female students approaching reading materials and texts differently. These experiences can influence what a student would find interesting or relevant, also having an effect upon their reading comprehension.

Students also have different schema based upon experiences and knowledge from foreign language education or native multilingualism, providing a larger vocabulary to use when retrieving prior knowledge. Having this broader base of schema could have a positive effect upon the reading comprehension of students with knowledge of foreign language compared to students who are completely monolingual. What is unknown is the difference in the amount of influence that foreign language education has on reading comprehension.

Research has shown evidence of rich metalinguistic knowledge that children with developing phonological skills bring to the acquisition of reading skills (McQuarrie & Abbott, 2013). This evidence could have practical implications for the education of bilingual children. The need exists for data collecting from examining differences in reading comprehension for students in the same grade between those who complete a foreign language course and those who do not, and the effects of having a broader schema from learning a second language.

Examining the reading comprehension differences between male and female students who complete and who do not complete foreign language classes, will provide further insight into the gap in reading comprehension between males and females. Schwabe et al. (2015) noted that there is a strong need to understand the biological sex gap in reading and language achievement. Better understanding of instruction with reading comprehension and acquisition will help provide researched-based curricula that supports higher levels of academic achievement in this area. Poor reading comprehension skills have an effect on a student in multiple areas of his or her life. Therefore, studying the gap between males and females, along with the possible gap found with and without foreign language instruction, is necessary.

CHAPTER THREE: METHODS

Overview

This chapter presents the research design, research questions, null hypotheses, participants, settings, instrumentation, procedure, and methods for data analysis in this study. The rationale for the selection process for the participants and the process of selecting an instrument to provide the data necessary to evaluate the null hypothesis are further discussed.

Design

This quantitative causal-comparative study examined the relationship between reading comprehension skills and successful foreign language course completion, as well as the relationship between reading comprehension skills and biological sex. The data for analysis was acquired from archival data collected by the students' middle school English teachers in a rural southern West Virginia PK8 school during the 2016 - 2017 school year. For this study, a causal comparative design was used with the independent variables being foreign language participation and biological sex, and the dependent variable being reading comprehension. Causal comparative research is non-intervention research aimed at uncovering relationships by comparing groups of people who already differ on a variable of interest, searching for causes or effects of a preexisting factor of interest (Suter, 2012). A causal comparative design was used because this study explores cause-and-effect relationships between variables but without using the experimental method (Gall, Gall, & Borg, 2015). This ex post facto design is most appropriate in a causal comparative design, as the conditions of the study already exist, archival data will have already been gathered from pretests and posttests from past scholastic reading inventory tests, and the students were already placed into and completed the courses without manipulation based on the study (Gall & Gall, 2007).

Research Questions

RQ1: Is there a difference in reading comprehension scores between middle school students who successfully complete a Spanish course and those who do not when controlling for pretest scores?

RQ2: Is there a difference in reading comprehension scores between male and female middle school students who successfully complete a Spanish course and those who do not when controlling for pretest scores?

Hypotheses

H₀1: There is no difference in reading comprehension scores as measured by the Scholastic Reading Inventory between middle school students who successfully complete a Spanish course and those who do not, when controlling for pretest scores.

H₀2: There is no difference in reading comprehension scores as measured by the Scholastic Reading Inventory between middle school female students who successfully complete a Spanish course and those who do not, when controlling for pretest scores.

H₀3: There is no difference in reading comprehension scores as measured by the Scholastic Reading Inventory between middle school male students who successfully complete a Spanish course and those who do not, when controlling for pretest scores.

H₀4: There is no significant interaction effect between middle school students' biological sex and completion of a Spanish course in terms of reading comprehension scores as measured by the Scholastic Reading Inventory, when controlling for pretest scores.

Participants and Setting

The participants for the study were drawn from a convenience sample population of middle school students enrolled in a Title I school in a rural, southwestern school district of West Virginia. The school hosts students in grades prekindergarten to eighth grade with 52% of the student enrollment identified as male and 48% identified as female, and 22% of students identified as receiving special education services through an individualized education program. While all students receive a free breakfast and lunch, 65% were identified as living in a low-socioeconomic home. The school district was located in a lower-to-middle income area where the ethnicity of the population is 98.2% Caucasian, 1.4% African-American, and 0.4% Hispanic. The median income in this school district is approximately \$22,000.

Among the population of 6th through 8th grade students, a convenience sample of 200 students was selected, with 100 males and 100 females. A convenience sample was utilized because the locale is familiar to the researcher, and the population size can be accommodated through requesting data from the local school administrator (Gall & Gall, 2007). The grade levels of the students within the sample was 6th through 8th with the students' ages ranging from 12 through 16. The study sample was chosen from students in these grade levels who completed a Scholastic Reading Inventory at the beginning and ending of each school year, measuring the growth in reading comprehension. Within this group, a subgroup of 50 males and 50 females who have successfully completed a foreign language course was identified. Successful completion of a first-year course (Spanish A) was determined by identifying students enrolled in a second-year course (Spanish B). The rosters from past Spanish B courses were used because these students had successfully completed a foreign language course in order to be allowed entry into a second year of Spanish class. The decision to use a sample size of 200 was made because

using a two-way analysis of covariance (ANCOVA) with three groups recommends an adequate sample size of 96 participants being obtained for a medium effect size and statistical power of 0.7, with a significance level of $p < .05$ (Gall & Gall, 2007). An analysis of covariance, ANCOVA, was used in analyzing the data collected in this study. Gall et al. (2015) define ANCOVA, analysis of covariance, as “a statistical procedure for determining whether the difference between the mean scores of two or more groups on a measure is statistically significant, after adjusting for initial differences between the groups on one or more pretests” (p. 570).

Participants in this study received reading/language arts instruction within a general classroom setting. Students within each classroom setting were in the same grade with the subset of students who were participating in foreign language education being students who chose Spanish as an elective and were approved by administration to enroll in Spanish. The students within the reading/language arts courses were required to complete this class as a core subject and ranged from grades 6th through 8th grade. All students enrolled in Spanish were included in the study.

Instrumentation

All students in this population were administered the Scholastic Reading Inventory during the first weeks of the 2014-2015, 2015-2016, 2016-2017, and 2017-2018 academic years. The purpose of this instrument is to measure the ability to comprehend narrative and expository texts of increasing difficulty for students in grades 1 through 12 (Scholastic, Inc., 2014). The Scholastic Reading Inventory (SRI) was developed in 1998 as a print-based assessment to measure reading comprehension (Scholastic, Inc., 2014). However, in 1999 Scholastic started developing a computer-based version to be used (Scholastic, Inc., 2014). Versions of the SRI

computer-based assessment were released between 1999 and 2006. The current SRI College and Career version was launched in 2014 (Scholastic, Inc., 2014).

The validity of the SRI has a Winsteps Item Analysis of 0.94 (Scholastic, Inc., 2014). The Winsteps Item Analysis is an instrument used to determine validity measure of an assessment. The content-sampling error was estimated by calculating the internal consistency reliability for Foundational Reading Assessment scores. For reliability of test-retest for reader measure consistency, the total accuracy coefficient alpha is 0.89 (HMH Reading Inventory, n.d.). This instrument has been used in numerous studies seeking reading levels among its participants (Lembke et al., 2017; Conoyer et al., 2017; Stebbins, Stormont, Lembke, Wilson, & Clippard, 2012).

Students were administered the SRI Computer version. This assessment measures reading comprehension before and after receiving reading and language instruction. There is no time limit for students to complete the assessment. The questions the students receive are based upon real-time student performance, with correct answers moving the student to more challenging texts and incorrect answers moving the student to less-challenging texts. Each student is given differing numbers of questions; the assessment is concluded when enough information has been gathered to determine the student's reading level.

The students were administered the assessment by the Title I teacher, and all records and data are kept securely by this teacher and the assistant principal. The SRI provides a Lexile score for each student (Morsy, Keiffer, & Snow, 2010). Lexile scores are used by educators and parents to determine if a student can comprehend a text at a particular grade level and to match students with text at their reading level. Lexile score bands can be used by teachers to determine targeted reading levels for students at each grade level and to document reading gaps between

the achieved and goal reading levels (Swanson & Wexler, 2017). Scores from this assessment will range from 0L to 1700L, with each grade level expected to perform at varying intervals between the minimum and maximum score. Students who score 190L are considered to be reading at a first-grade level, and students who score 1386L and higher are reading above a high school senior level. Students who score below 0L are given a score of BR, meaning the student is a beginning reader. The expected scores corresponding to the grade levels of students in this study are 925L to 1185L, indicating reading levels for 6th through 8th grade. This score assists in identifying students who are reading and comprehending below grade level, at grade level, and above grade level (Morsy et al., 2010). The instrument is scored automatically as the student completes the questions within the assessment, providing a score immediately upon finishing.

Procedures

The first step in completing this study consisted of obtaining permission from the Liberty University Internal Review Board, school administrator, district administrators, and the dissertation committee. Liberty University IRB approval is found in the Appendix. Once permissions have been obtained, the participating students were selected. Among the population of students who completed the Spanish courses, each student was anonymously assigned a number with the participants being chosen through a random drawing of the numbers until the 50 males and 50 female students were selected. The same process was used when selecting the participants from the population of students who did not complete the Spanish courses with an equal number of 50 males and 50 females. It should be noted that students who enrolled in the Spanish courses had differing levels of reading comprehension and achievement as indicated by the SRI. Students with and without an Individualized Education Program were permitted to enroll in the Spanish courses.

After the participants were selected, the identified students' SRI data were collected from the Title I teacher, who administered the Scholastic Reading Inventory to all of the students within the first three weeks of the school year, usually by the end of August, and from the Assistant Principal who also maintains assessment results within a secure database. All students were then given a post assessment of the SRI within the final weeks of the same academic year in order to measure growth, usually mid-May. The SRI data for the selected students who successfully participated in Spanish instruction, as indicated by enrollment in Spanish B, were compiled onto a spreadsheet without including the students' names. Those identified who did not complete Spanish courses also were compiled onto a spreadsheet without including the students' names. Once the data was collected and analyzed, the data was given back to the Title I teacher and Assistant Principal to be kept in a secure location.

Data Analysis

Data was analyzed using a one-way ANCOVA for null hypotheses one, two, and three, and a two-way ANCOVA for null hypothesis four. An ANCOVA is used to adjust for differences that previously exist between groups as well as when the researcher wants to control the variable of predetermined differences between treatment and control groups (Gall & Gall, 2007). This study's independent variables were the students' biological sex and completion or noncompletion of a Spanish course. There was a continuous covariate, the students' pretest Lexile score, and a continuous dependent variable, the students' posttest Lexile score from the reading inventory. Both the covariate and the dependent variable were ratio scale and, therefore, continuous. A convenience sample was used. The participants were randomly drawn from the population of students who had and had not completed a foreign language course.

The Statistical Package for the Social Sciences, SPSS, 20.2 was used to calculate descriptive statistics. Data was screened before running the one-way and two-way ANCOVAs. Outliers were identified using a box-and-whisker plot for each group and variable. Outliers were evaluated to determine whether to omit or not. Also, a Kolmogorov-Smirnov test was used to test the assumption of normality while the assumption of equal variances used the Levene's Test of Equality of Error Variance of at least .05 (Warner, 2013). For nulls one, two, and four, there was a violation of Levene's test; therefore, a data transformation was necessary. The assumption tests for the ANCOVA also included a scatter plot between the pre-test and post-test variable for each group to test the assumption bivariate normal distribution and assumption of homogeneity of slopes.

Since two analyses were run, an ANCOVA and a 2-way ANCOVA, a Bonferroni correction was needed to guard against type I error. The alpha level was calculated to be: $0.05/2 = .025$ (Warner, 2013).

Further items reported consisted of descriptive statistics of mean (M) and standard deviation (SD), number (N), number per cell (n), degrees of freedom (df within / df between), observed F value (F), and significance level (p), effect size and power (Warner, 2013). The alpha level was set at $p < .025$.

CHAPTER FOUR: FINDINGS

Overview

Chapter Four presents descriptive and inferential statistics on pretest and posttest Lexile scores for students who have completed a Spanish course and students who have not completed a Spanish course, as differentiated between students' biological sex. A detailed report of descriptive statistics will be included for the data collected during the study. Finally, results of all data analysis are presented.

Research Questions

RQ1: Is there a difference in reading comprehension scores between middle school students who participate in foreign language education and those who do not when controlling for pretest scores?

RQ2: Is there a difference between reading comprehension scores of male and female middle school students who participate in foreign language education and those who do not when controlling for pretest scores?

Null Hypotheses

H₀1: There is no difference in reading comprehension scores as measured by the Scholastic Reading Inventory between 6-8th grade students who successfully complete a foreign language course and those who do not, when controlling for pretest scores.

H₀2: There is no difference in reading comprehension scores as measured by the Scholastic Reading Inventory between 6-8th grade female students who successfully complete a foreign language course and those who do not, when controlling for pretest scores.

H₀3: There is no difference in reading comprehension scores as measured by the Scholastic Reading Inventory between 6-8th grade male students who successfully complete a

foreign language course and those who do not, when controlling for pretest scores.

H₀₄: There is no significant interaction effect between 6-8th grade students' biological sex and completion of a foreign language course in terms of reading comprehension scores as measured by the Scholastic Reading Inventory, when controlling for pretest scores.

Descriptive Statistics

Descriptive statistics were generated for the 200 participants. As ANCOVA is sensitive to unequal group sizes, each sub-group had 50 participants. There were 100 female students, 50 of whom completed a Spanish course and 50 who did not, and 100 male students, 50 of whom completed a Spanish course and 50 who did not (See Table 1). Descriptive statistics for each group are provided in Tables 2 - 5. Notice that the descriptive statistics are given for the \log_{10} of the posttest scores. For nulls one, two, and four, there was a violation of Levene's test; therefore, this data transformation was necessary. For null hypothesis three, a \log_{10} trans was not required because the Levene's test was tenable (see Table 4). The factors leading to the decision to transform the posttest data is discussed in the Assumptions Testing section.

Table 1

Number of Participants by Biological Sex and Completion of Spanish Course

		<u>Value Label</u>	<u>N</u>
Biological Sex	0	Male	100
	1	Female	100
Participation in Spanish	0	Not in Spanish	100
	1	Took Spanish	100

Table 2

*Descriptive Statistics Log₁₀*Dependent Variable: Log₁₀

<u>Sex</u>	<u>Participation in Spanish</u>	<u>Mean</u>	<u>Std. Deviation</u>	<u>N</u>
Male	Not in Spanish	2.824	.265	50
	Took Spanish	3.016	.076	50
	Total	2.920	.216	100
Female	Not in Spanish	2.898	.172	50
	Took Spanish	3.021	.070	50
	Total	2.960	.144	100
Total	Not in Spanish	2.861	.225	100
	Took Spanish	3.019	.073	100
	Total	2.940	.185	200

Table 3

Descriptive Statistics Males Only

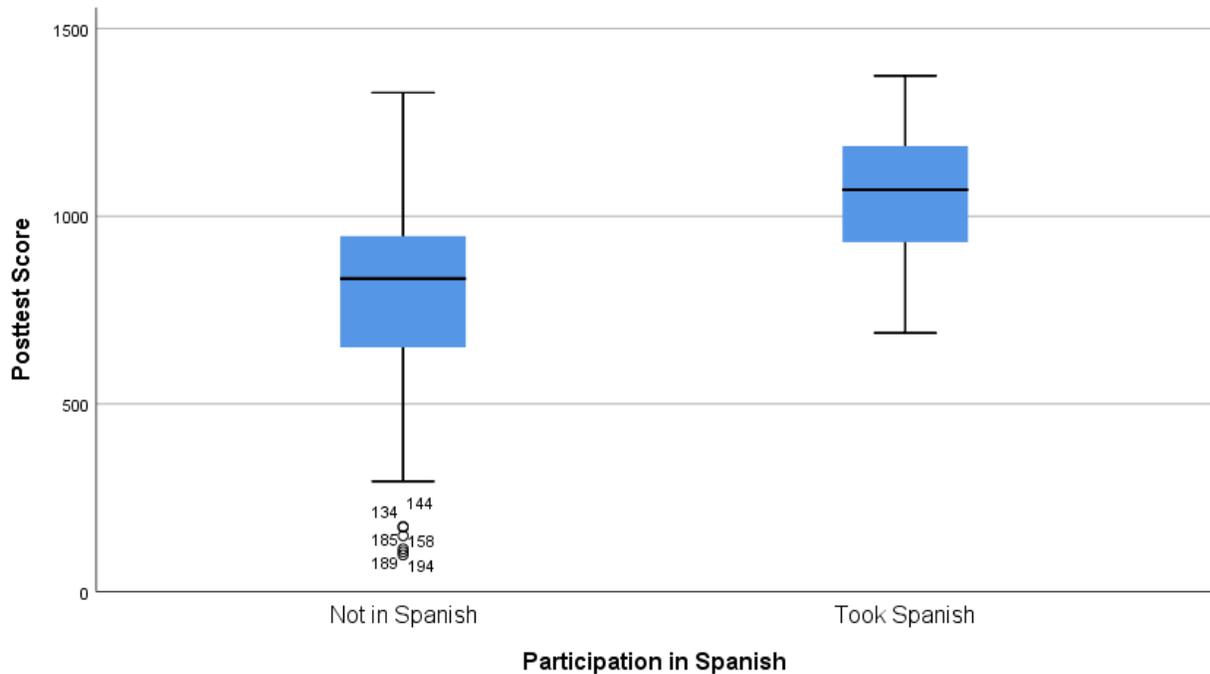
Dependent Variable: Posttest Score

<u>Male Participation in Spanish</u>	<u>Mean</u>	<u>Std. Deviation</u>	<u>N</u>
Not in Spanish	761.72	300.689	50
Took Spanish	1054.80	173.594	50
Total	908.26	285.230	100

Results**Data Screening**

The data were screened for missing values. All groups had equal numbers of participants, 50 per subgroup and no values were missing. Next, box plots were created to examine the data for extreme outliers. As seen in Figure 1, six outliers were identified (See Figure 1). An examination of the residuals showed that the outliers were not extreme outliers, so no outliers were removed.

Figure 1. Boxplot of posttest scores by participation in a Spanish course.



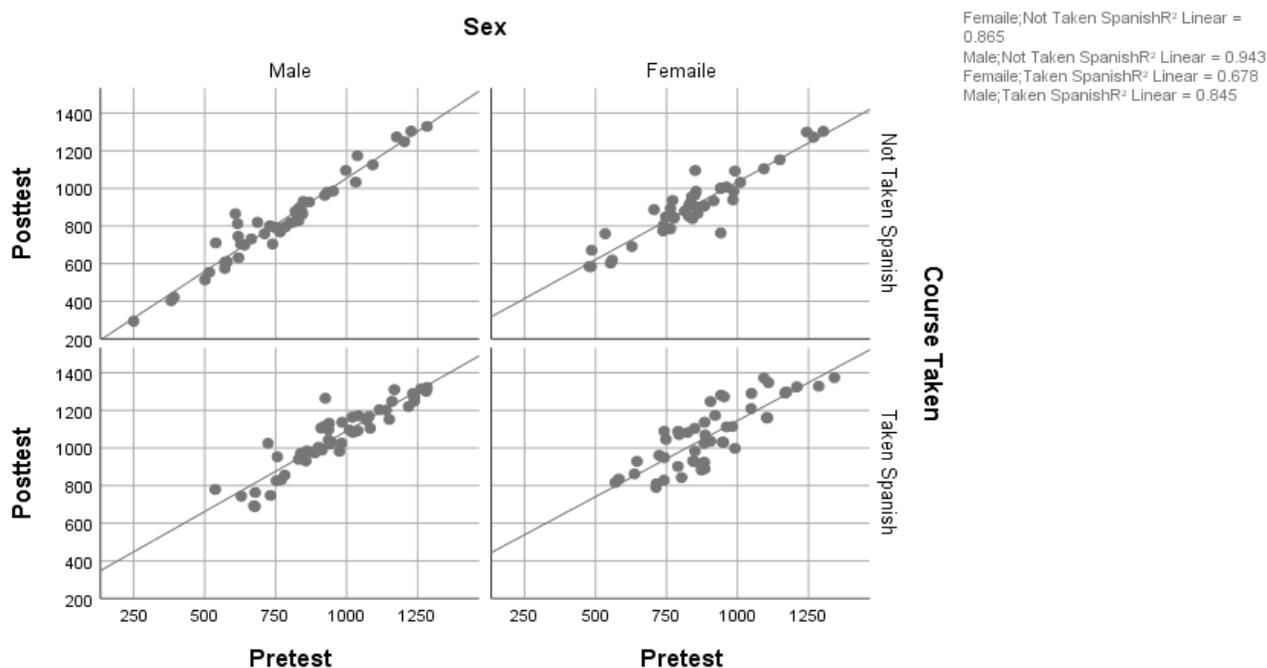
Assumption Testing

The first four assumptions of ANCOVA are met in that:

- the dependent variable is continuous (posttest Lexile scores),
- there are 2 independent variables, both are categorical, biological sex (male coded as 0 and female coded as 1), and course completion (not completing a Spanish course coded as 0 and completing a Spanish course coded as 1),
- there is a continuous covariate (pretest Lexile scores) and
- all observations are independent.

The assumption of linearity was met by visual inspection of scatter plots. For each group (biological sex and course completion) the pretest scores were plotted vs the posttest scores. For each group, a linear relationship is observed (see Figure 2).

Figure 2. Scatter of posttest by pretest by students' biological sex.



The assumption of bivariate normal distribution is also observed in the scatter plots in Figure 2.

Each exhibits a cigar shape. The assumption of homogeneity of slopes is tenable as the interaction course pretest result for the posttest scores test of between subjects effect yields $p = .067$ as seen in Table 4.

Table 4

Tests of Between-Subjects Effects

Dependent Variable: Posttest Score

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	8563879.200 ^a	3	2854626.400	479.107	.000	.884
Intercept	472111.487	1	472111.487	79.237	.000	.297
Course	74193.466	1	74193.466	12.452	.001	.062
Pretest	5797842.332	1	5797842.332	973.082	.000	.838
Course * Pretest	20230.410	1	20230.410	3.395	.067	.018
Error	1120146.003	188	5958.223			
Total	184111619.000	192				
Corrected Total	9684025.203	191				

a. R Squared = .884 (Adjusted R Squared = .882)

The assumption of normality was tested using the Kolmogorov-Smirnov test and was found tenable with $p = .200$ for each group (see Table 5).

Table 5

Tests of Normality

Kolmogorov-Smirnov ^a			Shapiro-Wilk		
<u>Statistic</u>	<u>df</u>	<u>Sig.</u>	<u>Statistic</u>	<u>df</u>	<u>Sig.</u>
.067	94	.200*	.981	94	.204
.071	99	.200*	.978	99	.088

a. Lilliefors Significance Correction

*. This is a lower bound of the true significance.

Finally, Levene's test was used to test the assumption of the equality of variances. The result seen in Table 5 indicates a significant result, so the assumption of equal variance is not tenable (see Table 6).

Table 6

Levene's Test of Equality of Error Variances^a Null Hypothesis One

Dependent Variable: Posttest

<u>F</u>	<u>df1</u>	<u>df2</u>	<u>Sig.</u>
17.224	1	188	.000

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + Pretest + Course

Due to violation of the Levene's Test, a data transformation was performed using \log_{10} to provide the results seen in Table 7. The Levene's Test result of $p = .120$ shows that the assumption of equality of variance after the transformation is tenable. Using the \log_{10} transformation of the posttest scores, the researcher continued with the ANCOVA.

Table 7

Levene's Test of Equality of Error Variances^a Null Hypothesis Two

Dependent Variable: Log ₁₀				
<u>F</u>	<u>df1</u>	<u>df2</u>	<u>Sig.</u>	
1.972	3	196	.120	

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + Pretest + Sex + Course + Sex * Course

Null Hypothesis One

H₀₁: There is no difference in reading comprehension scores as measured by the Scholastic Reading Inventory between students who successfully complete a foreign language course and those who do not, when controlling for pretest scores.

To test null hypothesis one, a one-way ANCOVA was conducted. Based on the results shown in Table 8, there is a significant effect of taking a Spanish course on the Lexile scores of students after controlling for the pretest Lexile scores, $F(1, 197) = 11.98$, $p < .001$, partial $\eta^2 = .057$, which is a small effect size. The researcher rejects null hypothesis one at a 95% confidence level. There is a significant difference in the Lexile scores of students who take Spanish ($M = 3.0193$, S.D. 0.07318) and those who did not take Spanish ($M = 2.8613$, S.D. 0.22547) when controlling for pretest Lexile scores (see Table 2 for means and standard deviations).

Table 8

Tests of Between-Subjects Effects

Dependent Variable: Log ₁₀						
<u>Source</u>	<u>Type III Sum of Squares</u>	<u>df</u>	<u>Mean Square</u>	<u>F</u>	<u>Sig.</u>	<u>Partial Eta Squared</u>
Corrected Model	5.320 ^a	2	2.660	351.335	.000	.781
Intercept	92.438	1	92.438	12209.665	.000	.984
Pretest	4.072	1	4.072	537.796	.000	.732
Course	.091	1	.091	11.988	.001	.057
Error	1.491	197	.008			
Total	1735.842	200				
Corrected Total	6.811	199				

a. R Squared = .781 (Adjusted R Squared = .779)

Null Hypothesis Two

H₀2: There is no difference in reading comprehension scores as measured by the Scholastic Reading Inventory between female students who successfully complete a foreign language course and those who do not, when controlling for pretest scores.

To test null hypothesis two, a one-way ANCOVA was conducted. Based on the results displayed in Table 9, there is a significant effect of taking a Spanish course on the Lexile scores of female students after controlling for the pretest Lexile scores, $F(1, 97) = 17.617$, $p < .001$, partial $\eta^2 = .154$, which is a medium effect size. The researcher rejects null hypothesis two. There is a significant difference in the Lexile scores of female students who take Spanish ($M = 3.0216$, S.D. = .07087) and those who do not ($M = 2.8984$, S.D. = .17220) when controlling for pretest Lexile scores.

Table 9

Tests of Between-Subjects Effects

Dependent Variable: PostLog ₁₀						
Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	1.540 ^a	2	.770	138.583	.000	.741
Intercept	45.431	1	45.431	8178.831	.000	.988
Pretest	1.160	1	1.160	208.892	.000	.683
Course	.098	1	.098	17.617	.000	.154
Error	.539	97	.006			
Total	878.225	100				
Corrected Total	2.078	99				

a. R Squared = .741 (Adjusted R Squared = .735)

Null Hypothesis Three

H₀₃: There is no difference in reading comprehension scores as measured by the Scholastic Reading Inventory between male students who successfully complete a foreign language course and those who do not, when controlling for pretest scores.

To test null hypothesis three, a one-way ANCOVA was conducted. In this analysis, the original posttest scores for male students were used without the \log_{10} transformation as the results of Levene's test were not significant., with $p = .151$ (see Table 10).

Based on the results presented in Table 11, taking a Spanish course has a significant effect on the Lexile scores of male students after controlling for the pretest Lexile scores, $F(1, 97) = 13.516$, $p < .001$, partial $\eta^2 = .112$ which is a medium effect size. The researcher rejects null hypothesis three. There is a significant difference in the Lexile scores of male students who take Spanish ($M = 1054.80$, S.D. 173.594) and those who do not take Spanish ($M = 761.72$, S.D. 300.689) when controlling for pretest Lexile scores.

Table 10

Levene's Test of Equality of Error Variances^a

Dependent Variable: Posttest Score				
<u>F</u>	<u>df1</u>	<u>df2</u>	<u>Sig.</u>	
2.097	1	98	.151	

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + Pretest + Course

Table 11

Tests of Between-Subjects Effects

Dependent Variable: Posttest Score						
Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	7670869.880 ^a	2	3835434.940	970.339	.000	.952
Intercept	127267.404	1	127267.404	32.198	.000	.249
Pretest	5523472.720	1	5523472.720	1397.402	.000	.935
Course	53424.480	1	53424.480	13.516	.000	.122
Error	383409.360	97	3952.674			
Total	90547902.000	100				
Corrected Total	8054279.240	99				

a. R Squared = .952 (Adjusted R Squared = .951)

Null Hypothesis Four

H₀4: There is no significant interaction effect of 6-8th grade students' biological sex and completion of a foreign language course on reading comprehension scores as measured by the Scholastic Reading Inventory, when controlling for pretest scores.

To test null hypothesis four, a two-way ANCOVA was conducted. Based on the results shown in Table 13, there is not a significant interaction between the biological sex of a student and taking a Spanish course on their Lexile scores after controlling for the pretest Lexile scores, $F(1, 195) = .152, p = .697, \text{partial } \eta^2 = .001$, which indicates a very small effect size. The researcher fails to reject null hypothesis four. There is not a significant difference in the Lexile scores between the biological sex of a student and taking a Spanish course on their Lexile scores after controlling for the pretest Lexile scores.

Due to the failed Levene's Test, the researcher used the posttest \log_{10} transformation data (see Table 12).

Table 12

Levene's Test of Equality of Error Variances^a

Dependent Variable: Log10

<u>F</u>	<u>df1</u>	<u>df2</u>	<u>Sig.</u>
1.972	3	196	.120

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + Pretest + S+ Course + Sex * Course

Table 13

Tests of Between-Subjects Effects

Dependent Variable: Log10

<u>Source</u>	<u>Type III Sum of Squares</u>	<u>df</u>	<u>Mean Square</u>	<u>F</u>	<u>Sig.</u>	<u>Partial Eta Squared</u>
Corrected Model	5.399 ^a	4	1.350	186.412	.000	.793
Intercept	90.720	1	90.720	12528.573	.000	.985
Pretest	4.013	1	4.013	554.149	.000	.740
Sex	.078	1	.078	10.821	.001	.053
Course	.089	1	.089	12.358	.001	.060
Sex * Course	.001	1	.001	.152	.697	.001
Error	1.412	195	.007			
Total	1735.842	200				
Corrected Total	6.811	199				

a. R Squared = .793 (Adjusted R Squared = .788)

The interaction of biological sex and course is not significant, meaning taking the Spanish course is not beneficial for only one biological sex, but is beneficial for both.

CHAPTER FIVE: CONCLUSIONS

Overview

Chapter Five contains the discussion of the study, along with a review and purpose. The conclusion regarding the study along with the literature pertaining to the results of this study is provided. The significance and additions to the body of knowledge and theory is addressed in the implications section. Finally, the limitations and recommendations for future research are provided to guide researchers looking to add to the body of literature or those whose research is similar but are studying different settings and populations.

Discussion

The purpose of this quantitative, causal-comparative study is to determine if foreign language education influences reading comprehension skills by student biological sex. Neman et al. (2013) define comprehension as a “process of establishing purposeful meaning from incoming information” (p. 221), while reading comprehension is defined as making meaning at the word, sentence, and text levels (van Kraayenoord et al., 2012). Reading is a process that requires interaction for the reader to develop and construct a meaning of the text using their own schemata (Khanam (b) et al., 2014; Neman et al., 2013).

The Schema Theory was appropriate to this study of reading comprehension skills and foreign language learning (Barr et al., 2002). According to the Schema Theory, students learn and reason by using abstract knowledge structures as induced from their ordinary life experiences (Oura, 2014). Therefore, there is the need for students to pull from experiences and situations of their past and present in order to have higher levels of learning and reasoning skills that can be used during reading instruction. Reading comprehension requires retrieving prior knowledge from memory (Yanmei, 2015).

Students who are provided reading instruction also have different outcomes and experiences based upon schemata. Students with greater prior knowledge of words and phrases develop a higher level of reading comprehension when compared to those students without the same or higher levels of schema. Pancheco and Goodwin (2013) found that students had improved acquisition in their vocabulary, spelling, and reading comprehension when they were able to activate prior knowledge of familiar words, root words, and morphological awareness in order to determine the new, similar, or related meanings of words and phrases being introduced within a new concept.

Background knowledge and schema help to enable readers to choose between multiple meanings of words (Neuman et al., 2014). Within languages, words that have multiple meanings are used within writings and readings. Students need to be able to determine the correct usage of words within their text in order to comprehend what is intended. Students with greater background knowledge and experiences tend to be able to better determine the proper meanings of words based upon their schema. Having a lack of schemata may impede the comprehension of a selected text when compared to students who have a broader pool of schema to use. When reading is an interactive process, the reader is able to make contributions to the text from information already processed as a supplement. The Schema Theory is identified in this concept with a type of schema-matching technique known as intertextuality (Chia & Kee, 2013). Zengin (2016) defines intertextuality as a set of relations which a text has with other texts or connecting similar texts that can have an influence on the reader's interpretation of the text based on the reader's prior knowledge and understanding.

Reading comprehension is an important tool for students to achieve not only academic success but also successful participation in many activities in school and beyond (Hagaman et

al., 2016). According to Bisson et al. (2014), the possibility exists that students who participate in foreign language education are receiving instruction and being exposed to a larger selection of vocabulary and word origins that will better allow them to activate prior knowledge and use reading comprehension skills for given texts and passages. Cummins (2017) notes that evidence shows that languages interact in various ways through the learning process, since literacy and reading skills transfer across languages as learning progresses. Furthermore, Cummins (2017) suggests that multilingual instructional strategies will provide a wider variety of learning opportunities to emerge among second language learners through cross-language transferring. This suggests that students who acquire a second language through foreign language education will use their broader selection of vocabulary to improve on reading comprehension skills. This provided the reason for the first research question asking if there was difference in reading comprehension scores between middle school students who successfully complete a Spanish course and those who do not when controlling for pretest scores. In this study, there was a significant difference between the pretest and posttest scores between students who complete a Spanish course and students who did not complete a Spanish course.

Gaps in reading comprehension exist between the different biological sexes (Juliá, 2016). These differences could stem from the different biological sexes having different schemata within their background knowledge and experiences affecting reading comprehension (Juliá, 2016). Hannon (2014) found that there are various gaps between the different biological sexes that exist in different areas. For example, Hannon (2014) found that there was a small gap for text inferencing and low-knowledge integration with males having the higher results with text inferencing. However, females were shown to have higher knowledge integration with text memory and an epistemic belief of learning being more predictive of reading comprehension

performance above the results of males (Hannon, 2014). This provided the reason for having a second research question asking if there was a difference between reading comprehension scores of male and female middle school students who successfully complete a Spanish course and those who do not when controlling for pretest scores. In this study, the student's biological sex did not have a significant impact on the student's reading comprehension scores between the pretest and posttest. Further discussion of research questions one and two are presented in the following subsections.

Research Question for Null Hypotheses One, Two, and Three

Is there a difference in reading comprehensions cores between middle school students who successfully complete a Spanish course and those who do not when controlling for pretest scores?

Null Hypotheses One, Two, and Three

All three null hypotheses associated with research question one were rejected.

H₀1: There is no difference in reading comprehension scores as measured by the Scholastic Reading Inventory between middle school students who successfully complete a Spanish course and those who do not, when controlling for pretest scores.

H₀2: There is no difference in reading comprehension scores as measured by the Scholastic Reading Inventory between middle school female students who successfully complete a Spanish course and those who do not, when controlling for pretest scores.

H₀3: There is no difference in reading comprehension scores as measured by the Scholastic Reading Inventory between middle school male students who successfully complete a Spanish course and those who do not, when controlling for pretest scores.

Readers will often construct meaning from clues found in a text which is related to the use of background knowledge in understanding the content (Khanam et al., 2014). Pancheco and Goodwin (2013) noted that bilingual learners may carry different schema than someone who is monolingual; furthermore, students who are multilingual have a broader schema to use when accessing prior knowledge with vocabulary including knowledge of various roots and morphological awareness to relate to a word's meaning. After analyzing the data gathered in this study, the results corroborate the research saying that students who are bilingual or learn a foreign language will have a broader schema to use to access prior knowledge furthering their reading comprehension skills.

Therefore, a significant difference was found in reading comprehension skills as measured by the Scholastic Reading Inventory between students who successfully completed a foreign language course and those who do not, when controlling for pretest scores. Khanam et al. (2014) support this when they say, "reading is an interactive process in which readers construct a meaningful representation of text using their schemata" (p. 83). This supports the idea that students who know or learn a foreign language will have more schemata to use for vocabulary during reading activities. When the data was separated by student biological sex, boys and girls, there was still a significant difference in each subgroup; that is, there was a difference in reading comprehension skills as measured by the Scholastic Reading Inventory between students when comparing girls who completed a foreign language course to girls who did not and boys who completed a foreign language course to boys who did not.

Research Question for Null Hypothesis Four

RQ2: Is there a difference between reading comprehension scores of male and female middle school students who successfully complete a Spanish course and those who do not when controlling for pretest scores?

H₀4: There is no significant interaction effect between middle schools students' biological sex and completion of a Spanish course in terms of reading comprehension scores as measured by the Scholastic Reading Inventory, when controlling for pretest scores.

When considering the student's biological sex, the possibility exists that completing a foreign language course will have a significant difference in benefit between boy and girls. Juliá (2016) already noted that gaps in reading comprehension exist between the different biological sexes, and that these differences could stem from the different biological sexes having different schemata within their background knowledge and experiences affecting reading comprehension. Therefore, the researcher wanted to use the data to determine if this difference also affected the influence of foreign language completion on students' reading comprehension skills growth. An analysis of the data revealed that there was no significant difference in the growth of reading comprehension skills when considering the students' biological sex. There was a significant difference in reading comprehension skills growth between students who completed a foreign language course and students who did not complete a foreign language course for both sexes. There is not literature available to which this result could be compared or contrasted; however, these results do support the assertion that students who learn a foreign language do have a broader knowledge base to use when retrieving information.

The findings of this study support Schema Theory in that students using different modalities of language learning are building a larger background of knowledge to use when

needing to acquire new skills, such as reading comprehension. Mouny et al. (2014) reported that in homes where bilingualism is a constant practice in the homes and classrooms, these skills also reinforce, value, and support bidirectional acquisition, learning, and strengthening of both languages, and furthermore provides a strong foundation for literacy.

Implications

The findings of this study will add to the literature on reading comprehension in middle school students. Discovering methods to help improve students' reading comprehension skills is imperative for schools in order to help students grow into productive adults. A considerable number of students do not encounter favorable academic and long-term outcomes because of reading difficulties (Ciullo et al., 2016). The number of low-level and non-readers are on the rise in the United States, and the potential negative effects on the individual can be devastating to their growth and success (Lipp & Helfrich, 2016). These effects, if the person does not receive instruction and intervention to close this learning gap, will carry into the student's adulthood when seeking employment, processing legal functions and necessities, and attempting to live comfortably within society. Furthermore, Lipp and Helfrich (2016) noted that students who are low-level or non-readers have a higher likelihood of being retained in school, being incarcerated, and living in poverty. Without the necessary reading fluency and comprehension skills expected by a society, low-level and non-readers often find themselves struggling to integrate and progress within a fast-paced world, often leading to unemployment and poverty (Hayat Qamar, 2017). Interventions that can have a positive impact on students' reading comprehension levels have the potential of improving the chances of students being more employable and achieving educational and occupational goals.

Level of education is positively linked to both employment rate and income level (Diaconu, 2014). Diaconu (2014) noted in his study that approximately 41% of adults without a high school level of education are employed; whereas, among adults who are high school graduates, approximately 63% have jobs. Furthermore, approximately 81% who have continued education beyond a high school diploma have jobs (Diaconu, 2014). The results of this study indicate that foreign language study can provide an intervention to support students in need of improved reading comprehension; therefore, students have the opportunity to achieve higher levels of education compared to students whose reading levels are not as high due to a lack of intervention services.

Given that the literature suggests that girls tend to have a higher level of reading comprehension skills when compared to boys (Chipere, 2014; Hannon, 2014; Juliá, 2016), the researcher assumed there would also be a significant difference between girls and boys in this study. However, the results in this study revealed there is not a significant difference, meaning that the participation and successful completion of a foreign language course is similarly beneficial for both girls and boys. While literature was not found that discusses differences in reading comprehension skills growth with the completion of a foreign language course, these results adds to the body of knowledge that foreign language learning is beneficial to girls and boys without any significant difference in amount of growth in reading comprehension skills.

Another implication that can be taken from this study is that schools should consider offering foreign language courses to middle school students to help improve their English reading achievement. Menijivar and Akhtar (2017) found that bilingual four-year-old English speakers had learned more vocabulary than monolingual children of the same age when provided the same instruction in a classroom setting. The findings from their study also noted that the

word learning advantage seen in bilingual adults may begin as early as during a person's preschool years. Students who are bilingual show that they have greater vocabulary breadth that will lead to higher reading comprehension because they are not distracted by needing to learn and understand new words during the process of reading for learning or information. Providing opportunities for students to learn a second language early in their school years will provide students exposure to more vocabulary, which in turn will improve reading skills, fluency, and comprehension. Schools should consider enrolling more students into a foreign language course or learning program, especially for students who have a reading disability or are underachieving in the area of reading comprehension. Since there is a gap in reading comprehension skills among students' biological sex (Juliá, 2016), one can imply that boys would greatly benefit from foreign language instruction. For this reason, schools should offer foreign language courses in middle school in order to improve boys' reading skills to address the issue with the gap between girls and boys.

Limitations

All of the students in this study were students at one middle school learning from the same curriculum. The results of this study should not be generalized beyond this population. Also, there are two middle school Language Arts teachers employed in this school at one time, with one teacher being constant throughout the years indicated in the study, and the other English teacher position exhibiting turnover every one to two school years. The students in the classroom where there was high turnover may have had instruction delivered differently compared to the students during the previous year, as well as those in the upcoming year; meanwhile, the other classroom having the same teacher for multiple years would have had more consistency in the style of instruction delivered. The quality of instruction provided to students has an effect on the

quality of intervention and improvement of reading levels for students with reading difficulties (Cuticelli, Collier, & Coyne, 2016). The quality of instruction may have varied per the teacher who was employed at the time each school year, leading to differing levels of improvement in reading skills. To limit the impact, student data was taken from multiple school years from both classrooms, allowing all levels of instruction to be included in case there were differing levels of quality instruction being provided.

Students with severe reading disabilities could have had a significant effect on the study. Some students have reading difficulties requiring more individualized attention and higher-level intervention services; however, this factor was limited by only using assessment scores from students who are enrolled in a general education English Language Arts course. Those students who received instruction within a special education environment were excluded from this study.

Recommendations for Future Research

The participants in this study were 6th – 8th grade students in a small, rural setting. Also, this study focused solely on students completing a Spanish course.

1. Using data from schools in different settings, such as in an urban environment.
2. Analyzing data from students of different grade levels, such as elementary or high school level students.
3. Analyzing data from students who completed a foreign language course other than Spanish, such as French, or Chinese.
4. Comparing results from students completing different foreign language courses, such as comparing Spanish language completers to French language completers.
5. Including special education students as their own group and analyzing the impact of language studies on this population.

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APPENDIX

LIBERTY UNIVERSITY.
INSTITUTIONAL REVIEW BOARD

September 25, 2018

Jason Cheek

IRB Application 3492: The Influence of Successful Foreign Language Course Completion on Reading Comprehension Skills by Student Sex

Dear Jason Cheek,

The Liberty University Institutional Review Board has reviewed your application in accordance with the Office for Human Research Protections (OHRP) and Food and Drug Administration (FDA) regulations and finds your study does not classify as human subjects research. This means you may begin your research with the data safeguarding methods mentioned in your IRB application.

Your study does not classify as human subjects research because it will not involve the collection of identifiable, private information.

Please note that this decision only applies to your current research application, and any changes to your protocol must be reported to the Liberty IRB for verification of continued non-human subjects research status. You may report these changes by submitting a new application to the IRB and referencing the above IRB Application number.

If you have any questions about this determination or need assistance in identifying whether possible changes to your protocol would change your application's status, please email us at irb@liberty.edu.

Sincerely,

G. Michele Baker, MA, CIP

Administrative Chair of Institutional Research

The Graduate School

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