

ABSTRACT

Title of dissertation: THE RELATIONSHIPS BETWEEN TEACHER VARIABLES AND OUTCOMES FOR LANGUAGE MINORITY LEARNERS IN GRADES 3-5 ON MEASURES OF VOCABULARY KNOWLEDGE AND READING COMPREHENSION

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Researchers have examined the relationships between teachers' preparation, educational attainment, and teaching experience and the overall academic achievement of their students. However, little attention has been given to the relationships between these variables and the achievement of language minority learners (LMLs) in mainstream classrooms. Likewise, though researchers have measured teachers' beliefs and attitudes related to the inclusion and instruction of LML students, researchers have yet to address how these teachers' beliefs and attitudes might relate to LML students' academic achievement.

This study was designed to examine relationships between teachers' preparation, teaching experience, educational attainment, and beliefs and attitudes and the achievement of LMLs in the areas of vocabulary knowledge and reading comprehension. Participants in the study were LML students in grades 3-5 (n=173) and mainstream classroom teachers (n=51) from three schools from in the Mid-Atlantic region and three schools from the Northeastern region of the United States.

Students were assessed at the beginning and end of the 2010-2011 school year using the Passage Comprehension and Vocabulary subtests of the Woodcock-Muñoz Language Survey-Revised (Woodcock et al., 2005). In the spring of 2011, teachers were asked to complete a survey designed to collect information related to their backgrounds, beliefs, and attitudes.

I used ordinary least squares regression with robust standard errors to explore relationships between students' outcomes and teachers' backgrounds, beliefs, and attitudes. The results indicated that teachers' level of teaching experience was significantly and positively related to their LML students' achievement in vocabulary knowledge. I found that teachers' level of preparation for working with LML students and their attitudes toward the inclusion of LML students in their classrooms were significantly and positively related to their LML students' achievement in reading comprehension. I also found a significant, negative relationship between teachers' beliefs about school support and their LML students' outcomes on the measure of vocabulary knowledge.

These findings suggest that teachers' backgrounds, beliefs, and attitudes related to the inclusion and instruction of LML students may in fact influence their LML students' academic achievement. Additionally, these findings provide insight into the complex relationships between mainstream classroom teachers, LML students, and students' academic outcomes.

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DEDICATION

To the students, parents, teachers, and staff of St. Agnes of Bohemia School in Chicago, Illinois. I am so grateful to have had the chance to know, work with, and learn from you.

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CHAPTER 1: INTRODUCTION

Language minority learners (LMLs) are the fastest-growing population of students in schools in the United States. In 1974, six percent of school-age children and youth in the U.S. spoke a language other than English in their homes. By 1999, that number had increased to 14%. Of this 14%, over half were enrolled in grades 1-4 (National Center for Education Statistics, 2004). By the year 2038, it is estimated that approximately 40% of students in schools in the United States will speak a language other than English in their homes (U.S. Department of Education & National Institute of Child Health and Human Development, 2003).

Increasingly, these LML students are receiving most or all of their instruction in English, within the context of mainstream, heterogeneous classrooms (Short & Fitzsimmons, 2007). The teachers in these mainstream classrooms possess a wide variety of qualifications, years of experience, and beliefs and attitudes about the inclusion and instruction of the students in their increasingly diverse classrooms. In 2002, over 40% of mainstream teachers in the United States reported teaching English language learners on a daily basis. Of these teachers, only 12.5% had received eight hours or more training specifically related to LMLs (National Center for Education Statistics, 2002).

A small but growing number of researchers have explored the ways in which mainstream classroom teachers are trained to work with LMLs (Durgunolu & Hughes, 2010; Menz, 2009). Researchers have also examined teachers' beliefs and attitudes related to the inclusion and instruction of LMLs in their mainstream classrooms (Clair, 1995; Johnson, 2009; Yoon, 2008). While these studies provide valuable insights into the complex interactions between mainstream classroom teachers and LML students, they

have not examined the impact that teachers' experiences, preparation, beliefs, and attitudes have on the academic outcomes of LML students.

A second, larger group of researchers has examined the impact that teacher variables appear to have on the academic achievement of the students in their classrooms (Connor, Son, Hindman & Morrison, 2005; Darling-Hammond 2000; Darling-Hammond & Youngs, 2002). Findings from these studies seem to suggest that specific variables, including teacher preparation, teacher experience, and teachers' educational attainment may make a difference in terms of children's academic achievement. However, the data from these studies has not been disaggregated to indicate the impact that these teacher factors may have on LML students.

Problem Statement

My review of the research literature has revealed that studies regarding teachers' preparation, educational attainment, and teaching experience have not examined the impact of these variables on the achievement of English language learners. Additionally, existing studies exploring teachers' beliefs and attitudes related to the inclusion and instruction of LML students in mainstream classrooms have not examined the relationship between these variables and the academic achievement of LML students. My study was designed to address these gaps in the current research base, and was guided by the following research questions:

1. How do teachers' levels of teaching experience, educational attainment, and preparation for teaching language minority learners (LMLs) relate to their LML students' outcomes on measures of vocabulary knowledge and reading comprehension?

2. How are language minority learners' outcomes on measures of reading comprehension and vocabulary knowledge related to their mainstream classroom teachers' attitudes toward (a) the inclusion of language minority learners in their classrooms, (b) the modification of reading and language arts instruction for language minority learners, and (c) professional development related to reading and language arts instruction for language minority learners?

My study examined the relationships between teacher variables (teachers' preparation, teaching experience, educational attainment, and beliefs and attitudes) and the achievement of language minority learners on measures of vocabulary knowledge and reading comprehension. As described in the next section of this paper, vocabulary knowledge and reading comprehension are critical components in the language and literacy development of LML students, and have a profound effect on their overall academic achievement.

Factors Related to the Language and Literacy Development of LML Students

General Factors

The population of LML students in U.S. schools is made up of a diverse group of learners who vary greatly in terms of the language or languages they speak at home, their level of literacy and/or education in their first language, their parents' educational backgrounds, and the socioeconomic status (SES) of their families (Thomas & Collier, 2002). However, the majority of LML students appear to share factors that put them at risk for difficulties in learning to read and speak English, which in turn puts them at risk for overall difficulties as learners in mainstream classrooms (August & Shanahan, 2006).

The process of learning to read in English is “an incredibly complicated phenomenon” (Snow, Burns, & Griffin, 1998, p. vi) for all learners. It is an especially complex undertaking for children who are in the process of learning English as their second language. General risk factors for LML students include the fact that they tend to come from low SES backgrounds and to attend schools with disproportionately high numbers of children in poverty, both of which are known to be risk factors for reading achievement (Snow et al., 1998). Cultural differences, or a mismatch between schools and families in terms of their definitions of literacy and ideas about education can also create obstacles to students’ learning to read in school (Snow et al., 1998).

Reading Comprehension Development

In spite of these obstacles, research has shown that LML students have the capacity to meet or even exceed the performance levels of their monolingual peers in many aspects of literacy learning including word identification and word attack (Lesaux & Siegel, 2003). The National Literacy Panel (NLP) on Language Minority Children and Youth echoed these findings, stating that “by and large, for language minority children, word level components of literacy either are or can be at levels equal to those of their monolingual peers” (August & Shanahan, 2006, p.13). These findings seem to indicate that LML students and monolingual students are similarly adept at learning and using the skills that they need to decode and understand individual words.

It is when LML students attempt to read words within the context of connected text that many begin to differ markedly from their monolingual English-speaking peers. The NLP found that LML students’ development of the skills needed to decode and comprehend connected text (referred to by the NLP as “text-level skills”) lagged far

behind their monolingual English-speaking peers' development of these same skills. These findings suggest that explicit instruction in text-level literacy skills, such as reading comprehension strategies, is especially critical to LML students' success in learning to read in English (August & Shanahan, 2006).

Vocabulary Development

Increasingly, researchers have suggested that the disparity in the level of text-level literacy skills between monolingual English speaking students and English language learners is also powerfully and directly linked to differences in English vocabulary knowledge (August, Carlo, Dressler & Snow, 2005; August & Shanahan, 2006). Many LML students are attempting to learn to read in English before they have developed oral proficiency and vocabulary in English.

Though it may seem obvious, it is important to consider the fact that in most mainstream classroom settings, LML students must learn oral language and literacy skills in English “with enormous efficiency” (Lesaux & Geva, 2003, p. 53) if they are to catch up with their monolingual peers. The majority of LML students require targeted help and support from their mainstream classroom teachers in order to develop literacy skills that meet grade-level expectations, and to “close the gap” between them and their monolingual English-speaking classmates (Carlo et al., 2004). Limited vocabulary knowledge in English affects LML students' comprehension of English text, and puts them at an increased risk for reading difficulties.

The CLAVES Project

Purpose

My study was conducted using data from the Comprehension, Linguistic Acquisition, and Vocabulary in English and Spanish (CLAVES) project, an IES-funded longitudinal study of the development of vocabulary knowledge and reading comprehension skills over time for monolingual and LML students in grades 2-5. I worked as a research assistant on the CLAVES project from September 2009 until September 2011. The principal investigators of the project were Dr. Rebecca Silverman and Dr. Jeffrey Harring of the University of Maryland, College Park and Dr. Patrick Proctor of Boston College. Drs. Silverman, Harring and Proctor agreed to allow me to use student assessment data for my study, and allowed me to develop, pilot, and administer a teacher survey in order to gather information about teacher factors that may be related to students' performance on measures of vocabulary knowledge and reading comprehension.

Student Measures

Students were pre-tested in the fall and post-tested in the spring of the 2010-2011 academic year on English language measures of reading comprehension and vocabulary knowledge. The Woodcock-Muñoz Language Survey-Revised (WMLS-R; Woodcock et al., 2005) Passage Comprehension and Vocabulary subtests were selected by the CLAVES team as assessments of reading comprehension and vocabulary knowledge, respectively. Each of these subtests has a high degree of reliability when used with students in the age groups that are the focus of the CLAVES project. Additionally, each of these measures has been nationally normed with diverse student populations that are similar to the population of students who are the subjects of the CLAVES study.

Teacher Measures

In collaboration with the CLAVES research team, I developed a teacher survey to gather information about teacher factors including teachers' level of teaching experience, teachers' educational attainment, the amount and type of training teachers had received related to instruction for LML students, and teachers' beliefs and attitudes toward the inclusion and instruction of LML students in their classrooms. I conducted a pilot test of the survey in the spring of 2010. Results from this pilot study are discussed in Chapter 3. Based on findings from the pilot study and feedback from my dissertation committee, I revised the survey in the spring of 2011 and pilot tested new questions with a small group of teachers (n=7). I then distributed the survey to all of the mainstream classroom teachers that were participating in the CLAVES study during the 2010-2011 school year. Please see Appendix G for a copy of the pilot version of the survey, and Appendix H for a copy of the final version of the survey.

Participants

Teachers. A total of 56 mainstream classroom teachers of students in grades 3-5 participated in the CLAVES study for the 2010-2011 school year. The teachers were recruited from one Northeastern site (n =26) and one Mid-Atlantic site (n =30) from one of three schools per site (n = 6 schools). Because the CLAVES study was designed to follow a cohort of students from grades 2-5 over the course of two years, most of the 3rd and 4th grade teachers in the study were participating for the second consecutive year, while the 5th grade teachers in the study were participating for the first time.

Students. Three hundred sixty-seven children in grades 3-5 participated in the CLAVES study during the 2010-2011 school year. Fifty-three percent of the sample was

comprised of monolingual English speakers. Forty-seven percent of the students spoke Spanish as their first language. For the purposes of my study, these students were characterized as language minority learners (LMLs). The LML students (n=173) who participated in the CLAVES project during the 2010-2011 school year were the subjects in my study.

Rationale for the Use of CLAVES Data

Student Data

I chose LML students in the elementary grades as the subjects of my study because these students represent the largest and fastest-growing segment of LMLs in schools in the United States (U.S. Department of Education & National Institute of Child Health and Human Development, 2003). Using the CLAVES student assessment data allowed me to examine a large sample of LML students in grades 3-5. Additionally, LML students in these particular grades are of great interest to me, considering that this is a period in students' academic development when they are often expected to transition from the "learning to read" stage of their literacy development to a stage in which they are "reading to learn" (Chall, 1983). This transition, which can be difficult for many students (Chall, Jacobs, & Baldwin, 1990) has been demonstrated by researchers to be particularly difficult for LMLs (August & Shanahan, 2006).

I also chose to use CLAVES student data for my study because of the high quality of the data itself. As noted, the measures selected for use in the CLAVES project each have a high degree of reliability when used with students in the age groups that are the focus of the project. Additionally, the student subjects provide a large sample of LML students who are Spanish speakers. In most cases, these LML students were members of

mainstream classrooms comprised mainly of monolingual English-speaking students, with small numbers of LML students in each classroom. This sample reflects the overall demographics of many U.S. schools that serve LML students: Like the students in the CLAVES study, the majority of LMLs in U.S. schools speak Spanish, and many attend schools where there are only a few LMLs in each classroom (Zehler et al., 2003).

Teacher Survey Data

As mentioned previously, the principal investigators of the CLAVES project agreed to allow me to develop a survey to collect information from teachers about their educational and cultural backgrounds and their beliefs and attitudes related to the instruction and inclusion of LML students in their classrooms. I selected a survey instrument as the means to collect these data in an effort to solicit information from teachers in the most convenient and least intrusive manner possible.

The first portion of the survey is designed to gather basic background information from teachers, and includes very straightforward questions such as “How many years have you been teaching at the K-6 level?” and “How many years have you been teaching LML students?” The second portion of the survey is designed to measure teachers’ beliefs and attitudes. Because teacher beliefs and attitudes is such a “messy” and complex construct (Pajares, 1992), I chose to model my teacher survey instrument after a survey that had already been developed, piloted, and used in a published study (Reeves, 2006). In this way, I hoped to not only gather the information that I needed from teachers, but also to build on and extend Reeves’ work. In Chapter 3, I will describe Reeves’ survey instrument and explain how I used it to guide my development of the CLAVES teacher survey.

Initial Research

A pilot study was conducted in the spring of 2010 both to test the survey instrument and to collect data to be used in an initial analysis of the relationships between student assessment data and teacher factors. The design, implementation, and results of this pilot study are discussed in detail in Appendix E.

Based on the outcomes of the pilot study and the recommendations of my dissertation committee, I made significant revisions to both the format and content of the questions in the teacher survey. A small group of current and former elementary school teachers (n=14) provided feedback on the new survey questions and format. I then incorporated their suggestions into the final version of the teacher survey. Please see Chapter 3 for a detailed description of the development and revision of the teacher survey instrument.

Limitations

Though I believe that this study is an important first step in the process of understanding the complex interactions between teachers and LML students in mainstream classrooms, the study does have several important limitations. I will provide a brief overview of these limitations here, and will discuss them in greater detail in Chapter 5.

First, the study relied on teachers' self-reports. While several researchers have found teachers' self-reports to be fairly reliable (Mayer 1999; Porter, Kirst, Osthoff, Smithson & Schneider, 1993), it is likely that teachers may have had difficulty answering questions that address issues such as the amount of training they have received (reported in estimated number of courses they have taken) with precise accuracy.

Second, both the student and teacher sample sizes in this study were relatively small. This may limit the applicability of findings from this study to the broader populations of teachers and students in the United States. However, the size of both samples exceed commonly accepted minimum size requirements for the type of analyses I selected for use in this study. In Chapter 3, I will provide a detailed description of these analyses and the requirements for their use.

Third, the LML students in this study are all native Spanish speakers. Selecting a sample of LML students who shared a common home language allowed me to include questions on the teacher survey that were directly related to the Spanish language (e.g. a question about using Spanish-English cognates). While the majority of LML students in the United States speak Spanish as their first language, teachers in U.S. schools are working with students who speak hundreds of different native languages and dialects (August and Shanahan, 2006). In many diverse areas of the United States, mainstream classroom teachers are providing instruction for LML students with a variety of different home languages within the same mainstream classroom. This study does not address the specific challenges that such teachers face.

Definition of Terms

The following definitions represent the meaning of terms and how they are used in this study:

Language minority learners (LMLs) are students who have been designated by their schools and districts as speaking a language other than English as their first language. A variety of terms are used by different schools and districts, including those in this study, to describe students whose first language is not English. This variety of terms

for students whose first language is not English is found in the research literature as well (Garcia, 2012). For this study, I have chosen to use *language minority learners* (LMLs) to describe all of the students from all six school sites who spoke Spanish as their first language, regardless of their level of development as readers, writers, and speakers of English. I have selected this term based on the definition of language minority learners provided by Garcia in his 2012 review of research related to young LML students. In his review, Garcia explained that the term “language minority learner” is used to describe “U. S. children whose native language and family culture are other than English” (Garcia, 2012, pp. 137).

Bilingual students are children who have been identified by their schools or districts as being able to speak both English and Spanish proficiently.

Monolingual students are children who have been identified by their schools or districts as only speaking English proficiently.

Vocabulary knowledge refers to a student’s understanding of the meaning of words and the ability to comprehend the words both in isolation and within the context of a spoken phrase or phrases. For the purposes of this study, vocabulary knowledge refers only to oral language, and does not take into account the ability to recognize and understand a word or words in print. Additionally, the measures used in this study to assess vocabulary knowledge are designed to assess the breadth of students’ vocabulary knowledge rather than the depth of students’ knowledge of individual words.

Reading comprehension is “the construction of the meaning of a written text through a reciprocal interchange of ideas between the reader and the message in a particular text” (National Institute of Child Health and Human Development, 2000, Ch. 4,

p. 39). Comprehension involves processes such as activating prior knowledge (Anderson & Pearson, 1984), interacting with the text (Rosenblatt, 1978), inferencing, and monitoring (Palinscar & Brown, 1984).

Summary

Nearly half of all teachers in schools in the U.S. will have LML students in their mainstream classrooms at some point in their careers. These teachers vary widely in terms of their cultural and linguistic backgrounds, their levels of teaching experience, the type and amount of preparation they have received to work with their LML students, and their beliefs and attitudes related to the inclusion and instruction of the LML students in their mainstream classrooms. These teachers also vary widely in terms of their ability to help the LML students in their classrooms become successful readers and speakers of English. It is critical that teacher educators, school administrators, and teachers themselves understand if and how teacher factors appear to influence their LML students' academic development.

My study explored relationships between teacher factors and LML student outcomes on measures of vocabulary knowledge and reading comprehension. Specifically, I examined how teachers' levels of teaching experience, educational attainment, beliefs and attitudes, and preparation for working with LML students may relate to their students' development of vocabulary knowledge and their ability to read and comprehend connected text.

This study was an initial step in the lengthy, complex process of exploring what types of support LML students may need from their mainstream classroom teachers in order to further their development as readers and speakers of English. This study may

also provide a starting point for future research examining what mainstream classroom teachers need from their teacher preparation programs, professional development programs, and school administrators in order to be successful educators of the LML students in their classrooms.

CHAPTER II: REVIEW OF LITERATURE

Introduction

An estimated 5.3 million language minority learners are currently enrolled in K-12 public schools in the United States (National Clearinghouse for English Language Acquisition, 2011). The majority of these language minority students spend most or all of their time during the school day receiving instruction in English, within the context of mainstream, heterogeneous classrooms (Short & Fitzsimmons, 2007). The levels of preparation, teaching experience, and educational attainment of the teachers in these mainstream classrooms vary widely. These teachers also possess a wide variety of beliefs and attitudes related to the inclusion and instruction of language minority learners.

A large body of research indicates that LML students in mainstream classrooms are at risk for reading difficulties (Snow, Burns, & Griffin, 1998) and overall difficulties related to their academic development and achievement (August & Shanahan, 2006). Many researchers have explored the relationships between mainstream classroom teachers' educational attainment, preparation, and teaching experience and their students' academic achievement. However, researchers have not yet explored the relationships between these aspects of mainstream teachers' backgrounds and the achievement of the LML students in their classrooms. Additionally, a growing number of researchers have examined mainstream classroom teachers' beliefs and attitudes related to the inclusion and instruction of LML students in their classrooms. So far, however, researchers have not examined if and how teachers' beliefs and attitudes might be related to their LML students' academic achievement. My study was designed to be an initial attempt to

address these gaps in the existing research literature, and was guided by the following research questions:

1. How do teachers' levels of teaching experience, educational attainment, and preparation for teaching language minority learners (LMLs) relate to their LML students' outcomes on measures of vocabulary knowledge and reading comprehension?
2. How are language minority learners' outcomes on measures of reading comprehension and vocabulary knowledge related to their mainstream classroom teachers' attitudes toward (a) the inclusion of language minority learners in their classrooms (b) the modification of reading and language arts instruction for language minority learners and (c) professional development related to reading and language arts instruction for language minority learners?

In this chapter, I review the evidence from existing research that supports each construct in my study: (1) the key roles that vocabulary knowledge and reading comprehension play in the literacy development of LML students (2) the disparities that exist between LML students and their monolingual English-speaking peers in terms of their vocabulary knowledge and reading comprehension skills (3) the relationships between key factors in mainstream classroom teachers' backgrounds (educational attainment, teaching experience, and preparation) and their students' achievement and (4) mainstream classroom teachers' beliefs and attitudes related to the instruction and inclusion of LML students. This review is not intended to be exhaustive, however. For the purposes of this dissertation, it was not feasible or productive to provide detailed reviews of each of the hundreds of studies related to the constructs I explored in my

research questions. Instead, I selected studies for this review based on the following criteria: (1) the studies focused on elementary or middle school students, (2) the studies were published in peer-reviewed articles, chapters, or books, and (3) the studies took place in or were related to students and teachers in schools in the United States.

The Literacy Achievement of Students Who Are Language Minority Learners

When considering factors that impact the literacy achievement of language minority learners, it is essential to understand who LML students are, and how their instructional needs differ from those of their monolingual English-speaking peers. First, it is important to point out that not all LML students are alike. LML students differ greatly in terms of their language proficiency, educational background, and subject-matter knowledge (Echevarria, Short, & Powers, 2006). These students bring a wide range of skills with them to school. LMLs with strong academic backgrounds in their first language are often able to transfer their educational knowledge from one language to the other as they become more proficient in English (August & Shanahan, 2006). Many other LMLs have little or no academic knowledge in their first language, and need explicit instruction in both the academic and cultural aspects of schooling in the United States (Lee, 2005).

Regardless of their level of academic knowledge in their first language, however, most LML students do not have the same levels of language and literacy skills in English as their peers from English-speaking homes (Echevarria et al., 2005). In fact, LML students tend to lag far behind their monolingual English-speaking peers on standardized measures of literacy skills. For example, on the 2009 National Assessment of Educational Progress (NAEP) reading measure, only three percent of eighth grade

students who were classified as English language learners scored “at or above proficient”, compared with 34 percent of their monolingual English-speaking peers. (National Center for Education Statistics, 2011).

In particular, LML students tend to lag behind their monolingual English-speaking peers in two key areas of their literacy development: vocabulary knowledge and reading comprehension (Cobo-Lewis, Pearson, Eilers, & Umbrel, 2002; Proctor, Carlo, August, & Snow, 2005; August & Shanahan, 2006). As mentioned previously, researchers have demonstrated that LML students who receive appropriate instruction are able to achieve at or above the levels of their English-speaking peers on measures of phonemic awareness and phonics skills (Lesaux & Geva, 2006). It is when LML students attempt to read and comprehend connected text that they begin to trail behind students who speak English as their first language.

Vocabulary Knowledge

Findings from a growing number of studies have suggested that disparities in the levels of literacy skills between monolingual English speaking students and language minority learners are powerfully and directly linked to differences in English vocabulary knowledge (August, Carlo, Dressler & Snow, 2005; August & Shanahan, 2006). Limited vocabulary knowledge in English has a profound effect on LML students’ comprehension of English text, and puts them at an increased risk for reading difficulties. It may also put them at risk of being misdiagnosed as having learning disabilities, when in fact their reading difficulties stem from their limited English vocabulary knowledge (August et al., 2005).

As Shanahan and Beck (2006) have pointed out, most LML students do not have the same opportunities as native English speakers for oral exposure to English words before they attempt to learn to read and write in English. Additionally, in many cases LML students have limited access to written materials in English in their homes, and may have difficulty practicing their English reading and writing skills in cases where their parents and caregivers do not have strong language and literacy skills in English (Snow, Burns, & Griffin, 1998). Thus, while high quality instruction that promotes both oral and written vocabulary development is important for all students, this type of instruction is particularly important for LML students.

In their 2006 review of research related to vocabulary instruction for LML students, Shanahan and Beck stated that many instructional practices that have been shown to be effective for native-English speakers have also been shown to be effective for LML students. These practices include teaching new words within meaningful contexts, teaching words within a variety of formats, multiple exposures to new words, and explicit word study that involves attention to letters, sounds, and parts of words such as prefixes and suffixes.

However, though these practices have been shown to benefit all students, researchers have demonstrated that adapting these practices to meet the specific needs of LML students can provide additional support for LMLs' vocabulary development. One such adaptation is vocabulary instruction in meaningful contexts that provides LML students with multiple "access points" to the meanings of words, or multiple layers of support for their understandings of words. An example of the effectiveness of these multiple layers of the support can be seen in Ulanoff and Pucci's 1999 study in which

students who were provided with direct translations of English text in Spanish did not show statistically significant gains in vocabulary knowledge, but those that were provided with Spanish language support, visual aids and role playing activities did show statistically significant gains.

As discussed previously, explicit vocabulary instruction for LML students also seems to be more effective when the words are presented in a meaningful context, and students are provided with opportunities to discuss and use the words in meaningful contexts as well. For example, in Bos, Allen and Scanlon's 1989 study, students who were asked to create semantic maps and other visual aids to demonstrate the meanings of and relationships between words showed greater gains than those who were asked to study a list of words and their definitions.

Additionally, there are other, more general modifications to instruction for language minority students that have been shown to support language minority students' linguistic and academic development. These include allowing students to use their native language in class, the use of materials in students' native language, the use of pictures, visual aids, gestures, and other forms of demonstrating the meaning of words visually or graphically, and, when applicable, the discussion of similarities (such as cognates) that exist between LML students' first language and English. (August & Shanahan, 2006).

Reading Comprehension

Many researchers have conducted studies that explored the development of reading comprehension for native English speakers. In their 2002 review of studies of reading comprehension, the RAND Reading Study Group identified several key factors that contributed to students' ability to read and comprehend English text. One of the

most important factors identified in this review was the level of students' oral language skills and vocabulary knowledge. Additional factors included students' levels of accuracy and automaticity in reading words and the breadth and depth of their background knowledge. Lesaux, Koda, Siegel, and Shanahan (2006) conducted a review of research related to literacy development for language minority learners and found that these same factors are equally important for LMLs.

Although the same factors related to reading comprehension are important for both native English speakers and LMLs, many of the instructional practices used to help students develop these factors have been developed or modified to meet the unique needs of LML students. For example, researchers have identified a number of methods to develop LMLs' English language proficiency. These methods include providing rich and varied language experiences, the direct and explicit teaching of words, and the teaching word-learning strategies (Graves, 2006; Nagy & Stahl, 2006). Researchers have also identified instructional methods developed to support language minority students' reading comprehension. Such methods include instruction and modeling of comprehension monitoring, the use cooperative learning groups, graphic and semantic organizers, question answering, question generation, and summarization (NICHD, 2000). In many cases these second-language methods have been borrowed from first language research but have been modified to meet the unique needs of students reading in a second language (Shanahan & Beck, 2006).

Researchers in the field of reading have explored additional factors that contribute to the gap in reading comprehension between LML students and students who are native English speakers. Some researchers have suggested that many LML students are likely to

bring different experiences and “funds” of background knowledge with them to school than their native English-speaking classmates, which in turn may impact their comprehension of many of the texts used in mainstream, English-only classrooms (Moll, Armati, Neff, & Gonzalez, 1992). Others have demonstrated that many LML students have deficits in the area of phonemic awareness and phonics knowledge, particularly if they come from a background in which their first language, such as Chinese, uses a non-phonetic writing system (Echevarria & Short, 2006). These deficits impact students’ ability to decode and understand words, which in turn impacts their reading comprehension.

Teacher Background Factors and Their Students’ Academic Achievement

Increasing numbers of researchers have suggested that specific factors in teachers’ backgrounds may be related to their students’ academic achievement (Connor, Son, Hindman & Morrison, 2005; Darling-Hammond, 2000; Darling-Hammond & Youngs, 2002). Darling-Hammond (2000) identified three specific teacher factors as being predictors of students’ academic achievement: (1) Teachers’ level or amount of teaching experience (2) teacher preparation and credentials and (3) teachers’ level of educational attainment and knowledge, both in terms of their general academic ability and their content-specific knowledge. In the following section, I will discuss studies related to each of these teacher factors and their relationships to students’ academic outcomes.

Teaching Experience

Historically, teaching experience seems is one of the most common factors examined by researchers in studies exploring relationships between mainstream classroom teacher factors in U.S. elementary and middle schools and their students’

academic achievement. Numerous researchers (Connor et al., 2005; Darling-Hammond & Youngs, 2002; Eberts & Stone, 1984; Ehrenberg & Brewer, 1995; Ferguson, 1991, 1998; Ferguson & Ladd, 1996; Hanushek, 1997; Kiesling, 1984; Link & Mulligan, 1986; Link & Ratledge, 1979; Monk & King, 1994; Murnane & Phillips, 1981; Rivkin, Hanushek, & Kain, 2001), have examined levels of teaching experience, usually in conjunction with other teacher factors such as educational attainment and teacher preparation. Outcomes from these studies have shown positive (e.g., Ferguson & Ladd, 1996), negative (e.g., Connor et al., 2005) and indeterminate (e.g., Rivkin, Hanushek, & Kain, 2001) relationships between teachers' level of teaching experience and students' academic achievement.

Educational Attainment

A second teacher background factor that has been examined widely by researchers is teachers' level of educational attainment. Numerous researchers (Connor et al., 2005; Eberts & Stone, 1984; Ehrenberg & Brewer, 1995; Ferguson, 1991; Ferguson, 1998; Ferguson & Ladd, 1996; Hanushek, 1997; Kiesling, 1984; Link & Ratledge, 1979; Murnane & Phillips, 1981; Rivkin, Hanushek, & Kain, 2001) have examined this factor, nearly always in conjunction with teachers' level of teaching experience. Similar to findings from studies examining teachers' levels of teaching experiences, findings from studies examining elementary school teachers' educational attainment have found positive (Ferguson & Ladd, 1996) negative (Ehrenberg & Brewer, 1995), and indeterminate relationships between teachers' levels of educational attainment and their students' academic achievement.

Preparation

A teacher background factor that has been examined less frequently by researchers working with teachers and students in the elementary grades is the amount of preparation that teachers have received in specific academic areas or related to specific populations of students. Researchers studying students and teachers in the secondary grades have examined this factor more frequently, comparing the amount of subject-area teachers' preparation in the subject that they teach to their students' academic achievement (e.g. Goldhaber & Brewer, 2000). Only two studies (Monk, 1994; Wenglinsky, 2000) have examined relationships between the amount of content-specific preparation elementary school teachers received and their students' academic outcomes in the content area being studied (mathematics, in both studies).

Monk (1994) used data from more than 2,800 students from the Longitudinal Study of American Youth to examine relationships between teachers' college coursework and students' academic achievement. Monk found that both teachers' amount of coursework in mathematics and their education courses in mathematics methods were positively related to students' achievement in mathematics across all grade levels included in the study. Similarly, Wenglinsky (2000) found that teachers' possession of a major or minor in mathematics was positively related to their eighth-grade students' achievement in mathematics as measured by the National Assessment of Education Progress (NAEP).

Overall, studies related to mainstream classroom teachers' background factors appear to indicate that these factors may be related to students' academic outcomes in significant ways. However, existing research has not yet addressed how these

background factors might relate to the academic development and achievement of specific groups of students within these mainstream classrooms such as special education students and LMLs.

Teacher Beliefs and Attitudes

The construct of teacher beliefs and attitudes is “messy,” complex and fairly difficult to define (Pajares, 1992). For the purposes of my study, I define teachers’ beliefs and attitudes as an interconnected series of ideas related to teachers’ views of teaching, learning, and schooling, teachers’ ideas about themselves and their students, and the values they ascribe to various aspects of the educational process and system in schools in the United States. In his 1992 review of the construct of teachers’ beliefs and attitudes, Pajares described the interconnectedness of teachers’ beliefs and attitudes, noting that “a teacher’s attitude about a particular educational issue may include beliefs connected to attitudes about the nature of society, the community, race, and even family” (p. 325). These interconnected beliefs and attitudes have been demonstrated by researchers to shape how teachers view their positions and roles within the school community, how they think about and interact with their students, and how their students develop, both academically and socially (Clark & Peterson, 1986; Mangano & Allen, 1986). Researchers have also shown that teachers’ beliefs and attitudes can influence their classroom practices (Johnson, 1992; Orellana, 1995).

My hypothesis that teachers’ backgrounds, beliefs and attitudes might be related to their students’ outcomes is rooted in Bronfenbrenner’s ecological systems theory (1976). This theory is based on the argument that “in order to understand human development, one must understand the entire ecological system in which growth occurs”

(Bronfenbrenner, 1994, p. 37). According to Bronfenbrenner, this ecological system is made up of a series of socially organized, nested subsystems that guide and support a person's growth and development. These subsystems range from the microsystem, or the relationship between a person and his or her immediate environment (such as their family or school), to the macrosystem, which has been described as "a societal blueprint for a particular culture or subculture (Bronfenbrenner, 1994, p. 40), including overarching characteristics such as customs and belief systems. Nested between the micro and macrosystems are mesosystems, or systems of microsystems (such as the relationships between home and school) and exosystems, which involve connections or relationships between two or more environments where at least one environment has an indirect influence on a person but does not contain that person directly (such as the influence of a parent's workplace on the home environment of a child).

Numerous researchers have explored the various systems described by ecological systems theory, and many have discovered significant relationships between these systems and individuals' development. For example, Epstein (1983) studied the impact of communication and joint decision-making by parents and teachers on the developmental outcomes of children. Epstein found that children whose parents and teachers had high levels of communication and collaboration in elementary school had both higher levels of initiative and independence higher grades in high school, even after controlling for other factors such as students' race and socioeconomic status. Thus, the mesosystem of linkages between home and school had long term, significant effects on children's academic and psychological development.

Bronfenbrenner originally developed his ecological systems theory to describe and explore the multitude of ecological factors that were related to children's development. In my study, I hypothesized that these ecological systems would not only guide and support the LML childrens' development, but also the development of the classroom teachers, shaping their growth both as individuals and as professionals within the field of teaching. Specifically, I hypothesized that these systems might shape and guide teachers' development of beliefs and attitudes related to the inclusion and instruction of LML students, and that, in turn, teachers' beliefs and attitudes might influence the microsystems in which LML students received literacy instruction – their mainstream classrooms.

Teachers' Beliefs and Attitudes and Their Students' Academic Achievement

Historically, most researchers that have examined teachers' beliefs and attitudes have explored the relationships that exist between these mainstream classroom teachers' beliefs and attitudes and their instructional practices (e.g. Richardson, Anders, Tidwell, & Lloyd, 1991) or their students' feelings or attitudes related to their positions as students in the teachers' classrooms (e.g. Fang, 1996). These studies provide valuable insight into the complex interactions between teachers and students, but do not provide information about how these interactions are related to students' academic achievement.

However, a few researchers have explored the relationships between mainstream classroom teachers' beliefs and attitudes and their students' academic development and outcomes (Love & Kruger, 2005; Muijs & Reynlods, 2002; Staub & Stern, 2002).

Though their studies were developed to explore different ideas and content areas, findings from each study indicated that teacher beliefs and attitudes that were viewed by

researchers as being positive, such as a belief in students' ability and capacity to be successful, were found to be positively related to their students' academic outcomes.

Love and Kruger (2005) developed their study with a focus on teachers' beliefs and attitudes related to their students' cultural backgrounds. Their study explored the relationships between teachers' culturally relevant beliefs and the academic achievement of their African-American students. Participants in the study were 50 teachers from two urban schools with large populations of African-American students. Teachers completed a researcher-designed survey of culturally relevant beliefs and practices. Their responses to the survey were correlated with their students' scores on standardized state achievement tests of reading and mathematics. The results of their analysis indicated that culturally relevant beliefs related positively to students' achievement scores in reading and mathematics, and that assimilationist beliefs related negatively to students' achievement scores in both mathematics and reading.

Muijs and Reynolds (2002) designed their study to examine mathematics teaching and learning. Their study explored relationships between teacher beliefs, practices, self-efficacy, subject knowledge, and behaviors and students' outcomes on measures of mathematics achievement. The researchers collected survey and observation data from 103 teachers and compared it to mathematics assessment data from their 2,148 students in grades 1-4. The researchers found that all of the teacher factors being examined were significantly related to student achievement, with teacher behaviors having the strongest relationship to students' assessment outcomes.

Staub and Stern's 2002 study was designed to explore teachers' pedagogical content beliefs related to elementary mathematics. The participants in the study were 27

mainstream classroom teachers and their 496 students in grades 1-3. The researchers used a survey designed to measure the degree to which teachers' beliefs reflected a cognitive constructivist orientation, rather than an associationist or "direct-transmission" view of teaching and learning. Staub and Stern then compared teachers' responses to this survey to their students' scores on standardized state assessments of mathematics, and found that students whose teachers had stronger cognitive constructivist orientations (which were considered to be "positive" beliefs by the researchers) had higher scores on the mathematics assessments than those students whose teachers had more associationist pedagogical content beliefs.

Though the group of studies exploring relationships between teachers' beliefs and attitudes and their students' academic outcomes is very small, and the focus of each of the studies is quite different, the findings of these studies suggest that teachers' positive attitudes and beliefs may be related positively to academic achievement for their students. However, a great deal of additional research is needed to support and confirm this conclusion.

Teachers' Beliefs and Attitudes Related to Language Minority Learners

Increasing numbers of researchers have investigated mainstream classroom teachers' beliefs and attitudes related to specific groups of students with unique instructional needs in their classrooms, including special education students (e.g. Woolfson & Brady, 2009; Stanovich & Jordan, 1998) and language minority learners (e.g. Walker, Shafer, & Iiams, 2004). The results of these studies indicate that, overall, teachers' beliefs and attitudes related to the inclusion and instruction of these groups of students vary widely, and are influenced heavily by teachers' personal backgrounds,

experiences in teacher education and professional development programs, and the level of support they receive from their colleagues and administrators.

Reflecting this wide variation, researchers examining mainstream classroom teachers' beliefs and attitudes related to the instruction and inclusion of LML students produced studies with a range of findings. These findings indicated that, in different situations, mainstream classroom teachers' beliefs and attitudes related to LML students were positive (Karabenick & Noda, 2004; Reeves, 2006), neutral (Youngs & Youngs, 2001), mixed (Garcia-Nevarez, Stafford, & Arias, 2005) or negative (Walker, Shafer, & Iiams, 2004).

Positive attitudes. In their large-scale study, Karabenick & Noda (2004) collected surveys from 729 mainstream classroom teachers in a large suburban school district that had recently experienced an influx of LML students. The researchers found that approximately 70% of the teachers surveyed agreed that LML students would be a welcome addition to their class. They also found that a majority of the teachers surveyed (66%) saw students' literacy skills in their first language as a benefit, and felt that these skills in their first language would support their development of English literacy skills. Additionally, 75% percent of the teachers surveyed viewed their students' bilingualism as a valuable asset.

Similarly, Reeves (2006) collected surveys from a large number of teachers (279) in a large suburban school district. However, the district in Reeves' study had a relatively low number of LML students, and many teachers who responded to the survey did not have LML students in their classrooms at the time of their participation in the study. Reeves's survey was designed to gather information about teachers' attitudes

toward the inclusion of LML students in mainstream classrooms, the modification of coursework for LML students, and professional development related to LML students. Reeves found that the majority of teachers who responded to the study had positive attitudes toward the inclusion of LMLs and the modification of instruction for LMLs, and neutral attitudes toward professional development related to LMLs.

Negative attitudes. The subjects of a study by Walker, Shafer, and Iiams (2004) found themselves in a similar situation as those in the study by Karabinick and Noda (2004) in that they were mainstream classroom teachers in a large suburban school district that had recently experienced a great influx of LML students. Unlike the teachers in Karabinick and Noda's study, however, the teachers surveyed by Walker, Shafer, and Iiams reported feeling overwhelmed, frustrated, and unhappy with the presence of LMLs in their classrooms. Nearly 70% of the 288 teachers who completed the survey reported that they were not interested in having LML students in their classrooms. Additionally, the researchers found that while only 13% of the teachers surveyed had received any training or preparation related to working with LMLs, 51% of the teachers reported that they would not be interested in such training if it were to be offered.

Neutral or mixed attitudes. The teachers in Clair's (1995) study also expressed a lack of interest in professional development related to LML students. In her 1995 qualitative study, Clair examined the attitudes of three fourth-grade mainstream classroom teachers in a large, urban public school both toward the instruction of the LML students in their classrooms and professional development opportunities related to instruction for LML students. Clair found that, although the three teachers generally had positive attitudes toward the LML students in their classrooms, they had very negative

attitudes toward professional development. The teachers felt that they did not have the need or the time for professional development related to LMLs, and questioned the usefulness of listening to “know-it-all professors telling [them] what’s effective and what’s not” (Clair 1995, p. 190). Each of the three teachers expressed a similar belief that the instruction that they were providing was good for LML students, and that as long as the quality of instruction they provided was consistently high, they did not need to adapt their instruction for LML students in any way.

Conversely, in his 1999 qualitative study of four mainstream classroom teachers in grades 4, 5, and 6, Gersten found that teachers were very interested in and enthusiastic about professional development and training opportunities. Each of the four teachers, however, reported feeling distant from and frustrated by the LML students in their classrooms. Gersten speculated that these teachers’ feelings of frustration and distance from their students may have stemmed from the fact that the teachers in his study did not share a common culture or first language with their students, and had not been trained to work with LML students.

In their larger qualitative study, Hite and Evans (2006) described yet another varied set of teachers’ beliefs and attitudes toward the inclusion and instruction of LML students. The researchers distributed surveys and conducted open-ended interviews with 19 mainstream classroom teachers of first grade students in a large urban school district. They found that all 19 teachers reported very positive attitudes toward and high expectations of the LML students in their classrooms. However, approximately half of the teachers reported making substantial adaptations to their instruction, such as providing materials in students’ first language, while the other half reported that they did

not adapt their instruction or materials for LML students. The teachers who did not adapt their instruction expressed similar beliefs to those of the teachers in Clair's study, stating that their materials and instruction were effective for all students, including LMLs, without any need for adaptations.

In two quantitative studies dealing with larger groups of teachers, Youngs and Youngs (2001) and Garcia-Nevarez, Stafford, and Arias (2005) found a range of attitudes among classroom teachers toward both the presence of LML students in their classrooms and the adaptation of instruction for LML students. Garcia-Nevarez, Stafford, and Arias found that teachers' attitudes toward LML students, their support of LML students using their first language in schools, and their own use of the LMLs' first language during instruction appeared to be related to two factors: teachers' certification in bilingual education/ESOL and teachers' years of experience. After collecting survey and interview data from 77 mainstream classroom teachers, Garcia-Nevarez and her colleagues found that teachers certified in bilingual education or ESOL were more likely to have positive attitudes toward the inclusion for LMLs, adaptations for LMLs, and the use of LML students' first language than those teachers who were not certified. Garcia-Nevarez et al also found that the more experience teachers had, the more negative their attitudes toward the inclusion and instruction of LMLs tended to be.

Similarly, Youngs and Youngs (2001) found that teachers' certification in ESL, training in multicultural education, and previous work with diverse groups of students to be predictors of teachers' positive attitudes toward the inclusion of LML students in their classrooms. Youngs and Youngs surveyed 143 teachers in a district with a low percentage of LML learners. The researchers found that the majority of teachers (57%)

had a neutral attitude toward having LML students in their classrooms, but had positive attitudes toward LML students in general. Teachers who had been trained to work with LMLs, had received training in multicultural education, and had previous experience working with diverse groups of students were found to be significantly more likely to have positive attitudes toward LMLs than those who had not had these types of experiences or training.

The findings of these studies displayed a great deal of variation, both between the overall outcomes of each study and within each study itself. For example, though the results of the study by Karabenick and Noda (2004) indicated that the majority of the 729 teachers surveyed held positive beliefs and attitudes related to LML students, their findings indicated that sizable numbers of teachers held beliefs and attitudes that were neutral or negative. Similarly, Walker, Shafer, and Iiams (2004) found that though the majority of the 522 teachers who participated in their study held attitudes and beliefs related to LML students that ranged from neutral to strongly negative, a sizable number of the teachers held positive beliefs and attitudes.

Due to the fact that teachers' beliefs and attitudes appear to be influenced greatly by the context in which teachers live and work, it is difficult to generalize the findings of individual studies to the broader population of teachers and students in U. S. schools. However, common elements in each of these studies seem to suggest that there are factors in mainstream classroom teachers' backgrounds that may be seen as predictors of their beliefs and attitudes related to the instruction and inclusion of LML students in their classrooms. These factors include teachers' level of teaching experience (particularly experience working with LML students), the amount of preparation or training they have

received related to LML students, and their overall educational attainment (Youngs & Youngs, 2001).

Summary

Teachers' levels of teaching experience, preparation, and educational attainment have been identified by researchers as factors that are related, both positively and negatively, to their students' academic achievement. However, existing studies do not provide information about how these factors may relate to the academic achievement of groups of students within mainstream classrooms such as special education students and English language learners.

Additionally, teachers' beliefs and attitudes have been identified by a small yet important group of studies as factors that may be related to students' academic outcomes. Findings from studies examining mainstream classroom teachers' beliefs and attitudes related to LML students vary widely, and appear to be influenced heavily by the context in which teachers work and by teachers' educational and personal backgrounds. Existing studies have not yet addressed if and how mainstream classroom teachers' beliefs and attitudes related to the inclusion and instruction of LML students may impact these students' academic development.

CHAPTER III: METHODS

Introduction

The purpose of this study was to explore relationships between teacher variables and LML students' reading comprehension and vocabulary development in the context of mainstream classrooms. Specifically, I investigated how different aspects of mainstream classroom teachers' backgrounds and experiences appeared to be related to their students' development over the course of the school year in terms of vocabulary knowledge and reading comprehension.

In this study, I was guided by two primary research questions: (1) How do teachers' levels of teaching experience, educational attainment, and preparation for teaching language minority learners (LMLs) relate to their LML students' outcomes on measures of vocabulary knowledge and reading comprehension? and (2) How are language minority learners' outcomes on measures of reading comprehension and vocabulary knowledge related to their mainstream classroom teachers' attitudes toward (a) the inclusion of language minority learners in their classrooms (b) the modification of reading and language arts instruction for language minority learners and (c) professional development related to reading and language arts instruction for language minority learners?

In this chapter, I will describe the research methods that I used in this investigation. I will provide details concerning the CLAVES study and my (a) research design, (b) data collection methods, (c) instrumentation, and (d) data analysis.

The CLAVES Study

Overview

The Comprehension, Language Acquisition and Vocabulary in English and Spanish (CLAVES) study was a longitudinal study designed to investigate breadth and depth of vocabulary development and reading comprehension, while also exploring the relationship between instruction and achievement on measures of reading comprehension and vocabulary knowledge among English monolingual and Spanish-English bilingual children in grades 2-5. The study was funded by a Goal One Identification grant from the Institute of Education Sciences that was awarded to Principal Investigators Dr. Rebecca Silverman and Dr. Jeffrey Harring of the University of Maryland, College Park and Dr. Patrick Proctor of Boston College.

I worked as a graduate research assistant with the CLAVES study from August 2009 until August 2011. My responsibilities while working with the CLAVES study included conducting classroom observations, administering student assessments, participating in the development of an observation protocol and coding instrument, and training fellow members of the research team. For the current study I created, pilot-tested and revised a survey instrument designed to collect information from all classroom teachers who participated in the CLAVES project during the 2010-2011 school year about their beliefs and attitudes, teaching experience, educational attainment, and preparation for working with LML students. I used the data from this revised survey instrument along with student assessment data from the CLAVES project to conduct a series of statistical analyses designed to explore the relationships between students'

performance on measures of reading comprehension and vocabulary knowledge and their teachers' backgrounds, beliefs, and attitudes.

Design of the CLAVES Study

The principal investigators of the CLAVES study used a cohort-sequential design to chart a model of development for students from 2nd through 5th grade. A cohort-sequential design integrates adjacent segments (i.e., grades in the CLAVES study design) consisting of limited longitudinal data on a specific cohort, which can be linked together with similar segments from other temporally related cohorts to determine the existence of a common developmental trend (Duncan, Duncan, & Hops, 1996; Marsh, Craven, & Debus, 1998). Thus, in the first year of the study (2009-2010), students and teachers in grades 2, 3, and 4 took part in assessments and classroom observations, while in the second year of the study (2010-2011) students and teachers in grades 3, 4, and 5 were the study's participants. The researchers' objective in implementing a cohort-sequential design, rather than a conventional longitudinal study design, was to measure development of the outcomes over the span of grades 2-5 in only a two-year window. In a conventional longitudinal study, a random sample of students would be obtained from a target population in the 2nd grade and followed for four years through 5th grade. An intentionally incomplete design, like the cohort-sequential design, allowed the CLAVES research team to study individual development over a longer interval using temporally overlapping measurements of various grades.

The CLAVES study researchers used pre and post-test assessment data to measure students' reading comprehension and vocabulary development, and used classroom observational data to make inferences about instruction's effect on students'

development in these areas. During the 2011 – 2012 school year, the researchers are working to analyze data, disseminate findings, and develop and implement an intervention program based on the study's findings.

Setting

Participants in the CLAVES study were recruited from one Northeastern site and one Mid-Atlantic site from one of three schools per site (n = 6 schools). The districts in which these schools are situated represent a range of demographic characteristics with sizable populations of Spanish-English bilinguals.

The Mid-Atlantic site, located outside of a major Mid-Atlantic city, has a large African American community and a fast-growing Latino population. The Latino population is diverse, but the majority of Latinos at the Mid-Atlantic site are of Central American background. The Northeastern site is also located within the metropolitan area of a major city. The school district in which the Northeastern site is located is changing rapidly, and is a center of Caribbean, Mexican and Central American immigration. The district as a whole is on the verge of becoming a majority non-white student community with 35% of all students residing in households where a language other than English is spoken.

Working with schools at both the Mid-Atlantic and Northeastern sites was particularly valuable for my research. As mentioned, the Mid-Atlantic site had a large percentage of African-American students, while the Northeastern site had a relatively large percentage of Anglo students. Both these groups are, more often than not, monolingual English-speaking. By combining subjects across geographic regions, the CLAVES researchers were able to sample a population of monolingual English speakers

that is more broadly representative of the English speaking population in the U.S. For the purposes of my study, this allowed me to study LML students within the context of mainstream classrooms that included students from a wide variety of backgrounds.

Furthermore, the diversity of the Spanish speaking population was enhanced by the use of both sites. The majority of LML students from the Mid-Atlantic site were of Central American descent while the LMLs at the Northeastern site came from Puerto Rico, the Dominican Republic, Central America, and Mexico. Thus, while all of the LML students in this study spoke Spanish as their home language, the students' cultural backgrounds varied considerably.

Participants

Students

As mentioned previously, a total of 367 students in grades 3-5 participated in the CLAVES study during the 2010-2011 school year. Fifty-three percent of the sample was comprised of monolingual English speakers. Forty-seven percent of the students spoke both Spanish and English with varying degrees of fluency; for the purposes of my study, these students (n=173) were classified as language minority learners. These LML students from the larger CLAVES study sample were the student subjects in my study.

All children in the target grade levels in the cooperating schools were invited to participate in the study. Parents were asked to complete a short questionnaire with items asking about children's age, gender, race, ethnicity, language background, and country of origin to return with their consent form. All children whose parents granted them permission to participate in the CLAVES study were included in the student sample.

Please see Table 1 for demographic information related to the LML students who participated in this study.

Table 1

Demographic Information Related to LML Student Participants

Student Characteristics	Mid-Atlantic Site	Northeastern Site	Total
Males	48	27	75
Females	65	31	96
LML Students in Grade 3	40	19	59
LML Students in Grade 4	44	21	65
LML Students in Grade 5	29	18	47
Qualified for Free/Reduced Lunch	100	48	148

As shown in Table 1, the samples of LML students at each site contained more females than males, and contained more students in Grade 4 than in Grades 3 or 5. Additionally, the majority of LML students at both sites came from relatively low income backgrounds, with approximately 88% of students at the Mid-Atlantic site and approximately 83% of students at the Northeastern site qualifying for free and reduced lunch.

Classroom Teachers

Fifty-six mainstream classroom teachers in grades 3, 4, and 5 from three Northeast school sites (n=26) and three Mid-Atlantic school sites (n=30) participated in the study during the 2010-2011 school year. The CLAVES study was designed to follow a cohort of students from grades 2-5 over the course of two years, which meant that most

of the 3rd and 4th grade teachers in the study were participating for the second consecutive year, while the 5th grade teachers in the study were all participating for the first time. All of the 56 teachers who participated in the CLAVES study during the 2011-2012 school year were asked to complete the CLAVES teacher survey in May 2011. A total of 51 teachers completed the survey.

Student Measures

Students were assessed in the fall (Time 1) and spring (Time 2) of the 2010-2011 academic year on English language measures of reading comprehension and vocabulary knowledge. The assessments were administered in a one-on-one setting by members of the CLAVES research team. Each member of the CLAVES research team was trained extensively in the proper administration and scoring of each of the assessments used in the CLAVES study.

Measure of Students' Reading Comprehension

The Woodcock-Muñoz Language Survey-Revised (WMLS-R; Woodcock et al., 2005) Passage Comprehension subtest was selected by the CLAVES research team to measure reading comprehension. In this measure, students read cloze passages silently in order of increasing difficulty and produced an oral response to an unfinished sentence. The examiner then marked the response as correct or incorrect. The internal reliability of the passage comprehension assessment for children between 8.0 and 11.0 years old is .81 to .91 (Woodcock et al., 2005). There are two forms of the English version (LS-E) of the assessment available. The CLAVES study researchers used the first of these two forms in the fall of 2010 as a pretest assessment, and used the second form as a posttest assessment at the end of the school year (April-June 2011).

The *WMLS-R* Passage Comprehension subtest was selected by the CLAVES research team as a measure of reading comprehension because of its high degree of reliability and validity, and because of the demographic similarities between the normative sample used by the developers of the assessment and the student participants in the CLAVES study. The normative sample for the *WMLS-R* included over 8000 children from diverse communities across the U.S. Concurrent validity between *WMLS-R* passage comprehension and the *Wechsler Intelligence Scale for Children-III (WISC-III)* is supported by reliabilities of .59 between the *WMLS-R* passage comprehension subtest and the *WISC-III* verbal IQ and verbal comprehension index (Woodcock, Muñoz-Sandoval, Reuf, & Alvarado, 2005).

Measure of Students' Vocabulary Knowledge

The Woodcock-Muñoz Language Survey-Revised (*WMLS-R*; Woodcock et al., 2005) Picture Vocabulary subtest was selected by the research team to measure students' vocabulary knowledge. In this task, students were shown pictured items ordered by increasing difficulty and were asked to say aloud the names of each picture. Testing was discontinued after a student missed 6 consecutive items. The internal reliability for children 8 and 11 years old on the picture vocabulary test is .90 and .92 respectively (Woodcock et al., 2005). There are two forms of the English version (LS-E) of the assessment available. The CLAVES study researchers used the first of these two forms in the fall of 2010 as a pretest assessment, and used the second form as a posttest assessment at the end of the school year (April-June 2011).

Like the Passage Comprehension subtest, the *WMLS-R* Picture Vocabulary subtest was selected by the CLAVES research team because of its high degree of reliability and

validity, and because of the demographic similarities between the normative sample used by the developers of the assessment and the student participants in the CLAVES study.

The CLAVES Teacher Survey

Working in conjunction with Dr. Silverman, Dr. Harring and Dr. Proctor, I developed the CLAVES Teacher Survey as a means to gather information about teachers' backgrounds, beliefs, and attitudes in an effort to begin to understand relationships that may exist between teacher factors and LML students' achievement in mainstream classrooms. In addition to gathering the data for this study, the CLAVES Teacher Survey also included questions designed to gather information that will be used in later analyses examining relationships between teachers' backgrounds and data from classroom observations.

I pilot-tested the survey in May of 2010, and revised it based on findings from the pilot test, feedback from teachers, input from the CLAVES research team, and recommendations from my dissertation committee. In Appendix E, I present a detailed description of the initial development of the survey, the CLAVES Teacher Survey Pilot, and the process and reasoning behind my revisions of the survey. Appendix H includes a copy of the final version of the survey that was distributed to teachers in the spring of 2011.

Teacher Factors Measured by the Claves Teacher Survey

I designed the CLAVES Teacher Survey to collect specific information from teachers about their backgrounds, beliefs and attitudes. In the next section of this paper, I will describe each specific area that I explored in the survey, and the process of developing the survey items related to each area.

Teaching experience. In the CLAVES Teacher Survey, the first two survey items were designed to collect information about the number of years of overall elementary school teaching experience each mainstream classroom teacher had, and the number of years each teacher had taught language minority students. These survey items were designed to be as concise as possible, and to focus on elementary teaching experience and experience working with language minority learners.

Figure 1. Survey Items Related to Teaching Experience

1. How many years (including the current year) have you taught at the K-6 level? _____
2. How many years (including the current year) have you taught language minority learners? _____

Teachers' educational attainment. I designed a survey item to collect information from teachers both about their level of educational attainment and the area or areas in which they have completed coursework or received advanced degrees. Please see Figure 3 to view this item. I hypothesized that while teachers' overall levels of educational attainment may be related to their language minority learners' outcomes on measures of reading comprehension and vocabulary knowledge, it may be more likely that outcomes in these areas would be related to teachers' coursework in the areas of reading, language arts, and specific coursework related to working with language minority students.

Figure 2: Survey Item Related to Teachers' Educational Attainment

3. Please describe your educational background:		
Level of Education	Circle One	Additional Information
Bachelor's degree?	Yes No	If yes, what was your major? _____ If yes, what was your minor? _____
		If yes, what was the focus or content of this coursework?

Coursework beyond Bachelor's?	Yes No	_____ _____
Master's degree?	Yes No	If yes, in what area or subject did you earn your degree(s)? _____ _____
Coursework beyond Master's?	Yes No	If yes, what was the focus or content of this coursework? _____
Doctoral degree?	Yes No	If yes, in what area or subject did you earn your degree? _____ _____
Which certifications do you hold? (e.g., Elementary Education, Special Education, Reading, ESOL, SEI, etc.)		_____ _____

Preparation for teaching language minority learners. In my study, information about teachers' level of preparation to work with language minority learners was gathered using two survey items. First, as described previously, information about teachers' coursework and degrees in specific areas was gathered in Survey Item 3. Second, working in conjunction with Dr. Silverman, I designed a survey item to collect additional information about the amount of coursework and professional development teachers had participated in related to working with language minority learners. Please see Figure 3 to view this survey item. Based on feedback from the dissertation committee, I modified this item to include ranges of number of courses and professional development sessions to help teachers more easily and accurately convey the general level of preparation they have received.

While the use of these ranges did not allow me to understand the exact level of preparation teachers have received, I believed that even this general measure of levels of preparation would provide important information to help me understand if and how teachers have been prepared to work with language minority learners. With the knowledge that, based on data from 2002, only 12.5% of mainstream classroom teachers had received eight hours or more training specifically related to LMLs (National Center for Education Statistics, 2002), I hypothesized that even relatively small amounts of preparation may give classroom teachers an advantage in working with language minority students that most of their colleagues did not have, and that this advantage might be reflected in their students' outcomes.

Figure 3. Survey Item Related to Preparation for Teaching Language Minority Learners

4. How much preparation have you had for working with language minority learners?	
Number of courses taken (please darken one circle): <input type="radio"/> None <input type="radio"/> 1 course <input type="radio"/> 2 courses <input type="radio"/> 3 courses <input type="radio"/> 4 or more courses	Number of sessions of professional development (please darken one circle): <input type="radio"/> None <input type="radio"/> 1 session <input type="radio"/> 2 sessions <input type="radio"/> 3 sessions <input type="radio"/> 4 or more sessions

Attitudes toward the inclusion of LMLs in mainstream classrooms. Figure 4 contains the items in the teacher attitudes portion of the CLAVES Teacher Survey that are related to mainstream classroom teachers' attitudes toward the inclusion of language minority students in their classrooms. Survey items 2, 4, 12, 16 and 20 are taken directly from a survey instrument developed by Reeves (2006) to measure mainstream classroom teachers' attitudes toward the LML students in their classrooms (though I have replaced

Reeves' term "ELLs" with "language minority learners"). Items 8 and 14 are based on items from Reeves' study, but I reworded them in an attempt to make them less blunt and/or less likely to make teachers feel defensive. For example, Item 8 is based on an item in Reeves' survey that read "I would welcome [language minority learners] in my classroom. I felt that teachers may not feel that they could answer that question honestly. I attempted to soften the question, saying instead "I have had positive experiences with language minority students in my classroom." Item 18 (language minority learners benefit from receiving reading and language arts instruction in mainstream classrooms) is an item I developed that was not included in Reeves' survey. I developed this item to gather more specific information about teachers' attitudes toward the inclusion of language minority students in reading and language arts instruction provided in mainstream classrooms.

Figure 4: Survey Items Related to Attitudes Toward the Inclusion of Language Minority Learners In Mainstream Classrooms

Question	Strongly Disagree	Disagree	Agree	Strongly Agree
4. The inclusion of language minority learners in mainstream classes benefits all students.				
8. I have had positive experiences with the inclusion of language minority students in my classes.				
12. Language minority learners should not be included in mainstream classes until they attain a minimum level of English proficiency.				
14. Mainstream classroom teachers have the time they need to provide effective reading and language arts instruction for language minority students.				
16. The inclusion of language minority learners in my class slows the progress of the entire class.				
18. Language minority students benefit from receiving reading and language arts instruction in mainstream classrooms.				

Attitudes toward adaptations for LMLs during literacy instruction. Figure 5 includes survey items related to teachers' attitudes toward modifications for language minority learners during reading and language arts instruction. Items 5 and 11 are taken from Reeves' survey, and have been modified only slightly to make them specific to reading and language arts instruction. These items include general adaptations for language minority students (allowing students to use their native language and the use of materials in students' native language) that have been demonstrated to support language minority students' linguistic and academic development (August & Shanahan, 2006).

I developed items 13, 17, and 19 to collect information about teachers' attitudes toward specific strategies or instructional activities that have been demonstrated to support language minority learners during reading and language arts instruction (August & Shanahan, 2006). These instructional activities include the use of visual aids, pictures, and gestures, the use of Spanish-English cognates, and the overall consideration of students' cultural and linguistic backgrounds when selecting materials for reading and language arts instruction.

Item 7 is very similar to an item from Reeves' study, but has been rewritten so that it is specific to reading and language arts instruction. I developed item 3 to be used in conjunction with item 7 to attempt to measure teachers' attitudes toward using any modifications at all with language minority students. I developed items 9 and 13 to collect information about attitudes toward modifications that have been shown not to support language minority learners in mainstream classrooms during reading and language arts instruction. For example, item 13 is designed to measure teachers' attitudes toward not asking LML students to participate in classroom discussions. Research has

demonstrated that participation in such discussions is an important component in language minority students' academic and linguistic development (Echevarria, Powers, & Short 2003, August & Shanahan 2006), and thus not asking language minority students to participate is not beneficial to them. Items 3, 7, 9, and 13 were backwards-scored during the data analysis process.

Though the items in this portion of the teacher survey relate to teachers' attitudes toward modifications for language minority students rather than their actual modification practices, it was my hypothesis that these attitudes may still be related to students' outcomes in the areas of vocabulary knowledge and reading comprehension. In future studies analyzing observation data from the CLAVES project, relationships between teacher attitudes toward modifications for language minority learners and observed teacher practices may be examined.

Figure 5. Survey Items Related to Attitudes Toward Adaptations for Language Minority Learners During Reading and Language Arts Instruction

Question	Strongly Disagree	Disagree	Agree	Strongly Agree
3. It is a good practice to use the same instructional techniques and materials with all students in mainstream classrooms.				
5. It is a good practice to allow language minority learners to use Spanish during reading and language arts lessons.				
7. Teachers should not modify their reading and language arts instruction for language minority students in mainstream classrooms.				
9. It is a good practice to encourage language minority students to avoid using Spanish while they are at school.				
11. It is a good practice to provide materials in Spanish for language minority learners during reading and language arts instruction.				
13. It is a good practice not to ask language minority students to participate in classroom discussions until they have reached high levels of proficiency in English.				
15. Teachers should consider students' cultural and linguistic backgrounds when selecting materials for reading and language arts instruction.				
17. It is a good practice to point out similarities between words in English and words in Spanish for language minority students (such as				

“electricity” in English and “electricidad” in Spanish)				
19. It is a good practice to use pictures, visual aids, gestures, and other non-verbal tools during reading and language arts instruction for language minority students.				

Beliefs about support for working with LML students. Figure 6 includes the survey items related to teachers’ beliefs related to support for working with LML students, including having access to the materials and resources they needed to work with LML students, opportunities for professional development related to teaching LML students, and school-based support from administrators and specialists in their work with the LMLs in their classrooms. These items are very similar to Reeves’ survey items, but have been adapted to gather information that is more specifically related to my research question. For example, in Item 1, Reeves’ question read “I have adequate training to work with English language learners.” I adapted the question to make it specific to reading and language arts instruction.

Findings from Reeves’ study indicated that teachers felt that they had not had adequate training to work with LML students, but were ambivalent toward receiving additional training. It is was my goal to build on and extend Reeves’ work in this area as well, and to explore relationships between teachers’ beliefs about support related to reading and language arts instruction for language minority learners and their students’ outcomes in these areas.

Figure 6. Survey Items Related to Attitudes Toward Support for Working with LMLs

Question	Strongly Disagree	Disagree	Agree	Strongly Agree
1. I have adequate training to provide effective reading and language arts instruction for language minority learners.				
2. I receive adequate support from school administration when language minority students are enrolled in my classes.				

6. Mainstream classroom teachers have the resources they need to provide effective reading and language arts instruction for language minority students.				
10. I am interested in receiving more training related to reading and language arts instruction for language minority learners.				
20. I receive adequate support from the ESL staff when ESL students are enrolled in my classes.				

Analytic Approach

Due to the inherently hierarchical nature of school systems in the United States, data collected in U.S. schools often consists of nested entities (students nested within classrooms, classrooms nested within schools, and so on). In the case of the data I collected for my study, I was concerned primarily with the “nestedness” of LML students within their teachers’ classrooms.

Hierarchical linear modeling (HLM) is one statistical technique that can be used to account for and explore “nested,” or correlated, data and to take into account the idea that “individual persons interact with their social contexts, and therefore the individual persons are influenced by the social groups or contexts to which they belong, and the properties of those groups are in turn influenced by the individuals that make up those groups” (Maas & Hox, 2005, pg. 86). However, in order to limit the risk of biased estimates of standard errors, recommended sample sizes for HLM are quite large. Minimum sample size recommendations for HLM are 50 cases at the group level (in the case of my data, the teacher level) and at least 20 cases per group at the individual level (for my data, the number of LML students in each teacher’s classroom) (Maas and Hox, 2005).

I had hoped to use HLM to analyze the data from my study and, with 51 teachers, my sample at the group level barely met the minimum number of subjects recommended

for the use of HLM. However, when I received the final student data from the CLAVES research team in November 2011, I realized that the number of LML students in each teacher's classroom ranged from 21 to 0 depending on the teacher. Thus, the size of my groups of students at the individual level did not meet the minimum recommendations in terms of sample size for the use of HLM.

However, I still wanted to account for the "nestedness" of the data (the fact that LML students were nested within teachers' classrooms), so I opted to correct the standard errors in the data set in order to account for the intraclass correlation of the data. I chose to do this by using ordinary least squares regression with robust standard errors. This statistical technique has been recommended by statisticians as a means to analyze correlated data (such as the data in my study) in instances where the use of HLM is not feasible due to sample size constraints (Cohen, Cohen, West, & Aiken, 2003), and has been used previously in education research involving students nested within classrooms (Silverman & Crandall, 2010).

Ordinary Least Squares (OLS) regression does not require quite as large a sample size as HLM. A common recommendation related to sample size for multiple regression analyses is that there must be at least five cases for every independent variable in social science research (Allison, 1999, p. 9). A more conservative recommendation (Stevens, 1996, p. 72) suggests that "for social science research, about 15 participants per predictor are needed for a reliable equation." Thus, my sample size of 173 students and 51 teachers exceeded the minimum requirements for this type of analysis. In the following sections of this paper, I will describe my additional reasons for selecting OLS regression and the models I developed to analyze my data.

Ordinary Least Squares Regression Analysis

OLS regression is an analytical technique that is well suited for examining the relationship between one dependent variable (student achievement on a measure of reading comprehension, for example) and a number of independent variables (such as teachers' levels of experience, preparation, and academic achievement). For each of the two student measures (the WMLSR Reading Comprehension measure and the WMLSR Picture Vocabulary measure), I conducted an OLS regression analysis in which students' posttest scores on the measure were used as the dependent variable. In each analysis, I used students' pretest scores on the measure as an independent variable in order to control for their initial levels of achievement. I then used teacher factors as additional independent variables in each analysis.

Due to the fact that teachers' of experience, preparation, and academic achievement have been demonstrated by researchers to be highly correlated with teachers' beliefs and attitudes (Youngs & Youngs, 2001), and because this type of multicollinearity does not contribute to a good regression model, I conducted two separate sets of analyses. In the first set, I examined the independent variables that were related to teachers' levels of teaching experience, preparation, and academic achievement. In the second set of analyses, I examined the independent variables that were related to teachers' beliefs and attitudes. Please see Table 3 for a description of these two sets of analyses and the models that accompany them.

For each set of OLS regression analyses, I developed baseline models in order to account for each independent variable's level of prediction of students' outcomes on the posttest measures. Baseline models for both the WMLSR Reading Comprehension

posttest and the WMLSR Picture Vocabulary posttest were developed by testing an intercept-only model first, then testing a model that used pretest scores as a covariate, and then testing models that added each additional independent variable, one at a time. In the first set of OLS regression analyses, these additional independent variables were teachers' level of educational attainment, teachers' years of experience at the K-6 level, and the amount of preparation teachers had received related to working with LML students. In the second set of OLS regression analyses, the additional independent variables were the three factors I extracted from the teacher survey items related to teachers' beliefs and attitudes. Building the models in this manner allowed me to explore "each independent variable in terms of what it [added] to the prediction of the dependent variable after the previous variables [had] been controlled for" (Pallant, 2010, p. 149).

I then calculated the Akaike's information criterion (AIC) for each model. The AIC is a measure of the relative goodness of fit of a statistical model (Cohen, Cohen, West, & Aiken, 2003). In a set of possible models, the one with the lowest AIC is generally seen as the preferred model for data analysis. I used the model with the lowest AIC that also had significant coefficients as the final baseline model for each of the two posttests. After establishing the baseline models for each of the two student measure posttests, I conducted two sets of OLS regression analyses for each posttest: One that used teacher background factors as independent variables, and one that used teacher beliefs and attitudes factors as independent variables. Students' pretest scores were also used as covariates in each analysis, and interactions between each independent variable and students' pretest scores were examined.

Principal Components Analysis

As described in detail in Chapter 2, the construct of teachers' beliefs and attitudes is quite complex. Due to the complex nature of this construct, a series of 20 questions was used on the CLAVES teacher survey to measure a variety of aspects of teachers' beliefs and attitudes. In order to be able to use data from these 20 questions in OLS regression analyses, I first conducted a principal components analysis (PCA) in order to "reduce" or summarize the data. Using a PCA allowed me to "produce a smaller set of linear combinations of the original variables that accounts for most of the variability in the pattern of correlations." (Pallant, 2010, p. 182). This made it possible for me to identify a smaller group of "factors" or variables that were represented by the 20 original questions, and to use these factors as independent variables in hierarchical multiple regression analyses to examine relationships between mainstream teachers' beliefs and attitudes related to the inclusion and instruction of LML students and their LML students' achievement on measures of vocabulary knowledge and reading comprehension.

Analysis Procedures

I used the SPSS 19 (SPSS, Inc., 2011) statistical software program to conduct the principal components analysis and the OLS regression analyses. Table 3 details the specific measures and analyses I used to answer my research questions:

Table 2

Table of Analysis Procedures

Question	Measures	Analysis
1. How do teachers' levels of teaching experience, educational	Teachers: CLAVES Teacher Survey (researcher-developed)	Two OLS regression analyses with robust standard errors

attainment, and preparation for teaching language minority learners relate to their LML students' outcomes on measures of vocabulary knowledge and reading comprehension?	<p>Students:</p> <p><i>Vocabulary measure:</i> Woodcock-Muñoz Language Survey-Revised (WMLS-R) Picture Vocabulary Subtest</p> <p><i>Comprehension measure:</i> Woodcock-Muñoz Language Survey-Revised (WMLS-R) Passage Comprehension Subtest</p>	
2. How are language minority learners' outcomes on measures of reading comprehension and vocabulary knowledge related to their mainstream classroom teachers' attitudes toward a. the inclusion of language minority learners in their classrooms b. the modification of reading and language arts instruction for language minority learners and c. professional development related to reading and language arts instruction for language minority learners?	<p>Teachers: CLAVES Teacher Survey (researcher-developed)</p> <p>Students:</p> <p><i>Vocabulary measure:</i> Woodcock-Muñoz Language Survey-Revised (WMLS-R) Picture Vocabulary Subtest</p> <p><i>Comprehension measure:</i> Woodcock-Muñoz Language Survey-Revised</p>	<p>Principal Components Analysis (PCA) using the 20 items from the "Survey on Teaching Language Minority Learners" section of the CLAVES Teacher Survey</p> <p>Two OLS regression analyses with robust standard errors</p>

Limitations

As with any study, this research project has limitations. Three major limitations that influenced this study were (a) the measurement tools, (b) the sample selection, and (c) the sample size for both the student and teacher samples.

As a graduate research assistant with the CLAVES project, I was involved with several aspects related to the development and implementation of the larger CLAVES study. However, because I was not one of the principal investigators, I was not involved in the selection of the measurement tools used in the study with the exception of the CLAVES Teacher Survey. Thus, I was not able to control which assessments were selected to measure students' achievement in the areas of reading comprehension and vocabulary knowledge. I believe that the principal investigators' reasons for selecting the Woodcock-Muñoz Language Survey-Revised (WMLS-R) Picture Vocabulary and Reading Comprehension are sound, and that the subtests provide valid and reliable assessments of student achievement in the areas of reading comprehension and vocabulary knowledge. However, I believe it would have been beneficial to have also included measures of reading comprehension and vocabulary knowledge that were designed specifically for use with LML students.

Additionally, because I was not involved in the initial development of the study, I was not able to control how teacher and student participants were selected to participate. While I believe that the principal investigators' reasons for selecting subjects for their study were completely valid, I believe that larger samples of both teachers and students and randomization in the selection of participants would have increased the generalizability of the study's findings.

On a related note, my lack of involvement in the selection of participants in the study also prevented me from determining the size of the samples of both teachers and students. With only 56 teachers and 173 LML students participating in the study, the sample sizes are smaller than I would like. However, both the teacher and student samples are still large enough to satisfy the commonly recognized requirement when using multiple regression analyses of at least five subjects or cases for every variable being examined (Allison, 1999, p. 9). My study involves two sets of OLS regression analyses, with three independent variables in each set. Thus, the sample is more than large enough to satisfy the minimum requirements for this type of analysis. I recognize, of course, that a larger sample would increase the generalizability of the findings from this study, and might also increase the likelihood of generating more results that are statistically significant.

Summary

My study explored the relationships between mainstream classroom teacher variables and LML students' outcomes on measures of vocabulary knowledge and reading comprehension. In undertaking this study, I sought to make an initial attempt to address two gaps in the existing research base: (1) I explored not only how mainstream classroom teachers' levels of teaching experience, educational attainment, and preparation are related to all of their students' outcomes as a group, but also how they appear to be related to the outcomes of LML students within their classrooms (2) I studied both the beliefs and attitudes of mainstream classroom teachers related to the instruction and inclusion of LML students in their classrooms and examined relationships

that might exist between these beliefs and attitudes and their LML students' outcomes on measures of reading comprehension and vocabulary knowledge.

CHAPTER IV: RESULTS

Introduction

The purpose of this study was to investigate potential relationships between teacher background factors, beliefs, and attitudes, and their LML students' outcomes on measures of reading comprehension and vocabulary knowledge. In this chapter, I will describe the findings from the analyses I used to explore the following research questions: (1) How do teachers' levels of teaching experience, educational attainment, and preparation for teaching language minority learners relate to their LML students' outcomes on measures of vocabulary knowledge and reading comprehension? and (2) How are language minority learners' outcomes on measures of reading comprehension and vocabulary knowledge related to their mainstream classroom teachers' attitudes toward (a) the inclusion of language minority learners in their classrooms (b) the modification of reading and language arts instruction for language minority learners and (c) professional development related to reading and language arts instruction for language minority learners? In the following sections of this chapter, I will describe each of the analyses I used to investigate each of my research questions, and will present the outcomes from each analysis. Where applicable, I will provide tables to support my findings.

Relationships Between Teacher Background Factors and Student Outcomes

My investigation of my first research question involved a series of analyses designed to help me understand if and how teachers' background factors might be related to their students' outcomes on measures of vocabulary knowledge and reading

comprehension. Descriptive statistics for each of the student measures can be found in Table 3.

Table 3

Descriptive Statistics for the Measures of Students' Reading Comprehension and Vocabulary Knowledge (n = 153)

	Minimum	Maximum	Mean	SD
WMLSR-Passage Comprehension-English-Form A-Raw Score (pretest)	5	27	17.37	3.988
WMLSR-Passage Comprehension-English-Form B-Raw Score (posttest)	4	34	18.45	3.633
WMLSR-Picture Vocabulary-English-Form A-Raw Score (pretest)	6	41	29.58	5.841
WMLSR-Picture Vocabulary-English-Form B-Raw Score (posttest)	5	39	30.18	5.550

The intraclass correlation revealed that 14.3% of the variance of students' posttest scores on the WMLSR Passage Comprehension measure and 15.8% of the variance of students' posttest scores on the WMLSR Picture Vocabulary measure could be attributed to classroom-level variance. This suggests that students' posttest scores were not independent of, and were impacted by, the students' membership in their teachers' classroom. However, as mentioned in chapter three, my student and teacher samples were not large enough for me to use multilevel modeling to analyze my correlated data. Instead, I chose to account for the intraclass correlation of my student and teacher data by using Ordinary Least Squares (OLS) regression with robust standard errors.

For each of the two student measures (the WMLSR Reading Comprehension measure and the WMLSR Picture Vocabulary measure), I conducted an OLS regression analysis in which students' posttest scores on the measure were used as the dependent variable. In each analysis, I used students' pretest scores on the measure as an independent variable in order to control for their initial levels of achievement. Additionally, I used three teacher variables as independent variables in each analysis: teachers' years of teaching experience at the K-6 level, teachers' level of educational attainment, and the amount of training teachers had received in working with LML students.

As described in Chapter 3, I first developed baseline models in order to account for each independent variable's level of prediction of students' outcomes on the posttest measures. Baseline models for both the WMLSR Reading Comprehension posttest and the WMLSR Picture Vocabulary posttest were developed by testing an intercept-only model first, then testing a model that used pretest scores as a covariate, and then testing models that added each additional independent variable, one at a time. I then calculated the Akaike's information criterion (AIC) for each model. I used the model with the lowest AIC that also had significant coefficients as the final baseline model for each of the two posttests.

After establishing the baseline model for each of the two student measure posttests, I conducted analyses for each posttest using each of the following independent variables: teachers' educational attainment, teachers' years of experience teaching at the K-6 level, and the amount of preparation teachers had received related to working with LML students. In each analysis, the independent variables were included and interactions

between each independent variable and students' pretest scores were explored. Final models for each posttest were chosen by selecting the best-fitting model, which was the model that had significant coefficients and the lowest AIC.

Results from the OLS regressions with robust standard errors are displayed in Tables 4 and 5. Standardized regression coefficients for all models developed in the model-building process are included in each table.

Table 4

Models for Posttest WMLSR Reading Comprehension Scores (Standardized)

	Baseline models	Teachers' educational background variables			Variables of the interaction effects with pretest	
Coefficient	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Intercept	6.913***	7.131***	7.027***	7.251***	3.699***	5.595***
Pretest	0.667***	.684***	.682***	.652***	.871***	.754***
Teachers' educational attainment		-.286	-.273	-.469	.919	-.476
Teachers' experience teaching at the K-6 level			.014	.006	-.041	.003
Teachers' training for working with LML students				.356*	1.612	1.648*
Pretest x teachers' educational attainment					-.071	
Pretest x teachers' experience teaching at the K-6 level					-.083	
Pretest x teachers' preparation for working with LML students					.002	-.074
AIC	713.927	628.380	630.202	627.855	630.455	627.017

*p < .05, **p < .01, and ***p < 0.01.

Table 5

Models for Posttest WMLSR Vocabulary Scores (Standardized)

Coefficient	Baseline models	Teachers' educational background variables			Variables of the Interaction Effects with Pretest	
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Intercept	6.043***	6.565***	5.875***	5.809***	2.882	4.622
Pretest	.819***	.821***	.819***	.823***	.928***	.866***
Teachers' educational attainment		-.328	-.257	-.232	.839	-.312
Teachers' experience teaching at the K-6 level			.081*	.082*	.201	.248
Teachers' training for working with LML students				-.047	.066	-.054
Pretest x teachers' educational attainment					-.040	
Pretest x teachers' experience teaching at the K-6 level					-.004	-.005
Pretest x teachers' preparation for working with LML students					-.004	
AIC	656.224	657.817	655.073	657.015	662.379	658.591

*p < .05, **p < .01, and ***p < 0.01.

Table 4 Model 4 shows the relationship between teachers' background factors and their students' posttest scores on the measure of reading comprehension. In this model, there is a main effect of teacher's preparation for working with LML students. The main effect of teacher preparation and students' posttest scores is positive, showing a statistically significant relationship between higher levels of teacher preparation for working with LMLs and higher student scores on the reading comprehension posttest after controlling for students' initial levels of reading comprehension ability. No other teacher background factors were shown to be statistically significant.

Table 5 Model 4 shows the relationship between teachers' background factors and their students' posttest scores on the measure of vocabulary knowledge. In this model, there is a main effect of teachers' years of experience teaching at the K-6 level. The main effect of teachers' years of experience teaching at the K-6 level and students' posttest scores is positive, showing a statistically significant relationship between higher levels of teaching experience and higher student scores on the vocabulary measure posttest after controlling for students' initial levels of vocabulary knowledge. No other teacher background factors were statistically significant.

Relationships Between Teacher Beliefs and Attitudes and Student Outcomes

My investigation of my second research question involved a series of analyses designed to help me understand if and how teachers' beliefs and attitudes might be related to their students' outcomes on measures of vocabulary knowledge and reading comprehension. As in my first question, for each of the two student measures (the WMLSR Reading Comprehension measure and the WMLSR Picture Vocabulary measure), I conducted an OLS regression analysis in which students' posttest scores on the measure were used as the dependent variable. In each analysis, I used students' pretest scores on the measure as an independent variable in order to control for their initial levels of achievement. Additionally, I used three teacher variables as independent variables in each analysis.

However, before conducting the regression analyses related to this research question, I first conducted a principal components analysis (PCA) using the items on the teacher survey related to teachers' beliefs and attitudes. Initially, all 20 items related to teacher beliefs and attitudes from the CLAVES Teacher Survey were part of the analysis.

Nine items (2, 3, 5, 12, 13, 14, 16, and 17) were dropped from the initial analysis as a result of poor loadings. A discussion of these poor loadings and the possible explanations for them will be presented in Chapter 5. After dropping the items with poor loadings, I assessed the suitability of the remaining data for conducting a PCA. I noted that the Kaiser-Meyer Olkin value was .68, exceeding the recommended value of .6 (Kaiser 1970, 1974), and that the correlation matrix showed that many of the coefficients were .3 or above. Thus, I concluded that the use of PCA was appropriate with my data set.

The principal components analysis revealed the presence of four components with eigenvalues exceeding 1, explaining 30.7%, 19%, 14.8%, and 9% of the variance, respectively. I inspected the screeplot, and noted a break after the third component. Using Cattell's scree test (1966), I decided to retain three of the components for further analysis. The three components explained a total of 68.5% of the variance, with Component 1 contributing 36.2%, Component 2 contributing 19.2%, and Component 3 contributing 13.1%. To help me interpret these three components, I used oblique rotation. I chose to use oblique rather than orthogonal rotation because orthogonal rotation assumes that all of the factors in the analysis are independent of one another (Tabachnick & Fidell, 2007), and the factors in my dataset did not meet this assumption.

The rotated solution revealed that all three components showed a number of strong loadings and all variables loading substantially on only one component. My interpretation of the three components is, for the most part, consistent with the elements I was attempting to examine with the beliefs and attitudes items on the CLAVES teacher survey, with items related to teachers' attitudes toward inclusion loading strongly on

Component 2 and items related to teachers' attitudes toward the adaptation of instruction for LMLs loading strongly on Component 3.

However, I also attempted to measure teachers' beliefs about support for working with LML students. The items that loaded strongly on Component 1 were related quite specifically to teachers' beliefs about the level of support they receive in their schools for working with LMLs, rather than more generally to attitudes toward all types of support, including professional development. For this reason, I named the Component 1 factor "Beliefs about school support." I named the Component 2 factor "Attitudes toward inclusion", and named the Component 3 factor "Attitudes toward adaptation of instruction." The labels and survey items related to the three factors can be found in Table 6. Correlations between each of the survey items that make up each factor can be found in Tables 7, 8, and 9.

Table 6

Names and Survey Items Related to Teacher Beliefs and Attitudes Factors

Factor Name	Related Survey Items
Beliefs about school support	Item 6: Mainstream classroom teachers have the resources they need to provide effective reading/language arts instruction for language minority students. Item 20: I receive adequate support from the ESL/SEI staff when language minority students are enrolled in my classes.
Attitudes toward inclusion	Item 4: The inclusion of language minority learners in mainstream classes benefits all students. Item 8: I have had positive experiences with the inclusion of language minority students in my classes. Item 18: Language minority students benefit from receiving reading and language arts instruction in mainstream classrooms.
Attitudes toward	Item 7: Teachers should not modify their reading and language

modification of instruction	<p>arts instruction for language minority students in mainstream classrooms.</p> <p>Item 9: It is a good practice to encourage language minority students to avoid using their native language while they are at school.</p> <p>Item 11: It is a good practice to provide materials in English and students' native language for language minority learners during reading/language arts instruction.</p> <p>Item 15: Teachers should consider students' cultural and linguistic backgrounds when selecting materials for reading and language arts instruction.</p> <p>Item 19: It is a good practice to use pictures, visual aids, gestures, and other non-verbal tools during reading and language arts instruction for language minority students.</p>
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Table 7

Correlations Between Survey Items in Factor Related to Teachers' Beliefs About School

Support

Beliefs about school support		Item 20
	Item 6	.571**

*p < .05, **p < .01, and ***p < 0.01.

Table 8

Correlations Between Survey Items in Factor Related to Teachers' Attitudes Toward

Inclusion

Attitudes toward inclusion		Item 4	Item 8	Item 18
	Item 4	1	.446**	.517**
	Item 8		1	.582**
	Item 18			1

*p < .05, **p < .01, and ***p < 0.01.

Table 9

Correlations Between Survey Items in Factor Related to Teachers' Attitudes Toward
Adaptation of Instruction for LML Students

Attitudes toward the adaptation of instruction for LML students		Item 7	Item 9	Item 11	Item 15	Item 19
	Item 7	1	.379**	.480**	.108	.009
	Item 9		1	.327**	.276**	.099
	Item 11			1	.319	.125
	Item 15				1	.286**
	Item 19					1

*p < .05, **p < .01, and ***p < 0.01.

After extracting the three factors from the beliefs and attitudes portion of the CLAVES teacher survey, I conducted OLS regression analyses with robust standard errors. I followed the same procedures for these analyses that I used in the OLS regressions related to my first research question. As in my first set of OLS regression analyses, I used students' pretest scores on the measure as an independent variable in order to control for their initial levels of achievement. Additionally, I used three teacher variables as independent variables in each analysis: Teachers' beliefs about school support, teachers' attitudes toward the inclusion of LML students in their classrooms, and teachers' attitudes toward the adaptation of instruction for LML students.

Results from the OLS regressions with robust standard errors are displayed in Tables 10 and 11. Standardized regression coefficients for all models developed in the model-building process are included in each table.

Table 10

Models for Posttest WMLSR Reading Comprehension Scores (Standardized)

Coefficient	Baseline models				Variables of the Interaction Effects with Pretest	
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Intercept	6.913***	5.579***	.464	1.457	5.455	23.753
Pretest	0.667***	.681***	.705***	.708***	.451	-.632
Beliefs about school support		.192	.218	.187	1.294	.199
Attitudes toward inclusion			.336	.364*	-1.068	-1.394
Attitudes toward adaptation of instruction				-.058	.411	.022
Pretest x Beliefs about school support					-.063	
Pretest x Attitudes toward inclusion					.080	.098
Pretest x Attitudes toward adaptation of instruction					-.024	
AIC	713.927	571.669	571.187	573.025	573.234	572.437

*p < .05, **p < .01, and ***p < 0.01.

Table 11

Models for Posttest WMLSR Vocabulary Scores (Standardized)

Coefficient	Baseline models				Variables of the Interaction Effects with Pretest	
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Intercept	6.043***	6.438***	8.809***	11.027**	10.738*	12.450**
Pretest	.819***	.845***	.840***	.844***	.733***	.769***
Beliefs about school support		-.212	-.223	-.294*	-.203	-.749*
Attitudes toward inclusion			-.161	-.103	1.282	-.049

Attitudes toward adaptation of instruction					-.128	-1.079	-.130
Pretest x Beliefs about school support						-.002	.027
Pretest x Attitudes toward inclusion						-.062	
Pretest x Attitudes toward adaptation of instruction						.052	
AIC	656.224	598.776	600.305	601.678	599.130	600.921	

*p < .05, **p < .01, and ***p < 0.01.

Table 10 Model 4 shows the relationship between teachers' beliefs and attitudes toward the inclusion and instruction of LML students and their students' posttest scores on the measure of reading comprehension. In this model, there is a main effect of teacher's attitudes toward the inclusion of LML students in mainstream classrooms. The main effect of teachers' attitudes toward inclusion and students' posttest scores is positive, showing a statistically significant relationship between more positive attitudes toward the inclusion of LML students and higher student scores on the reading comprehension posttest after controlling for students' initial levels of reading comprehension ability. No other teacher background factors were shown to be statistically significant.

Table 11 Model 4 shows the relationship between teachers' beliefs and attitudes toward the inclusion and instruction of LML students and their students' posttest scores on the measure of vocabulary knowledge. In this model, there is a main effect of teachers' beliefs about the support they receive from their schools as they work with the

LML students in their classrooms. The main effect of teachers' beliefs about support and students' posttest scores is negative, showing a statistically significant relationship between teachers who believed that they were more supported by their schools and lower student scores on the vocabulary measure posttest after controlling for students' initial levels of vocabulary knowledge. No other teacher background factors were statistically significant.

Summary

The purpose of this study was to explore possible relationships between teacher background factors, beliefs, and attitudes and their LML students' outcomes on measures of reading comprehension and vocabulary knowledge. Findings from the analyses described in this chapter seem to indicate that relationships do exist between teacher factors and LML students' achievement as measured by standardized assessments of vocabulary knowledge and reading comprehension. In the following chapter, I will discuss these findings and their implications for future research.

CHAPTER V: DISCUSSION

Introduction

In this study, I examined relationships between teacher variables (teachers' preparation, teaching experience, educational attainment, and beliefs and attitudes) and the achievement of language minority learners on measures of vocabulary knowledge and reading comprehension. My study was guided by the following research questions:

1. How do teachers' levels of teaching experience, educational attainment, and preparation for teaching language minority learners (LMLs) relate to their LML students' outcomes on measures of vocabulary knowledge and reading comprehension?
2. How are language minority learners' outcomes on measures of reading comprehension and vocabulary knowledge related to their mainstream classroom teachers' attitudes toward (a) the inclusion of language minority learners in their classrooms, (b) the modification of reading and language arts instruction for language minority learners, and (c) professional development related to reading and language arts instruction for language minority learners?

In this chapter, I present a summary and discussion of the findings from this study. Next, I address the study's limitations. I then conclude the chapter with implications for future educational research that are based on this study's findings.

Summary of Results and Discussion

In the following section, I summarize the results of the analyses presented in Chapter IV and discuss my interpretation of these findings. First, I discuss the findings related to the following teacher background factors: teachers' educational attainment,

teaching experience in grades K-6, and teachers' preparation for working with LML students. Then, I describe the findings related to teachers' beliefs and attitudes related to the inclusion and instruction of the LML students in their classrooms.

Teacher Background Factors

Items were included in the CLAVES Teacher Survey that were designed to measure three factors related to teachers' backgrounds: Teachers' levels of educational attainment, teachers' levels of teaching experience in grades K-6, and teachers' levels of preparation for working with LML students. I selected these specific factors because they had each been used in large numbers of studies examining the relationships between teachers' backgrounds and their students' academic achievement, but had not been examined specifically in terms of their relationship with the academic achievement of LML students.

Teachers' Educational Attainment

The results of my analysis indicate that there was no statistically significant relationship between teachers' levels of educational attainment and their students' achievement on measures of reading comprehension or vocabulary knowledge. This may be due to the fact that I analyzed only teachers' levels of educational attainment, rather considering the specific subject area or areas in which teachers' had obtained their advanced degrees. As mentioned in Chapter 2, relationships between teachers' educational attainment and students' achievement in the area of mathematics have been explored in previous studies (Monk, 1994; Wenglinsky, 2000). In each of these studies, researchers found that significant, positive relationships between teachers' possession of

advanced degrees and students' educational attainment in mathematics existed only when the teachers had earned their advanced degrees in mathematics.

Only two of the 51 mainstream classroom teachers who completed the CLAVES teacher survey reported having earned advanced degrees that were related specifically to the subject (Reading/Literacy) or the student population (LML students) of interest in my study. Interestingly, the LML students who were members of these two teachers' classrooms (n=3) each made statistically significant gains between pre and posttests on both the vocabulary and the comprehension measures used in my study. Additional research with much larger groups of elementary school teachers with subject-specific advanced degrees is needed to explore these types of relationships further.

Teaching Experience in Grades K-6

The results of my analyses indicated that there was a significant positive relationship between teachers' level of teaching experience in Grades K-6 and their LML students' achievement on the measure of vocabulary knowledge. There are many possible explanations for this relationship. One possible explanation for this outcome is that more experienced teachers may have been more skillful and comfortable with the demands of managing their classrooms, and thus could devote more of their time and energy to their instruction. A second possible explanation is that more experienced teachers may have had the chance to become more comfortable with and adept at using the instructional materials in their classrooms. For the teachers at the Mid-Atlantic school sites, these materials included the Elements of Vocabulary program, a systematic, explicit vocabulary instructional program that the teachers were required by their district to use. Analysis of classroom observation data from the CLAVES project may determine

whether more experienced teachers appear to be more adept at using instructional materials, strategies, and techniques that support the vocabulary development of LML students.

Preparation for Working with LML Students

Findings from my analyses indicated that there was a significant, positive relationship between teachers' levels of preparation for working with LML students and their LML students' achievement on the measure of reading comprehension. Though other existing studies have not examined relationships between teachers' preparation for working with LMLs and their LML students' reading comprehension, a small number of studies have addressed relationships between teachers' preparation in specific content areas and their students' achievement in those content areas. As discussed previously, Monk (1994) and Wenglinsky (2000) examined relationships between elementary school teachers' preparation for teaching a specific content area (mathematics) and their students' outcomes in that area. In both studies, researchers found positive relationships between the amount of preparation teachers had received and their students' achievement in mathematics. Additional research is needed to continue to explore the relationships between teachers' preparation to teach specific subjects and to work with specific groups of students and their students' academic achievement.

Teacher Beliefs and Attitudes

Twenty items on the CLAVES Teacher Survey were designed to measure three aspects of mainstream classroom teachers' beliefs and attitudes: Attitudes toward the inclusion of LML students in their classrooms, attitudes toward the adaptation of

instruction for LML students, and attitudes toward professional development related to LML students.

Attitudes Toward the Inclusion of LML Students

The results of my analyses indicated that there was a significant, positive relationship between teachers' attitudes toward the inclusion of LML students and their LML students' achievement on the measure of reading comprehension. In other words, these results seem to indicate that the students of teachers who have more favorable or positive attitudes toward the inclusion of LML students in their classrooms have higher levels of reading comprehension. These findings support previous research that has found significant relationships between the teachers' perceptions of their students' abilities and their students' academic achievement (Jordan, Lindsay, & Stanovich, 1997; Cole, Gondoli, & Peeke, 1998).

Additionally, it is possible that teachers' positive attitudes toward the inclusion of LML students influenced various aspects of their classroom microsystems, and their interactions with LML students within those microsystems. As discussed by Bronfenbrenner (1994), the nature of these microsystems can impact students' psychological and intellectual development. It seems possible, then that teachers' positive attitudes may have influenced their interactions with LML students and the overall atmosphere in their classrooms. Both the teachers' interactions with their students and the classroom environments they created may have had an impact on LML students' learning outcomes. In other words, teachers' positive attitudes toward LMLs may have led them to create classroom environments in which LML students felt more

welcome, and in which interactions between LML students and teachers that supported the students' reading development were more likely to take place.

Attitudes Toward the Adaptation of Instruction for LML Students

The results of my analyses indicated that there were no significant relationships between teachers' attitudes toward the adaptation of instruction for LML students. This finding is likely due to issues with the design of the items that I developed to measure this aspect of teachers' beliefs and attitudes. Please see the section of this chapter titled "Issues With the CLAVES Teacher Survey" for a detailed description of the problems with the design of these items.

Beliefs about School Support Related to LML Students

As discussed in Chapter 4, I attempted to measure teachers' beliefs about the support they received for working with LML students using several items on the CLAVES teacher survey. The items that loaded strongly on the first component of my PCA were related specifically to teachers' beliefs about the level of support they received in their schools for working with LMLs, rather than more generally to attitudes toward support, including professional development. For this reason, I named the first component factor "Beliefs about school support." Results from my OLS regression analyses indicated that there was a significant, negative relationship between teachers' beliefs about school support and their LML students' achievement on the measure of vocabulary knowledge. Additional research is needed to begin to understand how and why teachers' beliefs about school support might be related negatively to their LML students' English vocabulary development.

One possible explanation is that the presence of more resources (such as materials, specialists, etc.) was an index of the level of need of the population of LML students at each school; in other words, it is possible that the schools with the greatest numbers of low-achieving LML students were allocated more resources by their districts. A second possible explanation, based in ecological systems theory, is that the linkages between administrators, specialists, and mainstream classroom teachers may have shaped the classroom teachers' beliefs about their roles and responsibilities related to the LMLs in their classroom. For example, teachers who reported the presence of higher levels of support for working with LMLs in their schools may have come to believe that, since specialists were working with their LMLs, that they themselves did not need to spend as much time working directly with the LML students in their classrooms or adapting their instruction to meet the needs of LMLs.

Rejected Survey Items

As mentioned in Chapter 4, I conducted a principal components analysis with the items in the beliefs and attitudes portion of the CLAVES Teacher Survey. As a result of my initial analysis of these items, I rejected eight of the 20 survey items based on their poor loadings. The rejected items and the factor related to teachers' beliefs and attitudes they were designed to measure are shown in Table 12.

Table 12

Rejected Items from the CLAVES Teacher Survey

Beliefs and Attitudes Factor	Survey Item
Teachers' beliefs about school support	Item 2: I receive adequate support from my principal and other administrators when language minority students are enrolled in my classes.

Teachers attitudes toward the adaptation of instruction for LML students	Item 3: It is a good practice to use the same instructional techniques and materials with all students in mainstream classrooms.
Teachers attitudes toward the adaptation of instruction for LML students	Item 5: It is a good practice to allow language minority learners to use Spanish during reading and language arts lessons.
Teachers' attitudes toward the inclusion of LML students in their classrooms.	Item 12: Language minority learners should not be included in mainstream classes until they attain a minimum level of English proficiency.
Teachers attitudes toward the adaptation of instruction for LML students	Item 13: It is a good practice not to ask language minority students to participate in classroom discussions until they have reached high levels of proficiency in English.
Teachers' attitudes toward the inclusion of LML students in their classrooms.	Item 14: Mainstream classroom teachers have the time they need to plan and provide effective reading and language arts instruction for language minority students.
Teachers' attitudes toward the inclusion of LML students in their classrooms.	Item 16: The inclusion of language minority learners in my class slows the progress of the entire class.
Teachers attitudes toward the adaptation of instruction for LML students	Item 17: It is a good practice to point out similarities between words in English and words in Spanish for Spanish-speaking language minority students (such as "electricity" in English and "electricidad" in Spanish)

As shown in Table 11, the rejected items were designed to measure three aspects of teachers' beliefs and attitudes. Items 2, 12, 14, and 16 were designed to measure teachers' attitudes toward the inclusion of LML students in their classrooms, and their beliefs about school support. Three of these four items contain words or phrases that suggest negative attitudes toward the inclusion of LML students, and negative beliefs about the support they receive from administrators. Teachers may not have felt comfortable answering these items honestly – in fact, many teachers added in a neutral

option to answer these items, or chose not to answer them at all. Items 3, 5, 13 and 17 were designed to measure teachers' beliefs and attitudes about the adaptation of instruction for LML students. These items were designed to include specific techniques and strategies that have been demonstrated to support (or in the case of Item 13, to detract from) the development of literacy skills in LML students (August and Shanahan, 2006). Teachers may not have been familiar with these specific techniques and strategies, or may have found the wording of these items confusing.

Limitations of the Study

As with any research project, my study had several limitations. In the next section of this chapter, I discuss limitations related to the methodology and generalizability of my study.

Limitations in Methodology

Data Collection

The student and teacher data used in my study was collected from a total of six schools in two geographic regions of the United States. During the data collection process, I worked as a research assistant with the CLAVES project, and administered student assessments at the school sites in the Mid-Atlantic region. I was also able to personally distribute and collect the teacher surveys in the Mid-Atlantic region, attaining a 100% return rate from teachers at the three Mid-Atlantic school sites (with the help of the CLAVES research team). I did not work in any of the school sites in the Northeastern region, and was not able to personally distribute or collect the teacher surveys. As a result, the teacher survey return rate from schools in the Northeastern region was lower (80.7%). Due to the small size of the overall sample of teachers, the missing data from

teachers in the Northeastern school sites is likely to have had an impact on my study's findings.

Additionally, though the measures of students' reading comprehension and vocabulary knowledge were each highly reliable, nationally-normed assessments, I only included one measure of each area of literacy learning in my study. Reading comprehension and vocabulary knowledge are both complex, multifaceted domains of learning and understanding, and it is likely that the assessments I used did not capture the entire scope of students' knowledge in each area.

Issues With the CLAVES Teacher Survey

As described above, my analyses of the CLAVES teacher survey data revealed several issues with the design and content of the survey instrument. Specifically, many of the items in the beliefs and attitudes portion of the survey did not measure the facets of teachers' beliefs and attitudes for which they had been designed. As a result, the beliefs and attitudes factors that I used in my final OLS regression analyses were derived from only half of the survey items.

Additionally, I included four response options in the beliefs and attitudes portion of the survey: strongly disagree, disagree, agree, and strongly agree. Based on the recommendation of Dr. Haring, teachers were not given the option to provide a neutral response using the response options I provided. However, a sizable number of teacher (n=14), created a neutral response option by intentionally checking the space between two responses or writing the word "neutral". This raises the question of whether more teachers would have selected a neutral response to survey items if one had been provided.

Finally, the design of the survey questions resulted in my having to rely on teachers' self-reports. As mentioned previously, while several researchers have found teachers' self-reports to be fairly reliable (Mayer 1999; Porter, Kirst, Osthoff, Smithson & Schneider, 1993), it is likely that teachers may have had difficulty answering questions that address issues such as the amount of training they have received (reported in estimated number of courses they have taken) with precise accuracy.

Limitations in Generalizability

There are several limitations to this study that impact the generalizability of my findings. Among the primary limitations affecting the study's generalizability are the size and the composition of both the student and teacher samples, and the manner in which students and teachers were selected to participate in the study.

Sample Size

The size of both the student and teacher samples used in this study meet commonly accepted minimum size requirements for the types of analyses I selected. A common recommendation related to sample size for OLS regression analyses is that there must be at least five cases for every independent variable in social science research (Allison, 1999, p. 9). A more conservative recommendation (Stevens, 1996, p. 72) suggests that "for social science research, about 15 participants per predictor are needed for a reliable equation." Based on these recommendations, my samples of 173 students and 51 teachers both exceed the minimum requirements for this type of analysis. However, both the student and teacher sample sizes in this study were relatively small. This may limit the generalizability of findings from this study to the broader populations of teachers and students in the United States.

Sample Composition

The composition of the student and teacher samples used in my study may also limit the generalizability of my findings. In the teacher sample, the 65% of the teachers who participated in the CLAVES study had earned an advanced degree, as compared to 49% of teachers in public elementary schools across the United States (National Center for Education Statistics, 2011). Additionally, in 2007-2008 teachers in public elementary schools in the U.S. had an average of 13 years of teaching experience (National Center for Education Statistics, 2011), while the teachers in the CLAVES study had an average of only eight years of experience. Thus, the teachers in the CLAVES study had more education and less experience than the average teacher in U.S. public elementary schools.

In the student sample, the LML students who participated in this study were all native Spanish speakers. I selected a sample of LML students who shared a common home language in order to be able to include items on the teacher survey that were related to the Spanish language specifically (such as Item 17, which addresses the use of Spanish-English cognates), and to study students from different schools and geographic areas that had a common home language. While 72% of LML students in the United States speak Spanish as their first language, mainstream classroom teachers in U.S. schools are working with students who speak hundreds of different native languages and dialects (August and Shanahan, 2006). In many culturally and linguistically diverse areas of the United States, mainstream classroom teachers are providing instruction to LML students with a variety of different home languages within the same mainstream classroom. Thus, my choice to focus solely on Spanish-speaking LMLs in my study limits the generalizability of the study's findings.

Sample Selection

As discussed in Chapter 3, because I was not involved in the initial development of the CLAVES study, I was not able to control how teacher and student participants were selected. Students and teachers were recruited to participate in the CLAVES study on a voluntary basis. During the 2010-2011 school year, all of the mainstream classroom teachers of grades 3-5 in each participating school and all of their students were invited to participate in the study, and all students and teachers who volunteered were included. While I believe that the principal investigators' reasons for selecting subjects for their study in this manner were completely valid, I believe that randomization in the selection of participants may have increased the generalizability of the study's findings.

Implications for Future Educational Research

The outcomes of my study present a number of implications or suggestions for future research. First, as mentioned previously, no other researchers have looked specifically at the relationships between mainstream classroom teachers' background factors, beliefs, and attitudes and their LML students' literacy achievement. Studies with larger, more diverse teacher and student samples are needed to confirm and extend the findings of this study.

Additionally, my study only attempted to determine which teacher background and attitudinal factors had relationships to their LML students' vocabulary and reading comprehension outcomes. I did not attempt to explore why or how these teacher factors were related to their students' outcomes. Studies that link the background factors, beliefs, and attitudes examined in this study to specific instructional practices are needed

in order to help teachers and researchers begin to understand why and how these teacher factors appear to be related to LML students' English literacy development.

In addition to collecting student assessment data and teacher survey data, researchers with the CLAVES project also collected observation data in the classrooms of the teachers who participated in the CLAVES study during the 2009-2010 and 2010-2011 school years. Working in conjunction with the CLAVES research team, I hope to use this observation data to begin to attempt to explore links, patterns, or relationships that may exist between teacher background factors, beliefs, and attitudes and the instructional techniques and strategies they use during literacy instruction.

Summary

In this study, I found that teachers' level of teaching experience was significantly and positively related to their LML students' achievement in the area of vocabulary knowledge. I also found that teachers' level of preparation for working with LML students and their attitudes toward the inclusion of LML students in their classrooms were significantly and positively related to their LML students' achievement in reading comprehension. Additionally, I found that teachers' beliefs about school support were significantly and negatively related to students' outcomes on the measure of vocabulary knowledge.

I described limitations related to the study's methodology and generalizability. I recommended that future research be conducted that replicates and extends elements of this study with larger, more diverse samples of students and teachers, and that uses more precise and comprehensive measures of teachers' beliefs and attitudes. I also discussed the need for future research that explores relationships between specific instructional

techniques or strategies used by teachers, teachers' background factors, beliefs, and attitudes, and their LML students' development as readers, writers, and speakers of English. I mentioned plans for future research with the CLAVES project that will begin to explore these types of relationships. Finally, I argued that the findings from this study provide insight into the complex interaction between mainstream classroom teachers, their LML students, and the LML students' academic outcomes.

Appendix A

Institutional Review Board Addendum Application

 UNIVERSITY OF MARYLAND COLLEGE PARK
 Institutional Review Board
Addendum Application

Protocol Number	10-0071
Protocol Title	Investigating Vocabulary Breadth and Depth and Comprehension in English Monolingual and Spanish-English Bilingual Elementary School Students
Risk Classification (check one)	Minimal Risk

Principal Investigator	Dr. Rebecca Silverman	Email Address	rdsilver@umd.edu
Address for Approval Letter	1308 Benjamin Bldg, College Park, MD 20742	Telephone Number	301-405-6465

Student/Co-Investigators	Dr. Jeff Harring	Email Address	harring@umd.edu
Telephone Number	301-405-3630		

To ensure an accurate and streamlined review of your Addendum Application, please provide the following information:

1) State what is being proposed and where in the protocol and/or consent what was changed.

We propose the following additions and/or changes to our original IRB protocol:

1. The following individuals will be collecting and handling data for the project, beginning September 22, 2010:

Candice Brie Doyle
 Christine Goode
 Maritza Gonzalez
 Paul Gordon
 Jennifer Letcher Gray
 Madeline Kleinman
 Anna Meyer
 Xiaoshu Zhu
 Sarah Beall Zelinke

2. Jennifer Letcher Gray is being added as a student investigator.
3. A teacher survey will be added as an additional means of data collection.

2) Provide the rationale/justification for the change.

1. The individuals listed above are graduate students at UMD who will be working as research assistants with the project for the 2010-2011 academic year.

2. Ms. Gray is a doctoral candidate in the College of Education at UMD, and will be using data from this project as part of her doctoral dissertation research. Her contact information is listed below:

Jennifer Letcher Gray
 Doctoral Candidate in Reading Education
 Department of Curriculum and Instruction
 2311 Benjamin Building
 Phone: 240.381.2611
 Email: jletcher@umd.edu

3. After completing the first round of teacher observation data collection, it was determined that additional information was needed in order to attempt to discover correlations between teacher variables such as training/education, teaching experience, and teacher ideas, beliefs, and attitudes and student outcomes on the assessment measures selected for the study. It was determined that a survey would be the least intrusive method of gathering this information.

3) State what impact the change has on risks to participants. Please state the number of currently enrolled participants and if the change in risk will require re-consent. If the changes will not require re-consent, please state why.

The addition of research assistants and the student investigator have no impact on risks to participants. The addition of the teacher survey may slightly increase risk to the teachers participating in the study, in that teachers may feel uncomfortable answering questions related to their beliefs and attitudes. This change in risk will require re-consent, and a modified consent form is attached to this document. However, teachers will be made aware that their answers on the survey will be kept strictly confidential, and that they are free not to answer any questions that they do not wish to answer for any reason without penalty of any kind. Currently, there are 52 teachers enrolled in the study. Thirty teachers were enrolled in the study in the 2009-2010 school year.

4) State whether the change has an impact on the scientific integrity of the study, (i.e. decreases, increases, no impact).

The addition of the teacher survey increases the scientific integrity of the study in that it

provides information to help our research team to better understand the complex relationships between teachers, students, and curricula in heterogeneous mainstream classrooms in the United States. An understanding of teachers' backgrounds, experience, and beliefs and attitudes about teaching and learning is critical to our investigation of vocabulary breadth and depth and comprehension in English monolingual and Spanish-English bilingual elementary school students. The teacher survey provides an opportunity for us to obtain this information in the least intrusive manner possible.

5) List the documents included with the application that have been modified (consent forms, flyers, data collection forms, surveys). State what has been changed in each modified document.

The teacher consent form has been modified to include additional information about the content and purpose of the teacher survey and the additional risks that the survey may pose for teachers. Additional, detailed information for teachers regarding their right to choose not to answer any questions that they feel may place them at any sort of risk has also been included. The teacher survey has been modified to include questions that have been rewritten and/or clarified based on feedback from last year's survey pilot.

Appendix B

Participant Consent Form

TEACHER CONSENT FORM – TEACHER SURVEY*Please initial and date each box*

Project title	Investigating Vocabulary and Comprehension in English Monolingual and Spanish-English Bilingual Students
Why is this research being done?	This is a three-year research project being conducted by Dr. Rebecca Silverman at the University of Maryland, College Park. The purpose of this research project is to understand the relationship between the vocabulary and comprehension development and instruction of monolingual English and bilingual Spanish English children in order to design appropriate intervention. To gather more in depth information relevant to instruction, Jennifer Gray, has created a teacher survey to gather information about teachers' backgrounds and perspectives on teaching and learning, and areas in which they would like to receive additional information and support.
What will I be asked to do?	For this portion of the project, you will be asked to complete a survey that will include a variety of question types and formats. This survey will take approximately 30 minutes to complete. You will only be asked to complete the survey once.
What are the risks of this research?	You may feel uncomfortable answering some of the questions on the survey. You are free not to answer any questions that make you feel uncomfortable in any way.
What are the benefits of this research?	You will receive a \$10 Target gift certificate to thank you for completing the survey. You will not receive any other compensation for completing the survey. This research is not designed to help you personally, but the results may help the researchers learn more about vocabulary and comprehension development and instruction in elementary school. This knowledge would provide information to you and other teachers supporting the language and literacy development of both monolingual English and Spanish- English bilingual students in elementary school. Also, as part of the arrangements we have made with the county, we will conduct professional development as requested on working with both monolingual and bilingual children to improve vocabulary and comprehension. You may benefit in the long term from this professional development.
Do I have to be involved in this research? May I stop participating at any time?	Your participation in this research is completely voluntary. You may choose not to take part at all. If you decide to participate in this research, you may stop participating at any time. If you decide not to participate in this study or if you stop participating at any time, you will not be penalized or lose any benefits to which you otherwise qualify.
What about confidentiality?	All of your answers to survey questions will be kept strictly confidential, and if a report or article is written that includes data from the survey, your identity will be protected to the maximum extent possible.
Who may I contact if I have questions?	This research is being conducted by Rebecca Silverman Ed.D. at the University of Maryland, College Park. If you have any questions about the research study itself, please contact Dr. Silverman at: 1311F Benjamin Bldg., Department of Special Education, University of Maryland, College Park, MD 20742. (telephone) 301- 405-6465 . Email address: rdsilver@umd.edu. If you have questions about the teacher survey, please contact Jennifer Gray at: (telephone) 240.381.2611 Email address: jletcher@umd.edu. If you have questions about your rights as a research subject or wish to report a research-related injury, please contact: Institutional Review Board Office, University of Maryland, College Park, Maryland, 20742; (e-mail) irbi@deans.umd.edu; (telephone) 301-405-0678. This research has been reviewed according to the University of Maryland, College Park IRB procedures for research involving human subjects.
Statement of	Your signature indicates that: you are at least 18 years of age; the research has been explained to

Consent	you; your questions have been fully answered; and you freely and voluntarily choose to participate in this portion of the research project.
Signature and Date	TEACHER NAME (please print)
	TEACHER SIGNATURE
	DATE
	SCHOOL

Appendix C

Institutional Review Board Addendum Approval Letter

IRB Addendum Approval

3 messages

University of Maryland IRB <irb@umresearch.umd.edu>

Thu, Dec 2, 2010 at 2:43 PM

To: "Dr. Rebecca Silverman" <rdsilver@umd.edu>, "Dr. Jeff Haring" <harring@umd.edu>, Jennifer Letcher Gray <jletcher@umd.edu>



Addendum Application Approval

To: Principal Investigator, Dr. Rebecca Silverman, Special Education
 Co-Investigator, Dr. Jeff Haring, Special Education
 Student, Jennifer Letcher Gray, Special Education

From: James M. Hagberg
 IRB Co-Chair
 University of Maryland College Park

Re: IRB Protocol: 10-0071 - Investigating Vocabulary Breadth and Depth and Comprehension in English Monolingual and Spanish-English Bilingual Elementary School Students

Approval Date: December 02, 2010

Expiration Date: February 19, 2011

Application: Addendum

Review Path: Expedited

The University of Maryland, College Park Institutional Review Board (IRB) Office approved your Addendum IRB Application. This transaction was approved in accordance with the University's IRB policies and procedures and 45 CFR 46, the Federal Policy for the Protection of Human Subjects. Please reference the above-cited IRB Protocol number in any future communications with our office regarding this research.

Recruitment/Consent: For research requiring written informed consent, the IRB-approved and stamped informed consent document will be sent via mail. The IRB approval expiration date has been stamped on the informed consent document. Please note that research participants must sign a stamped version of the informed consent form and receive a copy.

Continuing Review: If you intend to continue to collect data from human subjects or to analyze private, identifiable data collected from human subjects, beyond the expiration date of this protocol, you must [submit a Renewal Application](#) to the IRB Office 45 days prior to the expiration date. If IRB Approval of your protocol expires, all human subject research activities including enrollment of new subjects, data collection and analysis of identifiable, private information must cease until the Renewal Application is approved. If work on

the human subject portion of your project is complete and you wish to close the protocol, please [submit a Closure Report](#) to irb@umd.edu.

Modifications: Any changes to the approved protocol must be approved by the IRB before the change is implemented, except when a change is necessary to eliminate an apparent immediate hazard to the subjects. If you would like to modify an approved protocol, please [submit an Addendum request](#) to the IRB Office.

Unanticipated Problems Involving Risks: You must promptly report any unanticipated problems involving risks to subjects or others to the IRB Manager at [301-405-0678](tel:301-405-0678) or jsmith@umresearch.umd.edu

Additional Information: Please contact the IRB Office at [301-405-4212](tel:301-405-4212) if you have any IRB-related questions or concerns. Email: irb@umd.edu

The UMCP IRB is organized and operated according to guidelines of the United States Office for Human Research Protections and the United States Code of Federal Regulations and operates under Federal Wide Assurance No. FWA00005856.

1204 Marie Mount Hall
College Park, MD 20742-5125
TEL [301.405.4212](tel:301.405.4212)
FAX [301.314.1475](tel:301.314.1475)
irb@umd.edu
<http://www.umresearch.umd.edu/IRB>

Appendix D

Institutional Review Board 2011 Renewal Approval Letter

IRB Renewal Approval

1 message

University of Maryland IRB <irb@umresearch.umd.edu>

Thu, Feb 10, 2011 at 1:53 PM

To: "Dr. Rebecca Silverman" <rdsilver@umd.edu>, "Dr. Jeff Harring" <harring@umd.edu>, Jennifer Letcher Gray <jletcher@umd.edu>



Renewal Application Approval

To: Principal Investigator, Dr. Rebecca Silverman, Special Education
 Co-Investigator, Dr. Jeff Harring, Special Education
 Student, Jennifer Letcher Gray, Special Education

From: James M. Hagberg
 IRB Co-Chair
 University of Maryland College Park

Re: IRB Protocol: 10-0071 - Investigating Vocabulary Breadth and Depth and Comprehension in English Monolingual and Spanish-English Bilingual Elementary School Students

Approval Date: February 10, 2011.

Expiration Date: February 10, 2012

Application: Renewal

Review Path: Expedited

The University of Maryland, College Park Institutional Review Board (IRB) Office approved your Renewal IRB Application. This transaction was approved in accordance with the University's IRB policies and procedures and 45 CFR 46, the Federal Policy for the Protection of Human Subjects. Please reference the above-cited IRB Protocol number in any future communications with our office regarding this research.

Recruitment/Consent: For research requiring written informed consent, the IRB-approved and stamped informed consent document will be sent via mail. The IRB approval expiration date has been stamped on the informed consent document. Please note that research participants must sign a stamped version of the informed consent form and receive a copy.

Continuing Review: If you intend to continue to collect data from human subjects or to analyze private, identifiable data collected from human subjects, beyond the expiration date of this protocol, you must [submit a Renewal Application](#) to the IRB Office 45 days prior to the expiration date. If IRB Approval of your protocol expires, all human subject research activities including enrollment of new subjects, data collection and analysis of identifiable, private information must cease until the Renewal Application is approved. If work on

the human subject portion of your project is complete and you wish to close the protocol, please [submit a Closure Report](#) to irb@umd.edu.

Modifications: Any changes to the approved protocol must be approved by the IRB before the change is implemented, except when a change is necessary to eliminate an apparent immediate hazard to the subjects. If you would like to modify an approved protocol, please [submit an Addendum request](#) to the IRB Office.

Unanticipated Problems Involving Risks: You must promptly report any unanticipated problems involving risks to subjects or others to the IRB Manager at [301-405-0678](tel:301-405-0678) or jsmith@umresearch.umd.edu

Additional Information: Please contact the IRB Office at [301-405-4212](tel:301-405-4212) if you have any IRB-related questions or concerns. Email: irb@umd.edu

The UMCP IRB is organized and operated according to guidelines of the United States Office for Human Research Protections and the United States Code of Federal Regulations and operates under Federal Wide Assurance No. FWA00005856.

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TEL [301.405.4212](tel:301.405.4212)
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<http://www.umresearch.umd.edu/IRB>

Appendix E

The Development and Pilot Testing of the CLAVES Teacher Survey

Introduction

In this appendix, I will describe the development and pilot testing of the CLAVES Teacher Survey, the instrument that I used to gather information about teachers' levels of teaching experience, educational attainment, preparation and/or professional development related to LML students, and their beliefs and attitudes related to the instruction and inclusion of LML students in their mainstream classrooms. I will provide details concerning the CLAVES Teacher Survey including (a) the development of the survey, (b) the survey's components, (c) pilot tests of the survey, and (d) initial analyses performed using pilot survey and student outcome data.

The CLAVES Teacher Survey

Survey Development

I began developing the CLAVES Teacher Survey in October of 2009 as a means to gather information from mainstream classroom teachers who were participating in the CLAVES project related to their backgrounds, beliefs, and attitudes in an effort to begin to understand relationships that might exist between teacher factors and LML students' achievement in mainstream classrooms. In addition to gathering the data that I used in my pilot study, the pilot version of the CLAVES Teacher Survey also included questions designed to gather information that will be used in later analyses examining relationships between teachers' backgrounds and data from classroom observations. Working in conjunction with Dr. Rebecca Silverman, Dr. Harring and Dr. Patrick Proctor, I continued to revise and refine the survey over the course of the 2009-2010 school year.

The survey was pilot tested in May of 2010, and revised according to feedback from teachers and the CLAVES research team and recommendations from my dissertation committee. I distributed the final version of the CLAVES Teacher Survey to all 56 participating CLAVES teachers in May 2011.

Survey Components

As discussed in detail in Chapter 2, a substantial number of researchers have published studies that examined relationships between teaching experience (e.g. Connor, 2005; Darling-Hammond, 2000; Darling-Hammond & Youngs, 2002) teacher preparation (e.g. Wayne & Youngs, 2003; Goldhaber & Brewer, 2000; Rowan, Chiang, & Miller, 1997) teachers' educational attainment, and student achievement on a variety of measures. The results of these studies appear to be fairly inconclusive, however, and the data not from these studies has not been disaggregated to account for students' status as LMLs. I therefore included questions related to these factors in the CLAVES Teacher Survey in order to replicate and extend the work of previous researchers, and to examine how these factors appear to be related to the achievement of LML students within the context of mainstream classrooms.

Additionally, a growing body of research has examined mainstream teachers' beliefs and attitudes related to the instruction and inclusion of LMLs in their classrooms (e.g. Reeves, 2006; Youngs & Youngs, 2001). However, as of the writing of this dissertation, I was unable to locate any published studies in which researchers examined the relationships between mainstream classroom teachers' beliefs and attitudes and their LML students' achievement. I created and included a measure of teachers' beliefs and

attitudes in the CLAVES Teacher Survey in order to begin to explore these types of relationships.

As the pilot version of the CLAVES Teacher Survey was being developed, concerns were raised by members of the CLAVES research team about the accuracy of teachers' self-reported estimates of the amount of time spent in each type of preparation. The concerns expressed by the CLAVES research team are similar to those raised by other researchers, who have questioned the reliability and validity of self-reported teacher survey data (e.g. Mayer, 1999). However, in their review of literature examining the reliability and validity of self-reported teacher survey data, Supovitz and Turner (2000) found that, among the studies they reviewed, most had high degrees of correlation between teachers' self reports on surveys and their actual classroom practices and activities. Thus, although I realized that teachers would be unlikely to be able to report the amount of training they have received with perfect accuracy, I believed that their reports were likely to reflect the amount of preparation that they have received to a degree that would allow me to study the relationships that may exist between this type of preparation and their LML students' outcomes on measures of vocabulary knowledge and reading comprehension.

Initial Review/Revisions

After developing an initial draft of the survey, I shared the draft with Dr. Silverman and Dr. Proctor, who made suggestions for revisions and requests for the inclusion of additional questions designed to gather information that will be used in later analyses examining relationships between teachers' backgrounds and data from classroom observations. I revised the survey to incorporate their suggestions and

additional questions. The survey draft was then reviewed a second time by Drs. Silverman and Proctor, and then distributed for review to members of the CLAVES research team (n=6), all of whom were former classroom teachers. I then incorporated comments and suggestions from the research team members, and sent the draft back to Drs. Silverman and Proctor for a final review. The survey was then deemed ready to be piloted with teachers from the CLAVES project.

The CLAVES Teacher Survey Pilot Study

Participants

All 26 teachers from the Maryland site of the CLAVES project were invited to participate in the survey pilot study in April of 2010. Teachers were informed that, to thank them for completing the survey, they would be given a \$10 gift card. The surveys were distributed to all 26 teachers at the Maryland site of the CLAVES project at the beginning of May. Teachers were invited to mail the surveys back to the CLAVES project offices at the University of Maryland, to email or fax them directly to the research team, or to hold them until CLAVES research team members came to their schools to collect the surveys on May 26. All teachers who turned in the survey received their Target gift cards at this time. Of the 26 teachers invited to participate, 22 filled out and submitted at least some portion of the survey.

Revision of the Survey

After the pilot surveys were collected, feedback from both teachers and the CLAVES research team were used to revise and edit the survey. A smaller group of teachers (n=11) volunteered to provide feedback about the clarity of survey items, their experience taking the survey, and any changes they felt would help to improve the

survey. Members of the CLAVES research team also reviewed teachers' completed surveys and provided feedback. Based on this feedback, I eliminated or changed questions that didn't seem to yield the desired information and/or were considered unclear or confusing by teachers. Also, based on teacher feedback and the recommendations of CLAVES researchers, I removed many of the short answer items in the survey. Several teachers had reported that these items took too long to complete, and CLAVES researchers felt that they did not yield the types of rich information that they were hoping to collect. By removing these items, I was also able to shorten the survey, which teachers had reported was too long.

I then sent the revised draft of the survey to Dr. Proctor, Dr. Silverman, and members of the CLAVES research team, who reviewed the revised survey draft and provided feedback. I incorporated their changes, and then distributed the revised survey to a small group of classroom teachers unrelated to the CLAVES project (n=7) for additional feedback. A few minor changes in format and wording of questions were made. The revised survey was then sent to once again to Drs. Silverman and Proctor, who approved the survey and deemed it ready for distribution to teachers. I then shared the survey with members of my dissertation committee, who provided suggestions and feedback. Based on input from my dissertation committee, I made further changes to the survey, then sent it to both my committee members and Drs. Silverman and Proctor for approval. After the survey had been approved by my dissertation committee and Drs. Silverman and Proctor, I prepared final versions of the survey, which were used to collect my dissertation data. Please see Appendix G for a copy of the draft of the survey used in

the pilot study, and Appendix H for a copy of the final version of the CLAVES Teacher Survey that was distributed to teachers in the spring of 2011.

Implications for Final Data Collection

Reflecting on the pilot of the CLAVES Teacher Survey, I identified several ways in which the process of distributing and collecting the surveys could be improved and/or streamlined. First, I attempted to increase the teacher participation rate in 2011 both by using Target gift cards as an incentive, and also by travelling to each Maryland school site myself to both distribute and collect surveys and give each participating teacher their gift card in person. A research assistant from Boston College traveled to each Massachusetts school site to distribute and collect surveys and deliver gift cards. Second, as mentioned previously, changes were made to clarify questions and to pare down the overall length of the survey. In making these changes, I hoped to minimize the time and energy required of teachers to complete the survey.

Data Analysis

Data Preparation

After the survey documents were collected from teachers participating in the pilot study, data from the surveys was coded and entered into the SPSS program by members of the CLAVES research team. All participating teachers and students were assigned specific code numbers to be used in data analyses, and all data was kept strictly confidential. For the purposes of my initial analyses, teacher and student data was matched based on these numeric codes, and data from students whose teachers did not complete the survey was removed from the data set. Next, data from students who did

not complete both pre and post-test assessments was removed from the data set. Finally, the revised data set was used to conduct a series of multiple regression analyses.

Assumptions of Multiple Regression

Multiple regression has been described as “one of the fussier of the statistical techniques” (Pallant, 2010, p. 150) due to the number and type of assumptions that are made about data that must be met in order to use this technique. In the following paragraphs, I will describe each of these assumptions and the methods I used to test each assumption.

Sample Size As mentioned in Chapter 3, a common recommendation related to sample size for multiple regression analyses is that there must be at least five cases for every independent variable in social science research (Allison 1999, p. 9). A more conservative recommendation (Stevens 1996, p. 72) suggests that “for social science research, about 15 participants per predictor are needed for a reliable equation”. The sample size of the pilot study ($n=22$) meets the first recommendation, but not the second. Thus, the generalizability of the findings from my initial analyses is limited.

Multicollinearity Multicollinearity occurs when the independent variables used in regression analysis are highly correlated ($r=.9$ and above, according to most sources). Multicollinearity causes major problems in standard multiple regression analysis, which is a technique designed to show the relationship between each independent variable, controlling for all of the other independent variables, and the dependent variable. Thus, an assumption of multiple regression is that multicollinearity does not exist. To check this assumption, I referred to the “collinearity diagnostics” that are performed by the SPSS software program as part of the multiple regression procedure. In these

diagnostics, two values are generated: Tolerance and VIF. Tolerance is “an indicator of how much the variability of the specified independent is not explained by the other independent variables in the model” (Pallant, 2010, p. 158). A tolerance value of less than .10 indicates a high level of multiple correlation exists with other variables and suggests that multicollinearity is likely. The tolerance levels for my initial analyses were .457 (using comprehension the as dependent variable) and 1.045 (using vocabulary knowledge as the dependent variable), indicating that the multicollinearity assumption was not violated by either of my analyses.

Normality and Homoscedasticity Multiple regression also includes the assumptions of normality, or the assumption that residuals should be distributed normally about the predicted dependent value scores, and homoscedasticity, or the assumption that the variance of the residuals about the predicted dependent variable scores should be the same for all predicted scores. In the SPSS program, the Normal Probability Plot of the Standardized Residuals (Normal P-P Plot) can be used to check to check these assumptions. In the Normal P-P Plot, points should lie in a reasonably straight line from bottom left to top right in order for the assumptions of outliers, normality, and homoscedasticity not to be violated. Appendix I displays the Normal P-P Plots for both of my initial analyses. These plots indicate that the assumptions of normality and homoscedasticity are not violated for either of my analyses.

Initial Multiple Regression Analyses

After preparing the data set, I conducted two multiple regression analyses. In the first analysis, teachers’ level of teaching experience and level of preparation to teach LML students were used as independent variables, and the difference between LML

students' fall and spring scores on the WLMS – R Comprehension subtest was used as the dependent variable. In my second analysis, I used the same independent variables, but used the difference between LML students' fall and spring scores on the WLMS – R Picture Vocabulary subtest as the dependent variable. Both of these analyses revealed no statistically significant relationships between either of the teacher variables and students' outcomes.

Surprisingly, however, a relationship approaching significance (.09) was revealed between teachers' level of teaching experience and LML students' outcomes on the measure of reading comprehension, with findings indicating that the more years of experience teachers had, the lower their LML students' scores were on the reading comprehension measure. As discussed in Chapter 2, teaching experience has been identified as having a positive effect on student achievement by previous researchers (Wayne & Youngs, 2003; Darling-Hammond, 2000). However, student data in these studies were disaggregated only by classroom or by school, not by any specific student characteristics.

Interestingly, Garcia-Nevarez, Stafford, & Aria (2005) found a similar inverse relationship between teachers' level of teaching experience and their attitudes toward the LML students in their mainstream classrooms. Garcia-Nevarez and her colleagues speculate that this relationship may be based on teacher burnout over time due to the stress of attempting to differentiate their instruction to meet the diverse academic and linguistic needs of the students in their classrooms. It seems, then, that teacher burnout could be one possible explanation for my finding that teaching experience and LML student outcomes in reading comprehension appeared to be inversely related. Another

possible explanation for this relationship might be that teachers who were more recent graduates from teacher education programs may have been more likely to have had coursework specifically related to the inclusion and instruction of LML students (Menz, 2009).

As described previously, I was not able to use teachers' level of educational attainment in these analyses due to the lack of usable data generated by the pilot of the CLAVES Teacher Survey related to this variable. Unfortunately, I was also not able to perform initial multiple regression analyses using data related to teachers' beliefs and attitudes. In the next section of the paper, I will explain why I was unable to perform these analyses using data from the survey pilot.

Factor Analysis Related to Teachers' Beliefs and Attitudes

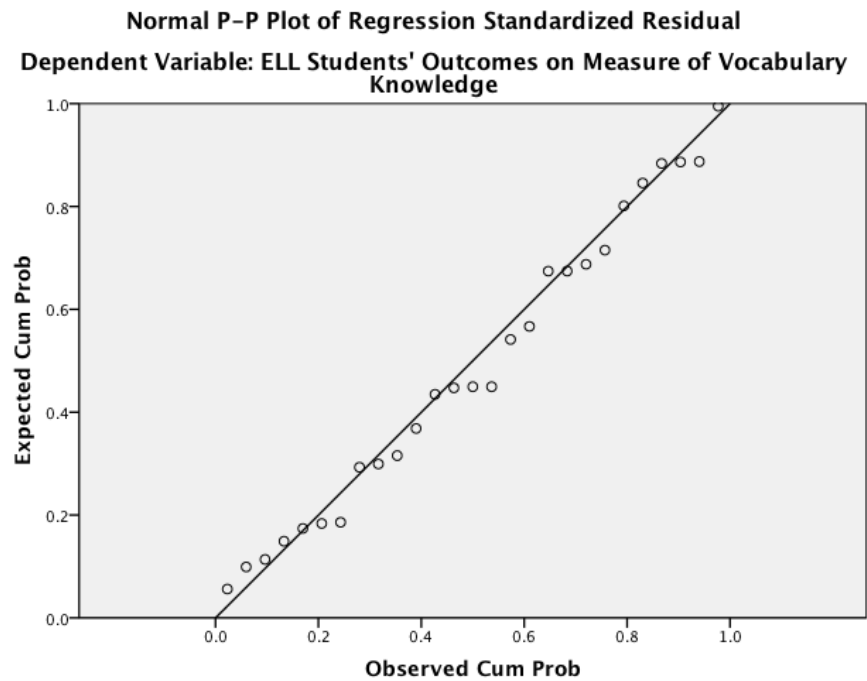
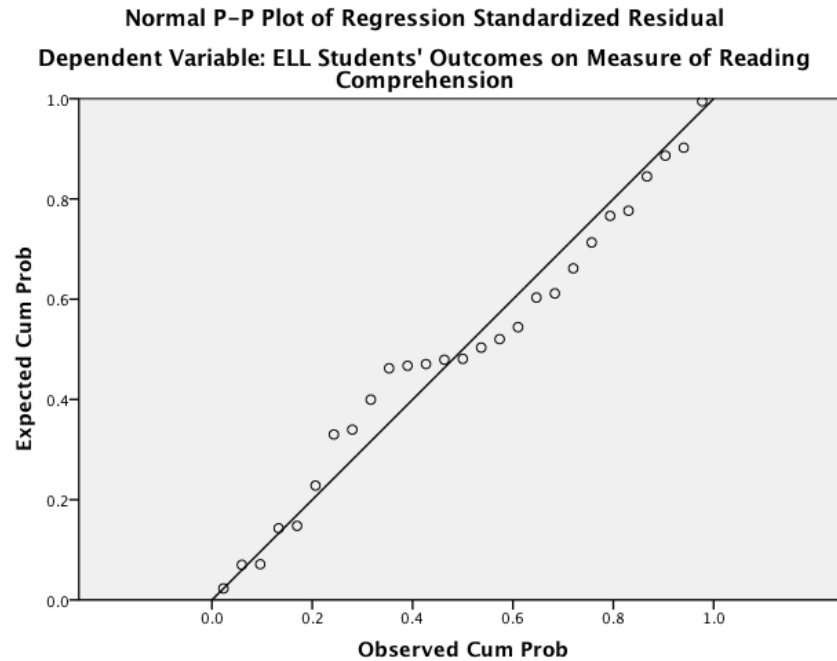
After collecting the survey documents from teachers, I was disappointed to learn that several teachers had not completed all of the items on the survey. In several cases, it seemed that teachers had become "fatigued" while taking the survey or had simply run out of time, causing them to leave the final portion of the survey blank. Unfortunately, the final portion of the survey was the measure of teachers' beliefs and attitudes. This resulted in only 17 teachers completing this portion of the survey. A factor analysis was conducted using data from these 17 teachers, and four factors were identified. However, the reliability of this factor analysis is highly questionable, given the very small size of the teacher sample. Additionally, this small sample size negated the possibility of conducting a valid, reliable multiple regression analysis using the factors identified by my factor analysis as independent variables, as the sample size does not meet even the minimum requirement of five cases per variable.

Limitations

As with all studies, there are numerous limitations to the CLAVES Teacher Survey pilot study. Perhaps the greatest limitation of this pilot study is the small size of the teacher sample, greatly limiting the generalizability of the study's findings. Additionally, this small sample size prevented me from being able to perform a reliable factor analysis and multiple regression analyses related to teachers' beliefs and attitudes, an issue that was further complicated by teachers' assumed "survey fatigue" and failure to complete the entire survey. I addressed the issue of teacher survey fatigue by shortening the survey overall, eliminating most short-answer questions, and clarifying unclear questions in the final version of the CLAVES teacher survey.

Appendix F

Normal Probability Plots of the Standardized Residuals for Pilot Study Initial Analyses



Appendix G

CLAVES Teacher Survey – Pilot Version

Part 1: Teacher Background

1. How many years (including the current year) have you been teaching:

At the K-6 level? _____

At the grade level you are teaching now? _____

In this district? _____

At this school? _____

Students who are English language learners (ELLs)? _____

Special education students? _____

2. Which of the following certifications do you hold (circle as many as apply)?

a. Relevant grade level

b. Relevant subject area

c. English as a second language

d. Bilingual education

e. Special education

f. Sheltered English Instruction

g. Other (please describe) _____

3. Do you speak a language other than English? _____

If yes, which language(s)? _____

4. In the past 5 years, have you had training (coursework, in-service training, other seminars/workshops) related to...	Yes or No	If yes, about how many hours (best estimate)?	If yes, what was the focus/content?	Do you feel that this is a subject you would like to know more about? Please explain.
Vocabulary instruction?				

Comprehension instruction?				
Linguistics/ Language Elements?				
English Language Learners?				

5. In a typical week, how many students do you work with in each category? *Please estimate.*

Speak and understand only English?	
Are English language learners (ELLs)?	
Are proficient in English and another language(s)?	
Speak an non-standard English dialect such as Ebonics/AAVE/Carribbean?	

6. On a typical day, what percentage of your language arts period do you spend on the following:

Phonics	
Vocabulary	
Fluency	
Comprehension	
Guided Reading	
Writing	
Grammar	
Other _____	

7. What percentage of the day do the following groups of students spend in these various instructional delivery models?

	%whole class	Who delivers instruction?	%small group	Who delivers instruction?	%1 on 1	Who delivers instruction?
Regular education students						
ELL students						
Special education students						

Part 3: Classroom Practices

Please answer the following questions with as much detail as possible:

Question	Answer
1. How do you teach vocabulary in your classroom?	
2. How do you teach reading comprehension in your classroom?	
3. Do students from your classroom get supplemental (extra) intervention in vocabulary and/or comprehension? If so, what does it consist of?	
4. Based on the needs of your students, what do you think supplemental interventions should include? How should they be implemented?	
5. Do you adjust your teaching for English language learners? If so, please explain.	
6. What knowledge and strategies would you recommend that pre-service teachers be taught about working successfully with ELLs?	

Part 4: Teacher Beliefs and Practices

Please check one response for each statement:

Question	Never	Seldom	Often	Always
1. I allow English language learners more time to complete their coursework.				
2. I give English language learners less coursework than other students.				
3. I allow English language learners to use their native language(s) in my class.				
4. I provide materials for English language learners in their native languages.				
5. Effort is more important to me than achievement when I grade English language learners.				
6. The inclusion of English language learners in my classes increases my workload.				
7. English language learners require more of my time than other students require.				
8. The inclusion of English language learners in my class slows the progress of the entire class.				
9. I receive adequate support from school administration when English language learners are enrolled in my classes.				
10. I receive adequate support from the ESOL staff when English language learners are enrolled in my classes.				
11. I conference with the ESOL teacher(s).				
12. I know how to appropriately modify my instruction to accommodate the needs of ELLs.				

Appendix H

CLAVES Teacher Survey – Final Version

CLAVES Teacher Survey

Last Name _____ School _____

1. Please describe your educational background:		
Level of Education	Circle or X One	Additional Information
Bachelor's degree?	Yes No	If yes, what was your major? _____ If yes, what was your minor? _____
Master's degree?	Yes No	If yes, in what area or subject did you earn your degree(s)? _____
Thirty credits beyond Master's?	Yes No	If yes, what was the focus or content of this coursework? _____
Doctoral degree?	Yes No	If yes, in what area or subject did you earn your degree? _____
Which certifications do you hold? (e.g., Elementary Education, Special Education, Reading, ESOL, SEI, etc.)		_____
2. How many years (including the current year) have you taught at the K-6 level? _____		
3. How many years (including the current year) have you taught language minority learners*? _____		
*In this survey, Language Minority Learners are students who are (a) exposed to a language other than English at home and (b) receiving English instruction in school.		
4. Do you speak a language other than English? Yes No (circle or put an X to one choice)		
If yes, which language(s)? _____		
5. How much training have you had for working with language minority students? (please darken one box)		
Number of courses taken: <input type="checkbox"/> No courses <input type="checkbox"/> 1 course <input type="checkbox"/> 2 courses <input type="checkbox"/> 3 courses <input type="checkbox"/> 4 or more courses	Number of sessions of professional development: <input type="checkbox"/> None <input type="checkbox"/> 1 session <input type="checkbox"/> 2 sessions <input type="checkbox"/> 3 sessions <input type="checkbox"/> 4 or more sessions	
6. Which programs/materials do you use for vocabulary instruction? (Use back if needed.)	7. What programs/materials do you use for comprehension instruction? (Use back if needed.)	
Programs: _____	Programs: _____	
Materials: _____	Materials: _____	

Survey on Teaching Language Minority Learners

***In this survey, Language Minority Learners are students who are (a) exposed to a language other than English at home and (b) receiving English instruction in school.**

Please check or X one response for each statement:	Strongly Disagree	Disagree	Agree	Strongly Agree
1. I have adequate training to provide effective reading and language arts instruction for language minority learners.				
2. I receive adequate support from my principal and other administrators when language minority students are enrolled in my classes.				
3. It is a good practice to use the same instructional techniques and materials with all students in mainstream classrooms.				
4. The inclusion of language minority learners in mainstream classes benefits all students.				
5. It is a good practice to allow language minority learners to use Spanish during reading and language arts lessons.				
6. Mainstream classroom teachers have the resources they need to provide effective reading/language arts instruction for language minority students.				
7. Teachers should not modify their reading and language arts instruction for language minority students in mainstream classrooms.				
8. I have had positive experiences with the inclusion of language minority students in my classes.				
9. It is a good practice to encourage language minority students to avoid using their native language while they are at school.				
10. I am interested in receiving more training related to reading and language arts instruction for language minority learners.				
11. It is a good practice to provide materials in English and students' native language for language minority learners during reading/language arts instruction.				
12. Language minority learners should not be included in mainstream classes until they attain a minimum level of English proficiency.				
13. It is a good practice not to ask language minority students to participate in classroom discussions until they have reached high levels of proficiency in English.				
14. Mainstream classroom teachers have the time they need to plan and provide effective reading and language arts instruction for language minority students.				
15. Teachers should consider students' cultural and linguistic backgrounds when selecting materials for reading and language arts instruction.				
16. The inclusion of language minority learners in my class slows the progress of the entire class.				
17. It is a good practice to point out similarities between words in English and words in Spanish for Spanish-speaking language minority students (such as "electricity" in English and "electricidad" in Spanish)				
18. Language minority students benefit from receiving reading and language arts instruction in mainstream classrooms.				
19. It is a good practice to use pictures, visual aids, gestures, and other non-verbal tools during reading and language arts instruction for language minority students.				
20. I receive adequate support from the ESL/SEI staff when language minority students are enrolled in my classes.				

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