Bethel University

Spark

All Electronic Theses and Dissertations

2018

Total Language Immersion Education and Achievement in Standardized Tests

Ndeye Kany Seck
Bethel University

Follow this and additional works at: https://spark.bethel.edu/etd

Part of the Educational Leadership Commons

Recommended Citation

Seck, N. K. (2018). *Total Language Immersion Education and Achievement in Standardized Tests* [Doctoral dissertation, Bethel University]. Spark Repository. https://spark.bethel.edu/etd/574

This Doctoral dissertation is brought to you for free and open access by Spark. It has been accepted for inclusion in All Electronic Theses and Dissertations by an authorized administrator of Spark.

Total Language Immersion Education and Achievement in Standardized Tests

Ndeye Kany Seck

A dissertation submitted to the faculty of Bethel University
in partial fulfillment of the requirements for the degree of
Doctor of Education

St. Paul, MN

May 2018

Approved by:

Advisor: Dr. Sarah Tahtinen-Pacheco

Reader: Dr. Joel Frederickson

Reader: Dr. Emily Mertes

© 2018

Ndeye Kany Seck

ALL RIGHTS RESERVED

Abstract

In this era of accountability, schools work hard to find ways to improve students' achievement especially performance on standardized tests. This quantitative study utilized two-by-two factorial ANOVAs and Chi-square tests of independence to test its primary and secondary research questions. Primary research questions included finding out whether or not there was a difference in third and fifth grade students' MCA-III math and reading scores based on whether they attend a total language immersion school or a traditional model school. Secondary research questions looked at potential differences in MCA-III math and reading scores between black and Free/Reduced Lunch students in total language immersion schools and black and Free/Reduced Lunch students in traditional school models. The study used MCA-III data from three total language immersion schools and three traditional model schools in two districts. Findings substantiated Cummins' Threshold Hypothesis which constituted the main theory at the basis of this research. Data analysis indicated that traditional school students' performed better in the third grade MCA-III especially in reading. However, immersion students outperformed their counterparts in mainstream schools in math especially in the fifth grade MCA-III. The null hypothesis related to the secondary questions was mostly rejected with black and Free/Reduced Lunch students in total immersion schools scoring higher than black and Free/Reduced Lunch students in the traditional control schools.

Dedication

I dedicate this dissertation to my devoted husband Mamour. His love, support, and unwavering belief in me made it possible to complete this work. It was truly a blessing from God to have him by my side during this Doctoral journey. He did not mind washing dishes, cleaning the house, and changing diapers so I could have time to study. His encouragement was constant and he never doubted that I would excel in each course and that I would finish this dissertation.

To my children Aisha and Babacar who were awesome throughout this journey. Aisha would readily sit next to me to do her homework while I did mine. Babacar would bring his toy cars and his books to keep me company when I was writing.

This work is also dedicated to my mom Aida and my dad Bassirou who made many sacrifices to make sure that school was always a priority for me. From afar, they closely followed the progress of my Doctoral journey. They constantly prayed, encouraged, and believed.

I could not hope for a more supportive family who thinks the world of me and has no doubt I can achieve anything. They are my sisters and brothers Kiné, Ndeye Name, Yama, Nafi, Ameth, Babacar, Saliou and Ndeye Fatou. They are also my American families, the Finsnesses and the Hashemi-Rads who welcomed me in their homes with open arms and made me part of their respective families. Dr. Lisa Finsness was a true inspiration during this process. Mory Hashemi-Rad is a second dad to me and he truly believed in me from the very moment we met.

To the memory of my uncle Djidiack and my brother Ousmane, both of them were inspiring to me in how much they valued education. To the memory of my grandmother Ndogou who was always one of my biggest supporters.

To my mother-in-law Aida, my cousin Mamadou Seck, and all my friends who were awesome cheerleaders during this Doctoral program.

Acknowledgements

Working on a dissertation requires collaboration, guidance and ongoing support that I received from many people these past four years.

First of all, I would like to express my sincere gratitude to my advisor Dr. Sarah Tahtinen-Pacheco. She was there for guidance and support. She also provided useful resources that would help advance my work. She graciously worked with me and was always full of encouragement and great advice. Moreover, she did all of this with a smile.

I am grateful to Dr. Joel Frederickson whose expertise in quantitative methodology was a lifesaver more than once. His patience was humbling and I deeply appreciated that he sat with me in his office to explain and work on many aspects of quantitative data analysis.

Dr. Emily Mertes was my formatting specialist and was tremendously helpful with some of the technicalities that made my work so much faster. I am thankful that she offered detailed and easy to follow feedback. She did not mind reviewing my work on her days off.

Lisa Bekemeyer at the Bethel Academic Writing Center spent many hours applying her wordsmithing magic to this research. Many thanks to the Directors of Evaluation and Research of the districts in this study and their staff members. They made it possible to have standardized test scores to compare in this study.

Many thanks to Dr. Tara Fortune who provided invaluable resources about language immersion. Much appreciation to Chris Holden for his guidance and to my colleague John Hanneman who had trust in me and told me about the Ed.D program at Bethel.

Special thanks to Dr. Paulson and all our Ed. D instructors, and to my cohort members especially Dr. Caleb Conklin who has been very supportive during the dissertation process.

Table of Contents

List of Tables 10

List of Figures 11

List of Abbreviations 12

Chapter I: Introduction 14

Introduction to the Problem 14

Background of the Study 15

Statement of the Problem 18

Purpose of the Study 19

Rationale 19

Research Questions and Hypotheses 21

Significance of Study 23

Definition of Terms 26

Assumptions and Limitations 28

Nature of the Study 29

Organization of the Remainder of the Study 29

Chapter II: Literature Review 31

Introduction 31

Evolution of Language Education in the United States 32

Theoretical Framework 36

Magnet Schools 43

Parents' Involvement in Language Immersion Programs 44

Types of Immersion Programs 44

One-way total or full immersion programs. 45

Two-way immersion programs. 46

Partial immersion programs. 47

Language Immersion Pedagogies and Practices 47

21st Century Skills 48

Benefits of Language Immersion Education 49

Challenges of Language Immersion Education 50

Standardized Testing 53

History and evolution of standardized testing in the U.S. 53

Minnesota Comprehensive Assessment (MCA). 54

Limitations of Standardized Tests 55

Chapter III: Methodology 56

Philosophy and Justification. 56

Research Design Strategy 56

Research Questions and Hypotheses 57

Theoretical Framework 59

Variables 60

Sampling Design 60

Setting 62

Instrumentation and Measures 63

Data Collection 64

Data Analysis 65

Limitations and Delimitations 68

Ethical Considerations 70
Chapter IV: Results 72
Sample 72
General Findings 73
Hypothesis Findings 74
Hypothesis 1 and 2 Findings. 75
Hypothesis 1a Findings 77
Hypothesis 1b Findings. 78
Hypothesis 3 and 4 Findings. 79
Hypothesis 3a Findings 80
Hypothesis 3b Findings 80
Summary of Findings 81
Chapter V: Discussion, Implications, Recommendations 83
Overview of the Study 83
Research Questions 84
Conclusions 86
RQ1 Conclusions 86
RQ2 Conclusions 87
RQ1a Conclusions 88
RQ1b Conclusions 89
RQ3 Conclusions 89

RQ4 Conclusions 90

RQ3a Conclusions 91

RQ3b Conclusions 92

Implications 93

Recommendations for Practitioners 94

Recommendations for Academics 95

Concluding Comments 96

References 98

Appendices 111

Appendix A: Demographic information for Suburban Schools 111

Appendix B: Demographic Information for Urban Schools 1a and 1b 112

Appendix C: Demographic Information for Suburban Schools 2a and 2b 113

List of Tables

1. Factors and Variables …….p.66

2. List of Retained and Rejected Null Hypotheses for each Pair of Schools under Study p.81

List of Figures

1. Directory of Foreign Language Immersion Programs in U.S. Schools ……..….p.35
2. Cummins' Iceberg Model of Language Interdependence ……..……..p.38
3. Cummins' Threshold Hypothesis ……..p.39
4. One-balloon Underlying Proficiencies ……..p.40
5. Cummins Quadrant Model ……..…p.43
6. Mean MCA-III Reading Scores for Suburban School District by School Model and Grade Level …….....…….p.75

List of Abbreviations

ACTFL: American Council on the Teaching of Foreign Languages

ANOVA: Analysis of Variance

AYP: Annual Yearly Progress

BICS: Basic Interpersonal Communicative Skills

CARLA: Center for Advanced Research on Language Acquisition

CBI: Content Based Language Instruction

CALP: Cognitive Academic Language Proficiency

CSS: Common Core Standards

CUP: Common Underlying Proficiency

CLIL: Content and Language Integrated Learning

CTSTR: Count too small to report

DOK: Depth of knowledge

ESSA: Every Student Succeeds Act

ESEA: Elementary and Secondary Education Act

FERPA: Family Educational Rights and Privacy Act

L1: first language

FLES: Foreign Language in Elementary Schools

HumRRO: Human Resources Research Organization

IL: Immersion language

MSAP: Magnet Schools Assistance Program

MAIN: Minnesota Advocates for Immersion Network

MCA: Minnesota Comprehensive Assessments

MDE: Minnesota Department of Education

NCLB: No Child Left Behind

OPI: Oral Language Proficiency Interview

SLA: Second Language Acquisition

SLIFE: Students with Limited or Interrupted Formal Education

SPSS: Statistical Package for the Social Sciences

STEM: Science, Technology, Engineering and Math

SUP: Separate Underlying Proficiency

TL: Target Language or Immersion Language or L2

UG: Universal Grammar

Chapter I: Introduction

Introduction to the Problem

The United States Department of Education was created in 1867 for the main purpose of collecting data on schools and teaching that would ensure effective school systems in America (U.S. Department of Education, 2016). This initial mission remains its top priority today and is exemplified in the tools used to collect the information. Assessment is increasingly a crucial tool in determining school effectiveness and setting up accountability guidelines. As a result, school systems in the U.S. prioritize optimal student performance on assessments, focusing on standardized tests in particular (DiCicco, 2016; Rafiuddin, 2015; Zhao, 2007). Efforts to improve assessment outcomes such as test scores include school improvement plans, programming such as language immersion and other choice programs, data collection and analysis, as well as implementation of a variety of instructional policies (Graue, Wilinski, & Nocera, 2016; Sobe & Boven, 2014).

There are currently numerous demands on U.S. schools, ranging from teaching global citizenship to improving standardized test scores. It is, then, crucial and challenging to establish programming that has the potential to meet these various demands in a cumulative and simultaneous manner (DiCicco, 2016). Language immersion education enhances students' communication skills through the promotion of bilingualism (Met, 2008) and develops students' cultural competence (Genesee & Cloud, 1998), both important aspects of global citizenship (DiCicco, 2016). If the mission of effective schools is to prepare learners to be multilingual and culturally competent individuals who perform well on standardized tests, is it possible to say that language immersion schools epitomize effectiveness in education?

This study aimed to determine how immersion students' standardized test scores compared with traditional school students' scores. Language immersion programs promote communication in a multilingual setting (Genesee & Cloud, 1998; Met, 2008). The ability to communicate effectively is one of the key skills identified for the 21st century learner (p21.org, n.d.). Most of the research conducted on language immersion and achievement shows high academic gains (Fortune, 2014; Wall, 2012). Through the years, the United States has seen an emergence of various language immersion programs that aim to meet the requirements of globalization in the 21st century.

Background of the Study

The United States Census Bureau (2013) indicated that there are over 300 languages spoken in the U.S. In addition, there are well over 60 million individuals who speak a language other than English at home, a number which has doubled from 30 million in 1990 (U.S. Census Bureau, 2013). Due to this changing face of American society, schools have increasingly become multilingual spaces.

In this 21st century, diversity, multiculturalism, and global awareness are at the forefront of most educational initiatives (DiCicco, 2016). The Partnership for 21st Century Learning (P21) is a coalition that the U.S. Department of Education founded in 2002 in partnership with businesses and policymakers. Its main purpose is to promote 21st century readiness for all K-12 students in the United States. P21 listed "communication in a multilingual environment" as one of the skills learners need to have in order to be successful in both life and work in the 21st century (p21.org, n.d.).

The need for multilingual skills is one of the driving forces behind the increasing number of language immersion schools in the U.S. The term, "one-way foreign language immersion,"

was first used in Canada in 1965 (Tedick, Christian, & Fortune, 2011). Soon after, this term was also used in the United States. In fact, Coral Way Elementary, a two-way bilingual school, was founded in 1963 in Florida to meet the needs of its growing Cuban community (Ovando, 2003). According to the Center for Applied Linguistics (2016), there were three language immersion schools in the U.S. in 1971. In 2011, there were 448 language immersion schools in the United States, including 50 located in Minnesota.

A plethora of factors explain the popularity of language immersion programs. Besides globalization and multiculturalism, another explanation of the prevalence of language immersion education is the effort to promote indigenous languages and correct past injustices due to colonization (Cammarata & Tedick, 2012). The flourishing expansion of language immersion programs also stems from the many advantages of being fluent in a second language. Fluency is a crucial tool to function well in a global society and can be an essential component to fulfilling the American Dream for many (Met, 2008; Valdeòn, 2015).

The constant exchange between different languages and cultures in our world make it a priority to work on mutual understanding and facilitate interactions (Cammarata & Tedick, 2012; Met, 2008). As a result, language immersion education may play the important role of bridging the diverse languages and cultures present in the United States. The expansion of language immersion programs across the United States and the demands of an increasingly diverse society bring about a definite need to explore second language learning (Met, 2008).

In a language immersion setting, one of the priorities is the integration of language and content (Cammarata & Tedick, 2012; Ruiz & Cenoz, 2015). This practice commonly bears the name of Content Based Language Instruction (CBI) in the United

States and Content and Language Integrated Learning (CLIL) in Europe (Cenoz, Genesee, & Goerter, 2013). The double focus on both language and content sets apart language immersion teaching from traditional language teaching. As a result, immersion educators have the obligation to include language objectives in most instructional activities. The immersion language (IL) is used to teach content concepts but is also the language under study (Cenoz, Genesee, & Goerter, 2013; Fortune & Tedick, 2008).

There are several language immersions models including one-way total immersion, double immersion, one-way partial immersion, and dual language immersion (Tedick & Wesely, 2015). This study focused on one-way total immersion programs. In this model, students receive all or almost all of their core instruction in the new language from kindergarten to second grade (Tedick et al., 2011). As its name indicates, a double immersion program focuses on two new or non-native languages. It resembles the total immersion model but focuses on two languages instead of one. Partial immersion programs offer instruction in both the IL and the native language. In a dual language immersion school, students from the majority language (English in the United States) learn the minority language (Spanish, for example) alongside students who are native speakers of the minority language. In a dual language immersion, instruction is bilingual and both majority and minority language students become bilingual and bi-literate at the same time (Tedick et al., 2011).

It is also important to note the variety in the languages that immersion schools target. In Minnesota alone, there are at least seven different languages that immersion schools focus on including Spanish, French, German, Mandarin, Dakota/Ojibwe, Hmong, and Korean (MAIN, 2015). The Center for Advanced Research on Language Acquisition (CARLA, 2016) noted that

despite starting the IL at various levels of elementary school, most immersion models ensure student proficiency in the IL.

Statement of the Problem

In our global and increasingly competitive world, a major goal for schools is to increase student achievement (DiCicco, 2016; Rafiuddin, 2015). Closing the Achievement Gap between different racial and socioeconomic subgroups is another component to this goal. Researchers have extensively studied the impact of foreign language immersion instruction on student achievement and praised its positive influence on student achievement (Boudreaux, 2010; Floyd, 2011; Kaptain, 2010). However, prior researchers indicated that most of the studies focused on dual immersion or Foreign Language in Elementary Schools (FLES) programs; they advocate the need to extend the research to other language programs including total language immersion (Grimes, 2008; Tedick & Wesely, 2015).

One marker of students' achievement is their performance on standardized tests. No Child Left Behind (NCLB) brought increasing demands on schools to improve students' test scores (Zimmerman & Dibenedetto, 2008). The Every Student Succeeds Act (ESSA), the law that replaced NCLB in 2015, similarly calls for the use of periodic standardized testing to gauge progress (U.S. Department of Education, 2015). This focus on higher test scores resulted in a narrowing of the subjects and an emphasis on reading and mathematics to the detriment of other subjects including world languages (Zhao, 2007). In this era of globalization, besides ameliorated test scores, schools also have to respond to the demands of college readiness, international competitiveness, and 21st century skills. The current reality of numerous requirements imposed on schools calls for solutions that can respond to several demands at once. It then becomes urgent for schools to find a panacea to help meet the multitude of obligations in

a simultaneous manner. Can total language immersion be the answer to both globalization demands and improved standardized test scores?

Purpose of the Study

The purpose of the study was to determine whether there was a significant difference in reading and mathematics MCA-III test scores between third and fifth grade students who attend a total language immersion school and students who attend a mainstream school in the same district. This study also aimed to determine whether there was a significant difference in MCA-III test scores between black students and Free/Reduced Lunch students in total language immersion schools and black students and Free/Reduced Lunch students in mainstream schools in the same district.

Rationale

Student success on the Minnesota Comprehensive Assessments (MCAs), are crucial for Minnesota public school districts. The MCAs are the state tests that help public school districts measure student progress toward Minnesota's academic standards. These tests are a federal requirement of the NCLB. The reading test is administered in grades three through eight and in grade 10; students in grades three through eight and in grade 11 take the math test (PACER Center, 2016). Districts use test scores to measure students' progress over time. Standardized test data are also used to gauge school effectiveness.

The Every Student Succeeds Act (ESSA) replaced NCLB in December 2015 (U.S. Department of Education, 2015). ESSA has the dual purpose of reviving the 1965 Elementary and Secondary Education Act (ESEA) and ensuring that students who have an educational disadvantage are well served (Larson, 2016). ESSA also gives more control to states when it comes to designing student progress measurements. All states must submit their plans to the U.S.

Department of Education by the end of the 2017-2018 school year. The Minnesota Department of Education or MDE (2016) announced that Minnesota will keep the same structure of assessments under NCLB. This decision allows the assumption that the MCA-III test will not be obsolete and will still be in use under ESSA.

Besides meeting federal and state legislative requirements, the MCA tests provide information to school districts regarding progress toward Minnesota's academic standards. Students take the test in reading, mathematics, and science at different grade levels. Local media and MDE publish MCA test scores. Parents often use these publications to select schools for their children (MDE, 2016). The state of Minnesota reports data from the MCA tests to the U.S. Department of Education to indicate how students are performing in Minnesota schools (MDE, 2015).

Despite the replacement of NCLB by ESSA in 2015, states still use standardized tests to measure student achievement. Standardized tests also have the purpose of ensuring accountability among various districts and schools. Parents receive detailed individual reports to inform them about their student's individual progress and about achievement in Minnesota academic standards. Aggregated test data is also available to help school personnel assess instruction and policies (MDE, 2015). Besides high standardized test scores, schools must also ensure that students are global and culturally competent citizens who are able to communicate in a multilingual setting (DiCicco, 2016). This study compared standardized test scores between total language immersion schools and traditional model schools. Results may be helpful for districts in making decisions about programming. This study also has the potential to contribute to the body of research on the effectiveness of language immersion programs.

Research Questions and Hypotheses

This study included the following primary and secondary research questions. Each research question is listed with the corresponding null hypothesis.

RQ1. What difference, if any, exists in MCA-III reading scores of third grade students based on whether they are in traditional classroom models or in total language immersion programs?

$H1_0$. There is no difference in MCA-III reading scores of third grade students based on whether they are in traditional classroom models or in total language immersion programs.

RQ2. What difference, if any, exists in MCA-III reading test scores of fifth grade students based on whether they are in traditional classroom models or in total language immersion programs?

$H2_0$. There is no difference in MCA-III reading scores of fifth grade students based on whether they are in traditional classroom models or in total language immersion programs.

The following sub- research questions are under research questions one and two.

RQ1a. What difference, if any, exists in MCA-III reading test scores in third and fifth grades between black students who attend immersion schools and black students who attend mainstream schools?

$H1a_0$. There is no difference in MCA-III reading test scores in third and fifth grades between black students in immersion schools compared to black students in mainstream schools.

RQ1b. What difference, if any, exists in MCA-III reading test scores in third and fifth grades between Free/Reduced Lunch students in immersion schools compared to Free/Reduced Lunch students in mainstream schools?

H1b$_0$. There is no difference in MCA-III reading test scores in third and fifth grades between Free/Reduced Lunch students in immersion schools compared to Free/Reduced Lunch students in mainstream schools.

RQ3. What difference, if any, exists in MCA-III math test scores of third grade students based on whether they are in traditional classroom models or in total language immersion programs?

H3$_0$. There is no difference in MCA-III math test scores of third grade students based on whether they are in traditional classroom models or in total language immersion programs.

RQ4. What difference, if any, exists in MCA-III math test scores of fifth grade students based on whether they are in traditional classroom models or in total language immersion programs?

H4$_0$. There is no difference in MCA-III math test scores of fifth grade students based on whether they are in traditional classroom models or in total language immersion programs.

RQ3a. What difference, if any, exists in MCA-III math test scores in third and fifth grades between black students in immersion schools compared to black students in mainstream schools?

H3a$_0$. There is no difference in MCA-III math test scores in third and fifth grades between black students in immersion schools compared to black students in mainstream schools.

RQ3b. What difference, if any, exists in MCA-III math test scores in third and fifth grades between Free/Reduced Lunch students in immersion schools compared to Free/Reduced Lunch students in mainstream schools?

H3b$_0$. There is no difference in MCA-III math test scores in third and fifth grades between Free/Reduced Lunch students in immersion schools compared to Free/Reduced Lunch students in mainstream schools.

Using MDE Report Card data to examine percentages of scores in each MCA-III category of Does Not Meet, Partially Meets, Meets, and Exceeds may help effectively answer the sub-research questions. Because MDE data is public, there are limitations on how it can be interpreted. Statistical analyses were performed to help offer insight regarding the impact of language immersion on the achievement of black students and those receiving Free/Reduced Lunch.

Significance of Study

There is very little research on the impact of total language immersion education on standardized tests in the United States (Rega, 2015). This is especially true of French immersion programs, which are mostly studied in Canada. The increasing popularity of language immersion programs in the United States, as shown by the growing number of immersion schools, is another indicator for the significance of this study.

The Center for Applied Linguistics (2016) indicated that foreign language immersion programs in the United States increased from three in 1971 to 448 in 2011. As a result, it is crucial to investigate the impact of language immersion programs on student achievement. There is especially very little research on the integration of content and language (Ruiz & Cenoz, 2015). Integrating content and language is one of the most prominent aspects of language immersion education. Furthermore, the popularity of language immersion was established before the adoption of the Common Core Standards (CCS). The CCS have the potential to promote language immersion schools even more.

In the United States, the adoption of CCS by over 40 states led K-12 education to focus on college and career readiness. Schools are now purposefully preparing students for college and employment (Hayes & Lillenstein, 2015). This focus on career readiness may create a renewed interest in bilingual education, including total language immersion. Researchers surveyed 300 businesses in California from various labor sectors and found two-thirds of employers favored hiring bilingual employees over monolingual employees who possess similar skills (Gàndara, 2015). As a result, language immersion schools are preparing students to be more competitive in the workforce.

Communicating in a multilingual setting is one of the key skills identified by The Partnership for 21st Century Learning to be successful in life, especially in the workplace (p21.org, n.d.). This study has the potential to contribute to the knowledge base concerning language learning benefits and limitations.

Conducting this study on the impact of immersion education on students' MCA-III reading test scores may shed light on the effectiveness of bilingual education practices. With the ever-growing immigrant population during the past three decades, U.S. schools and teacher training programs need to focus on bilingual education (Rong, 2012). With regard to this diversity, bilingual education programs may potentially be instrumental in helping schools tap into the formidable intellectual, linguistic, and cultural resources that bilingual students bring (Billings, Martin-Beltran, & Hernandez, 2010; Stewart, 2013).

MDE (2015) adopted the Common Core Language Arts Standards in 2010 and required all Minnesota public schools to start implementing these standards during the 2012-2013 school year. This study looked at the MCA-III tests which align with the CCS. This is significant when considering that one of the most serious gaps in language immersion research is due to the

absence of assessments that researchers can broaden at the national level (Tedick & Wesely, 2015). Much of the research on language immersion and achievement is based upon standardized tests using state level standards.

According to the Common Core Standards Initiative (2016), 42 states in the US have fully adopted both the language arts and mathematics CCS. Minnesota has not adopted the mathematic CCS but has fully implemented the entire Common Core Language Arts Standards with few additional content adaptations. Studying and comparing the MCA-III reading scores of immersion and non-immersion students may be relevant to other states using the CCS.

Another important aspect of this study is the focus on race, socioeconomic status, and participation or non-participation in total language immersion programs. Researchers who looked at these variables mostly focused on two-way or dual language immersion programs (Fortune, 2012; Lindholm-Leary & Block, 2010). Race, socioeconomic status, and achievement are at the forefront of the Achievement Gap debate, which dominates current issues in U.S. public schools (Zhao, 2007). Closing the achievement gap has been a concern for educational and political leaders for half a century (Mayfield & Garrison-Wade, 2015). This study aimed to shed some light on the effects, if any, of total language immersion on the racial and socioeconomic Achievement Gap in reading and math standardized tests.

Minnesota offers one of the earliest school choice programs in the nation (Friedman Foundation for Educational Choice, 2016). Minnesota residents with school age children are entitled to tax deductions and credits for education-related expenses, including monies for pupils' transportation by a third party. According to MDE (2015), approximately 30 percent of students in public schools exercised their right to choose a particular form of schooling such as open enrollment and language immersion programs. Besides listing the available choices, MDE also

provides fact sheets for parents on standardized tests translated into ten languages. This study intended to look at the effects total language immersion may have on standardized test scores. It has the potential to add to the information available about school choice and achievement on standardized test scores.

Definition of Terms

21st Century Skills. Specify a large set of skills and characteristics that are considered crucial for students to possess in order to be successful in today's world (The Glossary of Education Reform, 2016).

The American Council on the Teaching of Foreign Languages (ACTFL). ACTFL was founded in 1967. It promotes and expands the teaching and learning of all languages at all levels of instruction. ACTFL releases national standards for learning languages (ACTFL, n.d.).

Bilingual Education. A broad term that refers to instruction in two languages. Language immersion programs are a form of bilingual education.

Common Core Standards (CCS). A set of academic standards in mathematics and English language arts/literacy adopted by 42 states. The standards focus on ensuring that students graduate from high school with the skills and knowledge necessary to succeed in college, career, and life (Common Core Standards Initiative, 2016).

Content-Based Language Instruction (CBI). This term is generally used in the United States to describe the use of a second language to learn content. The approach differs from traditional language courses that utilize the language as content. CBI views the language as the medium of instruction (Cenoz & Genesee, 1998).

Content and Language Integration Learning (CLIL). This term was first used in Europe to address the need for promoting second language learning. CLIL refers to the dual

instructional focus of both language and content (Cenoz, Genesee, & Gorter, 2014).

Every Student Succeeds Act (ESSA). This national educational law was signed in 2015 to replace NCLB. It ensures equal opportunity for all students and gives states more control on student performance targets, accountability, and student support (US Department of Education, 2015).

Immersion. At least 50% of the content must be taught in the target language (Cummins, 1998; Tedick et al., 2011). In an immersion setting, the target language is the medium used to deliver content.

Minnesota Comprehensive Assessments (MCA): The MCAs are administered by Minnesota public schools between March and May in grades three through eight and in high school to assess students' progress in meeting the state academic standards in reading, mathematics, and science (MDE, 2016).

No Child Left Behind Act (NCLB). Signed into law in 2002, NCLB reauthorized the Elementary and Secondary Education Act (ESEA). It consisted of increased accountability for states, districts, and schools. It required annual standardized tests for students in grades three through eight. Under NCLB, assessment reports were conducted by subgroups and schools that did not make appropriate progress in all subgroups would undergo improvement processes to ensure all students would attain proficiency within 12 years (U.S. Department of Education, 2004).

Standardized Assessment. A set of consistent procedures for constructing, administering, and scoring an assessment. The aim of standardization is to ensure all students are assessed under uniform conditions to allow interpretation of their performance to be comparable and not to be influenced by differing conditions (ASCD, 1988).

Target Language or Immersion Language or (L2). The minority language used to deliver part or all of the instruction in an immersion setting.

Total or Full Immersion. Typically, all or almost all students only speak the majority language (English) upon entering the program. One hundred percent of core instruction is delivered in the target language from kindergarten to first grade. This is reduced to 80 percent when the formal instruction of English starts in second or third grade (CARLA, 2016).

Two-way or Dual Language Immersion. Students who speak the minority language (Spanish, for example) share the same classroom as students who speak the majority language (English). They learn from one another and the teacher speaks both languages (Tedick et al., 2011).

Assumptions and Limitations

This study had a limited scope because it looked at students' test scores in six elementary schools. Even though the MCA-III is a standardized test and test administrators use the same script during test administration, there may be variations in procedures and scheduling from one school to another. Schools can administer the test at any time from March 5 to May 5, the specified test window outlined by MDE, which varies by a few days every year. The timing of the test may differentiate the amount or depth of instruction that students in different schools receive before they take the test.

School districts are usually very protective of students' test scores. They have research request forms that researchers need to submit in order to receive permission to access and use student data. As a result, it is virtually impossible to have full disclosure of raw test scores and students' demographic information. This study used then public aggregated data reported by

MDE to find answers to its secondary questions related to student demographics and achievement on the MCA-III.

Another limitation to take into account is the many factors that may influence standardized test scores. There was an effort to select schools that show similar demographics but it is necessary to accept that no two schools are exactly the same. Factors such as attendance, teacher turnover, discipline issues, parental involvement, school culture, and climate may affect standardized test results.

Nature of the Study

This study used a quantitative methodology to contribute to the body of research on language immersion education. In particular, it attempted to shed some light on the effects, if any, that total language immersion educational settings have on reading and math standardized test scores in third and fifth grades. Test scores from three pairs (one immersion school and one traditional model school) of elementary public schools from two different Minnesota districts were used. Raw test scores from each pair of schools were compared to identify differences, if any, between the results from the immersion school and the traditional school. Secondary research questions focused on racial and socioeconomic background to compare aggregated public data of students' standardized test scores.

Organization of the Remainder of the Study

Chapter two reviews selected literature related to language immersion education, its theoretical framework, and its main characteristics. It also focuses on standardized testing, its history, and its limitations. Chapter three describes the methodology used in this quantitative study; it includes details about sampling, data collection, instrumentation, limitations of the methodology, and ethical considerations. Chapter four presents the findings related to each

research question. Chapter five discusses the implications of the findings. Chapter five also includes recommendations for further research followed by concluding remarks about the study and its findings.

Chapter II: Literature Review

Introduction

This study comprises a number of variables that call for an extensive review of the literature around language learning, the language immersion approach and philosophy, and standardized testing. To identify relevant themes in this research, each variable was reviewed from its origins to its current circumstances. The review also includes differing viewpoints to ensure a rather exhaustive representation of each aspect of the study.

Language learning in America has evolved throughout history (Alfaro, Durán, Hunt, & Aragón, 2014; Baker & Jones, 1998; Collier, 1989; Ovando, 2003). Immersion programs represent one facet of that evolution. Standardized tests appear to be a familiar topic in educational debates. Besides finding trends in the literature, it is important to underline the viewpoints of both the advocates and detractors of standardized testing. There are also laws related to language learning and standardized testing that are relevant to this literature review.

This study used Cummins' Interdependence Hypothesis Theory and his Threshold Hypothesis as the basis for its framework (Cummins, 1979). These two theories reinforce the idea that in immersion programs, learning a minority language is not detrimental to the majority language. On the contrary, literacy skills acquired in the minority language will transfer to the majority language. In other words, instead of competing, the minority and majority languages reinforce each other for deeper cognitive and academic gains (Cummins, 1979).

Evolution of Language Education in the United States

Discussions about language happened at the onset of the establishment of the United States as a nation. Despite the diversity of American Indian languages, the founders had a vision of a unified nation. This unification included traditions, history, and language (Kaplan & Owings, 2011). Nevertheless, the teaching of non-English languages in the United States evolved in very different ways throughout history. Historians describe the evolution of non-English language teaching and learning in four overlapping periods: the Permissive, Restrictive, Opportunist, and Dismissive periods (Baker & Jones, 1998; Kaplan, 2004; Ovando, 2003).

The Permissive Period (1700s-1880s) occurred during a heavy influx of immigration to the United States. This trend, combined with less federal and state supervision in rural schools, helped introduce many European languages, most notably German, in U.S. schools. At this time, it was mainstream to use the majority language of the community in school. As a result, German, Norwegian, and Dutch were regularly in use to instruct students across the United States, especially in the Midwest (Baker & Jones, 1998).

During the Restrictive Period (1880s-1960s), new laws provided funding to promote English learning (Baker & Jones, 1998). This period also saw the enactment of the 1906 Naturalization Act that required the ability to speak English to all immigrants who apply to become U.S. citizens. Restrictions on non-English languages during this era led to English being the only language used in U.S. schools during the first half of the twentieth century, despite the fact that there was no designated official language in the country (Ovando, 2003). World War I was instrumental in the Restrictive Period. Responding to the negative perception of the Germans, the U.S. Bureau of Education, through its Americanization Bureau, recommended English be the sole language of instruction in elementary schools (Baker & Jones, 1998).

The Opportunist Period (1960s-1980s) brought yet more changes to language education in the United States. In 1958, Title III of the National Defense Education Act aimed at reinforcing the instruction of foreign languages in American schools (U.S. Senate, n.d.). President Dwight Eisenhower authorized the law in response to the Soviet Union's launching of Sputnik (U.S. Senate, n.d.). This law provided funding to promote the instruction of foreign languages and the training of highly competent teachers. This period was at the onset of the introduction of language immersion programs.

Even though the term "immersion" was not used yet, the first dual language school in the United States started in Florida in 1963. Political turmoil in Cuba brought a massive wave of Cuban immigration to the United States, particularly to Florida in the early 1960s (Ovando, 2003). These newcomers wanted to ensure that their children spoke their native Spanish while going to school in the United States. In this effort, the Cuban community in Dade County started Coral Way Elementary, a two-way bilingual school where students learned both in Spanish and English (Baker & Jones, 1998; Ovando, 2003). This endeavor was a great success.

The term "one-way language immersion program" originated in Canada in 1965 (Cammarata & Tedick, 2012). Since then, these types of programs have exponentially grown in the United States (Center for Applied Linguistics, 2016). Most of the research on one-way and total language immersion programs was conducted in Canada; one trend in the research was that results linked language immersion to higher academic gains (Fortune, 2014; Genesee & Cloud, 1998; Marian, Shook & Schroeder, 2013; Wall, 2012). Throughout the years, the United States has seen an emergence of various language immersion programs that aim to meet the requirements of globalization in the 21st century as well as federal accountability demands (Met, 2008).

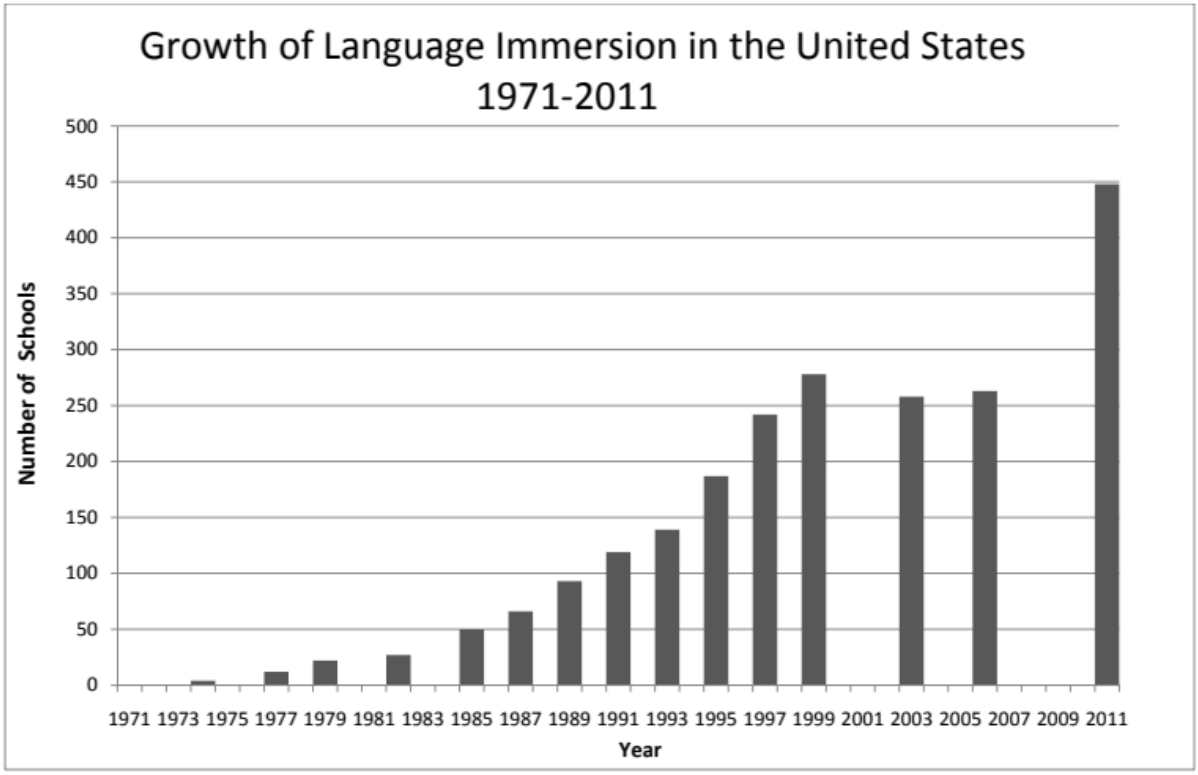
The Opportunist Period saw substantial changes in the legislation through the 1968 Bilingual Education Act and the 1974 "Lau v. Nichols" Supreme Court Case (Baker & Jones, 1998; Mehisto & Genesee, 2015). The Bilingual Education Act approved the use of non-English languages for instruction in schools. Critics of the law emphasized though that it did not go far enough in promoting the use of students' mother tongue in schools because its main objective was to ensure that non-English speaking students ultimately shifted to English (Baker & Jones, 1998).

In the Case of "Lau v. Nichols," the Supreme Court determined that students who speak little or no English should benefit from differentiated instruction and instructional tools in order to be successful in U.S. schools (Baker & Jones, 1998; Mehisto & Genesee, 2015). This decision triggered the use of corrective measures to address inequalities in education due to a lack of proficiency in English (Baker & Jones, 1998). However, the corrective measures (such as the isolation of limited English proficiency students from the mainstream classrooms) brought controversy and many amendments to the law (Stewner-Manzanares, 1988).

The proliferation of language immersion programs (see Figure 1) continues to take place amidst what is called the Dismissive Period (1980 to present) of bilingual education in the United States. The Dismissive period marked an emphasis on English immersion for students who speak a minority first language (Cadiero-Kaplan, 2004). It is remarkable that states are still undermining minority first languages and cultures when so much research points in the opposite direction. Many researchers, including Cummins, insisted that a strong foundation in the first language is a prerequisite for academic success in a second language. Speaking a minority language should be perceived as an asset and should be used at the service of acquiring the majority language (Cadiero-Kaplan, 2004; Collier, 1989; Cummins, 1979).

Figure 1

Directory of Foreign Language Immersion Programs in U.S. Schools



(Center for Applied Linguistics, 2016)

Even though there are many dual or two-way immersion programs that serve students who speak a minority language at home, traditional school programs favor an English-only environment for the aforementioned students. There is even an effort by schools to discourage the use of the minority first language (Cadiero-Kaplan, 2004). These practices undermine the concept of Additive Bilingualism (Cummins, 2000), the simultaneous development of a second language, and the reinforcement of the first language. Contrarily, Subtractive Bilingualism describes the mindset that one language replaces the other; reinforcing the minority first language is detrimental to learning English, the majority language (Cummins, 1994). This assessment of language learning generated a negative view of minority first languages and their use in schools. Total immersion programs under study in this research are automatically viewed

as a form of Additive Bilingualism because participants typically speak the majority language and are merely adding another language at school (Collier, 1989).

Theoretical Framework

Language immersion education is based on the integration of language and content. Put simply, students learn content in the target language (Cammarata & Tedick, 2012). Language acquisition theorists, such as Chomsky and Krashen, support the natural approach of learning a language that immersion education uses (Floyd, 2011).

Second language theorists, such as Krashen (2013), tested the Acquisition-Learning Hypothesis to differentiate between language learning and language acquisition. Acquisition refers to the subconscious gain of language as opposed to language learning which is a conscious process. Krashen (2013) argued that language immersion students go through both processes unlike other students in traditional second language programs.

Second Language Acquisition (SLA) theories explain second language learning and proficiency through various perspectives and hypotheses. In 1957, Skinner's behaviorist perspective argued that humans learn like any animal through imitation, practice, positive reinforcement, and habit formation (B. F. Skinner Foundation, 2014). Total immersion kindergarten students, who gain language skills imitating their teachers' utterances, may reinforce this view. Noam Chomsky's Nativist or Innatist Perspective (Chomsky, 1959) claimed that humans are born with an innate ability to acquire the language they are surrounded with through Universal Grammar (UG). In an immersion setting, students are surrounded by the target language on a daily basis. The Cognitive Perspective emphasized that humans file aspects of language that can be automatically accessed after regular practice. Finally, Vygotsky's Interactionist Perspective considers conversational interaction, which happens often in

immersion classrooms, as the main prerequisite to second language acquisition (Menezes, 2013). Immersion school practices align with these theories because students spend most of their school day hearing, speaking, and interacting in the immersion language.

The central theories of this study are Cummins' Interdependence Hypothesis (Figure 2, Iceberg Model) and his Threshold Hypothesis (Figure 3, Cummins, 1979). James Cummins developed the Interdependence Hypothesis in 1979 to establish the relationship between acquiring the native language and learning another language (Cummins, 1979). Cummins represented this theory as a dual iceberg to illustrate that languages may have apparent features that vary; however, beneath those features, there are common proficiencies across all languages. He posited that these common proficiencies include higher cognitive tasks such as literacy and problem solving which we commonly see in standardized tests. This Interdependence Hypothesis implies then that when total immersion students are engaged in standardized test-taking, they are tapping into proficiencies from the two languages they speak for optimal performance (Collier, 1989).

Cummins (1979) warned that in order to transfer the higher cognitive proficiencies across the languages they speak, children need to have a good command and a solid foundation in their first language (L1). He presented this view in his Threshold Hypothesis. According to Cummins (1979), total language immersion students will reap the benefits of the transfer of higher cognitive proficiencies between their languages because they receive their instruction in the immersion language in the lower grades while using their first language, which is usually the majority language, outside of school. In doing so, they are building levels of proficiency in both languages that will allow them to have the advantage of transferring higher cognitive proficiencies between both languages (Cummins, 1979; Collier, 1989).

Figure 2

Cummins' Iceberg Model of Language Interdependence

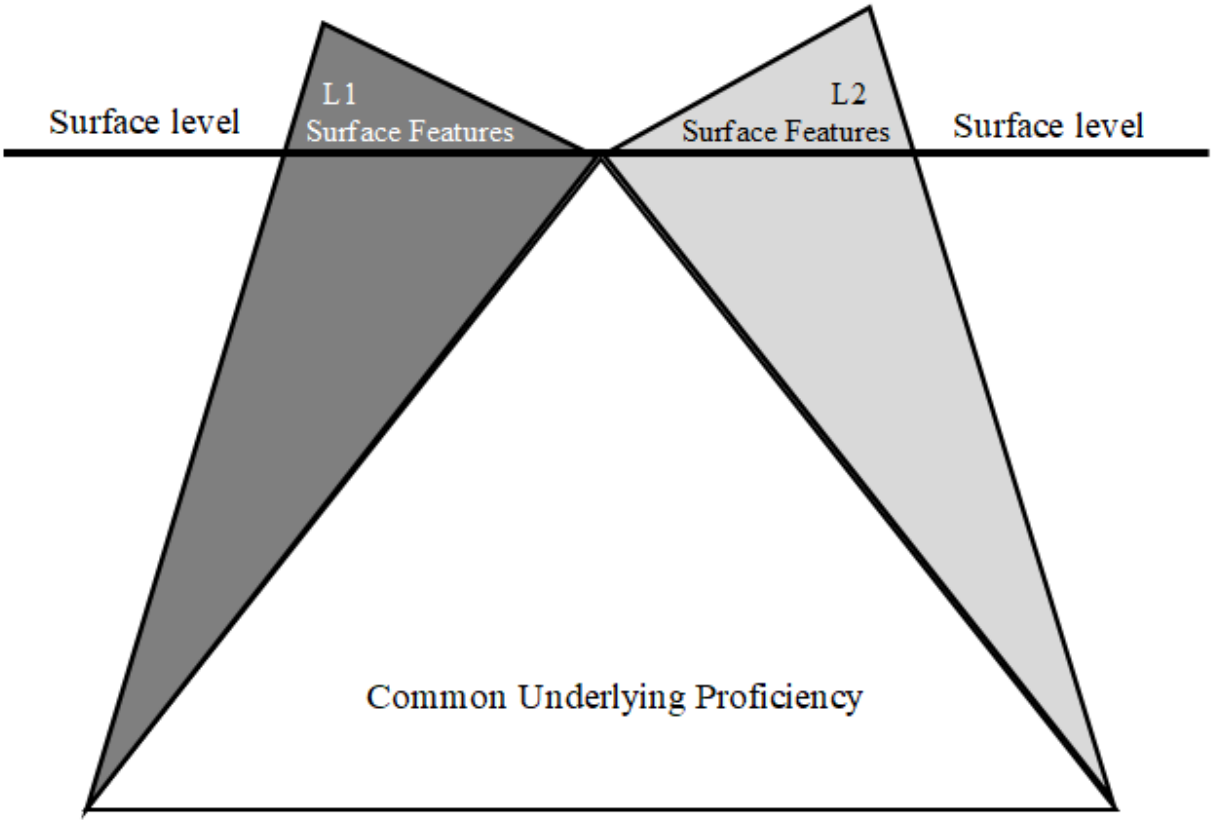
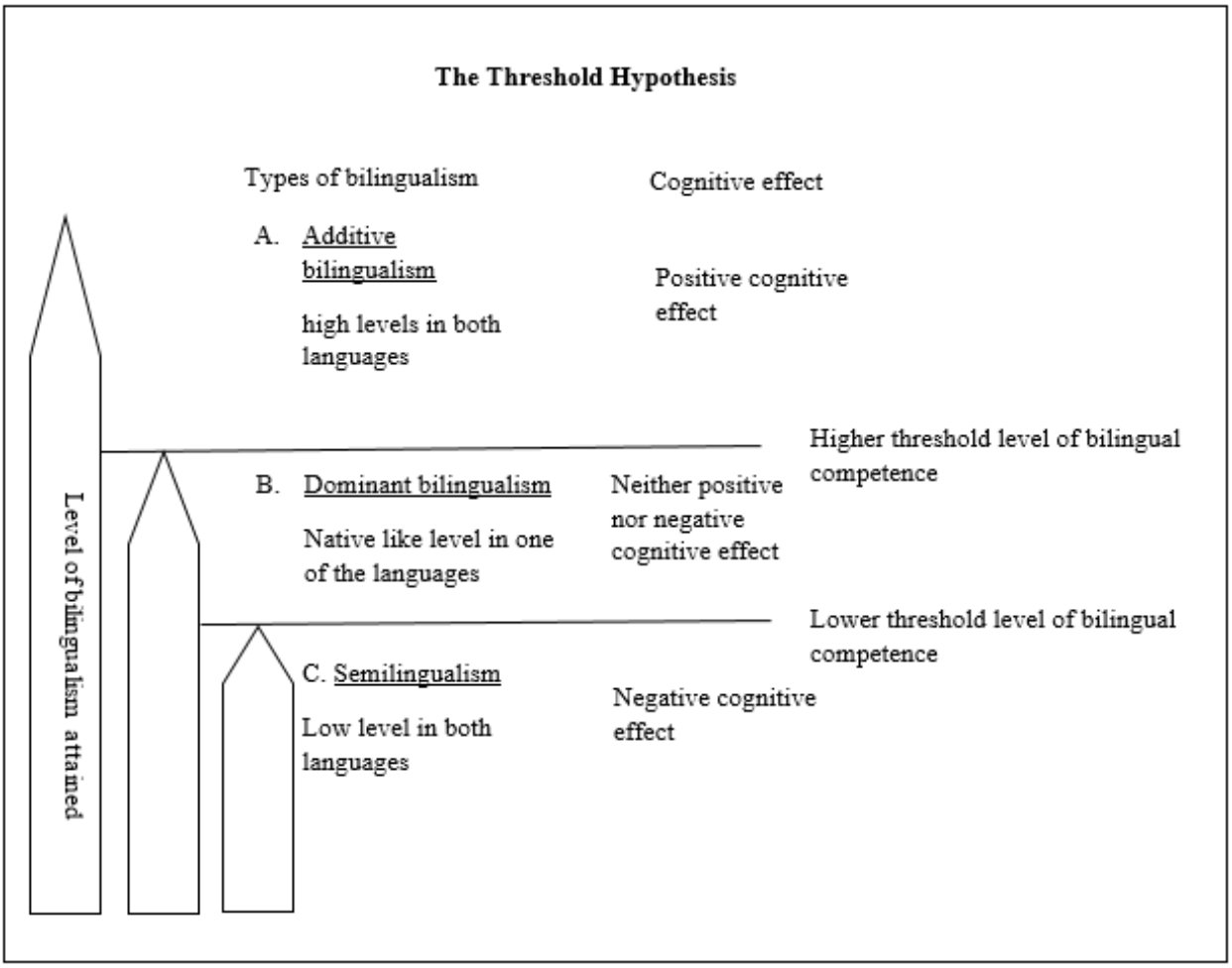


Figure 3

The Threshold Hypothesis

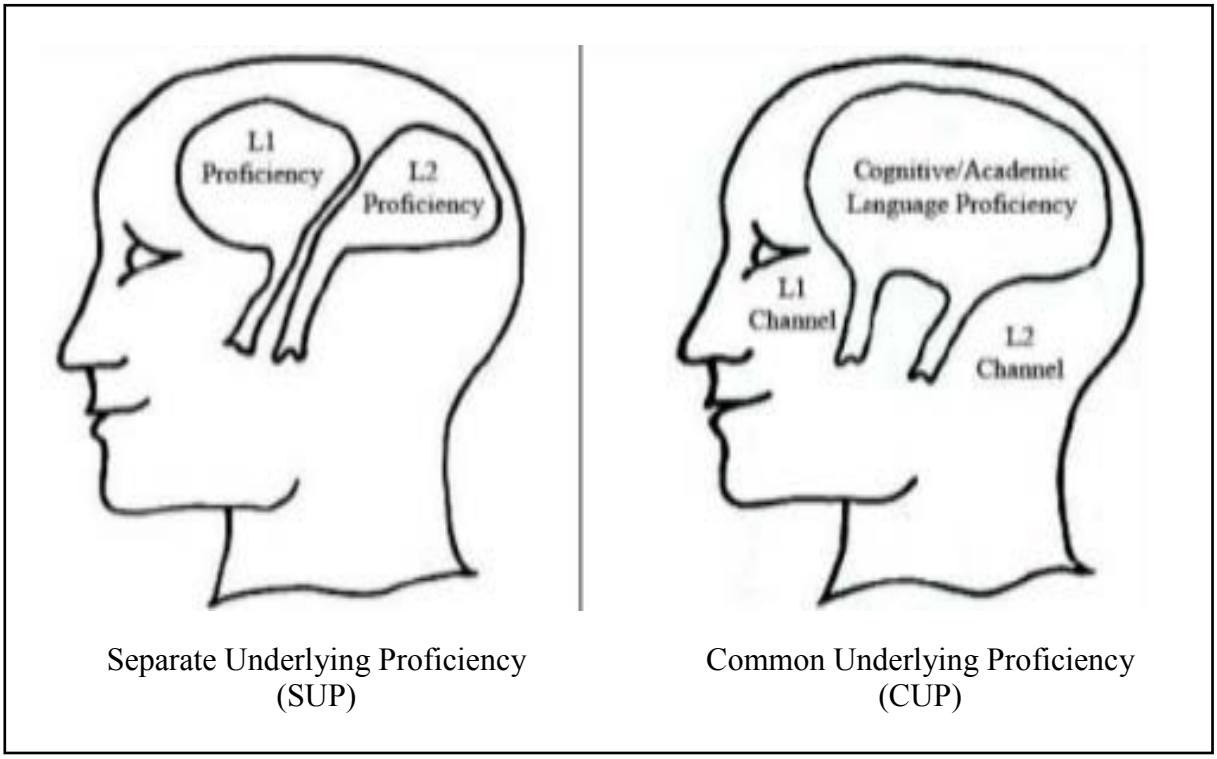


To further explain the relationship between acquiring the first language and learning another language, Cummins (1979) used the Common Underlying Proficiency (CUP) model (Figure 4, One Balloon). CUP illustrates that proficiencies in areas that require higher cognitive functions, such as learning content and problem solving, are common across languages. While total immersion students are learning a second language at an accelerated level in grades K through two, their first language is still developing in and outside of school. When English language arts instruction is formally introduced in either second or third grade, immersion students learn content through two languages, thus benefiting even further from the CUP of the

languages (Cummins, 1979; Collier, 1989). This study put CUP benefits to the test by comparing immersion and non-immersion students' standardized test scores.

Figure 4

One Balloon Underlying Proficiency



Beyond CUP, Cummins (1979) also made the distinction between Basic Interpersonal Communicative Skills (or BICS) and Cognitive Academic Language Proficiency (or CALPs Figure 5). BICS refer to the language that individuals use to interact in a social setting using contextual clues such as body language and facial expressions to facilitate communication and maximize mutual understanding. Contrarily, CALP indicates a more demanding use of academic language in a context-reduced setting that requires higher cognitive functions. In a concrete example, one can say that a conversation between children on the playground would illustrate BICS. A student who takes a standardized test is engaged in CALP.

Theories in quantitative studies should explain the reason why an independent variable *x* would have an impact on a dependent variable *y* (Creswell, 2014). The current research questions are based upon a main independent variable which is the school model (total immersion or traditional) and a dependent variable represented by MCA-III test scores. An application of CUP to the present study would propose that total immersion programs may positively influence students' standardized test scores. In fact, in a total immersion setting, students learn content through a second language (not English) which is a cognitively demanding task. When total immersion students take the MCA-III test in English, which requires students to perform cognitively demanding tasks in both literacy and mathematics, they tap into the common underlying proficiencies of their immersion language and their first language (English).

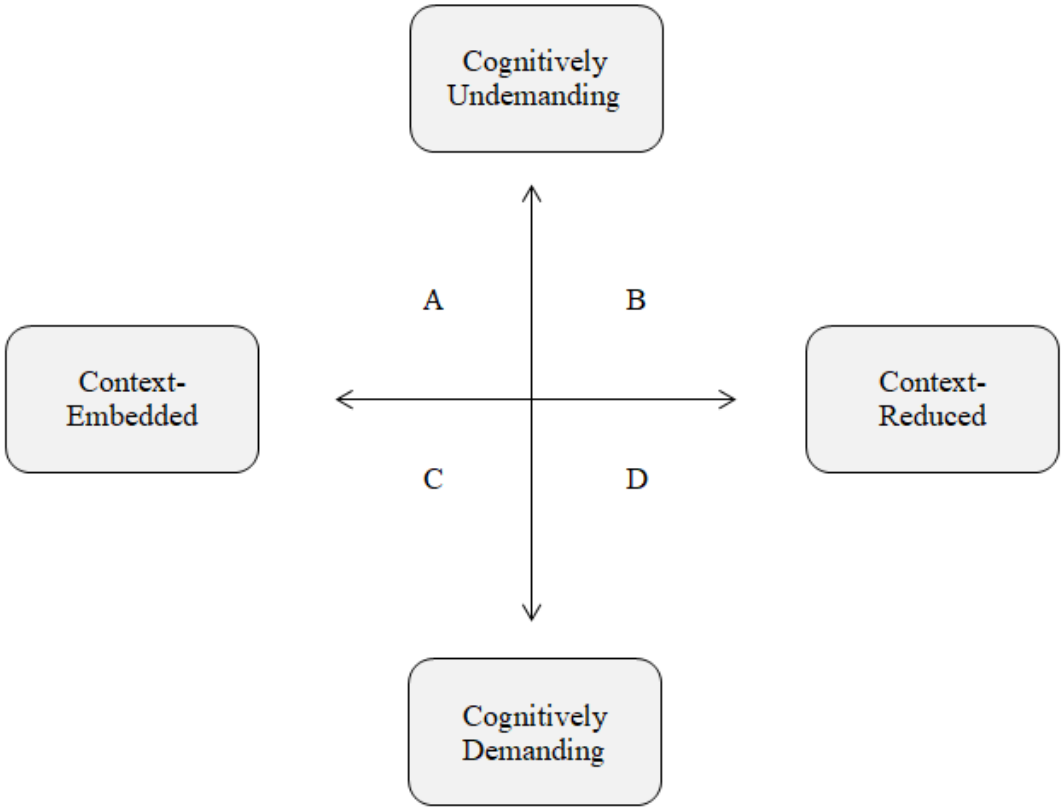
Even though researchers agree that Cummins made significant contributions to bilingual education (Baral, 1987; MacSwan, 2000), some argue that his Threshold Hypothesis may negatively affect students who speak a minority language. MacSwan (2000) criticized how teachers may see the Threshold Hypothesis as a basis to hold a deficit view of students who speak a minority language. Cummins' CALP and BICS dichotomy drew so much criticism that he stopped using this comparison in some of his subsequent publications (Baral, 1987). In particular, the term "semilingualism" generated heated debate due to its perceived pejorative connotation concerning the linguistic abilities of students who speak a minority language at home (Baral, 1987; MacSwan, 2000). As a result, beyond CALP and BICS, Cummins (1981) used a model that involves contextual support and the level of cognitive involvement in his construct of language proficiency. The continua below (Figure 5) describes how the tasks students have to perform can be classified into four categories: cognitively demanding, cognitively undemanding, context-embedded, and context-reduced (Cummins & Swain, 1986).

Cognitively demanding tasks refer to activities such as standardized tests that require higher cognitive function. When taking a standardized test, students may be engaged in solving word problems without the support of manipulatives. Cognitively undemanding tasks are in contrast less challenging and involve activities like conversations between peers. A context-embedded task would include visual and oral cues that would support the student in completing the task. An example may include a face-to-face conversation because gestures and facial expressions reinforce the communication. By contrast, a context-reduced task would not involve context clues that aid in accomplishing the task.

Cummins model of the quadrants still differentiate between interpersonal conversations and academic language. It is also apparent that BICS falls within the A quadrant and CALP appears in the D quadrant (Baral, 1987).

Figure 5

Cummins' Quadrant Model



Magnet Schools

Magnet Schools started in the United States in the 1960s after protests against education inequity and racial segregation (Magnet Schools of America, 2013). In 1970, federal funds were attributed to magnet schools in an effort to assist districts in desegregating. Through the Magnet Schools Assistance Program (MSAP), Congress provided funding for magnet schools throughout the United States. The hope was that this funding would help achieve three main objectives for magnet schools: promote diversity, improve academic performance, and extend school choice (Kitmitto, Levin, Betts, Bos, & Eaton, 2016).

Magnet Schools attract students and parents who share an interest in the particular theme of the school. Unlike neighborhood schools, most magnet schools do not have entrance

requirements but they use lottery systems to enroll students. Magnet schools include specialized foci such as Fine Arts, Foreign Languages (both immersion and non-immersion), and Science Technology Engineering and Mathematics (Magnet Schools of America, 2013). Because parents select magnet schools based on their own and their children's interests, parental involvement and partnership with such schools may be more substantial than in mainstream schools (Magnet Schools of America, 2013).

Parents' Involvement in Language Immersion Programs

Most language immersion schools are choice schools. This means parents make a conscious choice to enroll their child in a school that is not necessarily their neighborhood school. Usually, parents who select the school are more involved in their children's education and are more likely to support their learning in various ways (Steele, Slater, Li, Zamarro, & Miller, 2015). This increased parental support may influence academic achievement in choice schools such as public immersion programs. It is important to consider this variable in research, such as the current study that is related to language immersion and achievement.

Types of Immersion Programs

There are several models of language immersion education, but research seems to agree that the following eight characteristics are central to immersion programs (Johnson & Swain, 1997; Krashen, 1998):

1) The L2 is a medium of instruction

2) The immersion curriculum parallels the local L1 curriculum

3) Overt support exists for the L1

4) The program aims for additive bilingualism

5) Exposure to the L2 is largely confined to the classroom

6) Students enter with similar (and limited) levels of L2 proficiency

7) The teachers are bilingual

8) The classroom culture is that of the local L1 community

A common principle is that at least 50 percent of the instruction has to happen in the target language for a school to qualify as an immersion setting (Collier, 1989; Tedick, Christian, & Fortune, 2011). Models of language immersion programs include one-way total immersion, two-way or dual language immersion, and partial immersion.

One-way total or full immersion programs. This study focused on one-way total or full immersion programs. In one-way total immersion programs, the majority of students speak the dominant language (CARLA, 2016), which is English in this research. However, they receive instruction in all core content areas in the target language starting in Kindergarten (Collier, 1989). The amount of instruction in the immersion language is reduced to 80 percent when English starts in second or third grade (CARLA, 2016). The immersion promise is to equip students with literacy skills in two languages and a solid foundation in core academic subjects (Rega, 2015).

Students in the total immersion programs in this study receive 100% of their instruction in the target language from kindergarten to first and second grade (Collier, 1989). They start to receive formal English reading instruction in second and third grade. In Minnesota, total immersion students take the MCA-III reading test in third grade, along with their counterparts from traditional public-school models (MDE, 2016). Therefore, some of the total immersion students take the test merely seven months after starting to receive formal English reading instruction.

Students in total immersion programs also receive their mathematics instruction in the IL throughout elementary school. In Minnesota public schools, immersion students take the MCA-III math test from third grade to high school along with students in mainstream schools who receive their mathematics instruction in English (MDE, 2016). The MCA test items are in English and test administrators ensure they use English during testing and while reading test directions.

Two-way immersion programs. Two-way or dual language is the most popular (Pacific Policy Research Center, 2010) and the most researched (Slater, 2017) immersion program in the United States. Students who speak the minority language (Spanish, for example) share the same classroom as students who speak the majority language (English). They learn from one another and the teacher speaks both languages (Tedick et al., 2011). In two-way immersion language programs, students use one language at a time (Pacific Policy Research Center, 2010) to separate the languages and maximize language acquisition.

Many language learning researchers advocate for this model of language immersion because it values both the minority and the majority language (Collier, 1989). It strongly reflects the concept of Additive Bilingualism. Rather than keeping the minority language away from the classroom and replacing it with the majority language, the two-way immersion model includes both the student's fist language and the IL. Teachers are usually fluent in two languages and use them both in the classroom. Cummins (1979) advocated for this model of teaching a second language when he developed his Common Underlying Proficiency Model (Figure 2). He wanted to counteract the theory that when students learn and use their first minority language at school, it will then be harder for them to acquire the majority language. This view was very popular in the United States most of the 20th century and was supported by people who feared English

would fade amidst the many immigrant languages present in the U.S. (Oller & Eilers, 2002).

Partial immersion programs. Partial immersion programs differ in the amount of time devoted to the target language (Pacific Policy Research Center, 2010). Many partial immersion schools apply the 50/50 approach between the majority language and the target language. As opposed to total immersion, schools using the partial immersion model are less burdened with staffing challenges. Given the model, one teacher can instruct two classes when only half of the day is spent using the target language (Met, 1993). Even though this relative reduction of the use of the target language negatively impacts students' levels of proficiency, it eases parents' concerns about their children not receiving any instruction in the majority language, similar to the early grades of total immersion (Met 1993).

Language Immersion Pedagogies and Practices

Content Based Language Instruction (CBI) and Content and Language Integrated Learning (CLIL) are two terms that depict the immersion model approach. CBI is mostly used in the United States while CLIL is generally used in Europe; however, both terms emphasize the integration of language and content (Cenoz & Genesee, 1998; Cenoz, Genesee & Gorter, 2014).

In immersion schools, language learning is integrated in most subject areas. The target language is the medium through which teachers deliver instruction (Fortune, 2012). Parents choose to send their children to immersion schools with the expectation that they will acquire a second language and build solid literacy skills in two languages (Pacific Policy Research Center, 2010). Teachers typically select content-obligatory and content-compatible language objectives during lesson planning. This results in the integration of language and content (Kong, 2015). Beyond the content under study, every lesson becomes thus a language lesson and an opportunity to expand students' vocabulary.

In language immersion programs, it is necessary to address the goals of bi-literacy, bilingualism, and cultural competency. These needs call for a variety of instructional approaches including student-centered learning, differentiation, scaffolding, repetition, and explicit vocabulary instruction (Howard et al., 2018). Since in an immersion setting the target language is used to teach, every lesson becomes a language lesson. Vocabulary learning is embedded in daily lesson planning. Scaffolding and the use of visual aids is routine. Repetition and modeling must be the norm (Howard et al., 2018).

The American Council on the Teaching of Foreign Languages (ACTFL), founded in 1967, promotes and expands the teaching and learning of all languages at various levels of instruction. ACTFL released national standards for learning languages (ACTFL, n.d.). Another important role of ACTFL is to design standardized language assessments that measure oral production (ACTFL, 2016). This is an asset for immersion programs since they need to assess oral proficiency and set specific linguistic goals for students.

21st Century Skills

Twenty-first century skills specify a large set of skills and characteristics that are considered crucial for students to possess in order to be successful in today's world (The Glossary of Education Reform, 2016). The Partnership for 21st Century Learning determined that 21st century learners must be able to communicate in a multilingual setting (Genesee & Cloud, 1998; p21.org, n.d.). Language immersion schools respond to this goal as they aim to prepare students to be fluent in a second language.

Collaboration is another key aspect of 21st century learning (DiCicco, 2016; p21.org, n.d.). Immersion education helps foster students' collaborative skills. Effective immersion and dual language teachers should routinely use cooperative learning (Howard et al., 2018) to ensure

that students have the opportunity to use the target language in meaningful ways. Immersion teachers also facilitate collaboration and exchange opportunities between their students and students in countries where the target language is the majority language. This is an effective approach in helping students utilize native speakers as language role models to enhance their own production of the target language.

Beyond the language, immersion education also focuses on cultures where the target language is spoken. Immersion students get to learn a new language, but they also develop cultural competence through instruction and interactions with native speakers of the target language and culture. In addition, many immersion school staff are native speakers and members of the target language culture (Schwabsky, 2013) thus providing students opportunities to build cultural competency through daily communication.

Besides improved test scores, today's schools also have to focus on the requirements of globalization for education. Globalization emphasizes competitiveness between countries and requires a focus on 21st century skills. In partnership with businesses, educators identified a set of skills that 21st century learners must possess: creativity, collaboration, communication, and critical thinking (p21.org, n.d.). All of these simultaneous demands make it hard for U.S. schools to showcase their effectiveness in so many areas. As a result, schools have the tendency to focus on tested skills even if it means that creativity and innovation are ignored or not cultivated (Zhao, 2006).

Benefits of Language Immersion Education

Providing an environment that allows students to be bilingual and biliterate is one the main goals of immersion programs (Fortune, 2012). Besides the ability to interact with more people, research seems to agree that bilingual education is beneficial to student achievement

(Garcia & Kleifgen, 2010; Genesee & Cloud, 1998; Tedick et al., 2011). Several researchers reinforced the positive effects of bilingualism on cognitive development (Barac et al., 2014; Espinoza, 2015). Some studies focused on the long-term effects of bilingualism and found that it may contribute to protecting individuals from cognitive decline (Bialystok et al., 2012).

Collier (1989) synthesized an important body of research on academic achievement in a second language. One of her conclusions was that students in total immersion programs reach national norms on standardized testing by fifth grade and perform above average for the rest of their school years.

Challenges of Language Immersion Education

Language immersion is not without challenges, including adequate curricular materials that meet current standards and finding ways to have students properly use the target language (Tedick & Cammarata, 2012). Most total immersion parents do not speak the target language and cannot be as supportive as they wish. In addition, adequate staffing and proper assessment tools to gauge students' oral proficiency levels are often lacking (Tedick & Wesely, 2015).

All public schools, including immersion schools, must ensure that students are proficient in the standards the state determines for each grade level. The adoption of the Common Core Standards and the requirement to administer standardized tests make it even more important to meet these standards. Immersion schools have the challenging task of finding adequate curricular resources that are in the target language and that cover the required standards (Fortune, 2012). Furthermore, the language arts state standards refer to English language arts. As a result, immersion schools need to adapt them to match some aspects of the target language, such as grammar rules that are different from English.

Immersion school administrators face the double challenge of staffing their schools with individuals who have the appropriate certification and who are fluent in the target language (Tedick & Wesely, 2015). They may even need to recruit teachers from abroad (Met, 2008). Before NCLB, which brought tougher teacher qualification regulations, it was common practice to request provisional licenses for staff members who are fluent in the target language but do not have the specific certification that the position required. Many immersion school administrators end up hiring monolingual English speakers to teach non-core subjects such as music, art, and physical education. In Minnesota, it is common for immersion schools to hire native speakers who would come from a different country to assist teachers in the immersion classroom and act as language role models for the students and staff members.

Adequate professional development for language immersion teachers is a struggle that most immersion programs face (Tedick & Wesely, 2015). One of the major challenges of immersion programs is finding a balance between language and content. In order to meet this goal, teachers should benefit from preparation and ongoing training that focus on the integration of language and content. Unfortunately, research agrees that immersion programs need to address the lack of professional development opportunities that target the integration of language and content (Tedick & Cammarata, 2012; Tedick & Wesely, 2015).

Assessing students' oral proficiency may be very difficult due to a lack of benchmarks. Most immersion students' oral production in the target language is different from a native speaker's oral production (Fortune, 2012). Experts agree that immersion students sometimes have their own version of the target language (Tedick & Cammarata, 2012). Existing tools, such as the ACTFL Oral Language Proficiency Interview (OPI), may not cover all languages taught in immersion programs. In addition, existing tests may lack the features that make them easy or

feasible to administer them to a large number of people. The OPI consists of a 20-30 minute one-on-one interview (ACTFL, 2016) which makes it challenging to use on a large scale. As a result, immersion schools oftentimes end up not having a formal or standardized way of assessing one of their most important priorities - their students' oral proficiency in the target language.

Parents are one the greatest assets of any immersion school. They must be strategic partners in helping the program reach its goals through advocacy (Howard et al., 2018). The very fact that most parents *chose* to send their child to a language immersion school (Steele, Slater, Li, Zamarro, & Miller, 2015) makes them very supportive of the program. There are, however, limits that accompany the target language. Most parents do not speak the target language, especially in total language immersion programs where the majority of students speak the majority language at home (Schwabsky, 2013). This has the potential to limit their ability to help their child with specific learning difficulties.

A challenging aspect of immersion programs is that there are many misconceptions associated with this teaching methodology. Contrary to popular belief, language immersion is not meant only for students with above average academic abilities (CARLA, 2002) or those from upper-middle class families. This view has the potential of representing immersion program as elitist (Genesee, 2007). Genesee (2007) conducted a rather comprehensive review of the research and concluded that even though findings are limited, students with academic difficulties do benefit from being in an immersion setting. Another misconception is caused by the interchangeable use of terms, such as bilingual education and immersion, related to language learning and teaching. This lack of clarity in the language learning terminology creates confusion for practitioners that make it hard for the general public to understand immersion programs (Pacific Policy Research Center, 2010).

The goal of immersion programs is to ensure that students' bilingualism is plural because it encompasses the four language abilities as identified by Baker (2001): speaking, listening, reading, and writing. It is no easy task to reach such a multilayered goal when research agrees that immersion educators struggle to have students consistently use the target language in the immersion classroom (Fortune, 2012). This is especially true for students beyond the primary grades. Another difficulty is that immersion students rarely gain the grammatical accuracy of native speakers (Hermanto, Moreno, & Bialystok, 2012).

Standardized Testing

History and evolution of standardized testing in the U.S. The origins of standardized testing can be traced back to the Binet's IQ test and to World War I (Clarke, Madaus, Horn, & Ramos, 2000; Haney, 1984). In 1908, Binet used his Intelligence Quotient test to measure the intelligence of French students. This test drew much attention to learners' abilities and how to identify their strengths and weaknesses. However, when the U.S. Government saw the need to categorize new recruits during World War I, Binet's individualized IQ test lacked the practicality needed to quickly assess a large number of people. As a result, the Alpha & Beta test was created to assess new Army recruits in an efficient and swift manner using multiple choice items. After this, the popularity of standardized testing quickly reached schools (Haney, 1984).

The emphasis on standardized testing stems from the belief that students' scores can be instrumental in improving teaching and learning (Faria et al., 2014). Despite much skepticism on the effectiveness of standardized tests to measure learning, they are still used to ensure accountability in schools (Zimmerman & Dibenedetto, 2008). Even though it is not easy to pinpoint what makes schools effective, standardized tests are one crucial measure of effective schools (Frederick, 1987).

In response to growing accountability demands, school districts now face the obligation of putting programming and instructional practices in place that will have a positive effect on assessments results (Graue et al., 2016; Ingersoll, Merrill, & May, 2016).

Minnesota Comprehensive Assessment (MCA). Minnesota public schools administer the online MCA-III reading and mathematics in grades three through eight and in high school. In addition, the MCA science is given online to students in grades 5 and 8 and in high school (MDE, 2016). MCA-III are primarily designed to assure that students are meeting the state academic standards. The tests also assess alignment between the curriculum offered by districts and the state standards (MDE, 2016).

Standardized tests are grouped into three main categories: diagnostic, norm-referenced, and criterion-referenced assessments (Wiliam, 2010). As its name suggests, a diagnostic test aims at gauging the learners' knowledge prior to instruction in order to identify specific needs. A norm-referenced test is geared towards the students' varying levels of achievement. It measures the degree of mastery that students possess. A criterion-referenced assessment measure students' performance against a set of criteria or standards. The MCA-III is a criterion-referenced test that helps Minnesota school districts' gauge their application of the academic standards set by the state (MDE, 2015; Wiliam, 2010).

The reading and mathematics MCA tests take place between the months of March and May; both tests became adaptive in 2016 (MDE, 2016). This means that the current tests adjust to the student's learning level. In other words, students' answers determine the next question and its level of difficulty (MDE, 2016). This adaptive feature is a new addition that ensures more personalization.

MDE addresses the "teaching to the test" stigma that is commonly used against standardized tests. This was extremely important after the tougher requirements of NCLB hit schools hard, especially those that did not make the Annual Yearly Progress (AYP) list. MDE (2016) insisted that the MCA tests measure the schools' and districts' alignment to the Minnesota academic standards; therefore, "teaching to the test" simply refers to teaching the Minnesota standards.

Limitations of Standardized Tests

Assessing learning is a laudable endeavor that helps educators, school districts, and the community at large measure the effectiveness of particular instructional strategies (Wiliam, 2010). Standardized tests represent a fairly simple way of assessing a large number of students. There is, however, a great deal of controversy that surrounds the use of standardized tests in schools. Throughout the years, critics of standardized tests have denounced many aspects of the tests (Wiliam, 2010). It is true that standardized tests contain various limitations. Besides, test scores are the results of an assessment a student takes in only two or three days out of the school year. Another limitation is that researchers have pointed out systematic errors and biases in standardized testing. In addition, many have wanted a greater variety in ways of assessing students, teachers, and programs (Kane, 2015; Somers, Zhu, & Wong, 2011).

Another limitation is that standardized tests do not measure crucial skills such as creativity, collaboration, risk-taking, and innovation (Zhao, 2006). This is one of the weaknesses that most opponents of standardized testing list as its main shortcoming because these overlooked skills are central to the profile of the 21st century learner (p21.org, n.d.). Standardized tests mostly measure core subjects such as reading, mathematics, and science. Other subject matters do not receive the same attention given to tested content areas.

Chapter III: Methodology

Philosophy and Justification

The purpose of this research was to examine the effects of language immersion on standardized tests by comparing immersion and non-immersion students' MCA tests scores. This non-experimental research study compared standardized test scores between students enrolled in a total foreign language immersion program and students who attend a traditional school model. Non-experimental research approach is utilized to measure the extent of the relationship between quantitative variables such as test scores (Orcher, 2014; Patten, 2014). The study used standardized test scores from three immersion schools and three traditional schools in two Minnesota school districts. Testing data from two schools (one total immersion and one mainstream school) within the same district were compared. The two schools share similar demographics to help control for this variable that may influence standardized test results.

"A distinctive feature of quantitative research is that researchers gather data in such a way that the data are easy to quantify, allowing for statistical analysis" (Patten, 2014, p. 9). Standardized test scores are quantitative variables because they represent numbers that differ depending on individual performance (Patten, 2014). In an effort to compare immersion and non-immersion students' MCA-III test scores, this study gathered numerical data that calls for a quantitative methodology (Muijs, 2011).

Research Design Strategy

This non-experimental study used quantitative research to find answers to its primary research questions. Standardized test data were collected from two Minnesota public school districts. Each district has at least one total immersion elementary school and one mainstream elementary school with demographics somewhat similar to the selected immersion school. After

obtaining approval from the districts, students' raw MCA scores were collected in an electronic format. The study used therefore secondary data for analysis.

In order to answer the secondary research questions, standardized test data were collected from the Minnesota Department of Education website. This website includes an interactive data center that allows the public to find MCA test scores from public schools. Through the interactive data center, it is possible to view the percentages and actual numbers of students who were proficient (Meets and Exceeds) or not proficient (Partially Meets or Does Not Meet) on the MCA-III tests. The website also offers the opportunity to look at test scores by subgroups including racial and socioeconomic categories.

Besides the test results, the MDE data center also provides demographic information about Minnesota public schools. This is tremendously helpful in the preliminary work of identifying specific immersion and traditional model schools to include in this study. Additionally, the data center allows for side-by-side comparisons of schools with the percentages of students within various demographic subgroups.

Research Questions and Hypotheses

This study included the following primary and secondary research questions. Each research question is listed with its corresponding null hypothesis.

RQ1. What difference, if any, exists in MCA-III reading scores of third grade students based on whether they are in traditional classroom models or in total language immersion programs?

$H1_0$. There is no difference in MCA-III reading scores of third grade students based on whether they are in traditional classroom models or in total language immersion programs.

RQ2. What difference, if any, exists in MCA-III reading test scores of fifth grade students based on whether they are in traditional classroom models or in total language immersion programs?

$H2_0$. There is no difference in MCA-III reading scores of fifth grade students based on whether they are in traditional classroom models or in total language immersion programs.

These sub research questions are under research questions 1 and 2.

RQ1a. What difference, if any, exists in MCA-III reading test scores in third and fifth grades between black students who attend immersion schools and black students who attend mainstream schools?

$H1a_0$. There is no difference in MCA-III reading test scores in third and fifth grades between black students in immersion schools compared to black students in mainstream schools.

RQ1b. What difference, if any, exists in MCA-III reading test scores in third and fifth grades between Free/Reduced Lunch students in immersion schools compared to Free/Reduced Lunch students in mainstream schools?

$H1b_0$. There is no difference in MCA-III reading test scores in third and fifth grades between Free/Reduced Lunch students in immersion schools compared to Free/Reduced Lunch students in mainstream schools.

RQ3. What difference, if any, exists in MCA-III math test scores of third grade students based on whether they are in traditional classroom models or in total language immersion programs?

$H3_0$. There is no difference in MCA-III math test scores of third grade students based on whether they are in traditional classroom models or in total language immersion programs.

RQ4. What difference, if any, exists in MCA-III math test scores of fifth grade students based on whether they are in traditional classroom models or in total language immersion programs?

$H4_0$. There is no difference in MCA-III math test scores of fifth grade students based on whether they are in traditional classroom models or in total language immersion programs.

RQ3a. What difference, if any, exists in MCA-III math test scores in third and fifth grades between black students in immersion schools compared to black students in mainstream schools?

$H3a_0$. There is no difference in MCA-III math test scores in third and fifth grades between black students in immersion schools compared to black students in mainstream schools.

RQ3b. What difference, if any, exists in MCA-III math test scores in third and fifth grades between Free/Reduced Lunch students in immersion schools compared to Free/Reduced Lunch students in mainstream schools?

$H3b_0$. There is no difference in MCA-III math test scores in third and fifth grades between Free/Reduced Lunch students in immersion schools compared to Free/Reduced Lunch students in mainstream schools.

Theoretical Framework

James Cummins' (1979) principle of Additive Bilingualism (Figure 3) provides a framework for understanding the benefits of learning another language. Through his highly regarded Threshold Hypothesis (Figure 3) and Model of Language Interdependence (Figure 2), Cummins (1979) explains that students who attain high levels of bilingualism will reap cognitive benefits by tapping into the common underlying proficiencies across their two languages.

Cummins (1979) maintains that the underlying proficiencies that are transferable between languages refer to higher cognitive tasks such as problem-solving or taking standardized tests. As a result, when students learn a second language while developing their first language (which is the case for total immersion students), they are gaining cognitive advantages over their monolingual counterparts (Cummins, 1979; Collier, 1989). This study used Cummins' theory as the lens with which to view and compare total immersion students with non-immersion students' standardized test scores.

Variables

Creswell (2014) defines variable as "a characteristic or attribute of an individual or an organization that can be measured or observed and that varies among the people or organization being observed" (p. 52). In this study, the main variables, as reflected in the primary research questions, were the MCA-III test scores, the school models (immersion and traditional), and grade levels (three and five). The MCA test scores are measurements that reveal students' performance on the test, scores fluctuate depending on student performance on the test. School models are determined by practices and instructional strategies that can be observed and that differ whether the school is a language immersion school or a traditional school model.

Sampling Design

The first step in selecting a sample for this study was to identify language immersion schools in Minnesota. Minnesota Advocates for Immersion Network (MAIN, 2015) published a list of 70 immersion programs in Minnesota at the preschool, elementary, and secondary levels. This comprehensive directory was instrumental in selecting total immersion schools to consider in this study. The directory includes the district, the name and address of the schools, the immersion language used, the year the program started, and the contact information for each

school. The list helped identify three total immersion elementary schools located in different geographic areas of Minnesota. The selected schools had to be in existence for at least six years in order to have administered the fifth grade MCA and to have available test scores. The next step was to use the MDE data center to verify that each selected immersion school had MCA scores listed.

The subsequent step consisted of selecting traditional school models located in the same district as the selected language immersion schools. It was important to identify traditional schools that were geographically, demographically, and socioeconomically very similar to the identified language immersion schools. This may help minimize the many factors that may influence standardized test scores. The major issue in school selection lies in the fact that the large majority of immersion schools are *choice schools* whereas traditional school models usually welcome students who live in close proximity. This fact could be a limiting factor when comparing test scores between immersion and traditional school models. It was also important to verify that the selected mainstream schools had available MCA test scores through the MDE website.

This study used test scores from 130 to 254 students in each school (n = 1,141). This number represented the 2016 cohort of all third and all fifth grade students in each selected school. In the suburban district, the 2016 MCA-III scores of 211 immersion students in grades three and five were compared to 254 students in a traditional school model in the same district. In the urban district, MCA-III scores of 201 students in an immersion school were compared to 138 students in a traditional school with similar demographics in the district. The same comparison was done for MCA-III test scores of 207 students in a second immersion school and 130 students at a traditional school in the same urban district. The main sampling concerns

related to comparing different cohorts of students. Because of districts' reluctance to release information that may identify students, it was impossible to obtain MCA results from the same cohorts of students when they were in third grade and again when they took the MCA in fifth grade.

To diversify the sample of students, an effort was made to choose school districts that are geographically, demographically, and socioeconomically different. Selecting a diverse sample is especially important since diversity in sampling takes precedence over size (Orcher, 2014). In other words, it is better to have a small sample that reflects the diversity of the population than a larger sample that represents a narrow fraction of the population. One district is located in an affluent, upper middle-class suburb. The second district is in the city.

Setting

This study compared standardized test scores in six Minnesota public schools. It specifically focused on public school districts that have total language immersion programs. Data was collected from a suburban school district which has a total immersion school. In the urban school district, one French Immersion school and one Spanish Immersion school were compared to two traditional models within the district. Each of the three immersion schools' MCA-III scores were compared to the scores of a traditional school model located within the same district and presenting somewhat similar demographics.

Public standardized tests scores from MDE were used to look at students' various levels of proficiency as they relate to their racial identity and socioeconomic background. Race and socioeconomic status are important variables in student achievement; this was unveiled by the NCLB accountability requirements via the Achievement Gap that exists between black and white students and between socioeconomically disadvantaged students and students from higher

socioeconomic status (Wei, 2010; Zhao, 2007). The MCA test data include four different achievement levels: Does Not Meet Standards (D), Partially Meets Standards (P), Meets Standards (M), and Exceeds Standards (E). Districts consider that a student is not proficient if he/she scores a D or a P. This study used the same criteria to identify proficient students. The MCA-III exam measures achievement at the interval level.

MDE specified a range of scores to determine each achievement level. When students achieve at a D level in math and reading, their raw score falls within the 301-339 range in third grade and the 501-539 range in fifth grade. When students achieve at a P level in math and reading, their raw score falls within the 340-349 range in third grade and the 540-549 range in fifth grade. When students achieve at a M level, their raw score falls within the 350-365 range in math and 350-373 in reading in third grade. In fifth grade, the achievement level M includes scores in the 550-562 range in math and the 550-566 range in reading. When students achieve at an E level, their raw score falls within the 366-399 range in math and 374-399 in reading in third grade and the 567-599 range in math and 563-599 in reading in fifth grade.

Instrumentation and Measures

The MCA-III is the test that was used in this study to compare scores for total language immersion students and non-immersion students. MDE oversees its administration across Minnesota's public schools, and has hired panelists from the Human Resources Research Organization (HumRRO, 2013) to conduct an independent study to identify the alignment of the reading MCA-III to the specific benchmarks of the state standards. The panelists drew the following conclusion:

> Overall, the alignment results support the validity of the MCA-III reading assessments. Panelists' found the assessment items on each test form to be fully aligned with the

> benchmarks and to represent the desired categorical distribution. They also found each form to contain the minimum proportion of items at two of three depth of knowledge (DOK) levels- Level 2 – Skill/ Concept and Level 3 – Strategic Thinking. Psychometric investigations of the dimensionality and reliability of category level scores, or subscores, was supportive of the validity of these scores as well. (Deatz et al., 2013, p. 27)

Standardized tests' validity and reliability have been the objects of much research. Findings usually show strengths and weaknesses and imply that they should be a supplement rather than the sole determining factor of student achievement (Somers, Zhu, & Wong, 2011).

MDE requires that students in Minnesota elementary public schools take the math and reading MCA tests in grades three, four, and five. The MCA-III is an online assessment; test administrators are required to receive training on how to administer the test in order to maximize the standardization and uniformity of the process across the state. Videos and scripts are part of the materials available for test administrators to use. MDE also releases a two-month testing schedule window for districts to administer the MCA. Currently, students take the test in the spring between early March and the first two weeks of May (MDE, 2016).

Data Collection

To answer the primary research questions of this study, students' raw MCA scores were collected from two Minnesota public school districts that offer a total immersion school. Research request forms were submitted to each district for the release of raw scores from third and fifth grade MCA reading and mathematics exams. Test data came from a total immersion school and another demographically similar elementary school within the district. The research requests specified that the data be released in an electronic format.

To find answers to its secondary questions, the intent of this study was to collect MCA test data from the MDE website (2016) through their interactive data center called the "Minnesota Report Card." This website offers various options of reviewing MCA results for Minnesota public schools. The MDE Data Analytics Team organized the data in a user-friendly format for easy access of test scores and school demographics. The site uses numbers, percentages, color-coded charts, graphs, and tables to display the data. By adjusting the default settings, users are able to open up to six charts in order to compare schools' data.

The Minnesota Report Card offers users various categories to select in order to generate specific data. The categories include district, school, test, subject, year, grade level, ethnicity/race, gender, and other criteria. The other criteria section lists categories such as English Learner, Special Education, Free/Reduced Lunch, Homeless, Enrolled October 1, Migrant, and Students with Limited or Interrupted Formal Education (SLIFE).

Anyone who accesses the site can select any of the aforementioned categories to display the corresponding data about Minnesota public schools. The variety of options allows for a great range of data available. This study focused on MCA-III reading and math data of black and Free/Reduced Lunch students of the selected immersion and non-immersion schools

Data Analysis

This study used inferential statistics to test the hypotheses. The intent is to study if any relationships exist between language immersion education and achievement in standardized test scores in reading and math. A two-by-two factorial ANOVA was used for each primary research question in order to compare standardized test results for each pair of schools (immersion or traditional model) within the two districts. A Chi-square helped analyze data to respond to the secondary research questions.

"Factor Analysis is used to find patterns in the correlations among variables" (Vogt, 2007, p. 230). This study included several variables that Table 1 summarizes in a visual manner. Three language immersion schools were compared to three traditional schools within the same district. For each pair of schools, Table 1 shows the different variables that were analyzed in order to find answers to the research questions. As shown, the dependent variable in this study was MCA-III test scores. School districts usually combine students who exceed the standards and students who meet standards in the proficient category. Students who partially met or did not meet the standards are labeled not proficient. The model of school that students are enrolled in was the independent variable. In this study, it was either total language immersion or traditional school models.

Table 1

Factors and Variables

	MCA-III Test Score (DV)	
School Type (IV)	Meets or Exceeds	Partially Meets or Does Not Meet
Immersion	Percent of students in third grade reading	Percent of students in third grade reading
	Percent of students in third grade math	Percent of students in third grade math
	Percent of students in fifth grade reading	Percent of students in fifth grade reading
	Percent of students in fifth grade math	Percent of students in fifth grade math
Traditional	Percent of students in third grade reading	Percent of students in third grade reading
	Percent of students in third grade math	Percent of students in third grade math
	Percent of students in fifth grade reading	Percent of students in fifth grade reading
	Percent of students in fifth grade math	Percent of students in fifth grade math

The Chi-square test of independence was used to analyze results related to the secondary research questions of this study. The Chi-square test helped assess any statistical significances that a language immersion school may have on MCA-III test scores of black students and Free/Reduced Lunch students. In a chi-square test, participants are "classified in terms of two variables in order to examine the relationship between them" (Patten, 2014, p. 123). The current racial and socioeconomic Achievement Gap in Minnesota makes it compelling to look at the two

variables (race and socioeconomic background) to identify if any implications may exist in terms of being in a language immersion or a traditional school.

Descriptive statistics were also used to give an account of the demographics of each of the schools studied. This is an important aspect of the study because of the need to control for demographic differences. It was also instrumental in answering the secondary research questions that focused on race and socioeconomic status.

Limitations and Delimitations

One of the first limitations of this study was districts' reluctance to allow full-disclosure of students' raw test scores along with the demographic information. Having that access would have helped ensure the use of the same cohorts of students' scores in third grade and then in fifth grade, two years later. As a result, there were two sources of data collection. The first source was raw scores without identifiers from school districts to answer the primary research questions. The second source was the MDE online Report Card which helped make comparisons based upon students' racial and socioeconomic backgrounds.

Muijs (2011) recommended caution when trying to find relationships between two variables because of the potential interference of underlying factors. His advice is especially relevant in this study. Various factors may influence students' test scores and it would be naïve to not take that into account while comparing the scores. One way of addressing this is to select schools that are very similar in multiple aspects, including geographical proximity, school calendars, schedules, and student bodies (race, socioeconomic backgrounds, etc.). Despite this effort to select schools that present similar demographics, it was, however, very challenging to find an exact match to each immersion school. The MDE charts below present demographic information on the schools that were compared in this study. Even though two of the immersion

schools (1a suburban and 1a urban) present very similar racial and ethnic demographics to their mainstream counterpart, one of the immersion schools (2a urban) has significant demographic differences with its counterpart when it comes to race and ethnicity. It is clear that this disparity in demographics may have an influence on the test scores for schools 2a and 2b of the urban school district.

A quantitative methodology, which was used in this study, includes inherent limitations that are worth addressing. When comparing data, it is important to look at various aspects that may influence or alter the data. This contextual background is harder to establish in quantitative studies (Patten, 2014). In the present study, scaled standardized test scores were used; even though MDE provides scripts for test administrators, standardization has its own limitations. The physical dimensions of the classroom, class sizes, room temperature, student personal space, testing devices, the environment of the testing space, and the time of day are all important factors that were not included in this quantitative analysis.

Language immersion schools are mostly choice schools. Because parents choose to send their children to immersion schools, there may be a higher level of parental involvement. Steele et al. (2015) attempted to control for this variable by selecting dual-language immersion schools in Portland in which there are students who are randomly selected by lottery drawing to attend the schools. It is not apparent that such an alternative exists in Minnesota immersion schools.

Despite the release of a testing calendar by MDE, school districts do administer the test at different times within this window. The two-month testing window allows districts to stagger testing sessions, especially when students do not have individual devices and have to share a computer lab in order to take the online assessment. As a result, there is the possibility that students in a given school may take the test two months before or after their counterparts in a

different school within the same district. In a nine-month school year, there may be a significant difference in the instruction received in two months. This may make it difficult to compare schools and generalize results.

In conducting this study, there are several delimitations that do affect the generalizability of this research but are required for honoring feasibility. First, selecting three immersion schools reduces the scope of the study. Because the study focuses on the MCA-III exam which is the state-mandated test for Minnesota, it may not be possible to apply findings to other states. Two out of the three immersion schools selected focus on French and one school is a Spanish immersion. This difference in IL may also have an impact on students' scores. Selecting more immersion schools with languages such as Mandarin Chinese or Arabic could have helped expand the scope and generalizability of the study. Time constraints and the need for research request approvals from the school districts significantly restricted the number of schools and districts to include in this study as well.

Ethical Considerations

This study conducted a secondary analysis of data, which is one of the least intrusive research designs since there is no need to interact with research subjects (Vogt, 2007). Letters and numbers were used to identify schools and provide a certain level of anonymity. It is important to note that the very use of public data makes it harder to ensure anonymity because anyone can access the MDE website and closely check the test data to find the actual districts and schools used in the study. Identifying actual students is not likely, however. MDE also establishes individual students' anonymity by marking Count Too Small to Report (CTSTR) on reports for categories of data that involve fewer than 10 students.

School districts have the duty to safeguard students' academic records, including standardized test scores. The Family Educational Rights and Privacy Act (FERPA) requires that schools keep private any data that has the potential of identifying the student in question (Minnesota Statutes, 2016). School districts must be in compliance with the law regarding the release of students' educational data. The research request forms provide guidelines to researchers who must comply once they sign the forms. In this study, caution was used to ensure compliance with the terms listed on the research requests forms.

Student test scores were safeguarded and kept under password protected drives until the completion of the data analysis. This study also complied with the Belmont Report's (1979) principles and guidelines. Its three guiding principles are respect for person, beneficence, and justice. These principles require any researcher to minimize harm and maximize benefits for research participants. This study did not include any interaction with human subjects. Standardized test scores devoid of identifiers were used to compare immersion and traditional schools' performances on the MCA-III.

Chapter IV: Results

This section presents the findings from the data analysis. It also includes a discussion of the sample and the hypothesis testing for each primary and secondary research question.

Sample

To nullify or reject the null hypotheses in this study, MCA-III test scores from two school districts were used. The suburban school district included a French immersion school labeled 1a and a traditional school model labeled 1b. The urban school district included a French immersion school labeled 1a compared with a traditional school model 1b and a Spanish immersion school labeled 2a compared with a traditional school model labeled 2b.

In the suburban school district, MCA-III math test scores of third grade immersion students (n =108) and third grade students in a traditional school model (n =119) were used for comparison along with scores of fifth grade immersion students (n =105) and fifth grade students in a traditional school model (n = 135). The number of students in the suburban district account for a total of 213 immersion students and 254 non-immersion students. In the same suburban school district, MCA-III reading test scores of third grade immersion students (n =108) and third grade students in a traditional school model (n =118) were used for comparison along with scores of fifth grade immersion students (n =105) and fifth grade students in a traditional school model (n = 138). The MCA-III reading scores included a total of 213 immersion students and 256 from the traditional school model. Schools 1a and 1b in the suburban district present very similar demographics.

In the urban school district, MCA-III math test scores of third grade French immersion students (n = 108) and third grade students in a traditional school model (n = 81) were used for comparison along with scores of fifth grade French immersion students (n = 92) to compare with

fifth grade students in a traditional school model (*n* = 58). There were also MCA-III math test scores of third grade Spanish immersion students (*n* =115) and third grade students in a traditional school model (*n* = 74) used for comparison along with scores of fifth grade Spanish immersion students (*n* = 92) and fifth grade students in a traditional school model (*n* = 56). The number of students in the urban district account for a total of 407 immersion students and 269 non-immersion students. In the urban district the French immersion school had similar demographics to its traditional counterpart; however the Spanish immersion school presented a very different profile when it comes to race and ethnicity compared to its traditional counterpart. MCA-III reading test scores of third grade French immersion students (*n* = 110) and third grade students in a traditional school model (*n* = 79) were used for comparison along with scores of fifth grade French immersion students (*n* = 92) to compare with fifth grade students in a traditional school model (*n* = 58). There were also MCA-III reading test scores of third grade Spanish immersion students (*n* =116) and third grade students in a traditional school model (*n* = 74) used for comparison along with scores of fifth grade Spanish immersion students (*n* = 93) and fifth grade students in a traditional school model (*n* = 56).

General Findings

Statistical Package for the Social Sciences (SPSS) software was used to analyze MCA-III test scores. Two (immersion vs. traditional) by two (third vs. fifth grade) factorial ANOVAs were conducted of each of the two dependent variables (MCA-III math and MCA-III reading tests).

MCA-III scores are scaled by grade level with scores varying from 301 to 399 in third grade and 501 to 599 in fifth grade. Unsurprisingly, there was a massive statistical difference between third and fifth grade students in all MCA-III math and reading scaled scores. The

statistical significance of the difference in the grade levels was shown in the F ratio between grades three and five in both school districts, $F(1, 463) = 29{,}564.89$, $p < 0.001$ for math and $F(1, 465) = 20143.66$, $p < 0.001$ for reading in the suburban school district; $F(1, 335) = 16066.05$, $p < 0.001$ for math and $F(1, 335) = 9142.14$, $p < 0.001$ for reading in the urban school district.

In order to answer the secondary research questions, MDE interactive report card was used to collect MCA-III data about black and Free-Reduced Lunch students in the six schools targeted in this study. Schools 1a and1b in the suburban district did not have enough black and Free/Reduced Lunch students for public reporting. The two demographics (black and Free/Reduced Lunch Price) were labeled CTSTR for the suburban district. To protect students' privacy, MDE does not release records for demographical subgroups that represent fewer than 10 students. A Chi-square test of independence was conducted to examine the relations, if any, between racial and socio-economic background and performance on MCA-III when attending a total language immersion school or a traditional model school.

Hypothesis Findings

RQ1. What difference, if any, exists in MCA-III reading scores of third grade students based on whether they are in traditional classroom models or in total language immersion programs?

$H1_0$. There is no difference in MCA-III reading scores of third grade students based on whether they are in traditional classroom models or in total language immersion programs.

RQ2. What difference, if any, exists in MCA-III reading test scores of fifth grade students based on whether they are in traditional classroom models or in total language immersion programs?

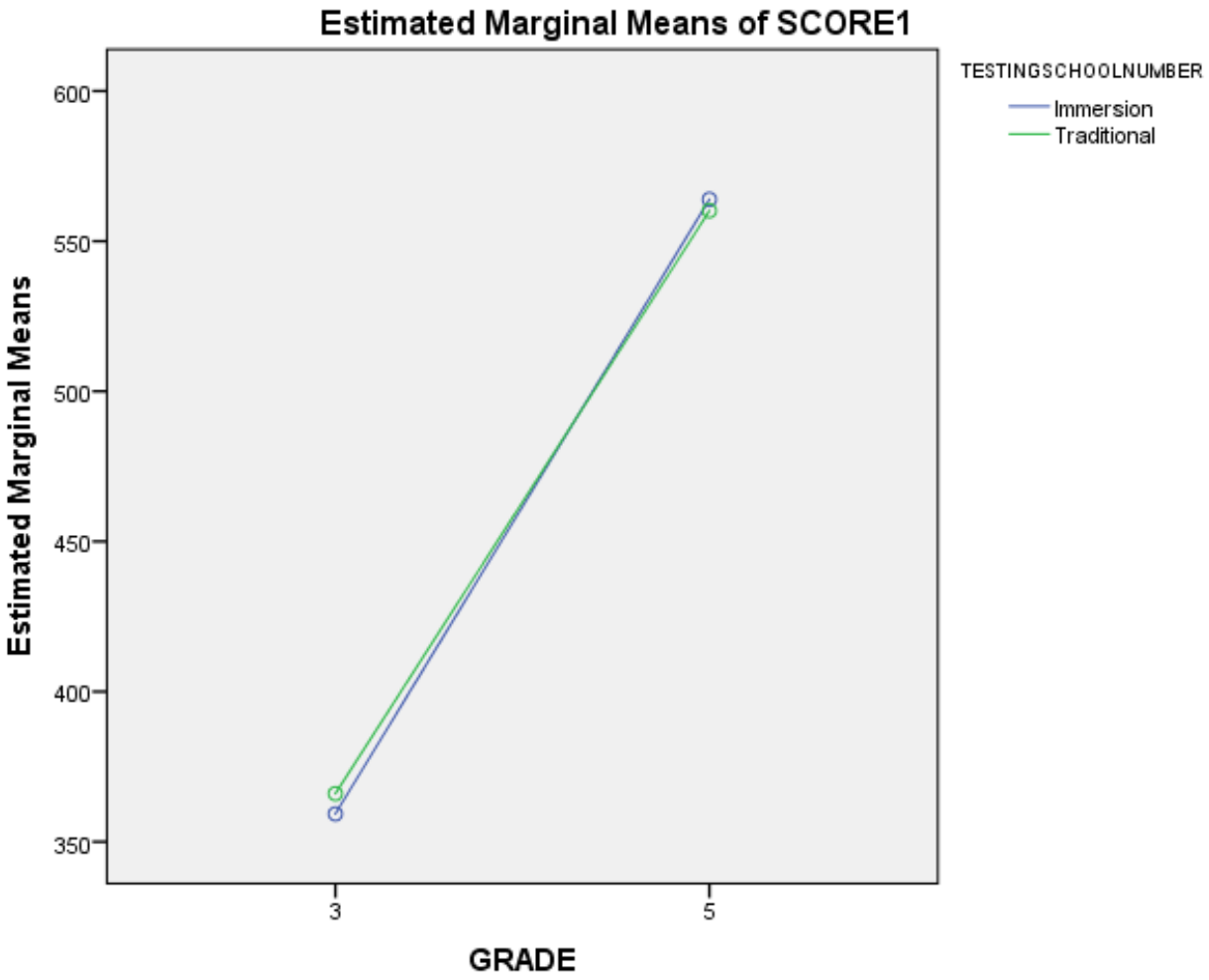
$H2_0$. There is no difference in MCA-III reading scores of fifth grade students based on whether they are in traditional classroom models or in total language immersion programs.

Hypothesis 1 and 2 Findings. To reject or confirm $H1_0$ and $H2_0$, a factorial ANOVA was completed through SPSS to examine whether there is a main effect for school model (language immersion vs. traditional) and whether there is an interaction between school model and grade level on the MCA-III reading test scores in third and fifth grades.

In the suburban school district, there was no main effect for school model, F (1, 465) = 1.10, p = ns. That is, there was no statistically significant difference between immersion students' (M = 460.15, SD = 103.63) and traditional students' (M = 470.66, SD = 98.12) MCA-III reading scaled test scores. However, there was a significant interaction between grade level and school model, F (1, 465) = 13.97, $p < 0.05$. Follow-up simple effects tests revealed that in third grade, traditional students scored significantly higher than immersion students on the reading Test, F (1, 224) = 7.49, $p < 0.01$. However, in fifth grade, immersion students scored significantly higher than traditional students, F (1, 221) = 6.81, p = 0.01. In other words, the MCA-III reading scores for immersion students increased at a higher rate from third to fifth grade compared to reading scores for the students in traditional schools (see Figure 6).

Figure 6

Mean MCA-III Reading Scores for Suburban School District by School Model and Grade Level



In the urban school district, when it comes to the French Immersion school 1a and its traditional counterpart 1b, there was no main effect for school model, F (1, 335) = 2.39, p = ns. That is, there was no statistically significant difference between immersion students' (M = 446.55, SD = 101.82) and traditional students' (M = 443.10, SD = 102.78) MCA-III reading scaled test scores. The interaction effect (school model by grade level) was also not significant, F (1, 335) = 0.82, p = ns. The MCA-III reading test scores between the Spanish immersion school and its traditional school counterpart showed a different trend. There was a significant main

effect for school model F (1, 335) = 8.76, $p < 0.05$. That is, traditional students (M = 444.66, SE = 1.44) had significantly higher reading scores than Spanish immersion students (M = 451.55, SE = 1.83). The interaction effect (school model by grade level) was not significant, F (1, 335) = 0.01, p = ns.

RQ1a. What difference, if any, exists in MCA-III reading test scores in third and fifth grades between black students who attend immersion schools and black students who attend mainstream schools?

H1a$_0$. There is no difference in MCA-III reading test scores in third and fifth grades between black students in immersion schools compared to black students in mainstream schools.

Hypothesis 1a Findings. A Chi-square test of independence was calculated to compare the proficiency of black students enrolled in the French immersion school 1a (located in the urban district) on the MCA-III reading test to the proficiency of black students enrolled in the traditional school 1b within the district. Although black students in the traditional school were more likely to be labeled proficient in the MCA-III reading (58%) than black students enrolled in a traditional school model (56%), the difference was not statistically significant χ^2 (1, N = 69) = 0.02, p= ns.

A Chi-square test was completed for black students in the Spanish immersion school 2a and in the traditional school model 2b. In this instance, black students enrolled in the traditional school model 2b were more likely to be labeled proficient in the MCA-III reading (44%) than black students enrolled in the Spanish immersion (28%), χ^2 (1, N = 97) = 2.33, p = 0.13.

RQ1b. What difference, if any, exists in MCA-III reading test scores in third and fifth grades between Free/Reduced Lunch students in immersion schools compared to Free/Reduced Lunch students in mainstream schools?

H1b$_0$. There is no difference in MCA-III reading test scores in third and fifth grades between Free/Reduced Lunch students in immersion schools compared to Free/Reduced Lunch students in mainstream schools.

Hypothesis 1b Findings. To test this null hypothesis, a Chi-square test of independence was performed to compare the proficiency of Free/Reduced Lunch students enrolled in the French immersion school 1a (located in the urban district) on the MCA-III math test to the proficiency of Free/Reduced Lunch students enrolled in the traditional school 1b within the district. Free/Reduced Lunch students enrolled in French immersion were significantly more likely to be proficient in the MCA-III math (69%) than Free/Reduced Lunch students enrolled in a traditional school model (43%), χ^2 (1 N = 115) = 7.71, p = 0.005.

Another Chi-square test was calculated for Free/Reduced Lunch students in the Spanish immersion school 2a and in the traditional school model 2b. In this case, Free/Reduced Lunch students enrolled in Spanish immersion were not more likely to be proficient in the MCA-III math (19%) than Free/Reduced Lunch students enrolled in a traditional school model (30%), χ^2 (1 N = 188) = 3.35, p = 0.07.

RQ3. What difference, if any, exists in MCA-III math test scores of third grade students based on whether they are in traditional classroom models or in total language immersion programs?

H3$_0$. There is no difference in MCA-III math test scores of third grade students based on whether they are in traditional classroom models or in total language immersion programs.

RQ4. What difference, if any, exists in MCA-III math test scores of fifth grade students based on whether they are in traditional classroom models or in total language immersion programs?

$H4_0$. There is no difference in MCA-III math test scores of fifth grade students based on whether they are in traditional classroom models or in total language immersion programs.

Hypothesis 3 and 4 Findings. In the suburban school district, there was no main effect for school model, F (1, 463) = 1.02, p = ns. That is, there was no significant difference between immersion students (M = 462.17, SD = 96.88) and traditional students' (M = 468.38, SD = 95.76) for MCA-III math scaled test scores. The interaction effect (school model by grade level) was also not significant, F (1, 463) = 1.32, p = ns.

In the urban district, the main effect for school model provided an F ratio of F (1, 335) = 4.84, p = 0.028. That is, there was a statistically significant difference between French immersion students in school 1a (M = 451.28, SD = 98.21) and traditional students' in school 1b (M = 439.04, SD = 100.40) for MCA-III math scaled test scores. The French immersion student scored higher in the MCA-III math than their counterparts in the traditional school. The interaction effect (school model by grade level) approached statistical significance, F (1,335) = 3.58, p =0.059. Results were similar for schools 2a and 2b of the urban district. There was no main effect for school model, F (1, 333) = 3.16, p = ns. This means, there was no statistically significant difference between Spanish immersion students' in school 2a (M = 434.54, SD = 99.77) and traditional students' in school 2b (M = 434.84, SD = 101.05) for MCA-III math scaled test scores. The interaction effect (school model by grade level) was not significant, F (1, 333) = 0.54, p = ns.

RQ3a. What difference, if any, exists in MCA-III math test scores in third and fifth grades between black students in immersion schools compared to black students in mainstream schools?

H3a$_0$. There is no difference in MCA-III math test scores in third and fifth grades between black students in immersion schools compared to black students in mainstream schools.

Hypothesis 3a Findings. A Chi-square test of independence was calculated to compare the proficiency of black students enrolled in the French immersion school 1a (located in the urban district) on the MCA-III math test to the proficiency of black students enrolled in the traditional school 1b within the district. Black students enrolled in immersion were significantly more likely to be proficient in the MCA-III math (76%) than black students enrolled in a traditional school model (46%), χ^2 (1 N = 68) = 6.40, p = 0.01. A similar analysis was performed on MCA-III math scores for black students in the Spanish immersion school 2a to compare their results to those of black students enrolled in the traditional school 2b. Black students enrolled in a traditional school model (29%) were more likely to be proficient in the MCA-III math than black students enrolled in immersion (16%), χ^2 (1 N = 96) = 1.98, p = 0.16.

RQ3b. What difference, if any, exists in MCA-III math test scores in third and fifth grades between Free/Reduced Lunch students in immersion schools compared to Free/Reduced Lunch students in mainstream schools?

H3b$_0$. There is no difference in MCA-III math test scores in third and fifth grades between Free/Reduced Lunch students in immersion schools compared to Free/Reduced Lunch students in mainstream schools.

Hypothesis 3b Findings. To test this null hypothesis, a Chi-square test of independence was performed to compare the proficiency of Free/Reduced Lunch students enrolled in the French immersion school 1a (located in the urban district) on the MCA-III math test to the proficiency of Free/Reduced Lunch students enrolled in the traditional school 1b within the district. Free/Reduced Lunch students enrolled in French immersion were significantly more

likely to be proficient in the MCA-III math (69%) than Free/Reduced Lunch students enrolled in a traditional school model (43%), χ^2 (1 N = 115) = 7.71, p = 0.01. A Chi-square test of independence was also completed for Free/Reduced Lunch students in the Spanish immersion school 2a and in the traditional school model 2b. In this instance, Free/Reduced Lunch students enrolled in the traditional school model 2b were more likely to be proficient in the MCA-III math (30%) than Free/Reduced Lunch students enrolled in the Spanish immersion (19%), χ^2 (1 N = 188) = 3.35, $p > 0.05$.

Summary of Findings

The findings of the different hypotheses were summarized in the table below to give an overview of MCA-III test scores of students from six schools in two school districts. Three of the schools were total language immersion schools and three schools were traditional model schools. The table shows which hypotheses were nullified or rejected by MCA-III scores data.

Table 2

List of Retained or Rejected Null Hypotheses for each Pair of Schools under Study

Null Hypothesis	Suburban French Immersion	Urban French Immersion	Urban Spanish Immersion
$H1_0$: No difference MCA-III reading 3rd grade	Retained	Retained	Rejected
$H2_0$ No difference MCA-III reading for 5th grade students	Retained	Retained	Rejected
$H1a_0$ No difference MCA-III reading for black students	NA	Rejected	Rejected
$H1b_0$ No difference in MCA-III reading for Free/Reduced Lunch students	NA	Rejected	Rejected
$H3_0$ No difference in MCA-III math scores of 3rd grade	Retained	Rejected	Retained
$H4_0$ No difference in MCA-III math test scores of 5th grade students	Retained	Rejected	Retained
$H3a_0$ No difference in MCA-III math for black students	NA	Rejected	Rejected
$H3b_0$ No difference in MCA-III math for Free/Reduced Lunch students	NA	Rejected	Rejected

Chapter V: Discussion, Implications, Recommendations

This chapter includes the summary of this study and the conclusions inferred from the findings presented in chapter four. It also provides a discussion of the implications as well as recommendations for further research.

Overview of the Study

This study employed a quantitative methodology with two-by-two factorial ANOVAs and Chi-square tests of independence to answer its primary and secondary research questions. Cummins' Interdependence Hypothesis (Figure 2, Iceberg Model) and his Threshold Hypothesis (Figure 3, Cummins, 1979) provided the theoretical framework for the study. These theories reinforced the notion that learning a second language while developing proficiency in a first language provides great benefits to the learner. These benefits include cognitive advantages that bilinguals demonstrate when they have high levels of proficiency in two languages.

The purpose of the study was to determine whether there is a significant difference in MCA-III reading and mathematics test scores between third and fifth grade students who attend a total language immersion school and students who attend a mainstream school in the same district. This study also aimed to determine whether there is a significant difference in MCA-III test scores between black students and Free/Reduced Lunch students in total language immersion schools and black students and Free/Reduced Lunch students in mainstream schools in the same district.

The sample in this study was selected from two main criteria: total language immersion school and demographically similar traditional schools within the same district. There were two school districts, the first one located in an affluent suburb and the second one located in an urban area. MCA-III test scores from a total of 1,141 students were examined.

Research Questions

This study included the following primary and secondary research questions. Each research question is listed with the corresponding null hypothesis.

RQ1. What difference, if any, exists in MCA-III reading scores of third grade students based on whether they are in traditional classroom models or in total language immersion programs?

$H1_0$. There is no difference in MCA-III reading scores of third grade students based on whether they are in traditional classroom models or in total language immersion programs.

RQ2. What difference, if any, exists in MCA-III reading test scores of fifth grade students based on whether they are in traditional classroom models or in total language immersion programs?

$H2_0$. There is no difference in MCA-III reading scores of fifth grade students based on whether they are in traditional classroom models or in total language immersion programs. These sub research questions are under research questions 1 and 2.

RQ1a. What difference, if any, exists in MCA-III reading test scores in third and fifth grades between black students who attend immersion schools and black students who attend mainstream schools?

$H1a_0$. There is no difference in MCA-III reading test scores in third and fifth grades between black students in immersion schools compared to black students in mainstream schools.

RQ1b. What difference, if any, exists in MCA-III reading test scores in third and fifth grades between Free/Reduced Lunch students in immersion schools compared to Free/Reduced Lunch students in mainstream schools?

H1b$_0$. There is no difference in MCA-III reading test scores in third and fifth grades between Free/Reduced Lunch students in immersion schools compared to Free/Reduced Lunch students in mainstream schools.

RQ3. What difference, if any, exists in MCA-III math test scores of third grade students based on whether they are in traditional classroom models or in total language immersion programs?

H3$_0$. There is no difference in MCA-III math test scores of third grade students based on whether they are in traditional classroom models or in total language immersion programs.

RQ4. What difference, if any, exists in MCA-III math test scores of fifth grade students based on whether they are in traditional classroom models or in total language immersion programs?

H4$_0$. There is no difference in MCA-III math test scores of fifth grade students based on whether they are in traditional classroom models or in total language immersion programs.

RQ3a. What difference, if any, exists in MCA-III math test scores in third and fifth grades between black students in immersion schools compared to black students in mainstream schools?

H3a$_0$. There is no difference in MCA-III math test scores in third and fifth grades between black students in immersion schools compared to black students in mainstream schools.

RQ3b. What difference, if any, exists in MCA-III math test scores in third and fifth grades between Free/Reduced Lunch students in immersion schools compared to Free/Reduced Lunch students in mainstream schools?

H3b$_0$. There is no difference in MCA-III math test scores in third and fifth grades between Free/Reduced Lunch students in immersion schools compared to Free/Reduced Lunch students in mainstream schools.

Conclusions

Two (immersion vs. traditional) by two (third vs. fifth grade) factorial ANOVAs were conducted of each of the two dependent variables (MCA-III math and reading tests) to find answers to the primary research questions. A Chi-square test of independence was performed to test the null hypothesis of each secondary question. The data analysis allowed the researcher to draw conclusions about each research question.

RQ1 Conclusions. What difference, if any, exists in MCA-III reading scores of third grade students based on whether they are in traditional classroom models or in total language immersion programs? Even though the null hypothesis was nullified for two out of the three pairs of schools under study, students in the urban traditional school scored higher than their Spanish immersion counterparts. Furthermore all third grade students in the three immersion schools had lower mean MCA-III reading scores than the third grade students in the three traditional schools.

Findings from this research question show that when it comes to reading test scores, third grade students in traditional school models are labeled more proficient than total language immersion students. This is potentially due to the timing of the test as it is related to the amount of English language arts instruction immersion students receive in third grade. MCA-III reading test assesses students' proficiency in the English language arts state standards. In the suburban school district, formal English language arts instruction begins at the beginning of third grade for immersion students. This is approximately seven months before the MCA-III tests are

administered. In the urban district, immersion students start receiving English language arts in second grade, two years after traditional model students. The late start of English language arts instruction for immersion students may therefore play against the third grade students and have a negative impact on their reading test scores when compared to third grade students in the traditional school model.

Considering Cummins' Threshold Hypothesis (Figure 3, Cummins, 1979), the findings about this research question reinforce the idea that a certain threshold in first and second language proficiency must be reached before the full benefits of bilingualism are apparent. One could then argue that third grade students in immersion schools have not yet gained enough proficiency in reading in both languages to show the advantages that bilingualism offers when it comes to higher order thinking tasks such as test-taking.

RQ2 Conclusions. What difference, if any, exists in MCA-III reading test scores of fifth grade students based on whether they are in traditional classroom models or in total language immersion programs? The data analysis performed on this research question showed that the immersion fifth grade students in the suburban school had a higher mean score than their counterparts in the traditional school model. However, fifth grade immersion students in the urban district scored lower on average than fifth grade students in the traditional school model.

When looking back at the findings about the MCA-III reading, it is apparent that students in the traditional school model demonstrated higher proficiency especially in third grade. By fifth grade, the data showed that the advantage is not as striking for students in the traditional school model with students in one immersion scoring higher than their counterparts in the traditional school. Another noteworthy trend that the findings show is that the mean scores of all immersion

students rose from third to fifth grade even when the first digit of the score, which simply represents the grade level, is not taken into account.

RQ1a Conclusions. What difference, if any, exists in MCA-III reading test scores in third and fifth grades between black students who attend immersion schools and black students who attend mainstream schools? This is a secondary research question and the data from it was analyzed using a Chi-square test of independence. Due to the low number of black students in the suburban immersion school and its control school, MDE marked the data CTSTR on their interactive website. As a result, the data related to this research question only pertain to the urban district.

The findings indicated that black students in the French immersion were more likely to be proficient in the MCA-III reading at 58% versus 56% in the traditional school model. However a different trend was noted for the Spanish immersion where 28% of the black students were proficient versus 44% in the traditional school. It should be noted that in the overall results for MCA-III reading, students in the traditional school model showed higher proficiency than immersion students. Consequently, having this split result between the two pairs of school when it comes to black students' performance may show an advantage for black students in immersion school.

MDE (2018) indicated through its interactive report card that the statewide proficiency level for the same year on MCA-III reading was 62% for all third and fifth grade students and 30% for black third and fifth grade students. The state data place the black students in the French immersion school largely above the statewide average at 58% and the black students at the Spanish immersion slightly below average at 28%.

RQ1b Conclusions. What difference, if any, exists in MCA-III reading test scores in third and fifth grades between Free/Reduced Lunch students in immersion schools compared to Free/Reduced Lunch students in mainstream schools? A Chi-square test of independence was conducted to test the null hypothesis of this secondary research question. Due to the low number of Free/Reduced Lunch students in the suburban immersion school and its control school, MDE marked the data CTSTR for these two schools. Consequently, only data from the urban district was used for this research question.

The null hypothesis was rejected in favor of Free/Reduced Lunch students in the French immersion school 1a who were proficient at 69% compared to 43% in the control school 1b. However, the null hypothesis was also rejected in favor of the control school 2b because 19% of Free/Reduced Lunch students in the Spanish Immersion school were proficient versus 30% in the traditional school 2b. The state averages (MDE, 2018) indicated that 44% of Free/Reduced Lunch students were proficient in third and fifth grades. The French immersion Free/Reduced Lunch students performed largely above the state average. The Free/Reduced Lunch students in the Spanish immersion school were largely below average.

RQ3 Conclusions. What difference, if any, exists in MCA-III math test scores of third grade students based on whether they are in traditional classroom models or in total language immersion programs? Findings from the factorial ANOVA retained the null hypothesis for two pairs out of the three pairs of schools under study. However, in the urban French Immersion school 1a, third grade students outperformed their counterparts in the traditional school 1b. This result shows a difference between math and reading. The MCA-III math test assesses students' performance on the math state standards. Unlike reading, math can be considered a neutral subject when comparing immersion and non-immersion students. Even

though, they study math in a different language, immersion students start math instruction at the same time as mainstream students. When looking at the findings from the factorial ANOVAs, the only statistically significant difference was in favor of French immersion third grade students who had a mean score of 361.70 compared to 355.32 in the control school. A possible inference to make is that the bilingual advantage that Cummins presents in his Threshold Hypothesis (Figure 3, Cummins, 1979) may be at play earlier in the language proficiency process depending on the subject matter in question. As a result, it would be interesting to see what the findings reveal about MCA-III math in fifth grade.

RQ4 Conclusions. What difference, if any, exists in MCA-III math test scores of fifth grade students based on whether they are in traditional classroom models or in total language immersion programs? This was the most anticipated section to find out whether it would confirm or refute the conclusions from the last research question regarding subject matter and the bilingual advantage. In light of the aforementioned conclusions, combining math and age should show a definite advantage for language immersion students especially when taking into account Cummins' principle Threshold Hypothesis (Figure 3, Cummins, 1979) that as students gain proficiency in their second language and keep developing their first language, they should demonstrate higher cognitive gains.

The factorial ANOVA performed to compare the data about fifth grade MCA-III math in our sample, showed a definite superiority in the results of language immersion students compared to mainstream students' results. All three language immersion schools outperformed their traditional counterparts when considering mean scores. The French immersion students' scores in the urban district actually presented a statistically significant difference when compared to students in the control school. These findings about the MCA-III math confirm Collier's

(1989) conclusions after her extensive review of research on academic achievement in a second language. She concluded,

> When students are schooled in two languages, with solid cognitive academic instruction provided in both the first and second languages, both language minority and language majority students generally take from 4 to 7 years to reach national norms on standardized tests in reading, social studies, and science (measures of thinking skills), whereas their performance may reach national norms in as little as 2 years in L1 and L2 tests in mathematics and language arts (the latter testing spelling, punctuation, and simple grammar points) (p.526).

The findings from this study substantiate Collier's conclusion. Overall, the language immersion students demonstrated their lowest performance in third grade MCA-III reading, they showed a slightly improved outcome in the fifth grade MCA-III reading; however, they clearly outperformed their counterparts from the mainstream schools in the fifth grade MCA-III math. This is particularly noticeable in the urban Spanish immersion school which showed a tendency to score lower than its traditional control school but had a higher mean score in fifth grade MCA-III math. A noteworthy reminder about this particular school is that its demographics were not as similar to its control school's as the other two immersion schools. MDE data (2018) showed that when it comes to race/ethnicity, the Spanish immersion school is predominantly Hispanic at 50.4%. That is, most students speak Spanish at home and are actually essentially developing their first language during their first years in school. This is unlike the typical, total immersion students who are really learning their second language when they start school.

RQ3a Conclusions. What difference, if any, exists in MCA-III math test scores in third and fifth grades between black students in immersion schools compared to black students in

mainstream schools? The Chi-square test of independence conducted on the data that pertain to this question indicated that at 76% proficiency, black students enrolled in the urban French immersion school showed a statistically significant difference compared to their traditional school counterparts who were 46% proficient. This is an encouraging trend for language immersion programs when we know that the statewide average for third and fifth grade black students in math is 33%. This result has the potential to contribute to the argument that language immersion programs may help reduce the nationwide Achievement Gap that exists between black students and other racial groups. However, when a Chi-square was performed on MCA-III math scores for black students in the Spanish immersion school 2a compared to results of black students enrolled in the traditional school 2b, black students enrolled in a traditional school model (29%) were more likely to be proficient in the MCA-III math than black students enrolled in immersion (16%). This result did not make the case for black students in immersion schools having cognitive advantages compared to black students in mainstream schools.

RQ3b Conclusions. What difference, if any, exists in MCA-III math test scores in third and fifth grades between Free/Reduced Lunch students in immersion schools compared to Free/Reduced Lunch students in mainstream schools? The Chi-square test of independence done on the data that pertain to this question indicated that Free/Reduced Lunch students enrolled in French immersion were significantly more likely to be proficient in the MCA-III math (69%) than Free/Reduced Lunch students enrolled in its traditional control school (43%). The statewide proficiency average for third and fifth grade Free/Reduced Lunch students was at 45% in the MCA-III math (MDE, 2018). The immersion advantage is clear when considering these results and knowing that the Achievement Gap exits also between students with lower socio-economic status who usually score well below the state average. These findings confirm the advantages

that dual language instruction showed for low socio-economic status students in a two-way immersion school (Lindholm-Leary & Block, 2010).

A Chi-square test of independence was also completed for Free/Reduced Lunch students in the Spanish immersion school 2a and in the traditional school model 2b. In this instance, Free/Reduced Lunch students enrolled in the traditional school model 2b were more likely to be proficient in the MCA-III math (30%) than Free/Reduced Lunch students enrolled in the Spanish immersion (19%). These findings do not support the idea of an immersion advantage. Unlike the French immersion, the Spanish immersion school in this study consistently demonstrated lower proficiency scores in the MCA-III compared to its traditional control school. A noteworthy difference with the Spanish immersion is that even though it is labeled a total immersion school, most of the students already spoke Spanish as their first language (MDE, 2018). This is by definition different from total language immersion in which most students speak the majority language and are only exposed to the immersion language at school (Tedick et al., 2011).

Implications

This quantitative study researched differences in third and fifth grade MCA-III reading and math test scores between three total language immersion schools and three traditional model schools. Most findings in this study reinforced the idea that language immersion students benefit from being bilingual when it comes to proficiency in standardized test scores. The data from the study also showed that fifth grade MCA-III scores were much more advantageous to immersion students than third grade scores. Another notable finding from the data analysis is that all immersion schools in this study presented higher fifth grade math scores than their traditional school counterparts. Implications from these findings include the necessity to review second language teaching and learning at all levels of schooling especially in elementary schools. It is

imperative to look at different options in school programming besides the traditional model.

The study also looked at black and Free/Reduced Lunch students' performance on the MCA-III and compared the results in the three immersion schools to the ones in the traditional school models. There was overall statistically significant differences that favored black and Free/Reduced Lunch students in total immersion schools compared to their counterparts in the respective control schools. A major implication of these findings is that language immersion programs should not be discounted when there are discussions around the very current topic of Achievement Gap between different racial and socio-economic status subgroups.

Recommendations for Practitioners

Educators, policymakers, and parents are obviously invested in student academic success, Academic success includes proficiency in standardized test scores and findings from this study imply that language immersion may have a positive effect on students' performance in standardized tests particularly the MCA-III tests. As a result, this list of recommendations applies to these different stakeholders:

1) School districts have an obligation to review language programs to optimize benefits for students. Language immersion shows promising advantages for students in general and greatly differs from traditional ways of teaching second languages in isolation, a few times a week.
2) Educators especially language teachers should reflect on ensuring the true integration of language and content as dictated by the immersion approach so students make the most of learning a second language. There should be a clear understanding of the effects of second language learning on students' cognitive abilities at different developmental stages.

3) Policymakers should promote the integration of content and language when making decisions about school programs and their funding.
4) Parents have an obligation to understand the different choices in school programs available within their school district. Choosing the appropriate school and program that is most likely to benefit children should be a priority for all parents especially those whose children fall in the categories that are already labeled at risk of performing below average when it comes to proficiency in the state standards as assessed by standardized testing.
5) All stakeholders must have an understanding of language learning and language acquisition theories before committing to language programs. Sometimes, benefits of learning a new language may not be apparent until after a certain time. It is important to be observant, patient, and to correctly assess progress.

Recommendations for Academics

Findings from this study warrant further research on the difference total language immersion may make in students' performance on MCA-III tests. It would be very helpful to find out if the upward trend noted between third and fifth grade especially in MCA-III math would hold true for immersion students beyond elementary. The Threshold Hypothesis (Figure 3, Cummins, 1979) supports that cognitive gains should rise as the student keeps developing proficiency in their first language and their second language in a simultaneous manner.

The difference noted in this study between reading and math scores is also worth exploring. There is currently a real effort to promote STEM (Science, Technology, Engineering and math) education in the U.S. (National Science and Technology Council, 2013). The statistically significant difference noted in this study between fifth grade immersion students'

MCA-III math scores and their counterparts in traditional schools requires further research in light of the current interest in STEM programming and the promotion of STEM subjects such as math.

This study focused on a handful of schools within two districts. Duplicating the research with a wider focus that would include more school districts even in rural areas could be instrumental in the possibility to confirm and generalize findings. It would also be interesting to conduct a longitudinal study on the same cohorts of immersion students to compare their standardized test scores over the years. This could be a true test to Cummins' Threshold Hypothesis (Figure 3, Cummins, 1979)

Concluding Comments

Chapter five marks the conclusion of this quantitative study on total language immersion education and achievement on MCA-III standardized tests. Findings mostly support the theoretical framework at the basis of the study which stipulates that students who learn a second language while developing their first one enjoy cognitive advantages compared to monolinguals (Collier, 1989; Cummins, 1979). Even though there was a large sample of 1,141 students' test scores used, it is however important to use caution in generalizing the findings. One immersion school's results did not show the bilingual advantage in proficiency on the MCA-III test when compared to its traditional model counterpart. The school in question did not meet all the criteria of a total language immersion given that most of its student body spoke the immersion language at home and are not necessarily developing two languages simultaneously between home and school. Moreover, it was not possible to find another school that matched the same demographics within the district. The selected control school was the closest but was not an exact match. The limitations imposed by the relatively small number of schools involved in this study require

further caution in the interpretation of the findings. One of the most remarkable findings that the data collected for this study showed is that language immersion fifth grade students showed tremendous proficiency in the MCA-III math compared to their counterparts in traditional schools.

References

Alfaro, C., Durán, R., Hunt, A. & Aragón, M. (2014). Steps toward unifying dual language programs, common core state standards, and critical pedagogies: oportunidades, estrategias y retos. *Association of Mexican-American Educators,8(2),* 17-30.

The American Council on the Teaching of Foreign Languages. (n.d.). *About ACTFL.* Retrieved from https://www.actfl.org/about-the-american-council-the-teaching-foreign-languages

Association for Supervision and Curriculum Development (1998). *Curriculum Handbook.* Retrieved from http://www.ascd.org/publications/curriculum_handbook/413/chapters/Bilingual_Education@_Effective_Programming_for_Language-Minority_Students.aspx

Baker, C., & Jones, S. (1998). *Encyclopedia of bilingualism and bilingual education*. Clevedon: Multilingual Matters.

Baker, C. (2001). The foundations of Bilingual Education and Bilingualism. Clevedon: Multilingualism Matters.

Barac, R., Bialystok, E., Castro, D., & Sanchez, M. (2014). The cognitive development of young dual language learners: A critical review. *Early Childhood Research Quarterly, 29*(4), 699-714. doi:10.1016/j.ecresq.2014.02.003

Baral, D. (1987). The Theoretical Framework of Jim Cummins: A Review and Critique.

Billings, E., Martin-Beltran, M., & Hernandez, A. (2010). Beyond English Development: Bilingual Approaches to Teaching Immigrant Students and English Language Learners. *Yearbook Of The National Society For The Study Of Education*, *109*(2), 384-413.

Boudreaux, N. (2010). *A mixed methodological study of factors contributing to student persistence and their impact on student attrition in foreign language immersion programs*. Retrieved from http://search.proquest.com/docview/522105954?accountid=8593

Bialystok, E., Craik, F. I., & Luk, G. (2012). Bilingualism: Consequences for mind and brain. *Trends in Cognitive Sciences, 16*(4), 240-250. doi:10.1016/j.tics.2012.03.001

Cammarata, L., & Tedick, D. (2012). Balancing content and language in instruction: The experience of immersion teachers. *Modern Language Journal, 96*(2), 251-269. doi:10.1111/j.1540-4781.2012.01330.x

Cadiero-Kaplan, K. (2004). *The literacy curriculum and bilingual education: a critical examination*. New York: Peter Lang.

Cenoz, J., & Genesee, F. (Eds.). (1998). *Beyond bilingualism: Multilingualism and multilingual education* (Vol. 110). Multilingual Matters.

Cenoz, J., Genesee, F., & Gorter, D. (2014). Critical analysis of CLIL: Taking stock and looking forward. *Applied Linguistics, 35*(3), 243-262.

Center for Advanced Research on Language Acquisition. (2016). *Types of Immersion Education: an introduction*. Retrieved from http://carla.umn.edu/immersion/acie/vol1/Feb1998_ImmersTypes.html

Center for Applied Linguistics. (2016). *Directory of foreign language immersion programs in U.S. schools*. Retrieved from http://webapp.cal.org/Immersion/.

Chomsky, N. (1959). A Review of B.F. Skinner's Verbal Behavior. *Language,* 35(1): 26–58.

Clarke, M., Madaus, G., Horn, C., & Ramos, M. (2000). Retrospective on Educational Testing and Assessment in the 20th Century. *Journal Of Curriculum Studies*, *32*(2), 159-81.

Collier, V. (1989). How Long? A Synthesis of Research on Academic Achievement in a Second Language. *TESOL Quarterly, 23*(3), 509-531. doi:10.2307/3586923

Common Core Standards Initiative. (2016). Standards in your state. Retrieved from http://www.corestandards.org/standards-in-your-state/

Creswell, J. (2014). *Research Design*. (4th ed.).Thousand Oaks: Sage Publications.

Cummins, J. (1979). Linguistic Interdependence and the Educational Development of Bilingual Children. *Review of Educational Research*, 49(2), 222-251. doi:10.3102/00346543049002222

Cummins, J. (1998). Immersion education for the millennium: What have we learned from 30 years of research on second language immersion? In M. R. Childs & R. M. Bostwick (Eds.) *Learning through two languages: Research and practice. Second Katoh Gakuen International Symposium on Immersion and Bilingual Education.* (pp. 34-47). Katoh Gakuen, Japan.

Cummins, J. (2000). *Language, Power and Pedagogy: Bilingual Children in the Crossfire.* Clevedon: Multilingual Matters

Cummins, J. (1994). The Acquisition of English as a Second Language, in Spangenberg-Urbschat, K. and Pritchard, R. (eds) *Reading Instruction for ESL Students.* Delaware: International Reading Association

Cummins, J., & Swain, M. (1986). Bilingualism in education: aspects of theory, research and practice. New York: Longman

Deatz, R., Smith, E., Thacker, A., Dickinson, E., Levinson, H., Nemeth, Y. (2013). *Independent Alignment Review of the Reading Minnesota Comprehensive Assessment (MCA-III).* Retrieved from http://education.state.mn.us/MDE/SchSup/TestAdmin/MNTests/TechRep

DiCicco, M. (2016). Global citizenship education within a context of accountability and 21st century skills: The case of Olympus High School. *Education Policy Analysis Archives, 24*(57). http://dx.doi.org/10.14507/epaa.24.2364

Faria, A., Greenberg, A., Meakin, J., Bichay, K., Heppen, J. (2014). Replicating the Relationship between Teachers' Data Use and Student Achievement: The Urban Data Study and the Data Dashboard Usage Study. *Society For Research On Educational Effectiveness*. Retrieved from http://eric.ed.gov/?id=ED562866

Floyd, K. (2011). *The impact of second language acquisition and student achievement from teachers' perspectives*. Retrieved from http://search.proquest.com/docview/913400107?accountid=8593

Fortune, T. (2012). *What the Research Says About Immersion. Retrieved from http://carla.umn.edu/immersion/documents/ImmersionResearch_Fortune.pdf*

Fortune, T. & Tedick, D. (2008). *Pathways to multilingualism: Evolving perspectives on immersion education*. Clevedon: Multilingual Matters.

Framework for 21st Century Learning. (n.d.). Retrieved from http://www.p21.org/about-us/p21-framework/261

Frederick, J. (1987). *Measuring School Effectiveness: Guidelines for Educational Practitioners*. Retrieved from http://files.eric.ed.gov/fulltext/ED282891.pdf

Friedman Foundation for Educational Choice. (2016). *The ABCs of School Choice*. Retrieved from http://www.edchoice.org/wp-content/uploads/2016/02/2016-ABCs-WEB-2.pdf

Gándara, P. (2015). Rethinking Bilingual Instruction. *Educational Leadership*, *72*(6), 60-64.

García, O., & Kleifgen, J. (2010). *Educating emergent bilinguals: Policies, programs, and practices for English language learners.* New York: Teachers College Press.

Gaston, J. (2011). *The effects of foreign language instruction on student achievement in a south dakota elementary school.* Retrieved from http://search.proquest.com/docview/865049612?accountid=8593

Genesee, F., & Cloud, N. (1998). Multiligualism is Basic. *Educational Leadership*, *55*(6), 62-65.

Genesee, F. (2007). French immersion and at-risk students: a review of research evidence. *Canadian Modern Language Review*, 63(5), 655-687.

The Glossary of Education Reform. (2016). *21st Century Skills*. Retrieved from http://edglossary.org/21st-century-skills/

Graue, M., Wilinski, B., & Nocera, A. (2016). Local control in the era of accountability: A case study of Wisconsin preK. Education Policy Analysis Archives, 24(60). http://dx.doi.org/10.14507/epaa.24.2366

Grimes, J. C. (2008). *The effects of student participation in FLES* programs on standardized test scores.* Retrieved from http://search.proquest.com/docview/89222958?accountid=8593

Haney, W. (1984). Testing Reasoning and Reasoning about Testing. *Review of Educational Research, 54*(4), 597-654. Retrieved from http://www.jstor.org.ezproxy.bethel.edu/stable/1170177

Hayes, L., Lillenstein, J. (2015). A Framework for Coherence: College and Career Readiness Standards, Multi-Tiered Systems of Support, and Educator Effectiveness. Special Issues Brief. *Center On Great Teachers And Leaders*.

Hermanto, N., Moreno, S., & Bialystok, E. (2012). Linguistic and metalinguistic outcomes of intense immersion education: how bilingual? *International Journal of Bilingual Education and Bilingualism, 15*(2), 131-145.

Howard, E., Lindholm-Leary, K., Rogers, D., Olague, N., Medina, J., Kennedy, D., Sugarman, J., & Christian, D. (2018). *Guiding Principles for Dual Language Education* (3rd ed.). Washington, DC: Center for Applied Linguistics.

Ingersoll, R., Merrill, L., & May, H. (2016). Do Accountability Policies Push Teachers Out?. *Educational Leadership*, *73*(8), 44-49.

Ioannou Georgiou, S. (2012). Reviewing the puzzle of CLIL. *ELT Journal: English Language Teaching Journal, 66*(4), 495-504.

Johnson, R. & Swain, M. (1997). *Immersion education: International perspectives.* Cambridge, UK: Cambridge University Press.

Kane, M. (2015). Adapting Accountability Systems to the Limitations of Educational Measurement. *Measurement: Interdisciplinary Research And Perspectives*,*13*(1), 44-48.

Kaplan, L., & Owings, W. (2011). *American education: building a common foundation*. Belmont, CA: Wadsworth, Cengage Learning.

Kaptain, H. (2010). *Primary students' proficiency and achievement: The difference two-way immersion programs can make.* Retrieved from http://search.proquest.com/docview/848636051?accountid=8593

Kitmitto, S., Levin, J., Betts, J., Bos, J., Eaton, M., & Society for Research on Educational Effectiveness. (2016). *What happens when schools become magnet schools? A longitudinal study of diversity and achievement*. Society for Research on Educational Effectiveness.

Kong, S. (2015). Designing Content-Language Integrated Learning Materials for Late Immersion Students. *TESOL Journal*, *6*(2), 302-331.

Krashen, S. (2013). *Second language acquisition: theory, applications and some conjectures*. Retrieved from http://www.sdkrashen.com/content/articles/krashen_sla.pdf

Larson, L. (2016) *The Every Student Succeeds Act (ESSA*). Retrieved from http://www.house.leg.state.mn.us/hrd/pubs/ss/ssessa.pdf

Lindholm-Leary, K., & Block, N. (2010). Achievement in Predominantly Low SES/Hispanic Dual Language Schools. *International Journal of Bilingual Education And Bilingualism*, *13*(1), 43-60.

Lundt Research. (2013). Independent t-tests Using SPSS Statistics. Retrieved from https://statistics.laerd.com/spss-tutorials/independent-t-test-using-spss-statistics.php

MacSwan, J. (2000). The Threshold Hypothesis, Semilingualism, and Other Contributions to a Deficit View of Linguistic Minorities. *Hispanic Journal Of Behavioral Sciences*, 22(1), 3-45.

Magnet Schools of America. (2013). *What are magnet schools?* Retrieved from http://www.magnet.edu/about/what-are-magnet-schools

Marian,V., Shook, A. & Schroeder, S. (2013). Bilingual Two-Way Immersion Programs Benefit Academic Achievement. *Bilingual Research Journal*, *36(2)*, 167-186. doi: 10.1080/15235882.2013.818075

Mayfield, V. & Garrison-Wade, D. (2015). Culturally Responsive Practices as Whole School Reform. *Journal Of Instructional Pedagogies*, *16*

Mehisto, P., & Genesee, F. (2015). *Building bilingual education systems: forces, mechanisms and counterweights*. Cambridge: Cambridge University Press.

Menezes, V. (2013). Second Language Acquisition: Reconciling Theories Open Journal of Applied Sciences, 2013, 3, 404-412 Open Journal of Applied Sciences, 2013, 3, 404-412. doi: 10.4236/ojapps.2013.37050

Met, M. (1993). *Foreign Language Immersion Programs ERIC Digest*. Retrieved from https://www.ericdigests.org/1994/immersion.htm

Met, M. (2008). A Cure for Monolingualism. *District Administration*, *44*(11), 35-47.

Minnesota Advocates of Immersion Network. (2015). *Immersion Programs in Minnesota*. Retrieved from http://www.mnimmersion.org/ImmersioninMN

Minnesota Advocates of Immersion Network. (2015). *Immersion Programs in Minnesota*. Retrieved from http://www.mnimmersion.org/Resources/Documents/Statewidepercent20ImmersionTableFormatFeb2015.pdf

Minnesota Department of Education. (2018). *Minnesota report card*. Retrieved from https://rc.education.state.mn.us/

Minnesota Department of Education. (2016). *The every student succeed act (ESSA) and Minnesota Overview*. Retrieved from http://education.state.mn.us/MDE/dse/essa/

Minnesota Department of Education. (2016). *Statewide testing*. Retrieved from http://education.state.mn.us/MDE/fam/tests/

Minnesota Department of Education. (2016). *Minnesota tests*. Retrieved from http://education.state.mn.us/MDE/dse/test/mn/MDE034350

Minnesota Department of Education. (2016). *Parent/Guardian guide to statewide testing.* Retrieved from http://education.state.mn.us/mdeprod/groups/educ/documents/hiddencontent/bwrl/mdu5/~edisp/mde059689.pdf

Minnesota Department of Education. (2015). *Testing information*. Retrieved from http://education.state.mn.us/MDE/JustParent/TestReq/

Minnesota Department of Education. (2015). *School Enrollment Choice*. Retrieved from http://education.state.mn.us/MDE/JustParent/SchChoice/

Minnesota Office of the Revisor (2016). *2016 Minnesota Statutes Educational Data*. Retrieved from https://www.revisor.mn.gov/statutes/?id=13.32

Morgan-Short, K., Steinhauer, K., Sanz, C., & Ullman, M. (2012). Explicit and implicit second language training differentially affect the achievement of native-like brain activation patterns. *Journal of Cognitive Neuroscience, 24*(4), 933-947.

Muijs, D. (2011). *Doing quantitative research in education with SPSS.* Thousand Oaks: Sage.

National Science and Technology Council, Committee on STEM Education. (2013). *Federal Science, Technology, Engineering, and Mathematics (STEM) education: 5-year strategic plan*. Retrieved from https://www.whitehouse.gov/ sites/default/files/microsites/ostp/stem_stratplan_2013.pdf

Oller, K. & Eilers, R. (2002). *Language and Literacy in Bilingual Children*. Clevedon, England: Multilingual Matters Ltd.

Orcher, L. (2014). *Conducting research: Social and behavioral science methods.* (2nd ed.). Glendale, CA: Pyrczak Pub.

Ovando, C. (2003). Bilingual education in the United States: Historical development and current issues. *Bilingual Research Journal, 27*(1), 1-24.

PACER Center. (2016). *MCA Statewide Tests* Retrieved from http://www.pacer.org/mpc/mcatests.asp)

Pacific Policy Research Center, (2010). *Successful bilingual and immersion education Models/Programs*. Retrieved from http://www.ksbe.edu/_assets/spi/pdfs/Bilingual_Immersion_full.pdf

Patten, M. (2014). Understanding *research methods: An overview of the essentials.* (9th ed.). Glendale, CA: Pyrczak Publishing.

Rega, M. (2015). *Reading and math outcomes of randomly selected majority culture students participating in an elective, parent choice, full academic content area Spanish immersion program*. Retrieved from http://search.proquest.com/docview/1667768873?accountid=8593

Rong, X. (2012). Advocacy-Orientated Teacher Education in New Gateway States. *Teacher Education And Practice*, *25*(4), 580-584.

Ruiz, d. Z., & Cenoz, J. (2015). Way forward in the twenty-first century in content-based instruction: Moving towards integration. *Language, Culture and Curriculum, 28*(1), 90-96.

Schulz, R. (1991). Second language acquisition theories and teaching practice: How do they fit? *Modern Language Journal, 75*(1), 17-26.

Schwabsky, N. (2013). Exploring principals' nonroutine problems in bilingual immersion schools: lessons learned for multicultural leadership. *Journal of School Leadership*, 23(5), 789-822.

Skinner, B. (2014). *Verbal behavior.* Retrieved from https://books.google.com/books?hl=en&lr=&id=v4CeAwAAQBAJ&oi=fnd&pg=PT1&ots=9fUVNz_7Cm&sig=mHfeiGU1tW5zJIsX9BF7W5AtQYg#v=onepage&q&f=false

Slater, R. (2017).*Why the dual language immersion approach will change achievement in american public schools*. Retrieved from https://www.americancouncils.org/news/why-dual-language-immersion-approach-will-change-achievement-american-public-schools

Sobe, N., & Boven, D. (2014). Nineteenth-century world's fairs as accountability systems: Scopic Systems, Audit Practices and Educational Data. *Education Policy Analysis Archives*, 22(118). http://dx.doi.org/10.14507/epaa.v22.1673

Somers, M., Zhu, P., Wong, E., & National Center for Education Evaluation and Regional Assistance, (2011). Whether and How to Use State Tests to Measure Student Achievement in a Multi-State Randomized Experiment: An Empirical Assessment Based on Four Recent Evaluations. NCEE 2012-4015. *National Center For Education Evaluation And Regional Assistance*,

Steele, J., Slater, R., Li, J., Zamarro, G., Miller, T., & Society for Research on Educational Effectiveness, (2015). Costs and Effects of Dual-Language Immersion in the Portland Public Schools. *Society For Research On Educational Effectiveness*,

Stewart, M. (2013). What is "Educated" in the 21st Century?. *Phi Delta Kappan*, *94*(7), 57-60.

Stewner-Manzanares, G., (1988). The bilingual education act: 20 years later. *New Focus, Occasional Papers in Bilingual education, (6),* 2-9.

Tedick, D., Christian, D., & Fortune, T. (Eds.). (2011). Bilingual Education & Bilingualism: Immersion Education : Practices, Policies, Possibilities. Bristol, GBR: Channel View Publications. Retrieved from http://site.ebrary.com.ezproxy.bethel.edu/lib/betheluniversity/reader.action?docID=10492854

Tedick, D., Christian, D., & Fortune, T. (2011). *Immersion education: Practices, policies, possibilities*. Bristol: Multilingual Matters.

Tedick, D., & Wesely, P. (2015). A review of research on content-based foreign/second language education in US K-12 contexts. *Language, Culture and Curriculum, 28*(1), 25-40. doi:10.1080/07908318.2014.1000923

U.S. Department of Education. (2016). The Federal Role in Education. Retrieved from http://www2.ed.gov/about/overview/fed/role.html

U.S. Department of Education. (2015). *Every Student Succeeds Act*. Retrieved from http://www.ed.gov/essa?src=rn

U.S. Department of Education. (2004). *NCLB Executive Summary*. Retrieved from http://www2.ed.gov/nclb/overview/intro/execsumm.html

U.S. Senate. (n.d.). *The National Defense Education Act*. Retrieved from https://www.senate.gov/artandhistory/history/minute/Sputnik_Spurs_Passage_of_National_Defense_Education_Act.htm

Vogt, W. (2007). *Quantitative research methods for professionals.* Boston: Pearson Education.

Wall, D. (2012). Immersion Education: Practices, Policies, Possibilities, edited by Diane J. Tedick, Donna Christian, and Tara Williams Fortune, *Bilingual Research Journal, 35(2), 243-246.* doi: 10.1080/15235882.2012.704481

Wei, X. (2010). Are More Stringent NCLB State Accountability Systems Associated With Better Student Outcomes? An Analysis of NAEP Results Across States. *Educational Policy, 26*(2), 268-308. doi:10.1177/0895904810386588

Wiliam, D. (2010). Standardized Testing and School Accountability. *Educational Psychologist*, *45*(2), 107-122.

Zhao, Y. (2006). Are We Fixing the Wrong Things?. *Educational Leadership*, *63*(8), 28-31.

Zhao, Y. (2007). Education in the flat world: Implications of globalization on education. *Phi Delta Kappa International*, *2*(4), 3–19. Retrieved from http://zhaolearning.com/wp-content/uploads/2011/02/KappanEdgeZhao.pdf

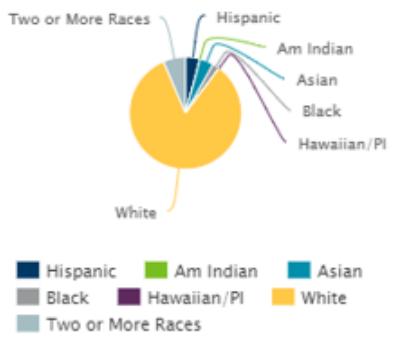
Zimmerman, B., & Dibenedetto, M. (2008). Mastery Learning and Assessment: Implications for Students and Teachers in an Era of High-Stakes Testing. *Psychology In The Schools*, *45*(3), 206-216.

Appendices

Appendix A: Demographic Information for Suburban Schools

Suburban Immersion School 1a

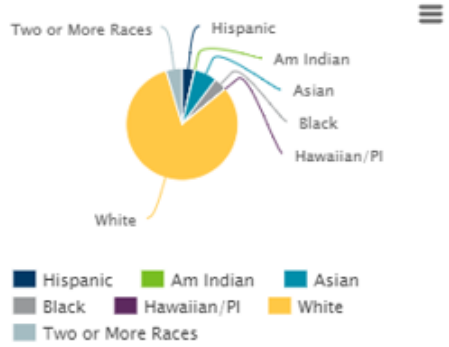
Enrollment by Race/Ethnicity



Race/Ethnicity	Count	Percent
Hispanic/Latino	27	4.2%
American Indian/Alaska Native	0	0.0%
Asian	26	4.0%
Black/African American	13	2.0%
Native Hawaiian/Pacific Islander	0	0.0%
White	535	83.3%
Two or More Races	41	6.4%
All Students	642	100.0%

Suburban Traditional School 1b

Enrollment by Race/Ethnicity



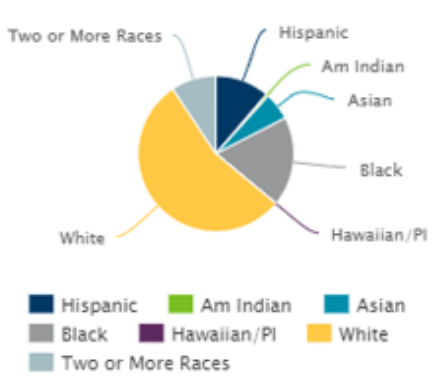
Race/Ethnicity	Count	Percent
Hispanic/Latino	26	3.6%
American Indian/Alaska Native	1	0.1%
Asian	48	6.6%
Black/African American	28	3.8%
Native Hawaiian/Pacific Islander	0	0.0%
White	595	81.3%
Two or More Races	34	4.6%
All Students	732	100.0%

(MDE, 2018)

Appendix B: Demographic Information for Urban Schools 1a and 1b

Urban Immersion School 1a

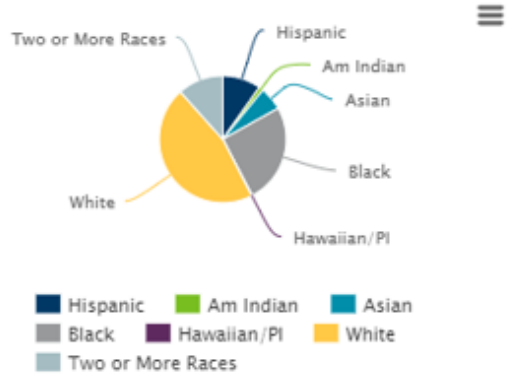
Enrollment by Race/Ethnicity



Race/Ethnicity	Count	Percent
Hispanic/Latino	41	11.2%
American Indian/Alaska Native	2	0.5%
Asian	21	5.7%
Black/African American	68	18.6%
Native Hawaiian/Pacific Islander	0	0.0%
White	200	54.6%
Two or More Races	34	9.3%
All Students	366	100.0%

Urban Traditional School 1b

Enrollment by Race/Ethnicity



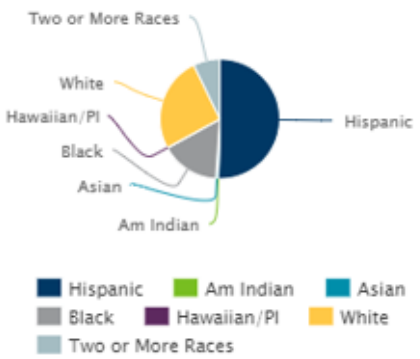
Race/Ethnicity	Count	Percent
Hispanic/Latino	44	9.8%
American Indian/Alaska Native	5	1.1%
Asian	27	6.0%
Black/African American	114	25.4%
Native Hawaiian/Pacific Islander	1	0.2%
White	206	45.9%
Two or More Races	52	11.6%
All Students	449	100.0%

(MDE, 2018)

Appendix C: Demographic Information for Suburban Schools 2a and 2b

Urban Immersion School 2a

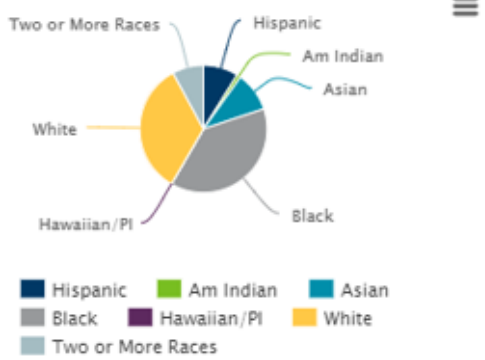
Enrollment by Race/Ethnicity



Race/Ethnicity	Count	Percent
Hispanic/Latino	357	50.4%
American Indian/Alaska Native	1	0.1%
Asian	4	0.6%
Black/African American	112	15.8%
Native Hawaiian/Pacific Islander	1	0.1%
White	182	25.7%
Two or More Races	51	7.2%
All Students	708	100.0%

Urban Traditional School 2b

Enrollment by Race/Ethnicity



Race/Ethnicity	Count	Percent
Hispanic/Latino	37	8.9%
American Indian/Alaska Native	4	1.0%
Asian	42	10.0%
Black/African American	161	38.5%
Native Hawaiian/Pacific Islander	0	0.0%
White	141	33.7%
Two or More Races	33	7.9%
All Students	418	100.0%

(MDE, 2018)