<u>PERCEPTIONS AND PATTERNS OF READING STRATEGY USE AS RELATED
TO READING ACHIEVEMENT AND LEARNING CONTEXTS OF U.S. HISPANIC
ENGLISH LEARNERS</u>

by

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Master of Education
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Dedication

This is dedicated to my loving husband Robert, my Atlas, who unselfishly held the world up around me to allow me to continue my unending learning journey.

Acknowledgements

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List of Abbreviations

Discriminant Function Analysis ....DFA
English Learners ....ELs
Elementary and Secondary Education Act ....ESEA
Fiscal Year .... FY
Hierarchical Cluster Analysis ....HCA
Inter Rater Reliability ....IRR
Large Scale Assessment..LSA
Local Education Agency..LEA
Multinomial Logistic Regression..MLR
Missing at Random .... MAR
Missing Completely at Random..MCAR
National Center for Education Statistics.. NCES
National Assessment of Educational Progress.. NAEP
No Child Left Behind..NCLB
Organization for Economic Cooperation and Development......................................OECD
Programme for International Student Assessment..PISA
State Education Agency... SEA
Striving Readers Comprehensive Literacy Program..SRCL
Student Approaches to Learning..SAL

Abstract

PERCEPTIONS AND PATTERNS OF READING STRATEGY USE AS RELATED
TO READING ACHIEVEMENT AND LEARNING CONTEXTS OF U.S. HISPANIC
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In this quantitative secondary analysis of PISA 2009 data, patterns and perceptions of

reading strategy use of U.S. Hispanic EL students and how these related to reading

achievement scores and learning contexts was investigated. Results of the analysis

indicated that U.S. Hispanic ELs cluster into three groups based on reading strategy use

frequency and students' understanding of the value of metacognitive reading strategies.

There were significant differences in reading achievement scores between the group that

accurately perceived the value of metacognitive strategies and the other two groups.

Specifically, students who understood the usefulness of metacognitive reading strategies

obtained scores within the PISA level considered to be successful readers, and those who

did not understand the value of metacognitive strategies obtained scores within the PISA

level considered baseline proficient readers. With regard to learning contexts, findings

indicated that positive learning contexts that included student-teacher relationship,

teacher expectations and supportive learning practices functionally discriminated between the lowest performing group and the other groups. Additionally, positive student-teacher relationship was predictive of cluster membership in the highest performing group as compared with the lowest performing group. The importance of understanding the value of metacognitive reading strategies and supportive instruction implicate the need for a dedicated source of adolescent literacy funding that is focused on building educator capacity concentrated on culturally responsive reading instruction for adolescent Hispanic ELs.

Chapter One

Introduction to the Study

With the requirement that schools close academic gaps between economically advantaged students and those who are from different economic, racial and ethnic backgrounds, the enactment of the No Child Left Behind Act (NCLB) of 2001 represented an important shift in the education system of the United States; one that relied on federally mandated tests and disaggregated data to measure progress toward closing the academic gap. Although student reading achievement has been measured and reported since the early 1970s using the National Assessment of Educational Progress (NAEP), the accountability aspect of NCLB generated the impetus for focusing resources on closing other achievement gaps (Craft & Slate, 2012). The growing ethnic and racial diversity of the student population of the United States' school system presents additional challenges in closing these gaps, specifically with regard to the number of United States' school-aged students who speak a language other than English at home, the greatest percentage of which speak Spanish (Batalova & McHugh, 2010; Gandara & Rumberger, 2009).

According to Hemphill and Vanneman (2011) NAEP results indicate that the achievement gap in reading has remained stagnant between Hispanic and White students since the enactment of NCLB. NAEP, however, is not the primary measure used for

NCLB accountability, for this purpose, state accountability assessments are used. Yet according to Craft and Slate (2012) inconsistencies in individual state standards to which these assessments are aligned do not provide an accurate picture of student achievement *across* the United States. Nevertheless, results from individual state assessments confirm NAEP data that the achievement gap in reading continues to exist between Hispanic and White students (Chudowsky, Chudowsky & Kober, 2009). These findings are important in understanding the status of the gap, but do not help to understand the underlying factors for the disparity in reading performance of adolescent Hispanic learners. Much of the research in understanding the gap in reading achievement of adolescent Hispanic learners has focused on language acquisition models with little attention given to effective reading instruction and even less on the influence of learning contexts.

Federal policies that address English Learners (ELs) are limited to language acquisition and accountability. Federal efforts aimed at closing the achievement gap in reading have concentrated primarily on elementary students with the exception of the Striving Readers Comprehensive Literacy Program (SRCL) (Striving Readers Program, 2005; Striving Readers Program, 2009). However, appropriations awarded for the SRCL are not focused on EL or Hispanic readers and are not intended solely for adolescent literacy. Funding distribution for the SRCL requires that state education agencies (SEAs) ensure that pre-K and elementary students receive 15 and 40 percent of the funding respectively with at least 40 percent of the grant funds to be distributed to serve students in middle and high school equally. For middle and high school students, SRCL has a twofold purpose (1) to raise students' literacy levels, and (2) to build a strong research

base for identifying strategies that improve adolescent literacy skills (Striving Readers Program, 2005; Striving Readers Program, 2009). In 2012, completed impact studies for the first cohort of SRCL recipients reported mixed results of successes with regard to interventions aimed at improving adolescent literacy achievement.

According to Craft and Slate (2012) the stagnant nature of the achievement gap is a factor that contributes to the continued rise in dropout rates of ethnic minority students. This is especially important for the Hispanic population with a dropout rate that is triple the rate of White students and almost double the rate of African-American students (U.S. Department of Education NCES, 2013c). When considering that students who drop out of high school impact the future of the United States' economy due to lost wages, taxes, productivity and purchasing power (Craft & Slate, 2012; Neild & Balfanz, 2006), it becomes increasingly important to attend to the needs of this growing population of students.

This study will examine associations between the use of reading strategies, learning contexts and reading achievement of adolescent Hispanic students in the United States. What follows is: an overview of the changes in the population of Hispanic students and the dropout rate in United States' schools; a description of measures of adolescent literacy; an explanation of adolescent literacy; a report of the gap in reading achievement of adolescent Hispanic students; a brief description of the federal policies and their impact related to ELs and adolescent readers, and lastly; implications of the potential economic impact of not addressing the literacy needs of this growing population of students in the United States. This chapter also includes a conceptual framework to

help frame the underlying foundation of this research project and concludes with four research questions and definitions of the operationalized terms used in this study.

Population Changes and Dropout Rate

The changing demographics of the United States are reflected in the population of United States' public schools. According to the U.S. Department of Education National Center for Education Statistics (NCES) (U.S. Department of Education NCES, 2012a) from 1980 to 2009 there was a significant increase in the number of children between the ages of five and seventeen years of age who spoke a language other than English at home. More specifically, the U.S. Census Bureau (2013) reports that between 1980 and 2010, the percentage of the school-aged population who speak a language other than English in the home has increased 158 percent; for those whose other language spoken in the home is Spanish, the increase was 232 percent. From 2001 to 2010, the percentage of students participating in English Language (EL) programs rose from 8 to 9.7 and are projected to make up 40 percent of the school-age population of the United States by 2030 (Aud et al., 2012; Thomas & Collier, 2002). An analysis of the 2009 Census Bureau American Community Survey revealed that that 73.1 percent of ELs spoke Spanish in their homes; this figure is supported by the trend evidenced in data from the U.S. Department of Education specifying that from 1990 to 2010, within the United States, Hispanic students enrolled in public schools in pre-K through twelfth grade grew from 11.7 percent to 23.3 percent (Batalova & McHugh, 2010; U.S. Department of Education NCES, 2009). These data make it clear that United States' school demographics are changing and are projected to continue to change in a manner that

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should alert policymakers to address the educational needs of this group that will make up an increasingly significant segment of the school population.

The EL population's growing presence in the United States' school system and assumptions about the make-up of the population can lead to counterproductive dialogue. Batalova, Fix and Murray (2007) report that 57 percent of adolescents who speak a language other than English in the home are United States-born citizens; an important fact in recognizing that ELs are not a transient population, but rather they are United States' citizens indicating that the United States' education system must acquire the capacity to serve this growing segment of citizens. Without developing the capacity to adequately serve this population, there are some current data that indicate there may be negative consequences. Kim (2011) reports a 25 percent dropout rate for EL students as compared to a 15 percent dropout rate for non-EL students. The dropout population is unevenly distributed with a bigger impact on Hispanic students than on other populations. According to the U.S. Department of Education, the dropout rate is 15.1 percent for Hispanic students, three times that of White students and almost double the rate of Black students (U.S. Department of Education NCES, 2013c, p.240). Without effective measures to close this gap, dropout rates, coupled with projections that the EL population will represent 40 percent of the student population by 2030, the United States can expect a significant increase in the number of dropouts.

According to Hernandez (2012) reading is a gateway skill and there is an association between reading and high school graduation. Students who do not read well after third grade fail throughout their educational careers and nine percent of those

students will not graduate from high school by the time they reach the age of nineteen (Hernandez, 2012). For Hispanic students, 28 percent of those who are not reading proficiently by the third grade will not graduate from high school by the time they are nineteen (Cantrell, Almasi, Carter, Rintamaa & Madden, 2010; Hernandez, 2012).

Measures of Adolescent Literacy

Researchers such as Pinkus (2008) report that ultimately students with low literacy skills are likely to drop out of high school; without the ability to read and comprehend high school level text these students begin to disengage from coursework and from school, eventually leading to a decision to drop out of school. This leads to the question of how the United States identifies students with low literacy skills and defines skill level. In the mid-1960s the Elementary and Secondary Education Act (ESEA) was enacted to end the war on poverty by ensuring that all children had access to an equal education through funding intended to support reading, writing and mathematics in primary and secondary schools. If equal education was to be obtained, metrics and instruments were needed in order to establish a baseline of educational attainment and to measure changes.

The National Assessment of Educational Progress (NAEP). In the early 1960's, the Commissioner of Education, Frank Keppel, proposed collecting information on school children as a measure of the efficacy of the educational process (Beaton et al. 2011). Fulfilling Keppel's vision, NAEP, now known as the Nation's Report Card, was first given in 1971 as a measure of the educational achievement of nine-, thirteen- and seventeen-year-old students (Beaton et al.). The first data on the 1970-1971 reading

scores revealed a large gap in achievement between minority students and White students (U.S. Department of Education NCES, 1983). Between 1971 and 1980, there were three NAEP assessments administered in 1971, 1975 and 1980. Results showed that nine-year old students scored significantly higher in both 1975 and 1980; however, there were no significant changes found for thirteen- and seventeen-year old students during the same time period, with no reported closing of the achievement gap between Hispanic and White students (U.S. Department of Education NCES, 1983).

Standards-based education. Through this period, individual state scores were not reported by NAEP. When the National Commission on Excellence in Education released *A Nation at Risk* it drew a considerable amount of attention to the condition of the United States' education system and prompted then Secretary of Education, Terrence Bell, to turn his focus to individual states to implement changes recommended in *A Nation at Risk* (National Commission on Excellence in Education, 1983). Despite data limitations, Bell devised a wall chart that included, among other information, ACT and SAT scores as measures of individual states' performance, an innacurate measure as these test scores generally assessed the abilities of college-bound students (Ginsburg, Jay & Plisko, 1988).

Also during this time frame, a handful of governors began to appreciate the importance of gathering more meaningful state level data, an action which eventually led to developing national education goals in 1989 and 1990 (National Education Goals Panel, 1999). The National Governors Association (NGA) mobilized to meet and discuss education goals at the 1989 Education Summit in Charlottesville, Virginia. The intent of

the summit was to establish a vision for improving America's education system. In 1990, the National Goals Panel (1990) published six national goals, which established a foundation for academic standards.

The details of the goals tied education to international comparisons, global economic competitiveness and productive employment data (National Education Goals Panel, 1990). Now that the goals were established, the next task was to measure states' movement toward achieving these goals, some of the measures that were to be used included NAEP test data and data from international testing. The baseline measures for these goals were the 1990 NAEP data (National Education Goals Panel, 1990). In 1994, the 103rd Congressed reauthorized the Elementary and Secondary Education Act as The Goals 2000: Educate America Act (P.L.103-227). In doing so, Congress added two additional goals, one related to teacher preparation and the other addressing literacy. This law served to codify the national goals. These eight goals were intended to outline a plan to identify world-class academic standards, measure student progress, and provide supports for students in order to meet the established standards.

Standards-and assessment-based accountability. The enactment of NCLB carried the concept of standards-based, outcome-based education further by mandating measurable improvement in student achievement for all student groups (Craft & Slate, 2012). This required states to develop standards and assessments that could accurately measure student achievement against the standards which individual states had established (Superfine, 2005). The state measures for academic progress under NCLB

differ from the NAEP; state assessments are not aligned with regard to national achievement standards but to various state standards.

Over the past century, important changes have occurred in the ways that literacy instruction and attainment are viewed, delivered and measured giving rise to the development of many different assessment tools. In the United States the most common assessments used to measure progress on scores of reading performance and attainment include NCLB-mandated annual state-level tests, the NAEP, Progress in International Literacy Studies (PIRLS) and the Programme for Internationale Student Assessment (PISA). These tests differ in purpose, format and testing cycle and as such, only two assessments are relevant in assessing the progress of adolescent learners and provide data that can be used to inform policy with regard to adolescent literacy - NAEP and PISA. The shortcomings of the NCLB-mandated state tests and PIRLS as measures of adolescent reading performance are highlighted briefly with detailed descriptions of NAEP and PISA following the highlights

United States' assessments. There are two primary assessments that are administered in the United States to measure educational attainment, NAEP and NCLB-mandated state assessments. The purpose of NCLB-mandated state tests is to measure student proficiency against state standards. Because the definition of proficiency varies from state to state, in addition to the state tests, students must participate in biennial NAEP testing of fourth and eighth graders (No Child Left Behind: A Desktop Reference, 2002). According to Craft and Slate (2012), across the nation pass rates varied greatly between state assessment measures and NAEP measures of reading and math due largely

to the flexibility of NCLB that allowed states to write their own standards, assessments and set their own pass rates. The NCLB-mandated state tests are not intended to be used as measures of adolescent literacy progress across the nation, but for accountability purposes (Menken, 2009). Because of the variability of standards and how definitions of proficiency vary from state to state, these would be poor instruments to use to inform policymakers on issues of adolescent literacy.

According to the U.S. Department of Education NCES (2014a) NAEP is a national test given to measure what students know and can do in various subject areas. The subject area tests are administered to a representative sample of fourth and eighth grade students biennially; prior to 2013, twelfth grade students were only included in long term trend assessments which were given every four years. The long term trend assessment is a longitudinal instrument which changes little over time and according to the U.S. Department of Education (U.S. Department of Education NCES, 2012c) by administering a uniform assessment across states and one which varies little from year to year, NAEP is positioned to provide an accurate representation of student progress across the nation over time.

In addition to the long term trend data, stability of the test, and uniformity of the test from state to state, learning context information is also collected via four questionnaires that are completed either by students, teachers or school administrators (U.S. Department of Education NCES, 2014a). These questionnaires collect information about students' demographic characteristics, classroom experiences, and educational support, data on teacher training, instructional practices, school policies and

characteristics, and information about students selected in the sample who have disabilities or limited English proficiency (American Institutes for Research, 2013). More specifically, the questionnaires collect information about learning contexts and gather information on variables that contribute to the understanding of reading achievement. These data are of the type that could be valuable to policy makers in assessing the efficacy of adolescent literacy policies or to serve as policy levers.

The National Assessments Governing Board (NAGB) was established by Congress in 1998 to oversee NAEP and to ensure fidelity to the intent of the testing program, provide a blueprint for the NAEP test, establish achievement levels, and communicate test results. American Institutes for Research (AIR) produced the reading framework for the reading assessment and item specifications for the NAGB for the 2009, 2011 and 2013 NAEP assessments. According to AIR (2013) the definition of reading for NAEP assessment purposes is "Reading is an active and complex process that involves: understanding written text; developing and interpreting meaning; and using meaning as appropriate to type of text, purpose, and situation" (p.37). Additionally, "This definition of reading is derived from research on reading acquisition and growth and reflects the definitions that guide the development of two international assessments of literacy, the Progress in International Reading Literacy Study (PIRLS) and the Programme for Student Assessment" (AIR, 2013, p. 37).

International assessments. There are two international assessments that measure literacy skills, PIRLS and PISA. PIRLS is administered by the International Association for the Evaluation of Educational Achievement (IEA) with a focus on the international

reading literacy achievement of *young* children. Young children, according to Mullis,

Martin, Kennedy, Trong and Sainsbury (2009) means that "the PIRLS target grade should

be the grade that represents four years of schooling, counting from the first year of

International Standard Classification of Education (ISCED) Level 1" (p.60). This age

was chosen because it is a pivotal point in children's learning process, the age that they

move from learning to read to reading to learn. In the United States the target age is the

fourth grade level, but in many countries students are still developing fundamental

reading skills. Because of the limited scope of testing age and the focus of literacy being

on young children, the PIRLS assessment data are most valuable for informing literacy

policy of students at the fourth grade level and below, not for informing adolescent

literacy policy.

    The other international literacy assessment, PISA, is given every three years and

coordinated by the Organisation for Economic Cooperation and Development **(**OECD**).**

Approximately sixty four countries participate in the testing, the majority of which are

OECD member countries (OECD, 2009). PISA is given every three years with one

subject (mathematics, reading or science) becoming the primary focus of study in each

cycle (Fleischman, Hopstock, Pelczar, & Shelley, 2010). To date, two PISA iterations

with a focus on literacy have been administered, in 2000 and 2009 (OECD, 2010b).

When the subject is the primary focus area, data are collected from students, parents and

school leaders to ascertain information about learning contexts and factors that influence

reading achievement. The PISA assessment is given to 15-year old students who are

nearing the end of their compulsory education. The 2009 PISA Framework (OECD,

2009) gives the definition as "Reading literacy is understanding, using, reflecting on and engaging with written texts, in order to achieve one's goals, to develop one's knowledge and potential, and to participate in society" (p.23). Data that are collected from PISA assessments could prove to be valuable in informing policymakers with regard to learning contexts and literacy achievement of adolescent learners because of: the age of students assessed and the information collected with respect to learning contexts and factors that influence reading achievement. The data collected on learning contexts and reading achievement factors are discussed in chapter three; limitations of this data set are discussed in chapter five.

Adolescent Literacy

According to Haynes (2010) historically, the United States' education system has provided adequate literacy instruction up to the third grade; it is often said that through third grade students learn to read, and from fourth grade forward they must read to learn. Ruiz-de-Velasco, Fix and Clewell (2000) describe the phenomena as follows:

> primary grades are dedicated to helping children develop English language and literacy skills, good study habits, shared understanding about academic expectations and appropriate student behavior. These primary skills make it possible for students to master academic subjects when they get to secondary school (p. 55).

An understanding of the term adolescent literacy is important in order to understand that age is an important factor in literacy acquisition and instruction. According to King-Shaver and Hunter (2009) the definition of adolescent literacy

continues to be a subject of debate for educators and researchers. From an historic perspective Thorndike's (1973-1974) definition of adolescent literacy is presented in terms of skills and age by suggesting that at about thirteen years of age (the onset of adolescence) reading is not a problem of decoding or the use of a discrete set of skills but instead a problem of reasoning. Chall's (1983) learning stages differentiate the use of these skill sets as the difference between learning to read and reading to learn, a phrase that is often associated with the change in instructional practices that occur at the fourth grade level. Moje, Overby, Tysvaer, and Morris (2008) add that the term adolescent literacy applies to the age range from about 12 years to 18 years of age, an age range that more accurately represents children who are experiencing the same social, cognitive and physical changes in addition to changes that are associated with attending secondary schools. Brozo and Simpson (2007) delineate the differences between the demands of primary and secondary schooling by recognizing that as students continue through school, they encounter increasingly difficult text coupled with more demanding content curricular expectations. These varying definitions suggest that adolescent literacy is not a unidimensional definition that includes only age range, but encompasses social aspects and skill ranges that are associated with higher level cognitive demands related to the increasingly broad set of text and other information sources that students encounter as they move through the secondary grades.

According to the U.S. Department of Education NCES (2013b), 26 percent of eighth-grade and 42 percent of twelfth-grade students read below the proficient level. This is an ominous statistic because, according to Phillips (2005), many secondary

teachers assume that all of their students arrive with the requisite skills to read and comprehend grade-level text. Reports from NAEP (U.S. Department of Education NCES, 2012b) indicate that United States' students are not making significant gains, especially at the secondary levels. Ruiz-de-Velasco, et al. (2000) also posit that for those who are entering late in the process, educators must recognize that literacy programs that are designed for elementary students, simply do not work and that there must be a set of literacy development strategies embedded in the secondary schools that serve the same function as those in elementary schools. According to Short and Fitzsimmons (2007) adololescent learners as a group differ from other learners, they have both in and out of school literacies, enjoy technology, assume some adult responsibilities and as such are more inclined to engage with text that meets their interests and self-perceptions as readers.

The increased literacy challenges presented in secondary schools exists for many students. These problems are exacerbated for students who are not native English speakers or are recent immigrants to the United States (Haynes, 2010). Much like their native English speaking counterparts, ELs progress well until the fourth grade when higher levels of comprehension and text engagement are required in order to access the curriculum which is predominantly delivered in a language in which they are not fully fluent (Olsen, 2006).

The Reading Achievement Gap

As measured by NAEP long term trend data (U.S. Department of Education NCES, 2012c) there has been a reading achievement gap between White and Hispanic

students since first measured in 1971. NAEP long term trend data (U.S. Department of Education NCES) indicate that overall, student reading achievement for United States' students has improved since 1971, but there have been no significant gains for 17-year old students. Since 1975, the first year that the gap between Hispanics and White students was measured, the gap has narrowed significantly, yet inconsistently, across age levels (U.S. Department of Education NCES, 2013a).

The NAEP framework defines differing achievement levels that include expectations of student performance that are deemed essential for student comprehension of text; these levels are denoted as *Basic, Proficient and Advanced* (see Appendix A). These achievement levels vary by cut score and performance descriptors across grade levels (U.S. Department of Education NCES, 2011a). As defined by the NAEP achievement levels, students who score *Below Basic* lack prerequisite knowledge and skills that are fundamental for proficient work at the intended grade level (U.S. Department of Education NCES, 2012b). Struggling readers are those who are one grade level or more behind in their reading proficiency, NAEP data clearly indicate that there are a greater proportion of struggling Hispanic readers than there are of White readers (U.S. Department of Education NCES, 2013a; U.S. Department of Education NCES, 2014b).

NAEP data (U.S. Department of Education NCES, 2013a) indicate that the overall trend for White and Hispanic, thirteen-year-old students has been an increase in the number of students reading at or above the proficient level with 74 percent of White and 51 percent of Hispanic students scoring at or above this level. For older students, the

trend differs, since 1999 there have been an increasing percentage of seventeen-year-old Hispanic students performing below the proficient level contrasted by a decreasing percentage of White students performing below the proficient level. For the 2012 assessment, 74 percent of seventeen-year-old Hispanic students scored below the proficient level as compared with 53 percent of seventeen-year-old White students scoring below the proficient level. For both populations as age increases, there is a corresponding decrease in the percentage of students who read at or above the proficient level (U.S. Department of Education NCES, 2012c) indicating that adolescent literacy continues to be problematic. These results are contrasted by the performance data of both nine-year old White and Hispanic students. Although there is a gap in performance between White and Hispanic nine-year olds students, for both populations, there has been a consistent increase in the percentage of students who read at or above the proficient level – again calling attention to the unique challenges of adolescent Hispanic learners as compared to younger learners.

Like NAEP, the OECD also defines achievement levels. For the PISA assessment, there are seven levels of proficiency (see Appendix A) as compared with the three levels described for the NAEP assessment. The reading proficiency levels of NAEP and PISA are not comparable in terms of equating those reading at a *Basic* level on the NAEP assessment with those at a specific achievement level on the PISA assessment. However, according to Fleischman et al. (2010) students at level three on the PISA reading literacy scale are considered to be typically successful at reading tasks of

moderate complexity while those reading at level two are considered as reading at the baseline of proficiency.

Lemke et al. (2001) report that the combined reading literacy results reported by race from the initial 2000 Program for International Student Assessment (PISA) are similar to NAEP results. Specifically, White students outperform Hispanic students by a statistically significant amount with the student group average score for White students being 525 ± 3.8 and the student group average score for Hispanic being 449 ± 4.3 (Fleischman et al., 2010). The disparity in these scores also represents differences in proficiency levels with the average scores of White students falling within proficiency level three and the average score of Hispanic students falling within proficiency level two. From the 2000 to the 2009 PISA assessment cycles, although the average group score has increased from 449 to 466, Hispanic students are still performing below that of White students - at a proficiency level two, which is considered a baseline level of proficiency (Fleischman et al.).

A comparison of the 2000 and 2009 PISA data reveal similar trends. Data from the OECD Learning Trends Report (OECD, 2010b) indicate that in 2000 and 2009 there were statistically significant differences in reading performance between Hispanic and non-Hispanic students in the United States. According to the U.S. Department of Education NCES (2013a), 25 percent of Hispanic students scored below level two on the PISA 2009 assessment as compared to 10 percent of white students and 58 percent of Hispanic students scoring below level three as compared with 30 percent of White students scoring below level three. This trend extends beyond the designation of

Hispanic students. The OECD (2010b) also reports that between 2000 and 2009 there was a statistically significant drop in the reading scores of United States' students who spoke a language other than the test language at home.

These data implicate that there are a significant number of adolescent American students who lack adequate literacy skills and that there are a significant number of Hispanic students who not only lack adequate literacy skills, but lack basic literacy skills. This is especially notable in the secondary grades for Hispanic students as evidenced by both NAEP and PISA data and the increase in the percentage of students who read below basic literacy levels and decreases in the percentage that read at or above proficiency level.

These historical data are important in establishing the relationship between effective policy with gains, or lack of gains, in literacy achievement, but they are lagging indicators. Policy makers need to identify and concentrate on data that will serve as leading indicators to help inform policy by integrating past trending with expected demographic changes in the population. Data are available from both the NAEP and PISA questionairres that, if valid, contain the type of information that may be useful to inform policy decisions related to adolescent reading. An overview of policies related to addressing ELs and adolescent reading achievement of United States' students will be presented next. The purpose of this examination is to identify what has been done historically to address the needs of the EL population and increase the reading achievement of adolescent learners and to ascertain how data from PISA could be used to

inform future policies directed at increasing the reading achievement of struggling adolescent Hispanic EL readers.

Impact of Federal Policies Related to ELs and Adolescent Readers

NCLB. ELs are protected by Title VI of the Civil Rights Act of 1964 which prohibits discrimination based on race, color, or national origin. More specifically, the 1970 U.S. Supreme Court case *Lau v. Nichols* (1974) required that states take steps to help ELs overcome language barriers to ensure their full participation in their district's educational programs. These steps include alternative educational services that are based on sound educational theory, which are adequately resourced and evaluated periodically until such a time as the student is deemed proficient enough in English to transfer to a regular program (U.S. Department of Education, Office for Civil Rights, 2005).

According to Payán and Nettles (2008) the dominant prevailing national policy for ELs is NCLB which requires states to identify ELs, measure their English proficiency and include them in tests that assess their academic skills. In addition to academic content assessment, Title III of NCLB requires that states set and meet Annual Measurable Achievement Objectives (AMAO) for English-Language proficiency. The AMAOs are used in the determining whether or not schools have met Annual Yearly Progress (AYP) and eligibility for ELs' exit into regular programs.

According to researchers such as Menken (2009) and Menken and Solorza (2014), the enactment of Title III of NCLB (20 U.S.C. § 3102), which sets English proficiency as the funding objective, terminated Title VII - the Bilingual Education Act (1994). Menken adds that the Bilingual Education Act (P.L. 103-382, 1994) was significant to

ELs, by acknowledging that language could act as a barrier to access to an equitable education and by providing support funding programs aimed at ameliorating these inequities, not native language. In addition to the focus on English language acquisition, AMAOs were also built into NCLB to ensure that ELs exit language support programs expediently (Menken).

Soĺorzano (2008) calls into question the validity of NCLB mandated tests that are administered to ELs after a single year of language instruction. Soĺorzano adds that tests given in a language in which students are not yet proficient, to measure academic progress can compromise the high-stakes decisions that educators make based on these test results. Menken (2009) further adds that it is unclear as to whether the mandated assessments are a measure of academic progress or of English language attainment. This is both a confounding and an unfortunate factor, as the scores from the tests are intended to measure academic progress and the scores are used to make high-stakes decisions which can have dire consequences on both students and schools.

The overall effect of NCLB testing mandates on ELs is dependent on many factors. Researchers such as Abedi and Dietel (2004) argue that NCLB establishes high expectations for *all* students, including ELs and seeks to eliminate achievement gaps. Other researchers such as Menken (2009) and Menken and Solorza (2014) argue that by displacing Title VII of ESEA with Title III of NCLB, that the rapid reclassification of ELs that is incentivized in the accountability provisions of NCLB (Title III, §3102), only serves to further the achievement gap. Still other researchers such as Soĺorzano (2008) argue that the tests are not valid measures of student academic progress and are therefore

unreliable measures on which to base high-stakes decisions that can negatively impact ELs, especially in instances of districts that serve a disproportionate number of ELs.

Striving Readers Comprehensive Literacy Program (SRCL). The purpose of the Striving Readers Comprehensive Literacy (SRCL) Program is to provide funding aimed at advancing literacy skills - including programs focused on adolescents, limited-English-proficient students and students with disabilities (Ayers & Miller, 2009). Beginning in 2006, roughly thirty million dollars per year for five years was allocated to funding SRCL Programs, these projects were completed and reported on in 2010 (U. S. Department of Education, Striving Readers Comprehensive Literacy Program, 2012). The 2005 SRCL Program had both a formula grant and a discretionary/competitive grant component. Five percent of the funding for the SRCL Program was reserved for national programs with the balance of the funds made available to state education agencies through a competitive grant process. Of the monies received by the states five percent could be reserved for state leadership activities, 15 percent for children from birth to age five, 40 percent for students in kindergarten through grade five and the remaining 40 percent to be reserved for middle and high school students. The funds awarded were to be used for research-based literacy practices including professional development and instruction for students who were reading below grade level (Striving Readers Program, 2005).

The 2006 SRCL Program cohorts were divided into two primary program components, school-wide interventions and intensive interventions aimed at meeting the specific needs of each student. Impact studies from the initial 2006 cohort of eight

participating districts show mixed results in terms of effectiveness (Ayers & Miller, 2009). In the Implementation and Evaluation of Targeted Interventions for Struggling Readers Report, an overview of the programs shows that in year one of implementation of the SRCL Program, high schools performed slightly better than middle schools on reading test scores measured in percentile units (Abt Associates, 2010).

Abt Associates (2010) report that results of the impact studies of the 2006 cohort of the eight participating school districts showed that few interventions demonstrated statistically significant gains in the performance measures of sixth- through twelfth-grade students. The statistically significant interventions included the Xtreme Reading Strategic Instruction Model, Learning Strategies Curriculum and Chicago Striving Readers English Language Arts Curriculum (Abt Associates, 2010); of these interventions, Xtreme Reading Strategic Instruction Model and Learning Strategies Curriculum are both variations of the Strategic Instruction Model (Deschler, Palinscar, Biancarosa, & Nair, 2007).

In a review of adolescent literacy intervention programs Shanahan (2005) examined components of some of the programs used in the 2006 SRCL cohorts. Of the programs that were variations of the Strategic Instruction Model, Xtreme Reading Strategic Instruction Model and Learning Strategies Curriculum, Shanahan reports that both of these programs relied on the use of reading strategies and supportive instruction that enabled students to access and utilize reading strategies independently. Simon et al. (2011) report that the Chicago Striving Readers English Language Arts Curriculum also

focused on supportive instruction in the use of comprehension based literacy strategies, but additionally the instruction had a culturally responsive component.

Two hundred million dollars were provided for the Striving Readers Comprehensive Literacy (SRCL) program in 2009 for FY 2010 (Striving Readers Program, 2009). According to the U.S. Department of Education the current program has a formula grant component and a discretionary/competitive grant component. States can apply for the formula grant to form literacy teams and then apply for the competitive grants to actualize the plans devised by the state literacy teams (Striving Readers Program, 2009). This differs from the previous SRCL in that state literacy teams write the state literacy plans and allocate funding for district-generated projects aimed at serving the needs of local education agencies. Currently there are six states funded under the competitive grant which include, Georgia, Louisiana, Montana, Nevada, Pennsylvania and Texas. For the FY 2016 budget, President Obama has requested $160,000,000 to fund SRCL, which is currently unfunded (U.S. Department of Education, 2015).

In the United States performance on literacy assessments has been the focus of attention for many years, more specifically, the gaps in performance achievement between different groups has drawn a great deal of attention, especially since the accountability measures associated with NCLB were enacted. According to Garcia and Kleifgen (2010) Title III (20 U.S.C. § 3102) is a discretionary/competitive grant that is aimed at ensuring that children who are LEP attain English proficiency. The focus of Title III (20 U.S.C. § 3102) is aimed at attaining English language proficiency, not on the skills that support progress within school such as literacy and mathematics. The SRCL

program, although not solely intended for adolescent learners, is the only federal program that funds literacy programs for adolescent learners with the flexibility for state literacy teams to include literacy plans that incorporate culturally relevant components.

The model of reading to learn after third grade has been challenged by researchers who now recognize that adolescents need specific literacy supports in order to navigate the increasingly difficult content material which they encounter in order to progress through the education system. The needs of adolescent readers differ from those of primary school students (Short & Fitzsimmons, 2007). Policies that support adolescent readers are currently unfunded in the federal budget leaving a gap that is unfilled by other federal programs or policies. Data on literacy outcomes from national and international data sets show declines in the performance of adolescent readers and especially adolescent EL readers, the majority of whom read *Below Basic* literacy levels. The achievement gap between ELs and other readers is not dissipating; without policy that is directed at correcting these inadequacies in literacy instruction, the gap should not be expected to close.

Implications and Potential Economic Impact

As discussed in a previous section of this chapter, one of the primary tenets of moving toward goals- and standards- based education was to ensure that the United States' education system prepared its citizenry to maintain a globally competitive economy and a productive labor force. Hanushek, Jamison, Jamison and Woessman (2008) report that the governors participating in the Charlottesville Summit predicted that the United States could expect significant gains on international test scores by setting

educational goals. According to Hanushek et al. these international scores serve as a proxy for increases in educational attainment, and that these gains would positively impact economic growth. The expectations were not met, but according to Hanushek et al., had the expected score gains been met the United States could have experienced a four and a half percent increase in the Gross Domestic Product (GDP) by the year 2015.

Using data from internationally based tests, Barro (2002) reports that the average years of educational attainment at the secondary level has a positive significant effect on the rate of subsequent economic growth and further adds that there is an indication that reading scores also have a positive effect on economic growth. Barro studied a broad panel of countries and compared the results separately. The comparative analysis revealed that there were higher convergence rates (estimated coefficient on log(GDP)) associated with rich nations included in the study. Using data from 14 OECD nations, Coulombe and Tremblay (2006) reported that international literacy test scores are more accurate measures of the productive nature of an individual in contributing to economic growth than other school data. Work of researchers such as Barro and Coulombe and Tremblay bring additional significance to the findings of Hernandez (2012) who reports that there is a strong relationship between literacy attainment and the dropout rate of Hispanics students.

In addition to studies based on statistical predictions of economic growth, data from the U. S. Bureau of Labor Statistics (BLS) (n.d.) reveal important information about educational attainment, wages and unemployment. These are all factors of economic growth and the BLS data support the findings Rumberger (2011) who posits that dropouts

are less likely to find jobs that pay living wages. According to the U. S. BLS (2013), 30 percent of employed Hispanic persons over 25 years of age do not have a high school diploma. Comparatively, nine percent of White, eight percent of Black and seven percent of Asian employed persons over the age of 25 do not have a high school diploma. This is an important factor, because according to U. S. BLS (2013), higher levels of education are associated with higher paying jobs and a lower likelihood of unemployment. The U.S. BLS (2013) reports on five major occupational categories. Of these categories, 21 percent of Hispanic workers are reported as working in the highest occupational category as compared with 38 percent of White workers, 30 percent of Black workers and 49 percent of Asian workers. In contrast, 32 percent of Hispanic workers are reported in the lowest two occupational categories as compared with 22 percent of White workers and 21 percent of Black workers.

Although Hispanic workers account for 15 percent of total employment, they are overrepresented by a substantial amount in lower paying jobs (U.S. Bureau of Labor Statistics, 2013). The wage difference between the higher level and lower level occupational categories is significant as reflected in the annual earnings of these demographic categories. The median weekly earnings for full-time employed persons by race/ethnicity is reported by BLS (2013) as $568 for Hispanic, $621 for Black, $792 for White and $920 Asian workers. Educational attainment is also a factor in median weekly earnings, with an average of 27 percent higher earnings for workers who are high school graduates as compared with those who did not complete high school. For Hispanic

workers, BLS reports 25 percent higher average weekly earnings for those who have completed high school (U. S. BLS, 2013, p. 59).

Unemployment rates also vary across race/ethnicity and educational attainment. The U.S. BLS (2013) reported that in 2012, the unemployment rate for Hispanics over the age of 20 was 10.3 percent. For Hispanic workers between the ages of 16 and 19 years of age the unemployment rate was reported as 28.1 percent. Comparably, the unemployment rate of Whites over 20 was reported as 7.2 percent and between the ages of 16-19 was reported as 22.5 percent. The unemployment rate for Hispanics with less than a high school diploma was reported by the U.S. BLS as 12.4 percent as compared with those who were high school graduates with no college as 8.3 percent (BLS, 2013, p. 8). These data serve as indicators that increases in the percentage of Hispanic high school dropouts could lead to higher unemployment for this growing demographic population.

According to researchers such as Cantrell et al. (2010), 28 percent of Hispanic students who are not reading proficiently by third grade will not graduate from high school. For those who do not graduate from high school, U.S. BLS data indicate that they will face higher rates of unemployment and receive less pay in lower level occupations. With an increasing percentage of Hispanic students attending schools in the United States and the disproportionate dropout rate of this population, the expected earnings and employment rate will contribute less to economic growth of the United States. According to Hanushek et al. (2008), a labor force that has the skills that are

related to educational attainment measures is essential to survive in a technologically driven economy and to achieve economic growth.

Statement of the Research Problem and Purpose

The largest demographic subpopulation of students enrolled in the United States is Hispanic students (Batalova & McHugh, 2010; U.S. Department of Education NCES, 2009). The achievement gap between Hispanic students and White students continues despite policy changes directed at closing the gap. Within the achievement gap, the literacy gap between White and Hispanic adolescent students is still growing (U.S. Department of Education NCES, 2013a), yet there are no national policies to address this issue. Reading achievement is associated with dropout rate, and of those who are not reading proficiently by third grade, nine percent will not graduate from high school (Hernandez, 2012). According to Hernandez, the dropout rate is disproportionately distributed, with Hispanic students experiencing a dropout rate that is three times the rate of White students (U.S. Department of Education NCES, 2013c). As reading achievement and the dropout rate are related, attention as to how to meet the needs of the growing population of Hispanic learners is warranted.

From NAEP data, information from researchers such as Hernandez (2012) and information from the Census Bureau, four issues emerge that are unique to Hispanic EL students within the United States' school population. First, reading achievement and being Hispanic affects high school completion considerably more than White students (Hernandez, 2012). Second, the reading gap between Hispanic and White students still exists and is not decreasing consistently. Third, the reading achievement gap between

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White and Hispanic students varies with age and has increased for older adolescents. Fourth, the percentage of both White and Hispanic students reading at or above a proficient level decreases inversely with age. Recognizing that the largest proportion of EL students are Hispanic, it is incumbent upon educators and policy makers to maximize the use of available resources in order to minimize the inequities that exist in both the dropout rate and achievement gap.

Amid the absence of policies that address adolescent literacy there is a need to explore learning contexts and practices that can be actualized in absence of these policies. As presented in chapter two, research exists that demonstrates the effects of learning contexts on student achievement, and the use of reading strategies on measures of reading achievement. The purpose of this study is to build understanding of how learning contexts and reading strategy use are associated with reading achievement of adolescent Hispanic EL students.

Research Questions

Research presented in chapter two of this study indicates that Hispanic and EL readers who access higher level reading strategies more frequently outperform those who do not. Research is also presented in chapter two indicating that positive learning contexts are associated reading achievement. Using student self-report questionnaire data, principal/designee reported school questionnaire data and reading assessment results from the PISA 2009 administration, this study will seek to answer the following research questions:

RQ1: How are adolescent Hispanic EL students clustered based on self-report data on frequency of use of memorization, elaboration and control strategies and the accuracy of their perceptions of the usefulness of the metacognitive strategies of understanding and remembering and summarizing?

RQ2: Are there significant differences in the reading achievement levels of adolescent Hispanic EL students based on the student clusters? If so, what differences between clusters account for these differences?

H_{01}: $\mu_1 = \mu_2 = \mu_K$; There are no differences in the reading achievement scores between student clusters.

H_a: $\mu_i \neq \mu_j$; $(i,j = 1,2\ldots K)$; There are differences in the reading achievement scores for some i and j student clusters.

RQ3: Are adolescent Hispanic EL students' perceptions of learning contexts predictive of cluster membership?

RQ4: Are the principals'/designees' perceptions of teachers' expectations of students and student-teacher relationships predictive of cluster membership?

Conceptual Framework

Despite the intent of NCLB, the achievement gap continues to exist between Hispanic students and White students; for adolescent Hispanic students, the gap is widening in reading achievement. Within NCLB there are no policies directed at improving adolescent literacy and the only policies that address the needs of Hispanic learners focus on English acquisition and accountability reporting. At the time of this

writing there have been four bills proposed for reauthorization of ESEA. The first, introduced by republican Senator Alexander, a discussion draft titled the Every Child Ready for College or Career Act of 2015 (Every Child Ready for College or Career Act of 2015, 2015), the second, proposed by republican Congressman Kline, the Student Success Act (H.R. 5, 2015), and the third, democratic Congressman Scott's substitute amendment to H.R. 5 (Substitute Amendment to H.R. 5, 2015). To date, the U.S. Senate Committee on Health Education Labor and Pensions has held three hearings on the Alexander discussion draft, the Kline and Scott bills have been introduced and debated and as of this writing, left as unfinished business. None of these bills include provisions for comprehensive literacy, however there is promise in one of the proposed amendments, the LEARN Act (H.R. 858, 2015).

The most recently introduced bill is a bipartisan effort by the Senate Health Education Labor and Pensions (HELP) Committee republican Chairman, Senator Alexander and democratic Ranking Member, Senator Murray. The draft bill titled the Every Child Achieves Act of 2015 (2015) contains provisions for adolescent literacy. The bill contains much of the language pertaining to adolescent literacy education as explicated in the LEARN Act (H.R. 858, 2015). Specifically, within the bill provisions for adolescent literacy are contained in Part D, Literacy Education for All, Results for the Nation (LEARN) §. 2401 – 2405. The bill contains much of the language pertaining to adolescent literacy education as explicated in the LEARN Act (H.R. 858). Without a reauthorization of ESEA that includes programs aimed at improving adolescent literacy achievement, there continue to be no universal programs aimed at improving adolescent

literacy or improving adolescent literacy of ELs. The SRCL program, which at the time of this writing, is still unfunded and has been serving only six states, remains the only program that provides resources specifically targeted for adolescent literacy.

It is important to note that although language contained in ESEA reauthorization bills contain language with regard to literacy education as contained in the LEARN Act (H.R. 858, 2015), concerns have been raised about the LEARN Act. In a critique of the LEARN Act Krashen (2010, January 31) raises concerns that the LEARN Act furthers the intent of initiatives such as Reading First (NCLB, 2001) that are focused on lower level reading skills. According to Richard Long, former Government Relations Director for the International Reading Association and current President of Literate Nation, there were a lot of lessons learned from Reading First and what was learned from these lessons has been incorporated into the LEARN Act verbiage to ensure that mistakes are not repeated. Specifically the language of the LEARN Act is written to provide states flexibility to allow state literacy teams to determine the best scientifically valid instruction and evidence based practices that should be employed to meet the literacy needs of the individual state (personal communication, March 16, 2015).

Krashen further posits that the use of explicit instruction in reading does not contribute to improved reading achievement, a statement that is contrary to the findings of researchers such as Olson and Land (2010) in their work with Hispanic middle school students in the Pathway Project. For example as part of the SRCL program (Striving Readers Program, 2005) research of Cantrell et al. (2010) involving adolescent struggling readers also showed that explicit strategy instruction focused on metacognitive awareness

of self-regulated strategy selection and use was associated gains in reading achievement.

According to Abt Associates (2010) SRCL Program grants that showed statistically

significant gains in reading achievement included programs focused on sustained,
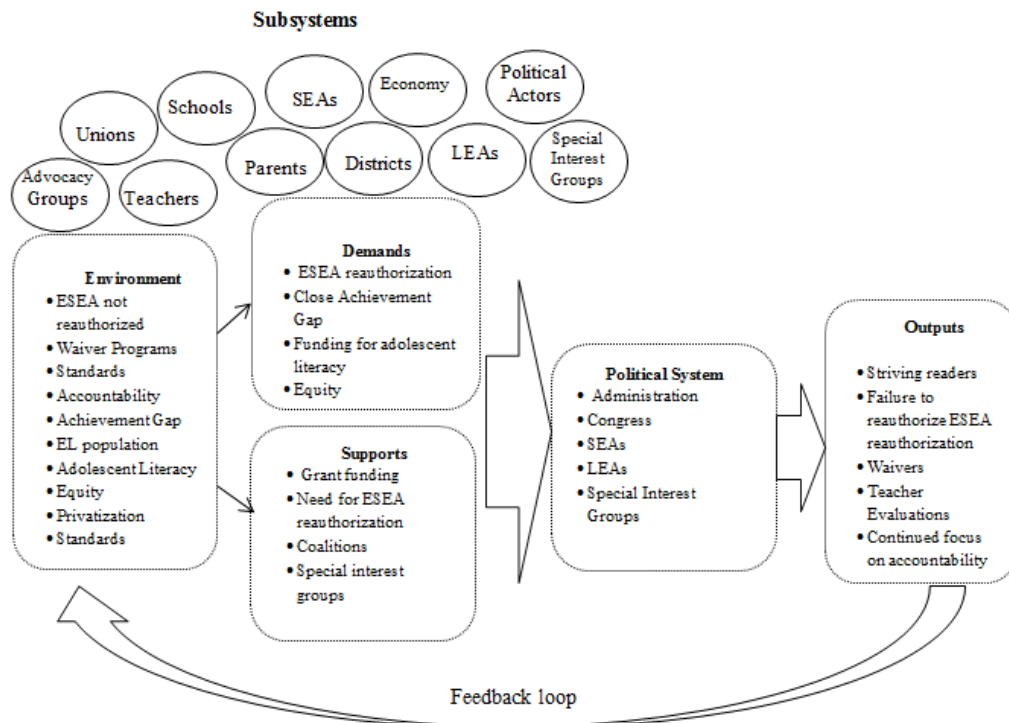
Figure 1. Systems analysis model of the political system. This figure illustrates the interactions of educational political subsystems and the political system. Adapted from Kirst, M.W. & Wirt, F.M. (2009). "The flow of influences and policy consequences in the school's political system" p. 63, in *The Political Dynamics of American Education*. Richmond, CA: McCutchan Publishing Company.

systematic strategy instruction that included higher level strategies, and importantly a

culturally relevant component. Krashen brings legitimate concerns to the policy arena

with regard to the LEARN Act; however, the assertions made are not universally consistent with findings with regard to adolescent learners.

In order to contextualize how the literacy needs of a growing subset of the United States education system's population is integrated into current, relevant demands of the United States' education policy system; Easton's Systems Analysis Framework (1965) will be used. Within the Systems Analysis Framework, Easton presents the central idea of subsystems of which our society is composed. These subsystems interact with each other to create a culture which interacts with a political system. The subsystems interact on various environmental issues. According to Easton, the political system, as the legitimate allocator of values, provides either material or symbolic resources for these subsystems of society. As all resources are never available to all subsystems at the same time, stress exists within and between subsystems creating a system of *inputs of demands* and *supports of the political system*. These demands and supports are then converted into outputs by the political system. These outputs are then reintegrated into the subsystem environment via a feedback loop. As the feedback enters into the subsystem environment, a new cycle begins (see Figure 1).

As we examine this model, we will consider only a subset of subsystems that are associated with stressors which are salient to education within the political system. Some of the subsystems include, but are not limited to: parents, teachers, state education agencies, school districts, local education agencies, advocacy groups, economic conditions, political actors, unions, and special interest groups. Some of these environmental stressors include, but are not limited to: continued failure to reauthorize

ESEA, waiver programs, accountability issues, equity, perceptions of a failing public education system, new standards, charter schools, the achievement gap, teacher evaluation, a growing EL population, and a lack of systematic adolescent literacy resources. All of these stressors create demands upon the political system which are delineated into supports and demands. The supports and demands can either act in tandem with or in opposition to each other. With respect to adolescent literacy for a specialized population, it is important to consider how these inputs and supports can work in tandem.

The subsystems are composed of various groups of political actors who overall are working to ensure that education policies meet their competing needs in an environment of dynamic tension. These needs, at times, may overlap or be at odds with other subsystems causing various subsystems to coalesce when they share similar philosophies and needs. These differing coalitions and subsystem groups act on various environmental issues creating either demands or supports of the political system. It is at this juncture that policies, such as adolescent literacy policies, aimed at improving literacy instruction of adolescent Hispanic ELs enter the political system. The various subsystems may recognize the overall need to improve literacy, but not all agree that adolescent literacy is an issue which needs to be addressed by the political system.

Subsystems interested in improving literacy of adolescents join forces and at times will seek support from sources outside of the immediate environment in an effort to ensure that their demands enter the political system with enough prominence to be acted upon favorably within the system. For example, a subsystem interested in literacy for

Hispanic adolescents may seek support from groups such as Advocates for Literacy Coalition, the International Literacy Association, the National Adolescent Literacy Coalition, Literate Nation, NCTE, The Council of Great City Schools, La Raza and other powerful advocacy groups. At the same time, subsystems in support of other types of education policies coalesce to ensure that there exists adequate support of extant policies, to ensure that the political system does not reduce resource availability or abandon beneficial policies that are in place. It is important that subsystems which share common foundational philosophies and needs do not undercut each other's efforts through the process of reallocation and/or reduction. This conceptual framework considers the interaction between the subsystems, environment and political system and how these elements must interact in order to introduce and incorporate policies aimed at improving outcomes of adolescent Hispanic ELs.

Definition of Terms

For the purpose of this study, the following terms and corresponding definitions were utilized.

Adolescent Literacy. The term adolescent literacy refers to the literacy education of students who are appropriately aged for enrollment in secondary schools, grades six through twelve.

Cognitive Reading Practices. These include active engagement and processing strategies used in the reading process and include strategies such as setting a purpose for reading, self-questioning and checking for understanding.

Control strategies. These encompass higher level reading strategies which actively involve the reader to monitor their own comprehension. Control strategies include checking for understanding, questioning, monitoring comprehension, elaborating, predicting, and summarizing.

Demographic. The term demographic is used in this study to describe characteristics of the study population.

Elaboration strategies. These are strategies which the reader uses to connect to prior knowledge and schema and integrate information with other text.

English Learners. English Learners (ELs) refers to students who are/were categorized or have been historically categorized as English as Second Language (ESL), Limited English Proficient (LEP) or English Language Learners (ELLs).

Hispanic. The term Hispanic refers to students who are of Latina/o, Central American, South American, or European Spaniard backgrounds whose families report speaking Spanish at home.

Learning Contexts. Learning contexts refers to conditions that extend beyond pedagogical practice and include teacher behaviors, student-teacher relationships, teacher expectations, and supportive instruction.

Memorization strategies. Memorization strategies are low level reading strategies that when used in isolation do not lead to deep understanding. These include strategies such as rereading text and repeating an idea over and over.

Metacognitive strategies. Metacognitive strategies include strategies that engage the reader in thinking about their own comprehension and the process of integrating a

broad range of strategies to comprehend text. These include strategies such as summarizing, inferring, self-questioning, checking for understanding and monitoring comprehension.

Student achievement. Performance as measured by large scale assessments that include NAEP, NCLB state mandated accountability assessments and PISA assessments.

Supportive Instruction. Supportive instruction includes teacher pedagogical behaviors that provide effective instruction that include explicit instruction for acquiring learning strategies and instruction that enhances comprehension. The instruction is prolonged, explicit, scaffolded and modeled and it includes opportunities for students to practice and receive timely teacher feedback.

Target population. The target population in this study includes male and female United States' students who self-reported their race/ethnicity as Hispanic and were between the ages of 15 years and three months old and 16 years and two months old at the time of the PISA 2009 administration. The target population includes students who were born in the United States and other countries and speak a language other than English at home. Within this work the term target population and study sample are used interchangeably.

Chapter Two

Review of Literature

To better understand the needs of adolescent Hispanic readers requires an analysis of

the literature that has examined a variety of factors that influence reading outcomes of

this population of students. The literature included in this review was identified through

searches of Web of Science, Education Research Complete, internet searches of websites

of professional organizations, Google Scholar, library searches, policy organizations,

U.S. Department of Education websites and databases. Terms used to search for relevant

materials included "literacy policy", "adolescent read*", "read* polic*", "adolescent EL*

learners", "EL* read* polic*", "ELL literacy policy", "marginalized read*", "high

school read*", "middle school read*", "high school literacy", "middle school literacy",

"struggling ELL read*" ,"read* strategy*, "large scale assessments read*, "Hispanic

lit*", "adolescent Hispanic read*", Hispanic read*", "ELL read*strat*", "ELL read*",

"Hispanic read* strateg*", "read* strat* use", "PISA read* strat*" "PISA read*", and

"PISA lit*".

The paucity of research for this specific population necessitates an examination of

the body of research that includes the entirety of English Learners (ELs) in addition to the

largest subpopulation of this group, Hispanic students. An analysis of the current

research for these populations can help contextualize factors that influence the reading

achievement of both the EL and Hispanic population. Much of the extant research

related to EL and Hispanic readers includes nuanced information on reading strategy use

and factors related to reading strategy use that influence reading achievement.

Conversely, there is little research which considers the impact of learning contexts on

reading achievement or the unique challenges that are associated with adolescent

Hispanic readers. In this chapter, an examination of research that contextualizes the

impact of these factors is provided moving from strategic reading to the impact of

learning contexts and supportive instruction models.

Strategic Reading

    Reading strategies. Many researchers concur that having high expectations, a

rigorous curriculum, and incorporating cultural aspects of diverse populations which

explicitly teach and scaffold reading strategies are important aspects of improving the

reading and writing achievement of adolescent ELs (Cantrell et al., 2010; Lopez, 2012;

Olson & Land, 2007). Lopez adds that higher level expectations require teachers to

support higher level instruction by helping students access and engage in the reading

process through the use of appropriate reading strategies. Researchers such as Rodriguez

(2012) report that many teachers of struggling adolescent EL students avoid explicitly

teaching and requiring students to read complex text and write analytical essays because

they feel that the skills necessary are too sophisticated for the population that they teach.

According to Olson and Land (2007) educators are doing a disservice to the adolescent

EL population when a non-challenging reading curriculum is employed that focuses on

skill instead of the application and explicit instruction of skills and strategies in conjunction with reading complex text.

In their seminal investigations of the role of metacognition in reading comprehension, Palinscar and Brown (1984) reported that given the ability to decode fluently, reading comprehension is strongly influenced by the compatibility of the readers' background knowledge, text content, and activation strategies employed by the reader to enhance understanding. According to Palinscar and Brown successful readers proceed through text automatically until a triggering event alerts them of a comprehension failure - this is when successful readers activate comprehension strategies. Triggering events include situations such as increased frequency in encountering unfamiliar concepts or when expectations about the text have not been confirmed. Good readers react to these triggers by engaging in active processing strategies; these are skills that struggling readers do not possess.

Palinscar and Brown (1984) identify the six most important active processing strategies of readers as setting a purpose for reading, activating background knowledge, focusing on the major content of text, questioning and evaluating content, monitoring comprehension through questioning, and utilizing both predictive and conclusive inferences. The authors group these six skills into four activities: summarizing, self-review, questioning, and clarifying and predicting all of which require activation of background knowledge and can act as either comprehension fostering or comprehension monitoring activities. The skills identified by Palinscar and Brown reemerge in research that is focused on adolescent ELs and Hispanic readers that is presented later in this

chapter. These are not skills that are intrinsic to struggling readers, but require students to be aware of a range of strategies, or declarative knowledge, as well as how and when to employ the reading strategies, referred to as procedural and conditional knowledge (Cantrell et al., 2010; Olson & Land, 2007).

Evidence from researchers such as Purdie and Hattie (1996) and Park (2010) inform us that patterns of strategy use can differ among different populations of students. Specifically, Purdie and Hattie found that general learning strategies can vary by student cultural background and Park found that patterns of reading strategy use can differ by language context. Examination of additional research that is focused on Hispanic and Spanish-speaking students can help to better understand how patterns of reading strategy use differ for the present study population.

Reading strategy use of Hispanic students and English learners. Researchers such as Lopez (2012) and Hughes and Kwok (2007) indicate that reading achievement is associated with student ethnicity/race. Researchers such as Padron and Waxman (1988) and Pritchard and O'Hara (2008) indicate that the use of reading strategies is associated with reading achievement. Expecting ELs to read and comprehend complex text is crucial for academic success and according to Park (2010) there is a significant positive correlation between reading strategy use and EL reading comprehension.

In order to study the associations between self-reported extent and use of cognitive strategies on gains in reading achievement, Padron and Waxman (1988) examined 82 Spanish-speaking elementary students. For this study, upper elementary students were administered pre- and post- test reading achievement measures in English.

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Using standardized tests, students were assessed in January and again in April to determine reading gains. In order to identify and assess the level of strategy use, students were administered the Reading Strategy Questionnaire (RSQ) (Padron & Waxman, 1988) after the post-test. Padron and Waxman used a stepwise multiple regression to determine which reading strategies were predictors of post-test reading achievement when controlling for pretest results.

There were seven strategies that were positively related to achievement which included summarizing, underlining important parts, questioning, self-generated questioning, recalling, questioning for understanding, note-taking and imaging; many of the strategies that were also identified by Palinscar and Brown (1984) as important strategies for comprehension. The researchers identified the most frequently cited strategies that were positively related to achievement as, questioning, recall, visualizing, and checking for word meaning. Of the most often cited strategies used, two of the strategies had significant negative effects on reading gains between the pre-and post-test; thinking about something else while reading and repeating the main idea over and over. The authors posit that these strategies impede comprehension by limiting the ability to use cognitive focus on making connections with and between elements of the text. The authors noted that were large differences in the ways that students in this study reported using strategies and indicated that higher achieving readers use more sophisticated strategies whereas lower achieving readers use less sophisticated strategies that are related to negative effects on reading achievement.

Padron and Waxman (1988) propose that for these upper elementary Spanish speaking students that inappropriate strategy use may interfere with reading comprehension and therefore contribute to lower reading achievement scores. Though an important finding, these are not generalizable to the population due to the relatively small sample size with the participants being drawn from within a single school and therefore does not consider differences in teaching/learning environments. The implication is that teachers place primary importance on teaching metacognitive strategies focusing on the specific strategies that are positively related to gains in reading achievement of upper elementary Hispanic readers.

The findings of Padron and Waxman (1988) are affirmed in later studies which involved comparative examination of EL students and reading achievement. Using an integrative, synthesis approach Fitzgerald (1995) completed an in-depth review of research in the United States examining EL cognitive reading processes. Fitzgerald found that there was overlap in the habits of successful readers and successful EL readers. Sixty seven published studies dating from 1989 to 1993 that included data-based research, conference papers, technical reports, and dissertations were reviewed using a systematic interpretive procedure. Multiple aspects of EL reading processes were examined separately within the review.

Fitzgerald (1995) reported that with regard to EL reading strategies, more proficient EL readers in the United States made use of vocabulary knowledge, used a wider variety of metacognitive strategies more frequently, took action to identify miscomprehension more often, used strategies that were meaning-oriented, used more

schema knowledge, and made more/better inferences. The author also reported that the cognitive processes of ELs and native English speakers were more alike than different with a few exceptions. According to Fitzgerald, the differences are important with EL readers using fewer metacognitive strategies, verbalizing metacognitive strategies less, selecting metacognitive strategies that differ in frequency of use from native English speakers. Additionally, ELs were found to monitor comprehension more slowly and perform reading tasks more slowly. Struggling EL readers did less acoustic scanning and focused more on text-level strategies such as checking for word meaning.

There are several limitations that need to be considered in the interpretation of these findings that involve identification of participant characteristics in the study. Because some of the studies included embedded research that predated 1989, certain operational definitions were incongruent with the definitions established by the Fitzgerald (1995) study. Some of the reviewed works did not delineate between native language and EL status and for many studies included, the extent of literacy in the participant's native language was not reported. Fitzgerald's findings that the cognitive reading strategies of EL readers is substantively similar to successful strategies used by native English language readers is important and brings to light differences both between and within populations of EL and native English language readers. In the Fitzgerald research review, the included research consisted of participants from various ethnic backgrounds but relatively few of the studies included adolescent students.

Adding to the research of Fitzgerald (1995), Jiménez, Garcia, and Pearson (1996) focused specifically on adolescent Hispanic students and compared the reading strategies

of successful sixth- and seventh-grade Hispanic readers with less successful sixth- and seventh-grade Hispanic readers and successful sixth- and seventh-grade White readers. The authors identified 14 students from two different school districts, eight of whom were successful Hispanic readers, three of whom were marginally successful Hispanic readers and three of whom were successful native English readers. General criteria for selecting the students included students' self-report of successful reading ability and the ability to think aloud while reading; for the Hispanic students, oral language proficiency in both Spanish and English and the ability to read in Spanish was required. Students' self-reported perception of reading ability was corroborated with teachers by examining reading performance data available from extant results from standardized measures.

In the qualitative study by Jiménez et al. (1996) there were two stages of data collection: group meetings and a series of three individual student sessions. During the group meetings students completed background questionnaires and measures of prior knowledge and practiced procedures that would be included in the individual sessions. The procedure for the individual sessions was the same for both Hispanic and native English students, with the exception that Hispanic students read texts in both Spanish and English and could think aloud using their preferred language. During the individual sessions, students read the provided texts using think-aloud procedures. Students were interviewed before their last think aloud to discuss their reading strategy use. The authors used a constant-comparative method to identify and code the strategies used by the students.

Jiménez et al. (1996) found that Hispanic readers used metacognitive processes in a variety of ways to comprehend text. These included monitoring comprehension, cognate use, questioning, rereading, activating prior knowledge and inferencing. Additionally, successful Hispanic readers demonstrated more motivation in working to comprehend text by actively engaging in problem-solving to make sense of text. The authors also reported that when reading in Spanish, successful Hispanic readers monitored their comprehension more frequently and reported that the strategies of questioning, rereading, evaluating, and comprehension monitoring were transferable across languages. These findings help to better understand differences in strategy use between Hispanic students and native English students and the differences between successful and unsuccessful Hispanic readers' strategy use. Although the findings from this qualitative study affirm some of the findings from Fitzgerald (1995), the small number of students included in this study precludes generalizing these results to a larger population.

Pritchard and O'Hara (2008) found that bilingual, native-Spanish speaking, eleventh grade students also used metacognitive strategies more often when reading in Spanish and that the use of strategies varied, but transferred from Spanish to English. These findings were based on a study conducted by the authors that included twenty participants who were randomly selected from a population of 100 bilingual, eleventh grade students within the United States. Students selected for the study were proficient readers in both Spanish and English as determined by district test scores and teacher judgment. Participants were given science passages to read in both Spanish and English.

To document patterns of strategy use, the researchers transcribed student responses to prompts while reading parallel Spanish and English science texts. While reading, participants stopped at predetermined points in the passages and described to the researcher what they were doing and thinking as they read. The recorded student responses were transcribed and examined to determine the cognitive operations that students underwent when reading the cued sentence.

Three phases of analysis were used: first, a qualitative analysis that resulted in four broad categories of strategy use; second, a quantitative analysis of categories of strategies was done to determine statistically significant differences in strategy use, and; third, a qualitative analysis of the processing strategies was done to understand how strategy use varied across the passage. The Friedman test was used to test for statistically consistent patterns in frequency of strategy use. Statistical significance was reported for English ($\chi^2 = 11.51$ $p = .01$), Spanish ($\chi^2 = 11.51$, $p < .001$), and differences in patterns of frequency use between English and Spanish ($\chi^2 = 12.06$, $p < .01$). Dunn's post hoc tests were run to determine where there was significance in pattern use for each of the categories.

The authors found that native language strategy use plays a more important role in second language reading than English proficiency. Whereas Purdie and Hattie (1996) found that patterns of strategy use varied across cultures, Pritchard and O'Hara (2008) examined whether or not patterns in strategy use were used to comprehend text and if the patterns varied across passages written in Spanish and English. The authors found that the readers reported four hierarchical, broad categories of strategy use including:

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monitoring comprehension, establishing intrasentential ties, establishing intersentitial ties, and establishing intertextual ties. These broad categories included many of the strategies identified in earlier works that specify effective strategies for Hispanic and EL readers, specifically taking action to solve problems, questioning, inferring, rereading, paraphrasing, summarizing, activating background knowledge and connecting to schema.

Similar to the findings of Jiménez et al. (1996) Pritchard and O'Hara (2008) found no differences in the types and range of strategies used. Instead, the authors found that students relied on the same strategies used across the passages in both the native language and English and reported differences in the frequency of strategies used, consistent with the findings of Fitzgerald (1995) and Jiménez et al. The authors also reported that more strategies were used when students read the Spanish passages than when reading English passages. Like Jiménez et al., the authors reported that when reading English passages students were more likely to use significantly fewer metacognitive strategies and relied more heavily on lower level, text-based strategies such as rereading. When reading Spanish text, the study participants were more likely to use metacognitive strategies more frequently and relied more heavily on higher level strategies that included inferring, paraphrasing, summarizing, making intertextual references and connecting to schema. The authors suggest that when students are reading in their native language they are better able to integrate information throughout the body of the text and that when reading English passages readers tend to resort to less effective text-based strategies.

Findings of researchers such as Jiménez et al. (1996), Fitzgerald (1995) and

Pritchard and O'Hara (2008) serve to inform that although readers were able to access

and utilize an array of strategies to aid comprehension of text, whether reading in their

native language or English, it was reliance on metacognitive strategies that allowed

readers to continue to construct meaning, yet these differed in range, frequency and

patterns of use between successful and unsuccessful EL readers. Importantly, Pritchard

and O'Hara report that native language strategy use played a more important role than

English proficiency in comprehending text. The authors posit that readers in this study

were more likely to integrate higher level strategies more frequently when reading in

their native language partly because of their use of comprehension monitoring strategies.

The authors' findings suggest that teaching students metacognitive strategies should be

an instructional priority for Spanish speaking students when they are reading in English.

This work also implies that it cannot be assumed that proficient readers automatically

transfer strategy use from Spanish to English. Furthermore, teachers need to employ

practices that explicitly instruct students how to transfer the use of effective reading

strategies from one language to the other.

Many of the characteristics identified in these works have been affirmed by more

recent research involving adolescent struggling readers, ELs and the subpopulation of

Hispanic ELs (Cantrell et al., 2010; Ferlazzo, 2012; Lopez, 2012; Olson & Land, 2007).

The overlap between findings of these studies indicates that strategy use is important to

Hispanic readers and that strategies transfer across language of text, but that patterns and

frequency of use differ. Specifically, less capable readers tend to utilize fewer strategies

and employ lower level strategies when reading in their second language whereas more capable readers access a greater number of metacognitive strategies, make an effort to solve problems, and connect text to relative schema. These works indicate that the strategies of activating prior knowledge, questioning, inferencing, engaging in problem-solving, summarizing, and monitoring comprehension are key strategies on which teachers of Hispanic and ELs should provide explicit supportive instruction.

Researchers such as Padron and Waxman (1988), Fitzgerald (1995), Jiménez, et al. (1996), and Pritchard and O'Hara (2008) provide evidence that there are a variety of factors which influence reading strategy use within the population of Hispanic and EL students. More specifically, there is overlap in the research findings providing evidence that the use of metacognitive strategies is positively associated with reading achievement of Hispanic and EL students. The metacognitive strategies most often cited by these researchers include strategies such as connecting to schema or activating background knowledge, and strategies such as summarizing, self-questioning, comprehension monitoring, predicting, and inferencing. Although the authors frequently cite student use of lower level strategies which include memorization and text-level strategies, the authors agree that more frequent use of metacognitive are associated with higher reading achievement.

The important contributions of Jiménez et al. (1996) and Pritchard and O'Hara (2008) have added significantly to understanding the strategies used and patterns of strategy use of adolescent Hispanic learners. Although the findings from these researchers are consistent with findings of other researchers such as Fitzgerald (1995) and

Palinscar and Brown (1984) the small sample sizes which were focused on such a specific target population should be noted when interpreting results of these studies. The Pritchard study included only proficient readers, which is not generalizable to all readers. In the Jiménez et al. study, Hispanic students came only from Central American countries, so we do not know if the findings are generalizable to a larger community of Hispanic students. The findings of Fitzgerald (1995), Jiménez et al. (1996), Pritchard and O'Hara (2008) and Padron and Waxman (1988) in identifying the range and pattern of strategies that are used by successful EL readers help strengthen the notion that strategy use varies within cultural context. However these studies are focused on a range of ages and strategy use, necessitating an examination of the relationship between student age and strategy use.

Reading strategy use and age. It is important to understand that reading is a developmental process, and that readers at different developmental stages may employ reading strategies with varying frequency, patterns, and levels of effectiveness across languages and cultures (Jiménez et al., 1996; Padron & Waxman, 1988; Pritchard & O'Hara, 2008; Purdie & Hattie, 1996). Readers move along a continuum beginning with early childhood when they first acquire word level skills and then, as suggested by Palinscar and Brown (1984), they form the ability to decode, readers begin to engage in reading processes that assist them in comprehending text. As they become increasingly adept at those skills, they are better able to expend more cognitive energy in finding deeper meaning in text which is in agreement with Padron and Waxman's (1988) assertion that attending to low level literacy tasks through the use of inappropriate

strategies can impede comprehension. Researchers such as Cantrell et al. (2010) report that as they move into early adolescence, students have higher levels of knowledge about text structure and a growing body of background knowledge, as they continue through adolescence, they become increasingly adept at monitoring their own cognitive process increasing their ability to utilize metacognitive processes.

By the end of the sixth grade, most students begin using a range of strategies to comprehend complex text (Cantrell et al., 2010). Understanding that these skills are required to become good readers, teachers should consider incorporating systematic, explicit strategies instruction to help struggling, adolescent and Hispanic EL readers. This type of instruction is needed to ensure that these students attain metacognitive control of specific reading strategies embedded within a positive learning context in order for them to be able to select appropriate cognitive strategies and apply them to construct meaning (Olson & Land, 2010; Pritchard & O'Hara, 2008).

The situation is complicated when considering the unique characteristics of adolescent learning in conjunction with EL status. According to Olson and Land (2010) very little comprehensive strategy instruction occurs in schools, especially for ELs. In addition to differences reported in the types of strategies used by varying cultures, effective selection of strategies and language in which students read (Jiménez et al., 1996; Padron & Waxman, 1988; Pritchard & O'Hara, 2008; Purdie & Hattie, 1996) there are reported differences in the response to reading strategy use and reading achievement gains between sixth- and ninth-grade students.

Cantrell et al. (2010) attribute these differences to developmental differences associated with age and suggest that in order to enhance strategy use for older adolescents strategy instruction should include aspects that help them to go beyond the text and connect to schema. In a study that was part of the Striving Readers Literacy Grant, Cantrell et al. examined the impact of the Learning Strategies Curriculum (LSC) on adolescent struggling readers. The LSC is a comprehensive set of reading strategies focused on metacognitive awareness of self-regulated strategy selection and use. Students included in the study were 302 sixth- and 353 ninth- grade who were from 12 middle schools and 11 high schools within a rural state. The students selected for the study were classified as struggling readers as measured by the Group Reading and Diagnostic Evaluation (GRADE). Approximately 90 percent of the students in the study were Caucasian and approximately 49 percent received free or reduced lunch. In order to determine if students were to be placed in the treatment or control group, the authors used a stratified, within-school iterative random sampling process.

For the LSC, the researchers hired intervention teachers for each of the schools to teach the intervention classes and to work with the teachers. In addition to the intervention teacher, 24 teachers received intervention training from a certified LSC specialist. There were six intervention strategies taught during the training: word identification, visual imagery, self-questioning, vocabulary strategy, sentence writing and paraphrasing. The strategies were taught sequentially and teachers followed the methods for instruction as outlined in instructional manuals over the course of the school year. Students' pre- and post- reading achievement scores were ascertained using a norm-

referenced standardized test of reading achievement, GRADE. In addition to the GRADE results, the Metacognitive Awareness of Reading Strategies Inventory (MARSI) (Mokhtari & Reichard, 2002) was used as a self-report measure of three broad categories of strategy use: global, problem solving and support strategies. To validate the effects of the self-report MARSI, think-alouds were constructed and used as a secondary data source. To ensure fidelity to treatment, intervention classroom observations were done and followed with teacher interviews as a secondary data source to the observations.

Cantrell et al. (2010) used hierarchical linear modeling to assess the impact of the intervention strategies and reported that sixth-grade students in the intervention group significantly outperformed those who did not receive treatment as measured by GRADE. Socioeconomic status, pretest scores and special education status were significant variables at the school-level. In contrast, there were no significant differences between treatment and control groups for the ninth-grade students, again SES and pretest scores were significant school-level effects. The intervention had a positive effect on sixth-grade students reading comprehension and reported use of problem-solving strategies. These problem-solving strategies included strategies such as visualizing, rereading, adjusting speed and trying to find the meaning of unknown words when there was a problem comprehending text.

The same was not true for ninth graders. The authors posit that these results suggest there are differing developmental needs between older and younger adolescents and add further that older adolescents need instruction that focuses on effectively integrating their knowledge, experience and context for a range of purposes. This

supports the idea that adolescent readers must be explicitly taught how to be responsive to text by monitoring their progress toward understanding within a framework of comprehension at the three levels identified by the authors: using visual information to obtain evidence from text, using background knowledge to assist in deeper understanding, and lastly constructing a situational model that helps the reader integrate information.

Importantly, the work of Cantrell et al. (2010) informs how developmental differences attributed to age can impact the effectiveness of reading strategy use. There are some limitations that need to be considered regarding the findings of this research. First, the participants of this study were predominantly Caucasian students and therefore these findings may not be generalizable to other populations. Second, although the treatment group received instruction in using the LSC, the instruction did not include explicit instruction on declarative, procedural and conditional knowledge aspects of reading strategy use. Third, the materials used in classrooms were not kept constant, and may have impacted the effective application of strategies being taught in different classrooms and grade levels. Lastly, the teachers' experience in teaching reading differed greatly between the sixth and ninth grade, with sixth grade teachers having an average of five years of experience and ninth grade teachers having an average of one year of experience which may have influenced outcomes.

According to researchers such as Olson and Land (2007), in order to construct an effective situational model, readers must first acquire three levels of knowledge of reading strategies which include (1) declarative knowledge – what the strategies are (2)

procedural knowledge – how to use the strategies, and (3) conditional knowledge – *when* and why to use specific strategies. Cantrell et al. (2010) add that these three levels of strategy knowledge are essential for effectively employing reading strategies. According to Olson and Land, metacognitive strategies, which involve the knowledge of one's own cognitive processes, include two dimensions, knowledge and regulation of cognition and that these two dimensions can be more accurately described as *what* we know about our own cognition and *how* we regulate it. The *what* includes declarative knowledge, procedural knowledge, and conditional knowledge; the *how* involves planning (Olson & Land, 2007). According to Iwai (2011) declarative and procedural knowledge and use of metacognitive strategies by EL readers involves planning, controlling, and evaluating understanding to help the reader: (a) set a purpose for reading, (b) predict, (c) summarize, (d) question, and (e) self- monitor with the strategies of questioning. Predicting, rereading, summarizing and monitoring were identified as particularly useful to Hispanic and EL readers (Fitzgerald, 1995; Jiménez et al., 1996; Padron & Waxman, 1988; Pritchard & O'Hara, 2008).

Educators who work with Hispanic ELs should consider focusing on explicit instruction in the declarative, procedural and conditional knowledge in employing strategies that are effective for Hispanic readers to help them access and apply these strategies effectively. According to Huang, Dotterweich and Bowers (2012) "Schools and teachers can no longer afford to think that ELs can learn to read once they master English" (p. 38); student success depends on a confluence of factors that support student learning. In addition to pedagogical knowledge, other factors that influence student

achievement include academic rigor and educational supports which should embrace positive student-teacher relationships, high expectations of student achievement, and supportive instruction (Jennings & Greenberg, 2009; Jussim & Harber, 2005; Wentzel, 1999).

Learning Contexts

Previous studies have examined the achievement of ELs that have focused on language acquisition models in absence of learning contexts (Gandara & Rumberger, 2009; Genessee, Lindholm-Leary, Saunders & Christian, D., 2005; Lopez, 2012; Slavin & Cheung, 2005). Teacher beliefs can also influence student academic development and achievement. These beliefs can manifest as classroom behaviors that are distinctly different from pedagogical practice and can influence, either positively or and negatively, the learning environment; when these behaviors are positive they can serve to ameliorate student obstacles to learning (Brophy, 1986; Good & Brophy, 2008; Jiménez, Smith & Teague, 2009). According to Tenenbaum and Ruck (2007) teacher beliefs encompass a range of teacher behaviors that include student-teacher relationship, expectations, academic support, and positive or negative reinforcement.

Student-teacher relationships. Teacher behaviors are a critical part of teaching effectiveness and should be considered as seriously as content knowledge and pedagogical knowledge because they can affect classroom dynamics in ways that improve or impede learning. For example, in a study of 995 predominantly Spanish-speaking third-, fourth- and fifth- grade students, Lopez (2012) examined teacher behaviors and student level characteristics as predictors of student reading achievement.

Three broad categories of teacher behaviors were examined, emotional warmth, classroom organization and instructional support. Using hierarchical linear modeling, Lopez confirmed established findings that emotional warmth and instructional support were positively correlated to positive student outcomes for elementary students at risk of failure. More specifically, Lopez found that when teachers value elementary students' social and cultural knowledge, their students have increased levels of achievement.

According to Lopez (2012), teacher behaviors that include promoting autonomy and responsibility, providing instructional opportunities that support higher level thinking, and applying learning to real-life applications create learning contexts that can help Hispanic students perform as well, or better than non-minority students. Researchers such as Ferlazzo (2012) have been urging educators to take a different view of ELs by viewing the assets they bring to school, rather than viewing them as having deficits. Teachers who help students access the assets they bring to school can help them improve reading and higher-order thinking skills. Ferlazzo identifies five steps in what he terms the organizing cycle to help tap into EL's intrinsic motivation; at the top of the list is building strong student-teacher relationships.

It is well established that the quality of student-teacher relationships affects academic outcomes (Hamre & Pianta, 2001; Hughes, Cavell & Wilson, 2001). Ferlazzo (2012) adds that teachers who pursue positive relationships with students tend to value students' background knowledge and use this information to help students connect their life experiences to reading. Minority students and low SES students are among those who are most affected by quality of relationship with teachers, and the quality of these

relationships can be predictive of reading skills based on minority status (Hamre & Pianta, 2001; Silver, Measele, Armstrong & Essex, 2005).

Hughes and Kwok (2007) studied first grade students with low literacy skills using latent variable structural equation modeling to examine the predictive value of ethnicity and gender in measures of student-teacher relationship and teacher parent relationships. The diverse group of 443 student participants included in the Hughes and Kwok study was comprised of 39 percent Hispanic, 36 percent Caucasian, and 25 percent African-American students. The researchers examined how student-teacher relationships and teacher parent relationships acted as mediators between classroom engagement and background characteristics. According to the researchers, there was a direct effect of reading achievement related to supportive relationships with students and teachers as well as a direct effect of reading achievement related to supportive relationships with parents and teachers. They also reported differences associated with ethnicity, with ethnic students being less likely to experience supportive student-teacher relationships. Although most measures used in this study were standardized instruments, reliance on author-developed questionnaires, modified standardized measures, and the use of portions of standardized measures are limitations that must be considered when interpreting results from this study. This study does not include students from any other grade level, and therefore is not generalizable to other age populations.

In a later work, Hughes, Wu, Kwok, Villarreal, and Johnson (2012) examined a cohort of 690 elementary students of varying abilities to study the correlation between student-teacher relationships and student motivation, and student-teacher relationships

and reading and math achievement. Many of the participants of this study also participated in the Hughes and Kwok (2007) study described previously and therefore the racial/ethnic composition was similar consisting of 38 percent Hispanic, 34.3 percent Caucasian, 23 percent African-American, and 4.7 percent other. The researchers found that children's perceptions of their teacher relationships were strongly predictive of reading achievement across all ethnicities. Of the two dimensions of student-teacher relationship studied, teacher conflict was a better predictor of engagement than the other relationship constructs examined. The authors found that there is a stronger effect for negative versus positive relationship aspects on both engagement and achievement. The research reviewed does not include grade levels outside of the elementary grades and therefore is not generalizable to secondary level students. However, from the studies reviewed in this section, it is evident that student-teacher relationships can affect student achievement of ELs in the elementary grades. In addition to student-teacher relationships, other teacher behaviors, including teacher expectations and supportive instruction will be examined in the following sections.

Teacher expectations. According to Tenenbaum and Ruck (2007) within the range of teacher beliefs that impact student achievement, teacher expectancy effects - a communicative process in which teacher beliefs translate into behaviors - can also influence student achievement. Researchers such as Tenenbaum and Ruck and Gandara and Rumberger (2009) agree that inequitable educational opportunities endure when EL instructional needs do not include the contextual nature of learning to promote EL achievement. On the other hand, ELs are most successful when teachers have high

expectations and offer a challenging curriculum. In researching barriers to Hispanic academic achievement, Becerra (2012) found that 27.8 percent of survey respondents reported that *lower teacher expectations* was a major perceived barrier that hindered academic achievement of Hispanic students. Lopez (2011) and others posit that although higher expectations can have positive effects on academic outcomes, not all teacher behaviors are generalizable to Hispanic students and teachers' expectations of students vary across ethnic minorities (Rosenthal & Jacobson, 1968; Tenenbaum & Ruck, 2007). Lack of academic rigor and expectations in EL classrooms have been characterized by teacher statements such as "They just can't do it" and "These kids will never go to college" (Rodriguez, 2012, p. 29).

To better understand how teachers' expectations, beliefs, interpersonal interactions and academic referrals differ across ethnic minorities, Tenenbaum and Ruck (2007) conducted multiple meta-analyses building on prior works that included studies dating back to the 1960s. More specifically, the meta-analyses examined differences between ethnic minority and European American students with respect to teachers' expectations, differences in teachers' referral rates and teachers' positive and neutral speech patterns. Studies conducted in the United States ranging from 1969 to 2003 that included both experimental and non-experimental design were included in the meta-analyses. For all of the meta-analyses performed a positive Cohen's d (1988) of computed effect size was related to more positive behaviors being directed toward European American students.

Findings from the 39 studies included in the first analysis indicated that teacher expectations are lowest for Hispanic students (d = .46) as compared with African American students (d = .25), and the other populations studied. Additionally, expectancy effects decrease as grade level increases, with the greatest differences occurring in elementary school (d = .28) and the greatest disparity occurring between high school (d = .26) and university level (d = .12). Additionally teacher expectations vary with geographic location of the study with the greatest differences occurring in the South (d = .39). In contrast, studies conducted in the West indicate that teachers held higher expectations of ethnic minority children over European American students (d = -.14)

The second analysis, which included a total of 15 studies, indicated that elementary, ethnic minority children received negative referrals more frequently (d = .46) as compared with high school students (d = .00) and that referral rates to gifted programs were found to favor European American students as compared to ethnic minorities (d = .92). With a small, but significant effect size of d = .21, the third analysis, which included 11 studies, revealed that teachers directed more positive and neutral speech toward European American students than minority students.

Collectively, the findings from Tenenbaum and Ruck's (2007) meta-analyses indicate that teachers continue to hold higher expectations of European American students over ethnic minority children with the greatest disparity between expectations of European American and Hispanic students. Positive behaviors, such as referrals to gifted programs and positive speech, tend to be directed toward European American students more than ethnic minority children. Teacher behaviors that reflect lower expectations,

more negative referrals and less positive referrals for ethnic minority students are not insignificant as they can have a direct impact on student achievement. That these negative teacher behaviors are occurring more frequently in elementary school is also of concern as it may impact student attitudes toward schooling when considering the research of Hughes et al. (2012) who report the stronger effect of negative versus positive interactions on both engagement and achievement.

These results of the Tenenbaum and Ruck (2007) study of teacher expectancy effects are important, but with the majority of the studies included in these analyses, teacher rater instruments were not standardized measures, but instead author created. Additionally, studies were duplicated for use within some of the analyses potentially biasing these findings toward the authors' hypotheses. Although important to examine study publication date as a moderator, reliance on early studies, may include research that included uncharacteristic design and analyses (Park, 2010). Additionally, the categorization of students at the elementary, high school, and university level does not allow for detailed analyses that can aid in understanding how teacher expectations vary with age and differing developmental stages.

In examining learning contexts, researchers such as Becerra (2012), Lopez (2012) and Hughes and Kwok (2007) help to build understanding of the ways in which incongruent cultural backgrounds can influence teacher behaviors. This incongruence is associated with less positive student-teacher relationships and a lack of understanding the funds of knowledge that students of diverse backgrounds bring to the school environment. In addition to student-teacher relationships, teacher expectations can affect

student outcomes (Gandara & Rumberger, 2009; Olson & Land, 2007) and these also differ across cultures with the lowest teacher expectations associated with Hispanic students. Huang et al. (2012) are explicit in their assertion that learning contexts matter and can affect student engagement and student achievement. In addition to student-teacher relationship and teacher expectations supportive instruction is another facet of teacher behavior that can influence student academic development and achievement (Jennings & Greenberg, 2009; Jussim & Harber, 2005; Wentzel, 1999).

Supportive instruction. Cantrell et al. (2010) suggest that the ability to learn and apply declarative and procedural knowledge precedes the ability to apply conditional knowledge which results in the effective use of reading strategies. They add that knowledge alone does not ensure effective strategy use to improve reading achievement. For this to happen, teachers must use supportive instructional practices in order to transfer knowledge of cognitive strategies and the responsibility of comprehension to students. In a quasi-experimental design study, Olson and Land (2007) studied how these challenges are unique to ELs by studying a predominantly Hispanic adolescent population in the Pathway Project. The Pathway Project was an eight year, intensive professional development program designed to reinforce reading and writing connections for ELs.

Members of the California Writing Project partnered with a large, low SES, urban California school district with a population comprised of approximately ninety percent Hispanic students to conduct the study, referred to as the Pathway Project. From 1996 to 2004, 94 teachers and approximately 2000, sixth through twelfth grade students per year

participated in the project. The students were from nine middle schools and four high

schools. The focus of the study was to determine the effectiveness of providing EL

students with supportive instruction which included explicit, prolonged instruction on

declarative, procedural and conditional knowledge of cognitive strategies that included

practice, scaffolding and modeling. Both qualitative and quantitative data were collected

for analysis which included: pre- and post- tests, student metacognitive logs, teacher

reflections, standardized test scores, GPA, and English placement rates at a local

community college.

During the course of the study teachers modeled think-alouds, invited student

discussions and held group brainstorm sessions to help students identify appropriate

reading strategies to aid in understanding complex academic text and to illustrate when to

apply declarative, procedural and conditional knowledge of strategy use. Once students

had become familiar with a number of strategies and their purpose, metacognitive

reflection was used to enhance their conditional knowledge of strategy use. Explicit,

scaffolded instruction was used to illustrate the metacognitive monitoring process during

reading. According to Olson and Land (2007) the emphasis on the goal of effective

strategy use versus declarative knowledge of the strategy was the critical component of

scaffolding.

As compared to the control groups, the average effect size for gains in pre- to

post- test scores over the course of the study ranged from $\Delta = .34$ to $\Delta = .64$ (Glass,

McGaw & Smith, 1981) or a 32 percent greater success gain than those in the control

group. The average post-test scores of those in the intervention group were 6.7 as

compared with 5.51 for the control group. The number of students scoring above the fortieth percentile, the cut-off level that triggers intervention, on the standardized measures of SAT-9 Reading and SAT-9 Total Language also favored the Pathways students. Forty six percent of the intervention group scored above the fortieth percentile on the SAT-9 Reading assessment and 62 percent scored above the fortieth percentile on the SAT-9 Language assessment as compared with the control group with 27 percent scoring above the fortieth percentile on the SAT-9 Reading assessment and 45 percent scoring above the fortieth percentile on the SAT-9 Language assessment.

For the qualitative measures, over 700 student logs were analyzed. From the analysis, three themes emerged: first, students recognized and appreciated the exposure to a rigorous curriculum and high expectations; second, students recognized that by developing and using appropriate cognitive strategies their ability to read and write analytically had improved; and third, students reported an improvement in motivation and confidence in reading and writing about complex academic text. Twenty teachers' reflection logs were also analyzed and were in agreement with the themes generated from the analysis of the student logs. According to Olson and Land (2007) supportive instruction aids adolescents as they progress along the continuum of the developmental reading process and helps them to focus more cognitive energy on comprehending text by utilizing a range of reading strategies. This important work helps to contextualize the importance of supportive instruction on the declarative, procedural and conditional knowledge of strategies for Hispanic adolescents to help them improve reading achievement.

Although the participants were identified as predominantly Hispanic, the data were not disaggregated on the basis of demographic information, so it is hard to determine if these methods of instruction are comparatively more beneficial for adolescent Hispanic learners, or if they differ across populations. The methodology for selecting the qualitative metacognitive journals for review was not discussed, and lacked rationale for the number of journals selected for review and did not include a description of the methodology of the review. Additionally there was no information given to indicate how these metacognitive reflections changed over time, therefore we cannot assess at which grade level students found these instructional methods to be most beneficial, which we recognize as important based on the work of Cantrell et al. (2010) with regard to how effectiveness of strategy instruction varies with age.

Culturally responsive supportive instruction. In addition to examining student-teacher relationships and teacher expectations, consideration of how these translate to supportive learning environments that can positively impact reading achievement of Hispanic students, and particularly adolescent Hispanic learners, is needed. According to the National Research Council (NRC) (2011) attributes of effective instruction that are of particular benefit to ELs include explicit instruction for acquiring learning strategies and instruction that enhances comprehension. The role of teachers in helping students comprehend text involves not only good teacher-student relationships, high expectations but also supportive instruction that includes culturally responsive instruction.

Jiménez et al. (2009) recommend the use of transnational literacies as a means of incorporating culturally relevant instruction in high school classrooms. Transnational

literacies, as defined by Jiménez et al., are "Written language practices of people who are involved in activities that span national boundaries" (p.17). The authors add that by incorporating transnational literacies into the classroom four goals can be accomplished. First, it builds better student-teacher relationships by helping teachers better understand the cultural backgrounds from which their students come. Second, it helps students connect and engage in authentic learning opportunities with each other by building background knowledge of diverse cultures. Third, it allows students to build on their own prior knowledge as opposed to always being tasked with building new background knowledge. Fourth, adolescent ELs become more engaged with their learning. Incorporating culturally relevant instruction can help teachers connect to and engage learners, but researchers concur that the effective use of reading strategies is a common characteristic of successful adolescent readers and as such, supportive instruction should be included in strategic reading instruction that incorporates culturally relevant information.

Teachers should make students aware of strategic reading behaviors and provide supportive instruction on how and when to access those behaviors. The work of Cantrell et al. (2010) indicates that struggling adolescent readers need explicit strategy instruction that includes scaffolding and modeling in order to facilitate the transference of responsibility from teacher to student. According to Brown and Broemmel (2011) scaffolding in reading is an integral part of supportive reading instruction and essential to the success of EL students' reading comprehension, but it is not consistently included in classroom instruction.

In order to be successful in scaffolding EL students, teachers must first recognize and value the competencies which ELs have acquired in their native language and their experiences (Jiménez, et al., 2009). Brown and Broemmel (2011) explain that deep scaffolding involves raising the comprehensibility of text by removing language barriers and engaging students by activating relevant cultural background knowledge to connect to texts that may otherwise have little or no cultural value to ELs, much as Jiménez et al. (2009) use transnational literacies. The value of this type of supportive instruction can affirm that teachers value the voice of culturally diverse students. Brown and Broemmel reframe the idea of before, during and after in traditional scaffolding models to priming, navigating, and amplifying to emphasize the importance and functionality of the three traditional phases of scaffolding. Each of the phases has a specific purpose: priming is intended to help ELs activate culturally relevant prior knowledge; navigating is intended to help ELs identify and apply reading strategies, and; amplifying is intended to help students make connections to the text.

Limitations of Research and Implications for Future Research

The increasing number of adolescent Hispanic and EL struggling readers adds to the numerous challenges which educators face. Current reading policies are focused primarily on early elementary literacy instruction with limited resources allocated to adolescent literacy programs, especially those which target Hispanic ELs. The purpose of this study is to explore factors associated with the reading strategy use of Hispanic EL readers and how these factors are related to achievement and learning contexts in order to better understand factors that may contribute to the gap in achievement. Although over

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the past four decades there has been considerable research focusing on reading

comprehension and reading strategy use, little of this research has examined the unique

needs of adolescent readers, and even less focused on struggling adolescent EL and

Hispanic readers.

In this review and analysis of the literature, reading strategy use was examined

from the perspective of identifying reading strategies and how reading strategy use varies

across and within ethnicity/race and age as well as how supportive instruction can be

used to transfer strategy use to Hispanic students. The review illuminates how

metacognitive strategies are associated with higher reading achievement and that the

frequency and patterns of use vary across age and ethnic background. According to

OECD (2009) "Metacognition in reading refers to the awareness of and ability to use a

variety of appropriate strategies when processing texts in a goal oriented manner" (p. 72);

this means that students who are metacognitively engaged in reading self-regulate their

reading behaviors and take an active role in the reading process. Readers must both be

aware of appropriate cognitive strategies and apply these reading strategies to aid in

comprehension.

The role of learning contexts has not been examined in conjunction with reading

strategy usage among the adolescent Hispanic EL struggling reader population. In this

review, the research indicates that learning contexts that include cultural awareness,

positive teacher behaviors (which include student-teacher relationships and rigorous

expectations) and supportive instruction are related to positive student learning outcomes

and reading achievement. The research examining learning contexts was focused on both

EL and Hispanic students, the majority of which included elementary students or a range of participants in which adolescents were not disaggregated, making it difficult to assess the effect of learning contexts on adolescent students.

This chapter also presents evidence that supportive instructional practices focused on transferring declarative, procedural and conditional knowledge of metacognitive reading strategies to adolescent Hispanic readers is associated with improved reading achievement. As with learning contexts, the limitations associated with the studies that were reviewed for reading strategy use, serve to inform where additional research is needed. As discussed earlier, there is a paucity of research in the area of reading strategy use and adolescent Hispanic EL students. Studies examined for this review were varied in methodology, and included a range of culture and age. Of the studies reviewed, the small sample sizes, low number of Hispanic participants, lack of adolescents included or lack of disaggregated data does not allow for generalizability of the findings to larger populations indicating a need for focused research in this area.

Research that is associated with teacher behaviors indicates that it is important for teachers to value and try to understand the cultural background of students within a culturally responsive supportive instruction model. Additionally the student-teacher relationship and teacher expectations vary across cultures and languages and are related to reading achievement in EL populations. This variance may influence usage of reading strategies that are associated with these differences in reading achievement. This confluence of factors may offer insight into identifying attributes of effective programs

that are specifically aimed at improving reading outcomes for adolescent Hispanic

readers.

Chapter Three

Research Methodology

In this chapter the rationale for the study is outlined, the research questions are

presented and the methodology that was used to answer the questions is described. This

study involves secondary analysis of extant data, and as such, the data collection

instruments and procedures for the primary data source are briefly described followed by

a detailed description of the primary study participants and data treatment as it pertains to

the extant data set. Following this description, the present study participants, variables to

be accessed, and data analysis procedures are explicated.

Rationale

There is an abundance of data that indicate that adolescent reading achievement in

the United States has not been improving since the introduction of measures designed to

assess educational progress (U.S. Department of Education NCES, 1983; U.S.

Department of Education NCES, 2011a; U.S. Department of Education NCES, 2012a).

Furthermore, the achievement gap between Hispanic and White adolescent students in

reading has increased rather than decreased (U.S. Department of Education NCES,

2013a). Historically, reading instruction has focused on students through the third grade,

but there is evidence that reading instruction designed specifically for adolescent learners

is needed. There have been many studies to support that strategy use, and more notably,

the use of cognitive strategies, can improve the reading achievement of adolescent students, and also research that indicates the use of these same strategies can improve the reading achievement of adolescent Hispanic students (Olson & Land, 2007). The PISA 2009 administration focused on reading and specifically collected data related to the use of reading strategies used by adolescent learners.

The literature presented in chapter two, suggests that in addition to the use of cognitive strategies, there is evidence that supportive learning contexts, which include student-teacher relationship, teacher expectations and supportive instruction behaviors, can also have a positive impact on reading achievement (Lopez, 2012). The research also proposes that there is an association between specific learning contexts and elementary students, but not of adolescent learners or adolescent Hispanic ELs. Likewise, the research offers that strategy use varies across cultures and that teacher behaviors can also vary according to student cultural background (Huang et al., 2012; Hughes & Kwok 2007, Tenenbaum & Ruck, 2007). Therefore, based on the literature reviewed, the purpose of this study is to examine the association of learning contexts, reading achievement and reading strategy use of adolescent Hispanic ELs in United States' schools.

Research Questions

Research presented in chapter two highlights how reading strategy use is an important factor in reading achievement and patterns of reading strategy use can differ across age and cultural background (Cantrell et al., 2010; Fitzgerald, 1995; Jiménez et al., 1996; Padron & Waxman, 1988; Park, 2010). In addition to reading strategy use,

learning contexts also play a role in reading achievement (Becerra, 2012; Brown & Breommel, 2011; Cantrell et al., 2010; Lopez, 2012; Olson & Land, 2007; Tenenbaum & Ruck, 2007). The research findings and analysis presented in the previous chapter indicate that Hispanic ELs differ from students of other cultural backgrounds in their experiences with learning contexts, the use of reading strategies and response to supportive instruction. Understanding that these differences play a role in student reading outcomes gives credence to studying the study population in order to better understand how students who are adolescent, Hispanic ELs perceive learning contexts and their use of reading strategies.

Learning contexts include student-teacher relationships, teacher expectations, and supportive instruction; according to Tenenbaum and Ruck (2007) these characteristics can be described as teacher behaviors. The findings and analysis of research presented in chapter two suggest that teacher behaviors differ across student cultures, with ethnically diverse students being less likely to experience positive student-teacher relationships (Lopez, 2012; Hughes & Kwok, 2007; Hughes et al., 2011) and teachers holding lower expectations for Hispanic students as compared with students from other cultural backgrounds (Tenenbaum & Ruck, 2007). With regard to supportive instruction, the research suggests that adolescent Hispanic students benefit from supportive reading strategy instruction and, as with positive student-teacher relationships and high teacher expectations, these factors are positively associated with reading achievement (Olson & Land, 2007).

Additional research analyzed in chapter two proposes that native culture, native language and age are associated with patterns and frequency of reading strategy use (Cantrell et al., 2010; Park, 2010; Purdie & Hattie, 1996) and these are also associated with reading achievement (Fitzgerald, 1995; Jiménez et al., 1996; Padron & Waxman, 1988). Hispanic and EL readers who access higher level reading strategies more frequently outperform those who do not (Fitzgerald, 1995; Jiménez et al., 1996; Padron & Waxman, 1988). These higher level reading strategies are often referred to as metacognitive strategies. Palinscar and Brown (1984) and other researchers (Fitzgerald, 1995; Padron & Waxman, 1988; Pritchard & O'Hara, 2008) identify higher level reading strategies such as setting a purpose for reading, monitoring comprehension, elaborating, questioning, predicting, and summarizing as types of metacognitive strategies. These metacognitive strategies can be further subdivided into more specific types of reading strategies that have to do with understanding and remembering and summarizing. Lower level strategies associated with less successful readers include strategies such as memorization, rereading, underlining and recitation (Purdie & Hattie, 1996) and text-level strategies.

Using student self-report questionnaire data, principal/designee reported school questionnaire data and reading assessment results from the PISA 2009 administration, this study sought to answer the following research questions:

RQ1: How are adolescent Hispanic EL students clustered based on self-report data on frequency of use of memorization, elaboration and control strategies and the

accuracy of their perceptions of the usefulness of the metacognitive strategies of understanding and remembering and summarizing?

RQ2: Are there significant differences in the reading achievement levels of adolescent Hispanic EL students based on the student clusters? If so, what differences between clusters account for these differences?

H_{01}: $\mu_1 = \mu_2 = \mu_K$; There are no differences in the reading achievement scores between student clusters.

H_a: $\mu_i \neq \mu_j$; $(i,j = 1,2...K)$; There are differences in the reading achievement scores of for some i and j student clusters.

RQ3: Are adolescent Hispanic EL students' perceptions of learning contexts predictive of cluster membership?

RQ4: Are the principals'/designees' perceptions of teachers' expectations of students and student-teacher relationships predictive of cluster membership?

In order to answer these questions, a subset of the PISA 2009 data set was accessed. The rationale for using PISA data in this study is discussed in the Measures of Adolescent Literacy section of chapter one.

Primary Data Source

This study is a secondary analysis of PISA 2009 data. The databases for this study were downloaded from the OECD website. The data used were extracted from the entirety of the PISA 2009 database which is maintained by the Australian Council for Educational Research (ACER) (OECD, 2012). In order to familiarize the reader with the

primary data source, a brief overview of the school level testing process, the 2009 PISA participants and the data source instruments used by OECD for data collection is given. Following this overview, descriptions of how study participants were accessed from the database, the variables accessed for this study, and treatment of the data associated with the variables accessed are discussed in detail.

Overview of the testing process. Data for the 2009 PISA data set were obtained from a sampling of schools from across the United States. Not all students within the sample schools took the PISA assessment. In the first stages of the PISA sampling, districts and schools were identified by region and were sent letters by an official at the National Center for Education Statistics (NCES) asking them to support the international testing effort. For schools who agreed to participate, a PISA school coordinator was assigned to work with the school (U.S. Department of Education NCES, 2011b).

Approximately six weeks prior to the assessment, PISA school coordinators worked with individual schools and nominated test dates within a specified testing window. Once the test date had been determined, two weeks prior to the assessment, teachers, students and parents were notified of the assessment via letters, brochures and other promotional materials (OECD, 2008). The notification materials included a consent letter which gave parents the opportunity to opt their children out of the assessment. If parents allowed their children to participate, no action was required, for parents who did not want their children to test; the signed letter had to be returned to the PISA school coordinator (U.S. Department of Education NCES, 2011b).

On the test day, students identified by PISA to be included in the student sample were notified of their participation in the assessment. Selected students reported to a predetermined testing area where the tests and student questionnaires were administered. Prior to testing, trained test administrators spent approximately ten to fifteen minutes distributing the test materials and reading the general directions (OECD, 2008). The trained test administrators oversaw the test administration. Of the distributed test materials, students were given one of thirteen different versions of the 2009 test booklet. The number and types of questions to be answered varied according to the booklet; all test booklets were designed to be completed within a two hour testing window. Of the questions to be answered, 51 percent of the questions were multiple choice and 49 percent were constructed response questions (U.S. Department of Education NCES, 2011b).

The total time allotted for the assessment and student questionnaire was three hours and fifteen minutes. The assessment was given in two one-hour blocks with a five minute break in between the two blocks. Once the tests were completed, students were given a 15 minute break. After the break, students were reconvened and given approximately 35 minutes to complete the student questionnaire which contained 46 multiple choice questions. After approximately 35 minutes, the session was brought to a close and the test materials were collected (OECD, 2008). All materials were accounted for and sent to the data processing center (U.S. Department of Education NCES, 2011b).

PISA participants. PISA used a two-stage stratified design to select students for participation in the PISA assessment sample; the first stage included the sample of

schools and the second stage included the sample of students. Participants considered as PISA eligible included students who had completed at least six years of formal schooling and were between the ages of 15 years and three months and 16 years and two months of age at the time of the assessment administration. Students included in the sample attended either full- or part- time public, private or foreign schools or vocational programs within the United States (U.S. Department of Education NCES, 2011b).

PISA school sample. In an effort to include all PISA eligible students, the school sample frame was developed using data from the 2005-2006 NCES Public Schools – Common Core of Data (CCD) and the 2005 - 2006 data from the Private School Survey (PSS) (U.S. Department of Education NCES, 2011b). There were 67,309 schools eligible in the United States' school sample frame; this included schools with grade seven or higher which operated within the fifty United States and the District of Columbia. A total of 1,251 schools were excluded from the sample. Schools excluded from the sample included homebound schools, correspondence schools, schools in hospitals and special education schools for students with physical limitations and detention centers. Schools were stratified by Census region (Northeast, South, Midwest and West) and school type (public or private). Schools were sorted within each stratum by grade range, locality, zip code, minority percentage and enrollment. A total of 167 schools were selected for the sample.

PISA student sample. From the 167 sample schools, 56,221 students within the United States were identified as PISA eligible (U.S. Department of Education NCES, 2011b). A sample of 6,677 students was extracted from this subsample. Of these 6,677

students selected, there were a total of 6,065 students who were coded as students to be assessed (U.S. Department of Education NCES, 2011b). Of the 6,065 students to be assessed, a total of 5,233 students within the United States were assessed for the PISA 2009 administration; the difference in the numbers between the students to be assessed and those actually assessed was attributed to absence and parent refusal to allow testing.

Instrument design. Beginning in 2000, the PISA assessment has been given every three years with one subject (mathematics, reading or science) becoming the primary focus of study in each cycle. To date, two PISA iterations with a focus on literacy have been administered, in 2000 and 2009 (OECD, 2009). When the subject is the primary focus area, in addition to the assessment, questionnaires are also given to collect data from students and school leaders to ascertain information about student learning, student characteristics and school characteristics germane to the focus area. For the 2009 assessment, literacy was the area of focus consequently the student questionnaires were focused on gathering data pertaining to literacy.

Test instrument. Test materials for the United States' administration of PISA 2009 included 13 versions of test booklets, a student questionnaire, a school questionnaire, a test administrator's manual, a school coordinator's manual, and three coding guides, one for each of the content areas assessed (OECD, 2012). The PISA 2009 reading assessment items consisted of both multiple choice and constructed response questions. For the 2009 PISA assessment, reading performance was reported as a combined literacy scale with scores ranging from 0 to 1,000 with a mean of 500 and a standard deviation of 100 (OECD, 2009). There were seven proficiency levels with

student proficiency levels reported to indicate the percentage of students who scored within a given range of defined knowledge and skills of increasing complexity (see Appendix A).

    Questionnaires. According to OECD (2009) questionnaire information was collected to address relevant policy concerns with regard to effective learning contexts in reading and classroom characteristics that were incorporated into the learning environment. The PISA questionnaires were designed to gain information that could aid in understanding how the educational practices at the classroom level were linked with student achievement (OECD, 2009). There were two questionnaires which were administered with the United States' PISA assessment; a student questionnaire and a school questionnaire (see Appendix B).

    Student questionnaire. Students were given approximately 35 minutes to complete the student questionnaire after completion of the assessment (U.S. Department of Education NCES, 2011b). .Within the questionnaire, students were asked to provide background information on their educational career, family context and resources, individual engagement in reading, instructional time, classroom and school climate, access and use of libraries and strategies in reading and understanding text, attitudes toward learning and engagement and motivation (OECD, 2009). One of the features of particular interest for the 2009 study was the student questionnaire information that was collected regarding learning contexts.

    In the questionnaire, the learning context information was referred to as classroom context and included information about the teacher, curriculum and instructional

strategies (OECD, 2009). Salient dimensions of the questionnaire with regard to classroom context included teacher attitudes toward students and instructional approaches. Of these instructional approaches, the questionnaire sought to gather information on metacognition and how teachers directed students to utilize metacognitive strategies to broaden their approaches to learning. According to OECD (2009) in addition to experience, subject and pedagogical knowledge, teachers' attitudes toward students, and setting high expectations are also important contributors to student success. The specific measures and coding of each variable accessed from the student questionnaire are presented in a later section of this chapter.

School questionnaire. The school questionnaire was answered within the test administration window by the principal or other designated school leader (U.S. Department of Education NCES, n.d.). The school questionnaires were designed to take approximately 35 minutes to complete and gathered information on four broad areas, the entirety of the educational system, school level information, instructional settings and information at the individual student level. The principal or designee provided information on the structure and organization of the school, student and teacher characteristics, school resources, school curriculum and assessment, school climate, school policies and practices, and characteristics of the principal or designee completing the questionnaire. Salient dimensions of this questionnaire included questions related to learning contexts, specifically, student-teacher relationship and teacher expectations. Questions posed in the questionnaires were generally in a Likert scale format in which respondents either agreed or disagreed with a statement, or reported on frequency of

occurrence. The specific measures and coding of each variable accessed from the school questionnaire are presented in a later section of this chapter.

Study Participants

As this study is a secondary analysis of extant data, I will describe the subset of participants to be accessed for this study. In this section I will describe the parameters for the selection of study participants which includes the study school sample and the study student sample. Additionally, I will describe the school and student population to assist the reader in better understanding the profile of the participants in this study.

Participants in this study were limited to students enrolled in United States schools who were administered the PISA 2009 student questionnaire and self-identified as Hispanic and speaking a language other than the language of the test at home. The participants were accessed from the entirety of the 2009 PISA data set of approximately 470,000 students who completed the assessment (OECD, 2010c). Students from the United States were extracted from the PISA data set. For this study, of the 5,233 students within the United States assessed by the 2009 PISA administration, 1,204 self-identified as Hispanic ($n = 1{,}204$) of the 1,204 students who self-identified as Hispanic, there were a total of 491 ($n = 491$) who reported that they speak a language other than English at home. As defined under NCLB (20 U.S.C. Title 9(A) § 9101 (25)), these students can be categorized as English learners or ELs. Other participant variables were obtained from principal responses to the school questionnaire which was administered to 167 school principals or their designees. Of the schools completing the questionnaire there were a total of 90 schools containing the sample study population of Hispanic ELs ($n = 90$).

After completing a missing value analysis of the cases that contain the study sample

population, adjustments were made resulting in the number of cases included in the study

analyses. A detailed description of the missing value analysis and case adjustments are

discussed in a later section of this chapter. The adjusted case numbers to be considered

in this study include a total of 455 Hispanic ELs (n = 455) and 89 schools containing the

study sample population (n = 89).

Study school sample. For this study, the school study sample was extracted from

the PISA 2009 data set. A total of 167 schools and 5,233 student records comprise the

entirety of the United States' data set. Of the 167 schools from the PISA 2009 data set,

90 schools contained the study sample population. A description of how these data were

extracted is described in a later section of this chapter. As explained previously,

adjustments to the cases due to missing data reduced the number of schools to be

considered within this study to 89. Within the 89 identified schools, the number of

students participating in the PISA assessment ranged from 14 to 42. There was an

average of five students per school within the 89 schools self-reporting as being both

Hispanic and speaking a language other than English in the home. The number of

students within each of the schools ranged from 1 to 27 students or from 2.5 percent to 75

percent of the tested population within the 89 sample schools.

The schools included in this study had varying percentages of EL student

populations. This is important to recognize as Fry (2008) posits higher concentrations of

ELs within a school are associated with lower achievment scores. The school

questionnaire asks principals/designees to categorize the percentage of students within

their school whose first language was a language other than the language of the test. Within the 89 schools identified in the study sample, the highest percentage of principals/designee's (48.9 percent) reported that between 0 and 10 percent of their school population's first language was not the language of the test, this was followed by 17 percent reporting that between 10 up to 20 percent of students' first language was a langague other than the language of the test. Other principals/designee's reported percentages of students speaking a language other than the test for the ranges of 20 up to 40 percent, 40 up to 60 percent and greater than 60 percent as 10.2 percent, 9.1 percent and 8 percent respectively. The lowest percentage (6.8 percent) of principals/designees reported that their schools did not contain students whose first language differed from the test and the greatest percentage of principals/designees reported that between 0 up to 10 percent of students' first language was a language other than the test. Using the school level questionnaire data regarding percentage ELs within the schools was accessed to allow for analysis to determine if this factor had any discriminatory influence on how students clustered with respect to the use of reading strategies.

Study student sample. Using the Statistical Package for Social Sciences (SPSS) software version 22.0 (Chicago, Il.), I extracted United States' students by the country code and filtered the data for cases which did not meet the criteria for the sample population as described previously. A description of how these data were extracted is described in a later section of this chapter. Of the 5,233 students within the United States participating in the 2009 PISA administration which were included in this study, a total of 455 ($n = 455$) did not contain missing data and met the criteria for the study sample

population of self-identifying as Hispanic and as speaking a language other than English at home.

Characteristics of the student population. The majority of students in the sample population were male (51.1 percent). According to OECD (2010a) there are statistically significant differences in the reading performance of United States' students on measures of reading achievement that are attributable to gender with girls outperforming boys on the 2009 PISA assessment by an average of 25 points. Additionally, OECD (2010a) reports that there are major differences between boys and girls in their knowledge of reading strategies with girls having greater knowledge of reading strategies. This information was accessed as it is useful in the analysis of the characteristics of cluster membership and factors which discriminate between the clusters.

Immigrant status among the sample population varied between three status categories. The three categories of immigrant status within the PISA data set include (1) native students, students with at least one parent born in the United States, (2) second-generation students, students born in the United States but their parent/parents were born in another country, and (3) first-generation students, students who were born outside of the United States and with parents who were also born outside of the United States (OECD, 2012). For the study sample population, 11.5 percent of students have a native immigrant status, 31.3 percent have a first-generation immigrant status and 57.2 percent of students have a second-generation immigrant status. This compares with the full United States PISA participant sample which contained 78.8 percent native, 12.6 percent second-generation, and 6.2 percent first generation immigrant status.

According to Schnepf (2004) United States students with an immigrant status are ten percent more likely to score at or below the PISA reading proficiency level two than native students. Schnepf also reports that students who self-report that one or both of their parents were born abroad on average score 15 percent lower on PISA than students whose parents were born in the country of the test. In addition to parents' country of birth, Schnepf reports that the time that immigrants live in the home country is also associated with achievement and that second generation students fare much better than those who were not born in the country of the test. Understanding that immigrant status and time spend in the United States can influence reading achievement; these data were accessed to better understand how these factors provided discriminatory influence associated with cluster membership.

Students who are PISA eligible are between the ages of 15 years and three months and 16 years and two months of age – the age at which students would be expected to be in their second year of high school. The average age of students in the study sample was $15.79 \pm .30$ years of age. In the study sample students reported having spent an average of $2.14 \pm .86$ years at their current school, commensurate with the expectation that in a traditional high school model, they have been in the same school for two years. The relevance of this number relates to student mobility as researchers such as Audette and Algozzine (2000) and Scherrer (2013) report that student mobility is negatively associated with overall student achievement and more specifically, reading achievement. This suggests that students who reported being in their school less than two years may have transferred high schools. It is important to note that this number only *suggests* this

notion and as such the information will be used only to guide exploratory analysis of cluster membership as it does not account for students who have repeated a grade, who attended non-traditional high schools and other anomalies.

Variables

Although the assessment items are the same for all countries, the United States' data contain both international variables as well as United States specific variables. This section identifies each of the variables accessed from the United States' data set for this study. There are two types of variables that are derived from the questionnaires, simple indices and scale indices (U.S. Department of Education NCES, 2011b). Simple indices are transformations or recoding of items. Scale indices variables are constructed through scaling of multiple items. Reliability and validity of the questionnaire data were obtained from full-scale field trials which included a representative sample of participants from all participating countries (OECD, 2012, p. 52). The student questionnaire variables are described first, followed by the school questionnaire variables, and lastly the assessment variables are described. Each variable is identified as either simple indices or scale indices and where applicable, reliabilities are reported.

Student questionnaire variables. The purpose of the student questionnaire is to collect information about students' demographic characteristics, classroom experiences, educational support, instructional practices and information on student reading engagement and strategy use (American Institutes for Research, 2013). More specifically, the questionnaire collects information about learning contexts and gathers information on variables that contribute to understanding of reading achievement with a

focus on reading engagement and metacognition. There are thirteen variables that were accessed from the student questionnaire for this study; these included race/ethnicity, home language, sex, immigrant status, country of birth age, reading strategy use variables, classroom climate variables and reading strategy usefulness variables. The scale variables for summarizing, understanding and remembering, control, elaboration and memorization, strategeis were compiled by OECD. These variables have been standardized for this study with the standardized variables preceded by the letter Z within the data set. Table 1 summarizes variable source (student questionnaire, school questionnaire, or assessment), variable type (simple or scale), variable descriptor and valid values within the study data set.

Demographic variables. There are six variables accessed to better understand the demographic characteristics that make up the study sample (see Table 1). These include race/ethnicity, home language, sex, immigrant status, country of birth age, and perecentage of students speak a language other than test. The first demographic variable, Race/Ethnicity is a simple indices variable collected from question five of the student questionnaire. In the United States' questionnaire, question five asks about the students' ethnic background, specifically if the student is Hispanic or Latino. This variable was used solely to extract participants from the full data set and is central to the answering all of the research questions as it identifies student data that are associated with race/ethnicity being reported as Hispanic. The variable is a nominal measurement with a numeric value of one assigned to students who report being Hispanic or Latino and a value of two assigned to students who report as not being Hispanic or Latino. There were

a total of 1,204 students within the United States who reported as being Hispanic or Latino.

The second demographic variable accessed was home language; as with race/ethnicity, this variable was used only to extract the sample from the full data set. Home langage is a nominal, numeric value with values being reported as either one or two. A value of one is assigned to students who report that the langage at home is the same as the language of the test (English) and a value of two is assigned to students who report the language at home as being other than the language of the test. The importance of this variable is to identify which students in the data set can be categorized as ELs in accordance with the definition of ELs in NCLB (20 U.S.C. Title 9(A) § 9101 (25)). A total of 4,466 students indicated that English was the language at home with 669 students responding that the language at home was a language other than English.

The third demographic variable accessed was sex. Sex is a nominal, numeric value with values being reported as either one or two. A value of one is assigned to students who report that they are female and a value of two is assigned to students who report the that they are male. Within the United States' sample, 48.7 percent of students were female as compared with 48.9 percent of the sample study population. A total of 51.3 percent of the United States' study sample population reported as being male and 51.1 percent of the target population reported as being male.

The fourth demographic variable that accessed was immigrant status. This numeric, ordinal value is derived from question 21 of the United States' student

Table 1

Variable Source, Coding, Descriptors and Values

Source	Coding	Description	Values
Student questionnaire			
Race/ethnicity	ST05A01	Student reported race/ethnicity	1= Hispanic 2= Not Hispanic
Home language	ST19Q01	Language spoken in home	1= English 2= Other language
Sex	ST04Q01	Gender	1= Female 2= Male
Country of birth age	ST18Q01	Age student entered US	0 to 16
Years at current school	ST02A01	Years student attended test school	1-8
School identification number	SCHOOLID	OECD assigned school identifier	1 to 164
Immigrant status	IMMIG	Differentiates student's and parent's birth nation	1= Native 2 = Second generation 3 = First generation
Summarizing	METASUM	Accuracy of usefulness of summarizing strategies	-1.62 to 1.56
Understanding and remembering	UNDREM	Accuracy of usefulnees of understanding and remembering strategies	-1.58 to 1.73
Control strategies	CSTRAT	Frequency of use of control strategies	-2.90 to 2.40
Elaboration strategies	ELAB	Frequency of use of elaboration strategies	-2.21 to 2.80
Memorization strategies	MEMOR	Frequency of use of memorization strategies	-2.70 to 2.52
Stimulation of reading engagement	STIMREAD	Teachers' stimulation of reading engagement	-3.28 to 2.40

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Source	Coding	Description	Values
Structuring and scaffolding strategies	STRSTRAT	Teachers' use of structuring and scaffolding strategies	-3.72 to 2.30
Student-teacher relationship	STUDREL	Quality of relationship with teacher	-3.27 to 2.30
School questionnaire			
Student-teacher relationship/ expectations	TRELEXP	Principal/designees perception of student teacher relationship and expectations	-1.70 to 1.67
Language other than test	SC08Q01	Perecentage of students speaking language other than test	1 to 6
Assessment			
Reading achievement score	PVREAD3	Third plausible value of reading achievment	204.56 to 741.44

questionnaire which asks the student to designate whether their mother and/or father were born in the United States or in another country. The simple indices variables for the counrty of birth are coded for the counrtry of birth for the student, mother and father respectively. A value of one is assigned to students who have a native status, a value of two is assigned to second generation students and a value of three is assigned to firstgeneration students. As compared with the United States' PISA population, within the study sample population there are fewer students with a native immigrant status, and more students with both a second and first generation immigrant status with the highest percentage of students reporting a second generation immigrant status. These are students who were born in the United States, but their parents were born in another country.

The fifth demographic variable accessed was country of birth age. This variable is a numeric, scale value. Students were asked to respond to the question "If you were not born in the United States, how old were you when you arrived in the United States?" Students were instructed to fill in the blank "_____ *years*" and instructed to write zero if they were less than 12 months of age when they arrived in the United States or skip to the next question if they were born in the United States.

Reading strategy variables. There are three primary reading strategy variables in PISA related to students' use of self-regulated learning strategies, these are memorization, elaboration and control strategies. According to OECD (2010a) memorization strategies are strategies that are used to memorize details of text or content such as repeated reading; elaboration strategies are strategies that are used to transfer new information to the student's existing background knowledge and schema, and; control strategies are those which aid the student in formulating questions about the purpose of text, task and content, and help the student self-supervise his/her own reading activities. These variables are used to measure the frequency of use of the strategies not how the strategies are perceived as being useful.

Questions 31a through 31m on the United States' student questionnaire were used by OECD to construct three scale indices variables. The questions are categorized according to three reading strategies: memorization, elaboration and control. According to OECD (2010c) this series of questions seeks to find how students learn by using reading strategies. This series of questions are ordinal, numeric values that range from one to four with values of seven to nine assigned to missing values. The stem question

for question 31 reads "When you are studying, how often do you do the following?" (OECD, 2010a, p. 270). Students are instructed to select one of four choices on a Likert-type scale that best describes the frequency with which they use the particular strategy described in each of the items 31a - 31m. The choices and coded values are: almost never, coded as one; sometimes, coded as two; often, coded as three, and; almost always, coded as four. Higher values are associated with higher importance given to the strategy as being useful (OECD, 2010a).

The three indices used to report the relative importance of strategies which OECD derived from question 31 reflect the frequency with which students reported using the strategy. These latent constructs were derived using item response theory (IRT) and include memorization, elaboration and control strategies. The significance of these variables is to identify the frequency of use of the different strategies as reported by Hispanic ELs. These data exist in the data set as continuous variables which have been standardized with a mean of zero and a standard deviation of one. Reliabilities for the PISA population for the indices were reported by OECD (2012) and Händel, Artelt, and Weinert (2013); reliabilities were calculated for the United States' and study sample population. When examining the reliabilities of all of the indices, the study sample population's reliability was equivalent to or above the reliabilities for either the entirety of the PISA population or the United States' population and never below either of the populations' reliability measures (see Table 2).

The index of memorization was derived from four items within question 31 of the student questionnaire. The statements which pertain to the index of memorization

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include four statements about memorization of text, rereading and reciting (OECD, 2010c). For example, item 31e reads "When I study, I read the text so many times that I can recite it." The values for the memorization indices are derived from the frequency with which students report using these strategies with higher values associated with greater frequency of use reported for the strategy. For the questions associated with memorization, there were a total of 0.4 percent missing values for the study sample (see Table 2). For the scale indices of memorization, the study sample reliability, although equivalent to the total PISA population (α = .76), is below the United States' population (α = .82) reliability measure (see Table 2).

The index of elaboration was derived from four statements from question 31 of the student questionnaire. As with the memorization index, the value for the elaboration index is derived from the frequency with which students reported strategies as useful, with the higher values associated with strategies that are most useful or important. Statements that were presented regarding elaboration indices included statements about relating information to background information, personal experiences and schema. For example, item 31j reads "When I study I try to understand the information better by relating it to my own experiences." For statements associated with elaboration, there was a total of 0.6 percent missing values for the study sample (see Table 2). Reliability for the elaboration index for the target population was α = .82 (see Table 2).The index of control strategies was derived from five items from the student questionnaire. Higher values in the control strategies index are associated with more

Table 2

Reliabilities and Percentage of Missing Values of PISA Questionnaire Items for United States and Target Population

Questionnaire item	PISA[a] (N = 470,000)		U.S.[b] (n = 2,533)		Study sample [b] (n = 455)	
	α	Missing values[c]	α	Missing values	α	Missing values
Reading strategy indices						
Memorization	.76	-	.82	.7	.76	.4
Elaboration	.81	-	.86	.9	.82	.6
Control strategies	.75	-	.86	.7	.84	.6
Classroom and climate indices						
Student-teacher relationship	.87	-	.92	1.1	.94	1.4
Stimulation of reading engagement	.87	-	.94	1.9	.94	1.6
Structuring and scaffolding strategies	.89	-	.96	2.5	.96	2.2
Metacognition indices						
Understanding and remembering	.84	-	.82	4.5	.83	3.7
Summarizing	.84	-	.86	4.9	.87	3.7
School variables						
Student-teacher relationship and expectations	- [d]	-	- [d]	-[d]	.84	0

[a] OECD (2012) and Händel, Artelt, and Weinert (2013). [b] These values were calculated using SPSS. [c] These values are reported by individual OECD country not for the entirety of the PISA data set. [d] This variable was calculated for use exclusively for the study population suing school questionnaire data.

frequent use of the strategies as reported by the student. Questions pertaining to the control strategy indices include statements about higher level reading strategies such as checking for understanding, self-questioning and connecting to other text. For example, item 31f states "When I study I try to figure out which concepts I still haven't really understood." For the questions associated with control strategies, there were a total of 0.6 percent missing values for the study sample (see Table 2). Reliability for the control strategies index for the study sample was α = .84 (see Table 2).

Metacognitive strategy variables. Metacognitive strategies are strategies that enhance the understanding, analysis and control of cognitive processes (OECD, 2010a). Metacognitive strategies are broadly categorized by OECD (2010a) as elaboration, summarization, control, and memorization strategies with each of the categories including discrete strategies. For example, discrete strategies associated with (a) elaboration strategies include tasks that are intended to connect text to the reader's schema and integrating the information with other parts of the text, (b) summarization strategies involve the identification and of primary themes, important information, and content detail, (c) control strategies involve the processes of self-questioning, comprehension monitoring and addressing difficulties in dealing with text (OECD, 2010a; p. 47).

Within the PISA 2009 framework, there are two metacognition indices which are intended to assess the degree to which students are aware of the strategies they employ while reading. The two metacognition indices assessed are summarizing (METASUM) and understanding and remembering (UNDREM); these metacognitive indices differ

from the reading strategy variables. The indices are used to measure the perceived effectiveness of the metacognitive processes of summarizing and understanding and remembering. As the reading strategies measure frequency of use, the metacognitive indices measure the accuracy of perceived usefulness of these strategies which embody "the extent to which students can store information, integrate it into a prior knowledge base and elaborate on it so that it can be applied to novel situations" (OECD, 2010a, p.79).

Two scaled indices were derived from questions 45 and 46 of the student questionnaire to report the accuracy of students' perceptions of the usefulness of the strategies of understanding and remembering and summarizing. To derive these values, within the student questionnaire, students were presented with two separate reading tasks, one for understanding and remembering and the other for summarizing. For understanding and remembering, the task and question was: "You have to understand and remember the information in a text. How do you rate the usefulness of the following strategies for understanding and remembering the text?" An example understanding and remembering strategy for this index was item 45b, "I quickly read through the text twice." For the index of summarizing the task and question was: "You have just read a long and rather difficult two-page text about fluctuations in the water level of a lake in Africa. You have to write a summary. How do you rate the usefulness of the following strategies for writing a summary of this two-page text?" An example of a summarizing text for this index was item 46c "I try to copy out accurately as many sentences as possible."

For each index, after reading the task an question, students rated the usefulness of the listed strategies between one and six on a Likert-type scale. On the scale, a score of one indicated that the strategy was *not useful at all* and a score of six indicated that the strategy was *very useful*. Both of these indices were scored using a rater-scoring system. The preferred ordering of the strategies was agreed upon by reading experts and national centers according to their effectiveness (OECD, 2009). Students were assigned a score that was based on student ordering as a proportion of the expert pairwise relations, and then the scores were standardized across OECD nations. These data exist in the data set as continuous variables which have been standardized with a mean of zero and a standard deviation of one. Higher values on both of these indices indicate better accuracy of the students' perception of the usefulness of the strategy. For both variables understanding and remembering and summarizing there were a total of 3.7 percent missing values within the study sample with a reliability for these indices of $\alpha = .83$ and $\alpha = .87$, respectively (see Table 2).

Classroom and school climate variables. Classroom and school climate variables are scale indices variables that are collected from questions 38, 41 and 42 in the United States' student questionnaire in order to collect information on classroom and school climate (U.S. Department of Education NCES, 2011b). There are three indices of classroom and school climate. These include teachers' stimulation of students' reading engagement, use of structuring and scaffolding strategies, and student-teacher relationship.

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The variable for teachers' stimulation of students' reading engagement is intended to measure the extent to which teachers interact with students in order to engage them in both reading and discussing text. The variable for the use of structuring and scaffolding strategies is designed to measure the extent to which teachers convey expectations, provide explicit instruction, assist in in helping students make connections and provide feedback to students. The variable for student-teacher relationship measures the extent to which teachers listen to students, are interested in students' well-being, and respond to student needs. These data exist in the data set as continuous variables which have been standardized with a mean of zero and a standard deviation of one. Values for these indices were derived from student responses to a question stem using a Likert-type scale.

The teacher stimulation of student reading engagement scale contained seven items from the student questionnaire; the seven items included statements related to the extent to which teachers interact with students in order to engage them in reading and discussing text. The stem question asks how often students report their teachers employing instruction that supports the engagement of reading and are then given seven statements. For example, item 41b says "The teacher asks questions that challenge students to get a better understanding of a text." Student responses and coded values are as follow: *never or hardly ever*, coded as one; *in some classes*, coded as two; *in most classes*, coded as three, and; *in all classes*, coded as four. Higher values indicate higher teachers' stimulation of students' reading engagement. For the questions associated with stimulation of reading engagement, there were a total of 1.6 percent missing values for the target population with a reliability of $\alpha = .94$ (see Table 2).

The use of structuring and scaffolding strategies variables are also scaled indices the scale included nine items related to the extent to which teachers convey expectations, provide explicit instruction, assist in in helping students make connections and provide feedback to students. Students are asked to respond to the question stem "In your English classes, how often does the following occur?" and are then presented with nine instructional practices that would indicate supportive or scaffolded instruction. For example item 42e states "The teacher asks whether every student has understood how to complete the reading assignment." Students are to respond to each of the statements and select a response. Student responses and coded values are as follow: *never or hardly ever*, coded as one; *in some classes*, coded as two; *in most classes*, coded as three, and; *in all classes*, coded as four. Higher values indicate higher teachers' stimulation of students' reading engagement. For the questions associated with the use of structuring and scaffolding strategies, there were a total of 2.2 percent missing values for the target population and a reliability of $\alpha = .94$ (see Table 2).

The index of student-teacher relations is derived from five statements intended to gage the level of student agreement related to the extent to which teachers listen to students, are interested in students' well-being, and respond to student needs. Students are asked to respond to the stem question "How much do you disagree or agree with each of the following statements about teachers at your school?" Students are given five statements and asked to select one response that best pertains to their relationship with their teacher. For example, item 38b states "Most of my teachers are interested in my well-being." The responses and coded values are: *strongly disagree*, coded as one;

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disagree, coded as two; *agree*, coded as three, and; *strongly agree*, coded as four.

Positive student teacher relationships are indicated by higher values on the indices. For the questions associated with student-teacher relationship there were a total of 1.4 percent missing values for the target population with a reliability of $\alpha = .96$ (see Table 2).

School questionnaire variables. The school questionnaire is administered to school principals or their designees. The purpose of the questionnaire is to gather school level information on the structure and organization of the school, school resources, student and teacher body, school curriculum, instruction and assessment, school climate, school policies and practices and principal characteristics (OECD, 2009). Within the school questionnaire, principals or their designees are asked to answer questions about their perceptions of teacher behaviors as well as school demographic characteristics including the percentage of students who speak a language other than the test within their school population.

In order to address RQ4, five items from the scaled indices of teacher behavior from the school questionnaire data set were accessed. These data were accessed to create the variable student-teacher relationship/expectations which is intended to measure the perception of student-teacher relationship and teacher expectations. It is important to note that teachers were not directly asked the questions that were used to create this variable and as such these data provide a proxy for teacher behaviors that actually occur in the classroom. The variables of interest which were used to derive student-teacher relationship/expectations variable include school questionnaire items that relate to teachers' expectations of students, student-teacher relationship, teachers meeting

students' needs, students' respect for teachers, and students being encouraged to achieve their full potential.

More specifically, the index for these items was derived from question 17 from the school questionnaire where principals or their designees were asked to respond to the question "To what extent is the learning of student hindered by the following phenomena?" Principals rated the degree to which these teacher behaviors occurred. An example of the phenomena posed was "Students not being encouraged to achieve their full potential." Principals selected one response on a Likert-type scale for each of the behaviors described. Responses and coded values for the responses were as follows: *not at all*, coded as one; *very little*, coded as two; *to some extent*, coded as three, and; *a lot,* coded as four. The items used to derive the scaled values were reverse coded for this index; therefore, higher values are associated with more positive teacher behaviors.

These five items are of particular interest because they specifically address teacher expectations of students and student-teacher relationship. A Pearson's *r* was used to test for a statistically significant correlation between these items. After examination of the correlation matrix, an exploratory factor analysis was performed to explore whether these questionnaire items could be used to create a scale for the variable student-teacher relationship/expectations.

Regarding the school characteristics pertaining to the percentage of students who speak a language other than English in the school, principals/designees were asked to respond to the question "About how many students in the tenth grade in your school have a first language that is not English?" Principals/designees were instructed to select

responses that described a range of students within the school whose first language was not English. The ranges and codings for these responses were as follows: *between 0 and 10 percent of students*, coded as five; *between 10 up to 20 percent of students*, coded as four; *between 20 up to 40 percent,* coded as three;between 4*0 up to 60* percent, coded as two, and, *greater than 60* percent coded as one.

Assessment variables. As discussed earlier in this chapter, each student was given a student booklet that contained test items in multiple domains with an emphasis on literacy assessment items. There were five item formats, standard multiple-choice, complex multiple-choice, closed-constructed response, short response items and open-constructed response. A total of 131 cognitive items were available for the literacy assessment, and each student received a booklet containing a sampling of the literacy assessment items. Overall reliability of the reading scales are reported as Cronbach's α = .92 for the United States (OECD, 2012) and α = .92 for the study sample.

Because every student is not administered every assessment item, student proficiencies are not observed values. Because each item has missing student responses it is impossible to estimate scores for individual students, to accommodate this, PISA used imputation methodology described in a later section of this chapter. The individual student scores are aggregated to produce scores for groups of students; these scores are called *plausible values*. For each student a set of five *plausible values* was generated in the literacy domain, these scores are intended to represent the distribution of similar students based on both assessment items and background questionnaire item responses. The United States' population reliabilities for generated plausible values for the reading

scale are reported as α = .92 (OECD, 2012). The plausible value score that will be accessed in this study is the third plausible value.

Data Procedures

There are three sources of data, student questionnaire data, school questionnaire data, and assessment data. This section contains information on the procedures that were used to prepare the data for analysis. This section contains a description of how the data were parsed to include only data that met the criterion for selection, how the data were prepared for analysis and how missing values were addressed.

Parsed data. As the study sample population in this study is United States' Hispanic EL students, cases that did not meet these three criteria were deleted from the data set. First, SPSS was used to sort the data by country code. All cases that did not contain the country code 840 for the United States were deleted, leaving 5,233 cases that met the condition of United States' students. Next, SPSS was used to sort cases for students who self-identified both as being Hispanic and speaking a language other than the language of the test at home. There were 1,204 students who self-identified as Hispanic ($n = 1,204$) of the 1,204 students who self-identified as Hispanic, there were a total of 491 ($n = 491$) who also reported that they speak a language other than English at home. Cases which did not meet both conditions were deleted from the data set. Schools which did not contain the target population were identified and parsed from the data set by filtering the data for students who did not self-identify both as Hispanic and as speaking a language other than English in the home. Of the cases that remained, there were a total of 90 ($n = 90$) schools containing cases that met these conditions. As

explained previously, these numbers were adjusted to account for missing values to $n = 455$ for the student sample and $n = 89$ for the school sample. The analysis of the missing values is discussed in a later section of this chapter.

Data preparation and cleaning. Variables in the data set were standardized and examined for the presence of outliers. Both student and school questionnaire variables accessed from the data set were standardized with a mean of zero and a standard deviation of one. Likewise, the reading achievement variables are standardized with a mean of 500 and a standard deviation of 100. For the reading achievement variable, Z scores were calculated for analysis of univariate outliers.

As will be described later in this section, the cases containing missing values were omitted using listwise deletion. All variables for the remaining cases were analyzed for both univariate and multivariate outliers. Individual variables were examined to detect the presence of univariate outliers. The standardized scores were sorted in ascending order to identify cases which contained Z scores > 3.29 (Tabachnick & Fidell, 2007). There were no Z scores which exceeded this value for any of the variables (see Table 3).

To detect the presence of multivariate outliers, variables were grouped according to the method of analysis, specifically the five variables that were accessed for cluster analysis were grouped for outlier analysis and the three student questionnaire variables used for multinomial logistic regression were grouped for analysis of outliers. Probabilities associated with the Mahalobonis D^2 and Cook's D were calculated using SPSS. Cases were identified as multivariate outliers if the probability was < .001. There

was one case, case 429, associated with the school questionnaire data with a *p* value of

<.001. As suggested by Dimitrov (2009), Cook's distance should be used to

Table 3

Analysis of Univariate Outliers

Variable by Source	n	Z-scores	
		Minimum	Maximum
Student Questionnaire			
Summarizing	455	-1.62	1.56
Understanding and remembering	455	-1.58	1.73
Use of control strategies	455	-2.91	2.40
Use of elaboration strategies	455	-2.21	2.80
Use of memorization strategies	455	-2.70	2.52
Use of stimulation of reading engagement	455	-3.28	2.40
Use of structuring and scaffolding strategies	455	-3.73	2.30
Teacher student relationship	455	-3.26	2.3
Valid n (listwise)	455		
School Questionnaire			
Student-teacher relationship/expectations	89	-1.7	-1.67
Valid n	89		
Assessment			
Reading achievement score		-3.08	3.09
Valid n	455		

examine the influence of this case, and that a Cook's *D* > 1.0 indicates an influential data

point. The Cook's *D* for this case is .01, well below the threshold value of 1.00

suggested by Dimitrov (2009) and as such, the case was retained for analysis.

Plausible values. The reading achievement scores for the participants in the study are not observed values and according to OECD (2012):

> As with all item response scaling models, student proficiencies (or measures) are not observed; they are missing data that must be inferred from the observed item responses. There are several possible alternative approaches for making this inference. PISA uses the imputation methodology usually referred to as plausible values (PVs). PVs are a selection of likely proficiencies for students that attained each score. (p. 140).

The use of plausible values produces a data set for student achievement that does not contain missing values as these fields are populated with the imputed plausible values.

Analysis of plausible values. The student achievement variables are imputed values that are reported as a set of five plausible values for each student. Recall that plausible values are not test scores, but instead random draws from the latent distribution of similar students and, as such, require special analysis of the scores. According to OECD (2012) because scores contain random error variance components, analysis involving achievement results should be run five times, one for each plausible value and then the scores must be averaged and significance tests adjusting for variation between the five sets of results must be computed (OECD, 2012). Alternately, OECD (2012) proposes an unbiased shortcut in which "analysing one plausible value instead of five plausible values provides unbiased population estimates as well as unbiased sampling variances on these estimates" (p. 129)." According to Judith Cosgrove, Research Associate at the Educational Research Centre of St. Patrick's College, this unbiased

method of analysis is commonly used when performing secondary analysis of PISA 2009 data involving plausible values (personal communication, July, 2010). As this study is a secondary analysis of PISA 2009 data, for the purpose of this study, I have made a random choice to use the third plausible value for reading achievement for this study.

Missing Data

There are a limited number of variables from the entirety of the PISA data set that were accessed for this study, and as such, a discussion of missing data as it pertains to the variables which were accessed for analysis follows. There are three primary areas of interest which pertain to this study, student questionnaire data, school questionnaire data and reading achievement data. These will be discussed in this order followed by a discussion of reading achievement data and plausible values and lastly, a discussion of treatment of missing data in this study.

Student and school questionnaire missing data. PISA does not impute missing information for questionnaire variables. Missing data occur when a respondent is expected to answer an item but no response is given. Within the data set, the variables that were accessed from the student questionnaire included answers to Likert style questions about frequency of reading strategy use and usefulness of reading strategies, as well as questions about classroom and climate. From the school questionnaire, the variables that were accessed pertain to teacher behaviors. These Likert style questions have valid response codes ranging from one to six and missing values that are coded from seven to nine.

The Likert items that were of interest in this study were designed to be combined to measure latent constructs that cannot be observed directly (OECD, 2012). For these items, scaling procedures were needed to construct meaningful indices, including indices that were used as variables in this study. These indices included (a) strategy use indices (memorization, elaboration and control strategies) reported as frequency of use on a four point Likert scale, (b) classroom and climate indices (student-teacher relationship, stimulation of reading engagement, and structuring and scaffolding strategies) also reported as frequency of use on a four point Likert scale, (c) metacognition indices (understanding and remembering and summarizing) reported as usefulness of strategy on a six point Likert scale, and (d) school variable indices (teacher behavior) reported as the extent to which learning is hindered by teacher behaviors on a four point Likert scale. A summary of the response rates to these questions pertaining to these indices can be found in Appendix D.

Within the extant database, the scale indices variables were derived using Item Response Theory (IRT) methodology, specifically, the partial credit model (OECD, 2012). Weighted Likelihood Estimates (WLE) were used to obtain individual student scores. OECD transformed these latent dimensions to scales with an OECD average of zero and a standard deviation of one; these constructs exist in the data set as the continuous variables that were accessed in this study. The latent constructs of interest in this study contained missing values that were coded in the data set as 9999.00. Treatment of these missing data will be described later in this section.

Student achievement missing variables. Because there were multiple versions of test booklets with varying subsets of items contained within, a common scale was established by OECD for all students using IRT to estimate scores for reading, mathematics and science. Through the use of IRT, statistical models are able to predict the probability of a student answering an item correctly based on the student's ability of answering other questions within the item bank correctly. The use of IRT allows for a sample of students' performance to be summarized using a scale or series of scales even though students are given different assessment items and generate plausible values, and as such, there are no missing data for plausible values of student achievement. For the literacy scale, the mean of the scale for the plausible values is 500 and the standard deviation is 100 (PISA, 2012).

Treatment of missing data. Like the international and the U.S. PISA data sets, the study sample data set contains missing data that necessitate investigation. Recall that both the student and school questionnaire data include observed data which were designed to be combined to measure latent constructs (OECD, 2012). For these items, four separate indices were derived using IRT methodology (a) strategy use indices, which includes the latent constructs memorization, elaboration and control strategies (b) classroom and climate indices which include the latent constructs student-teacher relationship, stimulation of reading engagement and structuring and scaffolding strategies (c) metacognition indices which includes the latent constructs understanding and remembering and summarizing, and (d) school variable indices which, includes the latent construct teacher behaviors.

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For the study sample, missing response rates for the student questionnaire ranged from 0.6 to 3.7 percent and from 0.0 to 1.1 percent for the school questionnaire as compared with missing response rates for the United States' population student questionnaire which ranged from 1.4 to 4.5 percent and from 0.0 to 1.2 percent for the school questionnaire items that will be accessed. Missing values for these latent constructs are coded in the data set as 9999.00.

According to OECD (2010c) an increased amount of missing and non-response values occur toward the end of the student questionnaire booklet implying that these data are not missing completely at random (MCAR). To contextualize the missing response rates, recall that the student questionnaire is given after the two hour test administration and that by the end of the questionnaire, students have been in the test session for approximately three hours and fifteen minutes. Additionally, the fact that students did not complete the questionnaire may be related to their reading ability or the use of reading strategies. The OECD reports (OECD, 2010c) that these missing data are instead missing at random data (MAR) which OECD defines as "missing values on an observed variable which are not dependent on that variable but may be a function of other variables" which is in agreement with the SPSS software manual's definition of MAR "whether a value is missing does not depend upon other values" (IBM, 2013, p.1) These definitions were applicable to the constructs of interest in this study, and as such the missing data were considered MAR.

A missing value analysis of the study sample data was conducted to gage the significance of the data that were missing from the target population data set and assess

procedures for handling the missing data (see Table 4). Results of the missing value

analysis indicate that 36, or roughly 7.3 percent of the 491 cases in the target population

data set contain missing values, with a total of 455 cases containing complete data for

analysis. A discussion of how the cases containing missing data were handled is

explained later in this section.

Missing values for the pertinent school questionnaire data included one school.

The school identified as containing missing data was school 0057. Of the variables of

interest within the teacher behavior construct, school 0057 was missing 60 percent of the

data. An examination of the data revealed that school 0057 contained only one student

who met the criteria for inclusion in the study sample. Graham (2009) states that missing

values of less than five percent are considered small and that listwise deletion of this

small amount of data is generally considered inconsequential. Because there were less

than five percent missing values for the school population, school 0057 was deleted from

the data set resulting in and adjusted population of $n = 89$ for the school population.

The missing value analysis was performed using SPSS multiple imputation

pattern analysis function and the entirety of the missing data was examined for the degree

of missing-ness in the student questionnaire data. The highest percentage of missing

values were for the variables understanding and remembering and summarizing, both

with 18 missing values, or 3.7 percent of the responses containing missing values. This is

of particular interest, because these items are constructed of the last two sets of questions

as they appear in the student questionnaire, consistent with the OECD observation that

there are more missing and non-response items that occur near the end of the student

Table 4

Missing Value Analysis: United States and Study Population

Variable	U.S. missing values			Study missing values		
	n	%	Valid n	n	%	Valid n
Summarizing	255	4.9	4,978	18	3.7	473
Understanding and remembering	234	4.5	4,999	18	3.7	473
Use of structuring and scaffolding strategies	130	2.5	5,103	11	2.2	480
Teachers' stimulation of reading engagement	98	1.9	5,135	8	1.6	483
Student-teacher student relationship	55	1.1	5,178	7	1.4	484
Elaboration strategies	46	0.9	5,187	3	0.6	488
Memorization strategies	37	0.7	5,196	2	0.4	489
Control strategies	36	0.7	5,197	3	0.6	488
Teacher behavior	2	1.2	163	1	1.1	89

questionnaire. The overall pattern of missing-ness follows the ordering of the questions

and the related constructs in the student questionnaire. An examination of the summary

of missing variables indicates that all variables that were accessed in this study missing

values with a total of 36 cases containing missing values and a total of 70 values (1.78

percent) that were missing from the data set. Results of the analysis are shown in Table 4

and in Figure 2. In addition to the frequency of the missing values, the pattern of

missing-ness was also examined to determine if there were additional patterns to the

missing-ness (see Figure 3).
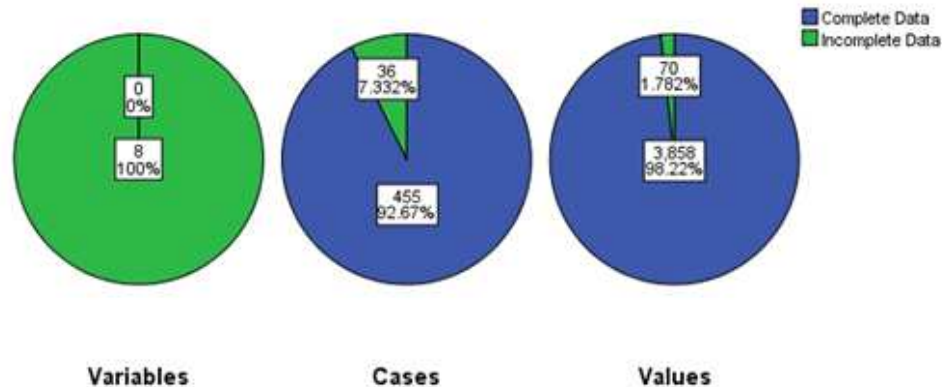
Figure 2. Graphical summary of missing values in the study sample. This figure
graphically illustrates the percentage of missing variables, cases containing missing
variables and percentage of missing values within the study sample.

These missing data for the target population school questionnaire were assumed to be

MAR, and as such, an appropriate method of handling these missing data was used.

According to Graham (2009) listwise deletion can be a useful approach to handling

missing data. Graham states that the primary problem with listwise deletion is twofold,

the loss of statistical power due to the unused partial data and biased parameter estimates.

Allison (2000) concurs and further adds that "the estimated standard errors associated

with listwise deletion are accurate measures of the true standard errors" (p. 76). Allison

states that listwise deletion is preferable to conventional imputation methods because

listwise deletion is not prone to Type I errors and that imputation methods often lead to

underestimates of standard errors and *p*-values.

United States Population

Target Population
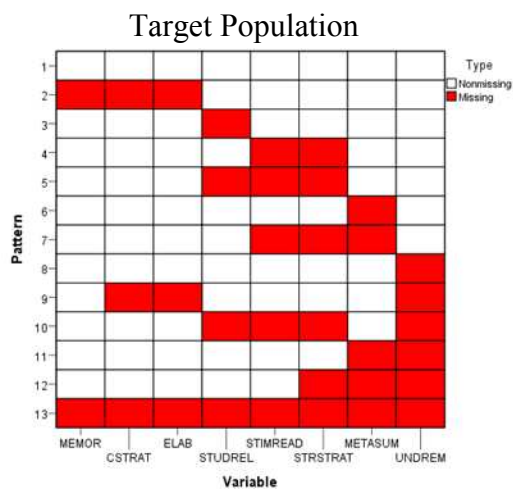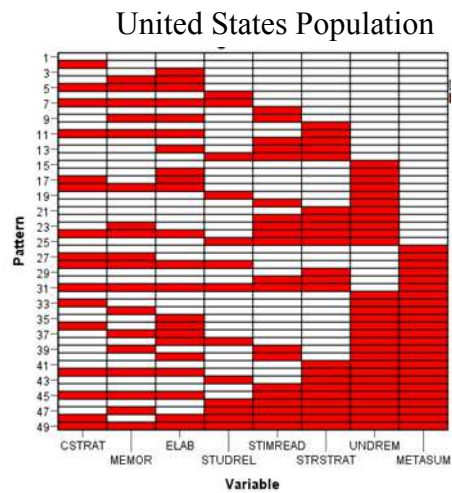
Figure 3. Missing value patterns from PISA 2009 student questionnaire responses on reading strategy variables. This figure graphically illustrates the comparative patterns of missing values of the United States and study sample populations.

Graham (2009) further posits that the loss of power is most likely inconsequential if the loss of cases due to missing data is smaller than five percent. For this study the

percentage of missing data is 7.3 percent, which will result in 455 cases remaining for analysis, if the cases containing missing values are deleted. The required sample size varies by analysis method, so in the following paragraph sample size requirements by analysis method are discussed.

First, for cluster analysis, Mooi and Sarstedt (2011) suggest that the required sample size is dependent on the number of variables that will be used in the cluster and that there needs to be a sample size of at least 2^m, where m is equal to the number of clustering variables. In this study, five clustering variables were accessed, making the required sample size $n \geq 2^5$ or $n \geq 64$. I consulted Hinkle and Oliver (1983) for an estimation of sample size for a one-factor ANOVA analysis that would be needed in order to reject the null hypothesis. For three clusters, the estimate of sample size as presented by Hinkle and Oliver with a level of significance ($\alpha = .01$), statistical power ($P = .99$), number of groups ($K = 3$) and effect size ($d = .5$) a sample size of 222 would be required for this analysis under these extremely conservative conditions. With respect to logistic regression, Schwab (2002) suggests sample size guidelines of a ten to one minimum ratio of valid cases to independent variables for logistic regression. For this study analysis, there were three predictor variables accessed from the student data questionnaire, which would necessitate an estimated 30 cases required for valid logistic regression. For the study analysis related to the school questionnaire data, there was a single predictor variable accessed as a predictor variable, indicating that ten cases would be required to satisfy the sample size requirement. For each type of analysis, the sample size of $n = 455$ satisfies the size requirements where student questionnaire data were

accessed and the sample size of $n = 89$ satisfies the sample size requirement where school questionnaire data are accessed.

Data Analysis

An examination of the relationships between the use and accuracy of perceived usefulness of reading strategies, reading achievement and classroom contexts may provide a lens for better understanding how policies intended to improve reading achievement can be tailored to meet the needs of Hispanic ELs. Using available self-report and reading achievement data from the PISA 2009 data set, a combination of statistical methods were used to explore the existence and significance of these associations. The subset of the PISA 2009 data set accessed included 455 students ($n = 455$) within 89 schools ($n = 89$). In order to analyze these data SPSS was used. Both exploratory and explanatory statistical methodologies which included hierarchical and k-means cluster analyses, discriminant function analysis (DFA), one way ANOVA multinomial logistic regression (MLR) and exploratory factor analysis (EFA) were used in the analyses. In this section, the methodologies and rationale for the use of the methodologies are described.

Analysis methods. The following paragraphs provide a detailed description of the methodologies used to answer the research questions. The methodologies are presented in the order in which they were used to answer the research questions. The methodologies described herein include two cluster analysis methods, DFA, one way ANOVA, MLR and EFA.

Cluster analysis. Patrick, Mantzicopoulos, Samarapungavan and French (2008) used self-report and observational data to conduct a cluster analysis to identify motivational learning profiles of children and explore the association with observed teacher-child relationships. Similarly, in this study cluster analysis was used to identify reading strategy use profiles of United States Hispanic ELs and (a) explore whether the clusters were associated with reading achievement and (b) if perceptions of learning contexts were predictive of the clusters in which the students belong. The Patrick et al. study used multiple types of cluster analysis to ensure stability of the results. In this study, hierarchical cluster analysis (HCA) was used in the exploratory steps of cluster analysis and then *k*-means and DFA were used for further analysis to better understand and describe the differences between the cluster groups and to validate and explain the cluster solutions.

To answer RQ1, the statistical process of cluster analysis was used to explore the patterns of strategy use of United States Hispanic EL students on the standardized latent constructs of memorization, elaboration, control strategies and the accuracy of the perceived usefulness of the metacognitive strategies of summarizing and understanding and remembering. As this was an exploratory process, different clustering procedures were used to determine the optimal clusters in order to answer RQ1. These methods included hierarchical and *k*-means clustering. Because *k*-means clustering requires the researcher to know in advance the number of clusters in which the data will be grouped (Norusis, 2005) Mooi and Sarstedt (2011) suggest a common practice of using a

hierarchal procedure to first determine the number of clusters and then apply the *k*-means cluster approach; this was the approach used in this study.

In deciding which clustering methodology to use, there were several factors to be considered. Mooi and Sarstedt (2011) suggest that consideration should be given to whether the relative magnitude of the variables within the group or across groups matters more. This study was aimed at delineating differences across the groups where dissimilarity or distance measures were more appropriate in answering the research questions. The Euclidean distance measure, a measure of dissimilarity, is suitable for continuous variables (Egan, 1984). As there was no evidence of significant multicollinearity (Norusis, 2005), Ward's method and the squared Euclidean distance measure were used in the HCA.

Hierarchical cluster analysis. For each of the cluster solutions, descriptive statistics were generated and the cluster means and standard deviations for each variable within the clusters were examined. In addition to an examination of the standardized cluster means, a one way ANOVA was run for each of the cluster solutions to examine the significance and *F*-values associated with each of the cluster variable values based on the number of clusters; information from this analysis was used to inform the number of optimal clusters to be used in the *k*-means analysis.

According to Norisus (2005), the determination of the optimal number of clusters is subjective and must be guided by theory as well as the purpose of the research. In deciding the optimal number of clusters to use in the *k*-means cluster analysis, consideration of theoretical information with regard to reading strategy use was given in

addition to the statistical analysis. Within the groupings, clusters which delineated the students' frequency of strategy use and accuracy of the students' perception of the usefulness of the metacognitive strategies were sought.

Prior to performing the *k*-means cluster analysis, the HCA solution was examined more closely in order to validate the solution. According to Mooi and Sarstedt (2011) to ensure stability of the cluster solution, multiple clustering procedures should be run on the same data set which should yield the same results that are not dependent on the order of the data. In order to validate the HCA cluster solution, HCA was repeated using the same process of reordering of the files as in the initial HCA, this time specifying the number of clusters. In addition to reordering the cases for HCA, the analysis was run using different methods including the centroid clustering method and the between groups clustering method. These were run using the squared Euclidean distance measure of similarity ordered on the descending values of the student identification number.

Descriptive statistics and one way ANOVA were performed for each of these orderings to assess the stability of the cluster solution. Analysis of these groups was performed to examine the grouping patterns of the means and significance of the variable contributions. These repeated clusterings were compared with the initial HCA solution and examined for similar grouping characteristics and similar *F*-values of the analyzed variables. When this analysis indicated that the solution was a stable, valid solution, the number of clusters to be analyzed using *k*-means cluster analysis was determined.

K-means cluster analysis. Having established the number of clusters needed to perform a *k*-means cluster analysis, the analysis was run using the same standardized

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variable values as were used in the HCA. Thirty iterations were run for the analysis.

Descriptive statistics and a one way ANOVA were run to examine the cluster centroid

means and the *F*-values associated with each of the variables. This information was used

to compare the characteristics of the clusters to the HCA cluster solution.

The next step of the *k*-means analysis was to validate the cluster solution.

According to Norisus (2005), a common approach to validation is to split the file into two

halves and analyze the two halves using the same parameter settings, if the two halves do

not differ significantly, then it is safe to presume that a stable solution has been achieved.

In order to validate the solution, fifty percent of the cases in the data file were randomly

selected to be used for comparison with the other 50 percent of cases in the file.

Randomness of the split was tested using an independent samples *t*-test and a chi-square

test to compare the sample halves. Following these tests, a *k*-means analysis was run on

each half of the sample. The resulting clusters were examined for consistency between

the two halves of the file. Having verified that the two halves were consistent, cluster

stability was established. The patterns of the clusters were examined holistically and

clusters were assigned descriptive names based on characteristics and patterns of strategy

use and accuracy of perceived usefulness of reading strategies.

Having established cluster stability, statistics and frequencies were run for each of

the clusters to examine the demographic make-up of the clusters and to better understand

student characteristics of membership within each of the clusters. Additionally, post hoc

tests and DFA were employed to further understand the contributing factors to

differences between the clusters and to validate and explain the cluster solution. In order

to identify the appropriate post hoc tests to be used with the data, a Levene's Test of homogeneity of variance was run. Both Tukey and Games-Howell (Howell & Games, 1973) post hoc tests were used to determine where differences between the clusters existed.

Discriminant function analysis. A discriminant function analysis was performed to examine additional variables that were not used in the cluster analysis to better understand how these additional variables helped discriminate between the clusters. Additional variables used in the DFA included both student and school characteristic variables as well as learning context variables. The student and school characteristic variables included the number of years at the current school, gender, the age of the student, the age at which the student moved to the United States, immigration status, and percentage of students who speak a language other than the test in school. As discussed in an earlier section of this chapter, these factors have been associated with lower student achievement. Research presented in chapter two indicates that learning contexts which include student teacher relationship and supportive learning strategies, such as teachers' stimulation of reading engagement and teachers' use of structuring and scaffolding strategies, are also associated with student achievement and as such, the discriminatory value of these variables could be useful in validating and explaining cluster membership. The structure matrix of the canonical functions that emerged from the analyses was examined to better understand each variable's contribution to the canonical functions. Additionally, the standardized canonical discriminant function coefficients, and the

territorial map were analyzed to better understand how these functions discriminated between clusters.

One way ANOVA. An important design factor was to understand where the differences between the clusters existed. This study was focused on understanding the differences between these groups rather than the similarities within these groups. A one way ANOVA was used to determine whether there were significant differences between the groups on the third plausible value of reading achievement. In this ANOVA analysis, the independent variable (IV) was the cluster designation and reading achievement was the dependent variable (DV).

To further understand differences between the clusters on the measure of reading achievement required the use of post hoc tests. Levene's test of homogeneity of variances was used to determine the appropriate post hoc test to be used. Results of the post hoc test were examined to determine where there were statistically significant differences between the clusters.

Multinomial logistic regression. According to Dimitrov (2009) the use of multinomial logistic regression is used to predict the chances of belonging to specific categories based on a set of predictors. In order to better understand the role of learning contexts, multinomial logistic regression analysis was used to determine if Hispanic EL student's perceptions of learning contexts were predictive of cluster membership. Similarly, multinomial logistic regression was used to explore whether the principals'/designees' perceptions of teachers' expectations of students was predictive of cluster membership. Multinomial logistic regression has been used to analyze data from

a large scale international assessment by researchers such as Oliveri, Ercikan and Zumbo (2013). These researchers used data from PIRLS 2006 to investigate sources of latent class (LC) differential item functioning using self-report data related to instruction and teacher related variables and the averaged plausible values of student reading achievement. Although the focus of this study differs from that one there are also similarities in the data set and rationale for the use of the methodology.

Multinomial logistic regression was used to answer RQ3 and MLR used in conjunction with EFA were used to answer RQ4. More specifically, for research question three, a three predictor logistic model was fitted to the data to ascertain the predictive value of student perceptions of student-teacher relationship, teachers' stimulation of reading engagement, and teachers' use of structuring and scaffolding strategies, on the likelihood of cluster membership. For research question four, a single predictor logistic model was fitted to the data to ascertain the predictive value of principal/designee perceptions of student-teacher relationship/expectations on the likelihood of cluster membership.

Exploratory Factor Analysis. In addition to MLR, exploratory factor analysis was used to determine whether or not a reliable composite variable could be obtained to serve as the indices of student-teacher relationship/teacher expectations. Prior to performing the EFA, the factorability of the five PISA 2009 school questionnaire items of interest was first examined. Criteria included for the correlation factorability included examination of Pearson's *r*, Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy,

Bartlett's test of sphericity, communality values and factor loadings. The Principal component analysis method was used was used in this factor analysis.

For both RQ3 and RQ4, the dependent variables were the nonmetric cluster designations. The independent variables were continuous in nature and as such were entered as covariates in the model. For research question three, these include the standardized variables for student perceptions of student-teacher relationship, teacher's stimulation of reading engagement, and use of structuring and scaffolding strategies for research question four, this included principal/designee perceptions of teacher relationship/expectations.

Chapter Four

Results

     This study was conducted to investigate how patterns of self-reported reading strategy use and accuracy of perceptions of usefulness of metacognitive strategies of Hispanic ELs are related to reading achievement as measured by PISA 2009. The study also attempted to determine if students' and principals'/designees' perceptions of learning contexts were predictive of the patterns of reading strategy use and accuracy of perceptions of usefulness of metacognitive strategies. A better understanding of how this specific population uses reading strategies and how learning contexts relate to the use of these strategies in this national subpopulation could help inform future policy related to improving reading instruction and reading achievement of adolescent Hispanic EL students.

     This chapter details the results of a quantitative study that examined a sample of 455 students in 89 schools across the United States. A specific focus was on the association between patterns of self-reported reading strategy use and reading achievement and whether students' and principals'/designees' perceptions of learning contexts were predictive of reading strategy use patterns. The research questions guided the study and analysis of the data. Comprehensive considerations about policy implications will be considered in the final chapter.

Research Question One

How are adolescent Hispanic EL students clustered based on self-report data on frequency of use of memorization, elaboration and control strategies and the accuracy of their perceptions of the usefulness of the metacognitive strategies of understanding and remembering and summarizing?

The first research question was created in an attempt to better understand the differences in the student profiles based on self-report data on the frequency of reading strategy use and the accuracy of the perceived usefulness of metacognitive reading strategies as determined through a rater-scoring system. Hierarchical cluster analysis and k - means cluster analyses were performed to obtain groupings. Discriminant function analysis was performed to validate and explain cluster membership. Prior to the analysis assumptions of cluster analysis were tested.

Cluster Analysis

Assumptions of cluster analysis. Prior to performing the analysis assumptions associated with performing cluster analysis were examined. According to Norusis (2005) in using cluster analysis, assumptions about the underlying distribution of the data are often unnecessary, however; the presence of multicollinearity can unequally weight closely correlated constructs and thus distort results by giving the closely correlated constructs more weight. In choosing a hierarchical methodology for determining the number of clusters, the data were tested for multicollinearity using a bivariate correlation analysis for the five standardized variables that were accessed for clustering. A Pearson's r was calculated for the standardized variables, of memorization, elaboration, control

strategies, summarizing, and understanding and remembering. The output was examined

for Pearson correlation values that exceeded .9, as according to Norusis (2005),

correlations above this threshold value can be problematic in HCA. An examination of

the correlation matrix revealed that there were no values that exceeded this threshold and

as such, the data are assumed to be noncollinear (see Table 5).

Table 5

Correlation Matrix for Cluster Analysis Variables

Variable	ZMETASUM	ZUNDREM	ZCSTRAT	ZELAB	ZMEMOR
Summarizing (ZMETASUM)	-				
Understanding and remembering (ZUNDREM)	.43**	-			
Use of control strategies (ZCSTRAT)	.21**	.19**	-		
Use of elaboration strategies (ZELAB)	.04	.07	.64**	-	
Use of memorization strategies (ZMEMOR)	.10*	.07	.72**	.55**	-

$* p < .05.$ $** p < .01.$

Hierarchical cluster analysis. Having established that the assumptions

associated with cluster analysis had been met, an initial HCA was run on the standardized

variables using Ward's Method and the squared Euclidean distance measure of similarity

to determine the optimal number of clusters to be used in the *k*-means cluster analysis.

Analysis of the agglomeration schedules and dendrograms resulting from the HCA indicated a need to reevaluate the cluster analysis for two, three, four and six clusters. Further analysis of the two, three, four and six cluster solutions was performed to examine characteristics of these various solutions.

The cluster solutions that contained four and six groups contained groups with nondescript delineation with regard to use and accuracy of perception of usefulness of reading strategies. Specifically, within these groups there were multiple clusters which contained similar mean values with regard to the grouping variables. The cluster solution that contained only two distinctive groups (1) students who reported very low use of strategies and did not understand the usefulness of the strategies and (2) students who reported high use of strategies and understood the usefulness of the strategies contained useful information; however, this all or nothing model did not appear to provide the most meaningful information for further analysis. The cluster solution with three clusters produced groups with means that differed on both frequency of strategy use and accuracy of the perceived usefulness of strategies. Analysis of the third group could help provide contrast information for this study to better understand the influence of learning contexts as related to the use of reading strategies.

Results of the analysis indicated that the HCA three cluster solution would provide the most meaningful information. Prior to further analysis of the three cluster solution, the validity and stability of the solution needed to be established. In order to establish the validity and stability of the solution, three random number variables were created to allow for reordering of the cases. Using these random number variables, a

reordering of the data set and reanalysis using both the centroid and between groups clustering methods was performed specifying a three cluster solution. The cases were reordered on ascending and descending values for the three random number variables and also on the ascending and descending student identification numbers. These repeated analyses for both reordering the data set and for alternate clustering methods produced similar grouping characteristics as the initial three cluster solution, that is three clusters of students who can be broadly described as having (1) all positive mean values, (2) all negative mean values, or (3) mixed mean values on the frequency of use of reading variables and the accuracy of perceived usefulness of the metacognitive reading strategies. Additional analysis of the HCA three cluster solution indicated that this solution would be optimal for further analysis using k-means clustering procedures.

Specifically, results of the HCA indicated that the three distinct groups of students differed on reading strategy use and accuracy of perceived usefulness of metacognitive strategies as determined by the cluster means on each of the variables analyzed (see Table 6). More precisely, the three groups were characterized as (1) students with very low reported usage of reading strategies and with a mix of very low and moderately low accuracy of the perceived usefulness of metacognitive reading strategies (see Table 6, Cluster 1, low strategy use), (2) students who reported both moderate to high use of reading strategies with moderate accuracy of perceptions of metacognitive strategy usefulness (see Table 6, Cluster 2, moderate strategy use), and (3) students who reported high use of reading strategy use with very low accuracy of perceived usefulness of

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metacognitive strategies (see Table 6, Cluster 3,high use/low accuracy). The standard

deviations for the variables within these clusters indicate that the groupings were fairly

Table 6

Means and Standard Deviations for HCA Clusters on Reading Strategy Variables

	Cluster					
	Low strategy use (n = 122)		Moderate strategy use (n = 289)		High strategy use/low accuracy (n = 44)	
Variable	*M*	*SD*	*M*	*SD*	*M*	*SD*
Summarizing	-.88	.70	.55	.68	-1.18	.67
Understanding and remembering	-.51	.84	.34	.93	-.85	.71
Control strategies	-.91	.90	1.02	.82	1.02	.82
Elaboration strategies	-.85	.86	1.24	.85	1.24	.85
Memorization strategies	-.81	.96	.18	.78	1.08	.84

homogeneous. Additionally, within the ANOVA analysis of this solution, examination of

the *p*-values and *F*-values revealed that each of the variables contributed significantly to

differences between the clusters (see Table 7).

   To validate the stability of the HCA three cluster solution the data were resorted,

reordered and reanalyzed on three random variables and two alternate analysis methods.

The repeated analyses produced similar grouping characteristics as the initial three cluster

solution, thus validating the stability of the solution. As the three cluster HCA solution

was both stable and could provide meaningful information with regard to student use of

reading strategies, *k*-means analysis was performed designating three clusters for

analysis.

Table 7

One Way ANOVA of HCA Three Cluster Solution

Variable	Source	SS	df	MS	F	p
Summarizing	Between	241.90	2	120.95	257.76**	< .001
	Within	212.10	452	.47		
	Total	454.00	454			
Understanding and remembering	Between	97.31	2	48.66	61.66**	< .001
	Within	356.69	452	.79		
	Total	454.00	454			
Control strategies	Between	162.67	2	81.33	126.19**	< .001
	Within	291.33	452	.65		
	Total	454.00	454			
Elaboration strategies	Between	164.45	2	82.23	128.36**	< .001
	Within	289.55	452	.64		
	Total	454.00	454			
Memorization strategies	Between	139.29	2	69.65	100.03**	< .001
	Within	314.71	452	.70		
	Total	454.00	454			

** *p* < .001.

K-means cluster analysis. A *k-means* cluster analysis was run for a three cluster

solution specifying a maximum of 30 iterations. The iteration history indicated that the

clusters stabilized after fourteen iterations with minor adjustments made in the final steps.

The clusters that emerged from the analysis were composed of 110 students in cluster

one, 208 students in cluster two, and 137 students in cluster three. The characteristics of the three clusters were consistent with the HCA solution. When examining the clusters, the variables were first examined with regard to positive and negative values and then assigned a descriptive value of high, medium or low based on the mean value of the strategy variable. For negative mean values, the values were termed as average to low average for values between 0 and -.30, very low for variables below -.80 and moderately low for variables with values in between these values. For positive variable means, these were considered average to moderate if the value of the mean was between zero and .30, and high if the value of the mean was above .8 with variable means in between being termed as moderately high.

The *k*-means analysis produced three clusters with the same patterns that were evident in the HCA three cluster solution. Although the order of the clusters were different, the *k*–means clusters can be described similarly, specifically within cluster one, students had high reported use of reading strategies and moderately low accuracy of perceived usefulness of metacognitive reading strategies (*strategy users/poor perceivers*). Within cluster two, students had average to moderately high mean values for reading strategy use and moderately high values for accuracy of perceived usefulness of metacognitive strategies (*strategy users/accurate perceivers*). Lastly, students within cluster three had very low mean values for reading strategy use and moderately low values for the accuracy of perceived usefulness of metacognitive strategies (*minimal strategy users/poor perceivers*). Further analysis was required in order to validate cluster membership of the three cluster solution.

As suggested by Norisus (2005) a common method for validating the stability of a cluster solution is to split the file and compare the cluster results from the two halves of the file. If significant differences are not detected, then it is safe to assume that a stable solution has been established. In order to establish the stability of the solution, a random sampling of 50 percent of the data file (first half) was selected for comparison with the remaining 50 percent of the data file (second half). The halves were checked for randomness of the sampling prior to performing k-means analysis on each half for validation.

An independent samples t-test and a chi-square test were performed to confirm randomness of the 50 percent of cases (first half). Results of the independent sample t-test indicated that there were no significant differences between the means of the halves of the file on any of the variables included in the cluster analysis (see Table 8) Additionally, a chi-square test of goodness-of-fit was performed to verify that the categorical variable gender was equally distributed between the two halves of the file. Having verified that the 50 percent sampling was random, as suggested by Norisus (2005), a k-means analysis was run on each half of the file using the same parameter settings.

Results of the cluster solutions for each half of the file were examined. In order to validate the solution, consistency between the file halves needed to be established (Norisus, 2005). The cluster means for each file half were examined on each variable to establish whether there was consistency both between the file halves and as compared with the initial k-means solution. Examination of the resulting cluster solutions and

related descriptive statistics revealed that the characteristics and patterns of the cluster solutions were consistent between each half of the sample and consistent with the patterns in the initial *k*-means solution. Results of this analysis indicated that a stable cluster solution had been reached.

Table 8

Results of t-test and Descriptive Statistics for Randomness of Sample

Variable	First half[a] (n = 220)		Second half (n = 235)		95% CI		*t*(453)
	M	*SD*	*M*	*SD*	Lower	Upper	
Summarizing	.05	.97	-.04	1.02	-.28	.09	-.98
Understanding and remembering	.01	.97	-.01	1.03	-.21	.16	-.23
Control strategies	-.05	1.01	.05	.98	-.08	.29	1.10
Elaboration strategies	-.03	1.04	.03	.96	-.13	.24	.63
Memorization strategies	.01	1.04	-.01	.96	-.20	.17	-.17

[a] First and second half of data file differ significantly, *p* <.05.

Examination of the means and standard deviations of the stable three cluster solution in Table 9 highlight the distinct patterns evident within the clusters. These values represent important differences between the clusters; clusters were named based on patterns within the clusters. Members of cluster one have mixed values, that is members of this cluster have high positive self-report values associated with the

frequency of use of reading strategies, yet moderately low values associated with the accuracy with which they perceive the usefulness of metacognitive reading strategies. This cluster was the smallest cluster ($n = 110$) and was named *strategy users/poor perceivers* because of their knowledge of strategy use, but poor accuracy of the perceptions of the usefulness of strategies. Members of cluster two, the largest cluster ($n = 208$) had average to moderately high average values on the self-report frequency of strategy use variables and moderately high values on the accuracy of their perceived usefulness of metacognitive strategies. This cluster was named *strategy users/accurate perceivers*. Lastly, the members of cluster three ($n = 137$) had very low values on the self-report frequency of use of reading strategies and moderately low use on the accuracy of perceptions of usefulness of metacognitive strategies. This cluster was named *minimal strategy users/poor perceivers*.

Having established stability of the three cluster solution and cluster names based on the patterns of cluster membership, the ANOVA for the three cluster solution was examined. The ANOVA analysis revealed that all of the variables contributed significantly to the differences between the clusters on reading strategy use and accuracy of perceived usefulness of metacognitive strategies variables (see Table 9). To better understand how the clusters differed on the strategy variables, post hoc tests were performed.

In order to identify appropriate post hoc tests, Levene's Test of homogeneity of variances was run. With the exception of the understanding and remembering variable, all other variables included in the cluster analysis violated the homogeneity of variance

assumption. For the understanding and remembering variable, a Tukey post hoc test was used. For the remaining variables, the Games-Howell post hoc test (Howell & Games, 1973) was used.

Table 9

Means and Standard Deviations for K-means Three Cluster Solution on Reading Strategy Variables

| | Cluster | | | | | |
| | Strategy users/poor perceivers (n = 110) | | Strategy users/ accurate perceivers (n =208) | | Minimal strategy users/poor perceivers (n = 137) | |
Variable	*M*	*(SD)*	*M*	*(SD)*	*M*	*(SD)*
Summarizing	-.55[a]	(.83)	.73[b]	(.62)	-.66[a]	(.84)
Understanding and remembering	-.45[a]	(.87)	.62[b]	(.82)	-.57[a]	(.79)
Control strategies	.85[a]	(.79)	.18[b]	(.63)	-.95[c]	(.84)
Elaboration strategies	.89[a]	(.79)	.66[b]	(.72)	-.81[c]	(.86)
Memorization strategies	.92[a]	(.74)	.05[b]	(.67)	-.81[c]	(.93)

Note. Means with differing superscripts within rows differ significantly, $p < .001$.

The post hoc tests indicated for the variables which measured accuracy of perception of usefulness of strategies (summarizing and understanding and remembering) there were significant differences between the *strategy users/poor perceivers* and the *strategy users/accurate perceivers*. The differences between the *strategy users/poor perceivers* and the *minimal strategy users/poor perceivers* clusters were not significant. For the variables that measured the frequency of strategy use (control, elaboration and

memorization strategies) there were statistically significant differences between all three

clusters.

Specifically, with regard to the variables which measured accuracy of perception

of usefulness of strategies (summarizing and understanding and remembering), results of

the Games-Howell post hoc test indicated that both members of the *strategy users/poor*

perceivers and the *strategy users/accurate perceivers*, (MD = -1.29 ± .09, *p* < .001) and

the *strategy users/accurate perceivers* and the *minimal strategy users/poor perceivers*

differed significantly (MD = 1.39 ± .08, *p* < .001) on the variable summarizing. The

larger difference occurred between the *strategy users/accurate perceivers* and the

minimal strategy users/poor perceivers. The Tukey post hoc test indicated that *strategy*

users/poor perceivers and *strategy users/accurate perceivers* also differed significantly

(MD = -1.07 ± .11, *p* < .001) on the understanding and remembering variable. Also the

strategy users/accurate perceivers and *minimal strategy users/poor perceivers* differed

significantly (MD = 1.88 ± .09, *p* < .001) on the same variable with the larger difference

occurring between the *strategy users/poor perceivers* and the *minimal strategy users/poor*

perceivers.

The post hoc test results also reveal that overall, for the frequency of use variables

(control, elaboration and memorization strategy variables), the largest overall mean

difference occurred between *strategy users/poor perceivers* and *minimal strategy*

users/poor perceivers on the control strategy variable (MD = 1.79 ± .10, *p* < .001) with

the smallest mean differences occurring between *strategy users/poor perceivers* and

strategy uses/accurate perceivers (MD = -.67 ± .09, *p* < .001). For elaboration, the

largest difference also occurred between the *strategy uses/poor perceivers* and *minimal strategy users/poor perceivers* (MD = 1.70 ± .11, $p < .001$) with the smallest differences occurring between *strategy users/poor perceivers* and *strategy users/accurate perceivers* (MD = .82 ± .09, $p < .001$). On the memorization variable, the largest mean difference occurred between the *strategy users/poor perceivers* and *minimal strategy users/poor perceivers* (MD = 1.70 ± .11, $p < .001$) with the smallest mean difference between *strategy users/accurate perceivers* and *minimal strategy users/poor perceivers* (MD = .86 ± .09, $p < .001$).

In addition to strategy use, other variables were accessed to better understand differences between the clusters. These variables were accessed in order to examine their discriminatory value in validating and explaining cluster membership. Table 10 displays descriptive statistics by cluster membership that includes the additional demographic variables accessed to perform a discriminant function analysis. The differences in the means of these variables aid in understanding the student and school characteristics of each cluster. The *minimal strategy users/poor perceivers* contain the greatest percentage of males, native born students, second generation immigrant status students, and the highest average years at current school. The *strategy users/poor perceivers* cluster is the smallest cluster and contains the highest percentage of students with first generation status and the highest average age at which immigrant students entered the United States. The *strategy users/accurate perceivers* is the largest cluster and contains students with the highest average student age and the highest percentage of females.

Table 10

Demographic Variables by Cluster

	Cluster		
Variable	Strategy Users/Poor Perceivers (n = 110)	Strategy Users/Accurate Perceivers (n = 208)	Minimal Strategy Users/Poor Perceivers (n = 137)
Age of student	15.8	15.8	15.8
Sex			
Female %	44.5	58.2	37.2
Male %	55.5	41.8	62.8
Immigrant status			
Native	8.3	11.2	12.0
2nd generation	51.4	58.0	65.4
1st generation	40.4	30.7	22.6
Years at current school	1.9	2.2	2.2
Country of birth age[a]	7.0	6.9	6.4

[a] Applicable only to 1st generation status students

With regard to school characteristics, members of the *strategy users/accurate perceivers* cluster contained the highest percentage of schools which reported greater than 60 percent of the school population containing students whose first language is not English. This cluster also contained the highest percentage of schools which reported that between 0 and 10 percent of the school's population contained students whose first language is not English. In contrast, the *minimal strategy users/poor perceivers* cluster contained the lowest percentage of schools which reported greater than 60 percent of the school's population containing students whose first language is not English and the

lowest percentage of schools reporting that between 0 and 10 percent of the school population contained students whose first language is not English.

Discriminant Function Analysis. A discriminant function analysis (DFA) of the student and school characteristic descriptors examined in conjunction with the learning context variables can help to discriminate cluster membership and validate the cluster solution. As these additional variables associated with students, individual teachers and individual schools are entered into the analysis, it is important to recall the nested nature of the PISA sampling structure as it relates to the present study population. Within the PISA sample design, schools are selected by region and then students are selected within schools. The PISA sampling methodology does not stratify the sample within schools by classroom or teacher and therefore the study sample is not nested.

Using these additional variables, a DFA was performed to better understand how these student and school characteristic variables in conjunction with the learning context variables help to discriminate between the *strategy users/poor perceivers*, the *strategy users/accurate perceivers* and the *minimal strategy users/poor perceivers*. Additional variables added for this analysis included: the number of years at the current school, gender, the age of the student, immigration status, the age at which the student entered the United States, percent of students in the school who speak a language other than the test at home, and the learning context variables including student perceptions of teachers' stimulation of reading engagement, teachers' use of structuring and scaffolding strategies, and student-teacher relationship.

Results of the DFA revealed that there were two statistically significant canonical functions at the $\alpha = .05$ level. An examination of results from the Wilks' Lambda test of functions indicated that the first linear discriminant function (LDF$_1$) was statistically significant, $\Lambda = .82$, $\chi^2(18) = 83.37$ $p < .001$). The second linear discriminant function (LDF$_2$) was also statistically significant, $\Lambda = .96$, $\chi^2(8) = 19.01$, $p < .02$). An examination of the Eigenvalues table show that the first linear discriminant function (LDF$_1$) accounts for 78.1 percent of the total variance for the set of nine variables across the three clusters. The remaining 21.9 percent is accounted for by the second linear discriminant function (LDF$_2$).

An examination of the discriminant function structure matrix (see Table 11) revealed that student perceptions of teacher behaviors (stimulation of reading engagement, structuring and scaffolding strategies, and student-teacher relationship), immigration status and age at which the student immigrated to the United States correlate with LDF$_1$. Gender, years at current school, student age and percent of students in school who speak a language other than the test correlate with LDF$_2$. The standardized canonical discriminant function coefficients were also examined to understand the relative magnitude of the contributions among the variables within LDF$_1$ and LDF$_2$.

A comparison of the standardized coefficients which are correlated with LDF$_1$show that LDF$_1$ is primarily defined by the three variables that are related to students' perceptions of learning contexts including teachers' stimulation of reading engagement (.40), teachers' use of structuring and scaffolding strategies (.40) and student-teacher relationship (.38) because these coefficients are much higher than the

coefficients for immigration status (.19) and age at which the student immigrated to the

United States (-.19). Similarly, the coefficients correlated with LDF_2 exhibit large

Table 11

DFA Structure Matrix

	Function	
Variable investigated	1	2
Use of structuring and scaffolding	.71[†]	-.14
Teachers' stimulation of reading engagement	.66[†]	-.80
Student-teacher relationship	.59[†]	-.07
Immigration status	.34[†]	.17
Country of birth age	-.32[†]	-.10
Gender	-.26	.71[†]
Years at current school	-.23	-.58[†]
Age of student	-.07	-.24[†]
First language not language of test	-.03	-.09[†]

Note. [†] Indicates largest absolute correlation between each variable and any discriminant function. Variables ordered by absolute size of correlation within function.

differences in the values of the coefficients with LDF_2 largely defined by gender (.76)

and years at the current school (-.61). The dimensions which these two functions

represent can be characterized for LDF_1 as teacher behaviors and LDF_2 as gender and

years at current school. These two dimensions provide the greatest separation between

the clusters.

To understand how these functions discriminate between clusters, I will first

address the location of the clusters on the territorial map coordinate plane and then

explain the discriminatory value of the canonical functions (see Appendix E). On the

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territorial map, LDF_2 is represented on the horizontal axis and LDF_1 is represented on the vertical axis. Students who have high scores on both LDF_1 and LDF_2 are located in the first quadrant of the coordinate plane and are associated exclusively with membership in the *strategy user/poor perceivers* cluster. Students with high scores on LDF_1 and low scores on LDF_2 are located in the second quadrant and are almost exclusively associated with membership in the minimal *strategy users/poor perceivers* cluster with a small representation of the *strategy users/poor perceivers* cluster. Students with low scores on both LDF_1 and LDF_2 are located in quadrant three and are predominantly associated with membership in the *minimal strategy users/poor perceivers* cluster, with a small representation of the *strategy users/accurate perceivers cluster*. Lastly, students with low scores on LDF_1 and high scores on LDF_2 are located in the fourth quadrant and are approximately equally associated with membership in the *strategy users/accurate perceivers* or the *strategy users/poor perceivers*.

A holistic examination of the territorial map suggests that LDF_1 weakly separates both the *strategy users/accurate perceivers* and the *strategy users/poor perceivers* from the *minimal strategy users/poor perceivers* on the vertical axis. Because teacher behaviors are positively correlated with LDF_1, the territorial map suggests that the *strategy users/poor perceivers* and *strategy users/accurate perceivers* perceive more positive teacher behaviors than members in the *minimal strategy users/poor perceivers* cluster. More simply, LDF_1 discriminates between the clusters which report using strategies moderately and the cluster that reports using strategies minimally. With respect to LDF_2, the *strategy users/accurate perceivers* were almost exclusively

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associated with lower score values of LDF$_2$. Because LDF$_2$ is characterized by gender and the number of years at the current school, this confirms that this cluster contains proportionally more females than the other two clusters, and more members that have been at their current schools longer than students in the *strategy users/poor perceivers* cluster, and shorter than students in the *minimal strategy users/poor perceivers* cluster with regard to the other clusters.

The results of the DFA are in alignment with research presented in chapter two regarding the positive association of both student-teacher relationship and supportive learning contexts on reading achievement and strategy use. More precisely, the DFA indicates that LF$_1$ functionally divides moderate strategy users clusters with *minimal strategy users/poor perceivers* on the constructs of learning contexts with those who perceive being more frequently exposed to positive learning contexts using strategies more frequently. Additionally, the *strategy users/accurate perceivers* cluster is associated with lower score values of LF$_2$ indicating that this cluster contains more females. The cluster membership supports the discriminant analysis.

Consideration of the characteristics of cluster membership based on reading strategy use, student and school characteristics within each cluster examined in conjunction with the results of the DFA help to validate the cluster solution. An ANOVA analysis revealed that there were statistically significant differences across clusters on the student variables of gender $\chi^2(2) = 33.79$, $p < .001$, immigration status $F(2, 444) = 3.78$ $p = .02$ and years at the current school $\chi^2(2) = 155.53$, $p < .001$. Descriptions of the

variables that differ significantly across clusters are discussed in the following paragraphs in relation to validation of cluster membership.

As presented earlier in chapter three, female students would be expected to be associated with the highest performing cluster and male students with the lowest performing cluster. More specifically, males would be expected to be associated with the lowest strategy users because of the gender differences with respect to strategy knowledge (OECD 2010a). This is clearly evident in the student characteristics of this cluster analysis. The *strategy users/accurate perceivers* which would be expected to contain the highest performing students contains the highest percentage of females and the *minimal strategy users/poor perceivers* cluster, which would be expected to contain the lowest performing students, contains the highest percentage of males. The other variables that differ significantly across clusters do not provide this clear association.

For example, with regard to immigration status, the *minimal strategy users/poor perceivers* cluster contains the largest percentage of second generation immigrant status students which Schnepf (2005) associates with lower reading achievement on the PISA assessment. Also in this analysis, the *strategy users/poor perceivers* cluster contains the largest percentage of students with a first generation immigrant status, which Schnepf also posits would also be associated with students with lower reading achievement – this is not contrary to the cluster solution as the largest percentage of this group of students does not belong to the group that would be expected to be the highest performing group. Additionally, although the frequency of strategy use differed significantly between these

clusters, the accuracy of perceptions of strategy use for these two clusters did not differ significantly.

The cluster that contains the average lowest number of years at the current school would be expected to be the lower performing group (Scherrer, 2013) as this may be associated with higher student mobility. This variable is hard to interpret as it does not delineate between types of schools and whether or not the student has repeated a grade which could impact the number of years at the school. Within this analysis, this variable provides confounding results with regard to cluster membership. For example, the *strategy users/poor perceivers* contain the students with the lowest average of years at the current school (M = 1.93, SD = .79) and the *minimal strategy users/poor perceivers* contain students with the highest number of years at the current school (M = 2.20, SD = .94).

Research Question Two

Are there significant differences in the reading achievement levels of adolescent Hispanic EL students based on the student clusters? If so, what differences between clusters account for these differences?

One Way ANOVA

The second research question was created to determine if and where there were differences in reading achievement based on the student clusters. A one way ANOVA was used to determine if there were significant differences on the reading achievement variable between clusters. Post hoc tests were performed to determine where there were

significant differences between the clusters on the reading achievement variable. Prior to the analysis, assumptions of ANOVA were tested.

Assumptions of ANOVA. Assumptions of ANOVA require that the data are normally distributed, that there is homogeneity of variance between the subgroups and that the population samples are independent. Violations of these assumptions can have negligible to severe consequences (Dimitrov, 2009). Specifically, violations of normality can be significant if the data are skewed or the population sizes are very small, or if the population distributions are skewed. Violation of the homogeneity of variance assumption can impact the ease or difficulty with which the null hypothesis is rejected and violations of the assumption of independence can have serious consequences on the accuracy of the ANOVA results.

Using SPSS, the data file was split on cluster membership and analyzed to explore data in each of the three clusters for normality, skewness and kurtosis on the reading achievement variable. The Kolmogorov-Smirnov and the Shapiro-Wilk tests were used to check for normality with both tests indicating that the data were normally distributed. The descriptive statistics were examined and calculations were performed to determine the presence of significant skewness or kurtosis by calculating the ratio of the skewness statistic to the skewness standard error and the kurtosis statistic to the kurtosis standard error. Results of these analyses revealed that although the data were normally distributed for the three clusters, the distribution of the *strategy users/poor perceivers* cluster was kurtotic with a value of 4.5 for the kurtosis statistic to the kurtosis standard error ratio.

As the Kolmogorov-Smirnov and the Shapiro-Wilk tests affirmed that the data were normally distributed, the ratio tests indicated that the *strategy users/poor perceivers* cluster distribution is kurtotic. According to Dimitrov (2009) for ANOVA "Violations of the normality assumption have negligible consequences on the chances for Type-I and Type-II error in testing the null hypothesis unless (a) the population distribution is highly skewed, (b) the *n*'s (sample sizes of the groups) are very small, and/or (c) one-sided tests are used [which applies only in the special case of ANOVA with two groups (K=2)]." None of these conditions described were extant indicating that Dimitrov's assertion should be accepted, that absent these conditions, there should be negligible consequences of using ANOVA for this analysis. With regard to homogeneity of variance, the Levene's test of homogeneity of variances was performed. Results indicated that the reading achievement in each cluster met the homogeneity of variance assumption, $F(2, 450) = .17$, $p = .18$.

ANOVA analysis. Results of the one way ANOVA indicated that there were statistically significant differences between the clusters on the reading achievement variable, $F(2, 452) = 17.73$, $p < .001$ and as such, the null hypothesis was rejected:

H_{01}: $\mu_1 = \mu_2 = \mu_K$; There are no differences in the reading achievement scores between student clusters.

and the alternate hypothesis that there were significant differences on reading achievement scores between the clusters was supported:

H_a: $\mu_i \neq \mu_j$; $(i,j = 1,2\ldots K)$; There are differences in the reading achievement scores of for some i and j student clusters.

The means and standard deviations for each the three clusters on the plausible

value score of reading achievement are presented in Table 12. Levene's test of

Table 12

Group Means and Standard Deviations on Reading Achievement Score

Cluster	n	*M*	*SD*	Maximum	Minimum
Strategy users/ poor perceivers[a]	110	448.47**	83.49	682.19	215.38
Strategy users/accurate perceivers[b]	208	485.43**	83.37	719.23	257.87
Minimal strategy users/ poor perceivers[c]	137	435.47**	73.36	741.44	204.56

[a] Scores differ significantly from *Strategy users/accurate perceivers.* [b] Scores differ significantly from *Strategy users/poor perceivers* and *Minimal strategy users/poor perceivers.* [c] Scores differ significantly from *Strategy users/accurate perceivers.* ** $p < .001$.

homogeneity of variances indicated that the assumption of homogeneity of variance was

met, and as such Tukey post hoc tests were used to determine where there were

significant differences between the clusters on the reading achievement variable.

Results of the Tukey post-hoc test reveal that the *strategy users/accurate*

perceivers reading scores were significantly higher than the *minimal strategy users/poor*

perceivers scores (MD = 49.86 ± 8.86, *p* < .001) and the *strategy users/accurate*

perceivers reading scores were significantly higher than the *strategy users/poor*

perceivers scores (MD = 36.95 ± 9.49, *p* < .001). There were no statistically significant

differences between the reading achievement scores of the *strategy users/poor perceivers* and the *minimal strategy users/poor perceivers* clusters ($p = .42$). To summarize, on the mean reading achievement scores, the *strategy users/accurate perceivers* scored significantly higher ($p < .001$) than both the *strategy users/poor perceivers* and the *minimal strategy users/poor perceivers* with no statistically significant difference ($p = .42$) in mean reading scores between the *strategy users/poor perceivers* and the *minimal strategy users/poor perceivers* clusters (see Table 12).

The ANOVA analysis and post hoc tests reveal that there are important differences between the clusters on both frequency of use and accuracy of perceived usefulness of reading strategies that can help account for differences in reading achievement. Specifically, the *minimal strategy users/poor perceivers* cluster, as expected from the literature presented in chapter two, is the lowest performing cluster, reporting both very low use and low understanding of reading strategies. The *strategy users/accurate* perceivers also cluster as the literature presented would imply, with average use of reading strategies with the least reported use of the lowest level strategy yet an understanding of the usefulness of the higher level strategies.

Lastly, the *strategy users/poor perceivers* although they report the very high frequency of use of reading strategies, they do not holistically understand the importance of the most useful strategies as evidenced their higher reliance on the low level strategy of memorization as compared to elaboration and control strategies. More importantly, as demonstrated by the ANOVA analysis, the differences in the frequency use of reading strategies between the *strategy users/poor perceivers* and the *minimal strategy users/poor*

perceivers does not significantly impact reading achievement scores between the clusters. To reiterate, for students who do not understand the usefulness of these strategies, there are not significant differences in the reading scores. It is important for these students to understand which strategies are useful. As evidenced by the significant differences in scores between the *strategy users/accurate* perceivers and the other clusters, it is evident that understanding the usefulness of the higher level strategies does contribute to significant differences between the clusters in scores of reading achievement for adolescent Hispanic EL students; however, it is important to note that cluster membership is not a proxy for reading achievement.

Research Question Three

Are adolescent Hispanic EL students' perceptions of learning contexts predictive of particular cluster?

Multinomial Logistic Regression

The third research question is intended to explore the predictive power of the three learning context variables on cluster membership. These predictor variables include measures of student perceptions of student-teacher relationship, teachers' stimulation of reading engagement, and teachers' use of structuring and scaffolding strategies. More specifically, the intent of this question is to report the odds of cluster membership based on the predictor variables. Prior to the analysis, assumptions of MLR were tested.

Assumptions of multinomial logistic regression. According to Dimitrov (2009) the assumptions associated with multinomial logistic regression include the absence of multicollinearity and that a linear relationship between the weighted combination of the

predictor variables and the natural log of the odds, and independence of observations. A

Pearson's *r* was used to test for statistically significant correlations between the predictor

items which included student perceptions of teachers' stimulation of reading engagement,

use of structuring and scaffolding strategies, and student-teacher relationship. The

Pearson's *r* analysis indicated that all of the variables accessed for the MLR analysis

were significantly correlated ($p < .001$) therefore must be analyzed for multicollinearity

(see Table 13).

Table 13

Correlation Matrix of MLR Predictor Values

Variable	STIMREAD	STRSTRAT	STUDREL
Teachers stimulation of reading engagement (STIMREAD)	-		
Use of structuring and scaffolding strategies (STRSTRAT)	.66**	-	
Student teacher relationship (STUDREL)	.29**	.36**	-

$**p < .01.$

Multicollinearity was examined by generating a linear regression analysis and

examining the associated collinearity diagnostics. Within the collinearity diagnostics, the

variance inflation factors (VIF) were examined to detect variables with values greater

than 10, as according to Dimitrov, these would indicate the presence of multicollinearity.

There were no values that exceeded these limits. Additionally, there were no tolerance values below 0.5, indicating that multicollinearity is not a concern. The assumption of a linear relationship between the weighted combination of the predictor variables and the natural log of the odds is tested by the goodness of fit test that is performed during the analysis and reported in the output.

Multinomial logistic regression (MLR) analysis. A three predictor logistic model was fitted to the data to ascertain the predictive value of student perceptions of student-teacher relationship, teachers' stimulation of reading engagement, and teachers' use of structuring and scaffolding strategies on the likelihood of membership in the *minimal strategy users/poor perceivers*, *strategy users/poor perceivers* or *strategy users/accurate perceivers* cluster. Cluster membership was the dependent variable in this model with student perceptions of student-teacher relationship, teachers' stimulation of reading engagement, and teachers' use of structuring and scaffolding strategies variables entered as the covariates in the model.

The value of the odds ratio for student-teacher relationship, Exp(B) = .76, indicated that as compared to the *strategy users/accurate perceivers* cluster the odds for membership in the *minimal strategy users/poor perceivers* cluster decrease by a factor of .76 for each one unit increase in student perceptions of student-teacher relationship score, when controlling for all other predictors. No other variables were found to be significant predictors of cluster membership (see Table 14).

Overall model fit. Examination of the model fit information revealed that the likelihood ratio test was statistically significant, $\chi^2(6) = 46.27$ $p < .001$ indicating that for

the data the model was an improvement over the intercept-only baseline model denoting

that these learning context variables were predictors of cluster membership.

Table 14

MLR Analysis of Group Membership as a Function of Learning Contexts

Cluster	Variable	B	χ^2	OR	95% CI Lower	95% CI Upper
Strategy user/ poor perceiver						
	Stimulation of reading engagement	.08	.29	1.09	.80	1.47
	Use of structuring and scaffolding strategies	.10	3.94	1.10	1.04	2.19
	Student-teacher relationship	.12	2.31	1.21	1.19	2.13
Minimal strategy user/ poor perceiver						
	Stimulation of reading engagement	-.22	1.88	.80	.59	1.10
	Use of structuring and scaffolding strategies	-.31	3.56	.73	.54	1.01
	Student-teacher relationship	-.27	4.49*	.76	.59	.98

Note: Reference group is Strategy user/accurate perceiver. Wald (*df* = 1).
**p* < .05.

The Pearson and the Deviance tests were used in conjunction with the Cox and

Snell and Nagelkerke Pseudo R^2 values to examine the goodness-of-fit. Both the

Pearson, $\chi^2(764) = 792.59$, $p = .22$ and the Deviance, $\chi^2(764) = 790.07$, $p = .25$ tests

indicated that the model was a good fit to the data as both had insignificant p values.

Additionally, the Cox and Snell R^2 ($R_{CS}^2 = .01$) and the Nagelkerke R^2 ($R_N^2 = .01$) values indicated that the relationship between the dependent and independent variables was weak with the explained variance ranging from 10 percent (Cox and Snell R^2) to 11 percent (Nagelkerke R^2). According to Peng, Lee and Ingersoll (2002) these indices should be used as supplemental to the overall evaluation of the model, tests of individual regression coefficients, and the goodness-of-fit test statistic as they are not true predictors of explained variance.

The descriptive information provided in the classification table (see Table 15) indicates an overall percentage accuracy rate of 50.5 percent. To assess the usefulness of the model as compared to this overall accuracy rate, the classification accuracy rate was compared with the proportional by chance accuracy rate. The proportional by chance accuracy rate was computed by taking the proportion of cases for each group from the case processing summary then squaring and summing the proportion of cases in each

Table 15

Classification Table of Observed and Predicted Frequencies for Cluster Membership by MLR

| | Predicted | | | |
| | Cluster | | | |
Observed cluster	1	2	3	Percent correct
1 Strategy users/poor perceivers	4	94	12	3.6
2 Strategy users/accurate perceivers	2	183	23	88.0
3 Minimal strategy users/poor perceivers	0	94	43	31.4
Overall percentage	1.3	81.5	17.1	50.5

group ($.24^2 + .46^2 + .30^2 = .36$). The proportional by chance accuracy rate was compared with the overall percentage accuracy rate produced by SPSS as reported in the classification table. For the model to be characterized as useful, this value was compared to one that is 25 percent greater than the proportional by chance accuracy rate (. 36 * 100 * 1.25 = 44.9%). The SPSS generated classification accuracy rate was 50.5 percent which was greater than the proportional by chance accuracy criteria of 44.9 percent indicating that the model predicts substantially better than chance alone.

It is important to note, that the model does not predict equally well for all groups with highest accuracy for the *strategy users/accurate perceivers* cluster and the lowest accuracy reported for the *strategy users/poor perceivers* cluster. The coefficient for the predictor variable student perceptions of student-teacher relationship ($p = .03$) was statistically significant as a predictor between the *minimal strategy user/poor perceiver* cluster and the *strategy user/accurate perceiver* cluster. There were no statistically significant predictors in distinguishing between the *strategy user/poor perceiver* and the *strategy user/accurate perceiver* clusters.

Research Question Four

Are the principals'/designees' perceptions of teachers' expectations of students and student-teacher relationships predictive of cluster membership?

Exploratory Factor Analysis

The fourth research question was intended to explore the predictive value of principals'/designees' perceptions of the learning contexts of student-teacher relationships and teacher expectations on cluster membership. To answer this question,

data from the school questionnaire related to principal/designee perceptions of student-teacher relationship and teacher expectations were accessed. Specifically there were five items accessed from the school questionnaire related to the OECD derived scale index of teacher behavior. The teacher behavior index contained additional items that were not specifically related to student-teacher relationship and teacher expectations. The five items of interest were accessed in order to examine the factorability of these items using exploratory factor analysis. were significantly correlated ($p < .001$). Results presented in Table 16 indicate that the

Table 16

Correlation Matrix for School Questionnaire Teacher Behavior Items

Variable	ST17Q01	ST17Q03	ST17Q05	ST17Q08	ST17Q13
Teacher's low expectations (ST17Q01)	-				
Student-teacher relations (ST17Q03)	.53**	-			
Student's needs not met (ST17Q05)	.52**	.50**	-		
Students lacking respect (ST17Q08)	.38**	.56**	.39**	-	
Students not encouraged (ST17Q13)	.56**	.55**	.51**	.37**	-

**$p < .01$.

The factorability analysis included examination of Pearson's *r*, Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy, Bartlett's test of sphericity, communality

values and factor loadings. A Pearson's *r* was used to test for a statistically significant correlation between these items. The Pearson's *r* analysis indicated that all of the items strength of the correlations between these items range from low to moderate at the .01 level (Dimitrov, 2009, p. 138). Having established that these items were significantly correlated, a principal component analysis was run on the five items. The KMO value of .75, was above the commonly recommended value of .6 and the Bartlett's test was significant (χ^2 (6) = 808.39, *p* < .001) indicating that factorability was feasible.

Examination of the communality values revealed that all items with the exception of "Students lacking respect" had values greater than .5. Additionally, the factor loadings were examined in which the same pattern emerged, all items with the exception of "Students lacking respect" had approximately equal factor loadings ranging from .80 to.85. The "Students lacking respect" factor loading was .34. Based on the communality and factor loading values for the "Students lacking respect" item, the item was eliminated and the factor analysis was performed on the four remaining items which included (1) teacher's low expectations, (2) student-teacher relationship, (3) student's needs not met, and (4) students not encouraged.

A principal component analysis of the remaining four items was conducted to create a composite factor to represent principal/designee perceptions of student-teacher relationship/expectations based on principal/designee responses to school questionnaire items. The analysis revealed that the principal/designee perceptions of student-teacher

Table 17

Principal Component Analysis Factor Loadings and Communalities for Student-Teacher Relationship/expectations (n = 455)

Item	Factor loading	Communality
Student-teacher relationship	.85	.71
Teachers' low expectations	.84	.73
Student's not encouraged	.82	.65
Student's needs not met	.80	.68

relationship/expectations factor explains 69.07 percent of the variance. A composite score was created for the factor that was based on the mean of the items and the respective loadings on the factor as a variable to represent principal/designee perceptions of student-teacher relationship/expectations (see Table 17). Higher scores on this factor indicated better principal/designee perceptions of student-teacher relationship and higher teacher expectations. Reliability of the new scale variable was Cronbach's $\alpha = .84$.

Multinomial logistic regression. A single predictor logistic model was fitted to the data to ascertain the predictive value of principal/designee perceptions of student-teacher relationship and teacher expectation on the likelihood of membership in the *minimal strategy users/poor perceivers*, *strategy users/poor perceivers* or *strategy users/accurate perceivers* cluster. Cluster membership was the dependent variable in this model with the principal/designee perceptions of student-teacher relationship/expectation variable entered as the covariate in the model. Results of the analysis indicated that there was no statistically significant predictive value of the variable principal/designee perceptions of student-teacher relationship/expectations on cluster membership.

Examination of the model fit information revealed that the omnibus test of model fit was not statistically significant, $\chi^2(2) = 0.98$, $p = .61$ indicating that the model was not an improvement over the intercept-only baseline model denoting that the variable principal/designee perceptions of student-teacher relationship/expectations is not a statistically significant predictor of cluster membership.

Summary of Findings

An analysis of data from the PISA 2009 administration which included 455 Hispanic ELs enrolled in 89 schools within the United States revealed that this student population clusters into three significantly different groups related to frequency of reading strategy use and accuracy of perceptions of metacognitive strategy usefulness. These three clusters were characterized as *strategy users/poor perceivers*, *strategy users/accurate perceivers*, and *minimal strategy users/poor perceivers*. Descriptive statistics of the cluster membership revealed that the *strategy users/poor perceivers* contained the smallest percentage of students with native status and second generation immigrant status, the lowest mean value of years students had spent at their current school, and the highest mean value for the age of students who were not born in the United States. The *strategy users/accurate perceivers* cluster contained the highest percentage of female students and the highest mean value for age of student. The *minimal strategy users/poor perceivers* contained the highest percentage of male students, the highest percentage of native and second generation immigrant status students, the highest mean value of years students had spent at their current school and the lowest mean value for the age of students who were not born in the United States.

Additionally, post hoc tests revealed that the clusters differed on the specific strategies that were analyzed for this study. For the strategies reported by frequency of use, which included variables related to use of control strategies and elaboration strategies, the largest differences occurred between *strategy users/accurate perceivers* and *minimal strategy users/poor perceivers*. This differed for memorization strategies where the largest difference occurred between the *strategy users/poor perceivers* and *minimal strategy users/poor perceivers*. For the accuracy of the perceived usefulness of metacognitive strategies variables, which included summarization and understanding and remembering strategies, the largest mean differences also occurred between *strategy users/poor perceivers* and *minimal strategy users/poor perceivers.*

A DFA revealed that two canonical functions characterized two dimensions which provided the greatest separation between clusters. The two dimensions which these functions represent can be characterized as LDF_1 for student perceptions of teacher behaviors and as LDF_2 for gender and years at current school. Of these two functions, LDF_1, which included student perceptions of teachers' stimulation of reading engagement, teachers' use of structuring and scaffloding strategies. and student-teacher relationship accounted for 78.1 percent of the total variance across the three clusters. The remaining 21.9 percent is accounted for by LDF_2. The territorial map suggests that the greatest discrimination occurs between the *minimal strategy users/poor perceivers* and the other two clusters on LDF_1 indicating that the *strategy users/poor perceivers* and *strategy users/accurate perceivers* report more positive perceptions of teacher behaviors than members in the *minimal strategy users/poor perceivers* cluster.

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Although not a proxy for reading achievement, the clusters differ in reading achievement scores as well as strategy use, student and school characteristics, and discriminant value. The largest differences in mean reading achievement scores were between the *strategy users/accurate perceivers* and the *minimal strategy users/poor perceivers cluster*. There were also statistically significant differences in the mean scores between *strategy users/accurate perceivers* and the *strategy users/poor perceivers* clusters; the differences between the *strategy users/poor perceivers* and the *minimal strategy users/poor perceivers* were not statistically significant. The mean scores for the *minimal strategy users/poor perceivers* and *strategy users/poor perceivers* clusters fall within the range of PISA proficiency level two scores and the *strategy users/accurate perceivers* fall within the range of PISA proficiency level three scores. Importantly, the differences between these two proficiency levels delineate between those who are considered successful readers and those who are at the baseline of proficiency (Fleischman et al., 2010).

Lastly, the learning contexts related to teacher behaviors that included student and principal/designee perceptions of supportive learning, student-teacher relationships and teacher expectations were analyzed for their predictive value of cluster membership. Results of these analyses revealed that student perceptions of student-teacher relationship was the single variable that was a statistically significant predictor of cluster membership. Specifically, student perceptions of student-teacher relationship was found to be predictive of cluster membership between *minimal strategy users/poor perceivers* and *strategy users/accurate perceivers* and that for each unit increase in score on the student-

teacher relationship scale the probability of membership in the *minimal strategy users/poor perceivers* cluster decreases by a multiplicative factor of .76.

Chapter Five

Conclusions

Enactment of the No Child Left Behind Act of 2001 called for data to be disaggregated between subgroups to facilitate the closing of achievement gaps between economically advantaged students and those from different economic, racial and ethnic backgrounds. Researchers such as Hemphill and Vanneman (2011) report that the achievement gap in reading between Hispanic and White students still exists and has remained stagnant since the enactment of NCLB. Data from NCES (U.S. Department of Education NCES, 2013a) indicates that not only is the gap stagnant, but between adolescent White and Hispanic students, it is widening.

Federal policies that address ELs are limited to language acquisition and accountability, and federal efforts aimed at closing the achievement gap in reading are focused primarily on elementary students. The population of Hispanic students enrolled in public schools within the United States grew from 11.7 percent to 23.3 percent from 1990 to 2010 (Batalova & McHugh, 2010) and experienced a 1.7 percentage increase in the number of students participating in EL programs between 2001 and 2010 (Aud et al., 2012). Without policies aimed specifically at improving the reading achievement of the growing population of adolescent Hispanic EL students it is doubtful that the gap will

narrow and that the problems associated with poor reading achievement of this population will dissipate. The purpose of this study was to explore how reading strategy use and learning contexts are associated with reading achievement of adolescent Hispanic ELs in order to inform policy.

The research questions that guided this study were as follows:

1. How are adolescent Hispanic EL students clustered based on self-report data on frequency of use of memorization, elaboration and control strategies and the accuracy of their perceptions of the usefulness of the metacognitive strategies of understanding and remembering and summarizing?

2. Are there significant differences in the reading achievement scores of adolescent Hispanic EL students based on the student clusters? If so, what differences between clusters account for these differences?

3. Are adolescent Hispanic EL student's perceptions of learning contexts predictive of the probability of a student belonging to a particular cluster?

4. Are the principals'/designees' perceptions of teachers' expectations of students and student-teacher relationships predictive of cluster membership?

Discussion of Results

Data analysis revealed that adolescent Hispanic EL students within United States' schools cluster into three significantly different groups based on reading strategy use and that reading achievement scores vary significantly with, cluster membership. These three clusters are characterized as students who use reading strategies minimally and do not

have a good understanding of the usefulness or effectiveness of metacognitive reading strategies, *minimal strategy users/poor perceivers*; students who use strategies frequently but do not have a good understanding of the usefulness of metacognitive reading strategies, *strategy users/poor perceivers,* and; students who report using reading strategies and who accurately perceive the usefulness of reading strategies, *strategy users/accurate perceivers.* In this study, students in the *strategy users/accurate perceivers* clusters have statistically significantly higher reading achievement scores than those in both the *strategy users/poor perceivers* and the *minimal strategy users/poor perceivers* clusters. There is ample research to support these findings with regard to the relationship between reading strategy use and reading achievement (Padron & Waxman, 1998; Palinscar & Brown, 1984; Pritchard & O'Hara, 2008). Researchers such as Fitzgerald (1995) report that for ELs the frequency of use of higher level metacognitive and control strategies are positively associated with reading achievement while researchers such as Padron and Waxman (1988) report that the use of lower level strategies or strategies that are used inappropriately impede reading comprehension of Spanish speaking students. Although there is abundant research on the association between reading strategy use and reading achievement, cluster membership does not serve as a proxy for reading achievement in this study.

In addition to strategy use and reading achievement, the literature provides ample evidence for the proposition that learning contexts including student-teacher relationship, teacher expectations and supportive instructional practices are positively associated with reading achievement (Hughes & Kwok, 2005; Tenenbaum & Ruck, 2007). Results of

this study support that claim. For the population studied, the learning contexts which included student and principal/designee perceptions of student-teacher relationship, teacher expectations, and supportive instructional practices (specifically, teachers' use of stimulation of reading engagement strategies and teachers' use of structuring and scaffolding strategies) served as the discriminating factor between the *minimal strategy users/poor perceivers* and the other two clusters with members of the *minimal strategy users/poor perceivers* reporting the least positive experiences with learning contexts. When examining the predictive power of learning contexts, analysis revealed that for this population, student and principal/designee perceptions of teacher expectations, teachers' use of stimulation of reading engagement strategies and structuring and scaffolding strategies were not predictive of cluster membership. However, student perceptions of student-teacher relationship was predictive of cluster membership and had predictive value for membership between the *strategy users/accurate perceivers* and the *minimal strategy users/poor perceivers* clusters, between which there are statistically significant differences in reading achievement scores. Specifically, previous research indicates that student-teacher relationship can have a direct positive effect on student achievement (Hughes & Kwok, 2005; Tenenbaum & Ruck, 2007) and results of this analysis revealed that lower scores on the student-teacher relationship scale increased the odds of belonging to the *minimal strategy users/poor perceivers* cluster as compared to the *strategy users/accurate perceivers* cluster.

Implications

Patterns of Strategy Use and Reading Achievement

Because strategy use differs by culture (Park, 2010; Purdie & Hattie, 1996) it is important to recognize that results of this analysis are not generalizable to a broader population. Strategy use is usually associated with positive gains in reading achievement; however, Padron and Waxman (2008) found that for Spanish speaking students, the use of low level strategies such as memorization or inappropriately using strategies can have significant negative effects on reading achievement. This is important as ELs tend to use lower level strategies more frequently and are less able to verbalize or select appropriate metacognitive strategies (Fitzgerald, 1995). EL students who read in English tend to use lower level strategies (Jiménez et al., 1996; Pritchard & O'Hara, 2008) and successful Spanish speaking ELs use more metacognitive strategies when reading in Spanish as compared to English. Fortunately, these strategies are transferable across languages (Jiménez et al., 1996; Pritchard & O'Hara, 2008).

A deeper examination of the patterns of strategy use for the study population revealed that the *minimal strategy users/poor perceivers* report to a high degree that they do not use any of the reading strategies. However, the *strategy users/poor perceivers* report using the lowest level reading strategies (memorization) the most frequently and the highest level of reading strategies the least frequently (control strategies). This is exactly opposite of what the highest performing group, the *strategy users/accurate perceivers* report with regard to frequency of reading strategy use. Although not true across all OECD nations, OECD (2010a) reports that the use of memorization strategies

is associated with lower reading performance in the United States' population, and that reported use of higher level strategies is positively associated with reading achievement across all OECD nations. Although cluster membership is not a proxy for reading achievement in this study, the findings of this study and others, suggest that in order to increase the reading achievement of adolescent Hispanic ELs, these students must be taught how to access and recognize the purpose and value of specific reading strategies in order to use strategies effectively, with consideration given to the factors that are unique to this population.

The analysis of data for this population revealed that neither members of the *minimal strategy users/poor perceivers* nor the *strategy users/poor perceivers* group accurately perceived the usefulness of higher level metacognitive strategies. Importantly, these two groups did not differ significantly on the mean scores of reading achievement, implying that the accuracy of perceived usefulness of metacognitive strategies plays a larger role than self-reported frequency of use for strategies. Combined, these two groups comprise 54.3 percent of the study population with the mean scores of reading achievement of these two groups at PISA Level two, which is considered to be at the baseline of proficiency (Fleischman et al., 2010). The mean reading achievement score of the highest performing group, the *strategy users/accurate perceivers*, is at PISA Level three, which includes readers who are considered to be successful at reading tasks of moderate complexity (Fleischman et al., 2010). Although not supported by a statistical analysis, this finding implies that understanding the usefulness of reading strategies delineates between successful readers and those who are not successful readers within

this population. According to OECD (2010a) if students were aware of effective

metacognition strategies reading achievement gaps such as these would be expected to

narrow by approximately 20 percent.

As reading achievement varies across clusters in this study,, this study indirectly

supports evidence from researchers such as (Fitzgerald, (1995) Jiménez et al.(1996) and

Padron and Waxman(1988) that the appropriate use of higher level strategies is

associated with higher reading achievement. In addition to the use of strategies, it is

essential to recognize the importance of not only using strategies, but understanding how

and when to use strategies in order to avoid overuse of low level strategies and/or

inappropriate use of strategies (Cantrell et al, 2010; Padron & Waxman, 1988). In order

to employ reading strategies effectively, adolescent Hispanic EL students must be aware

of not only the declarative knowledge of strategies but value the procedural and

conditional knowledge of strategies as well (Olson & Land, 2007). According to Olson

and Land, in order to be effective, this instruction must be prolonged, explicit, and

include modeling and scaffolded practice of appropriate strategy use.

This study revealed that for adolescent Hispanic ELs, poor perception of the

usefulness of metacognitive reading strategies is not limited to students who have very

low reported usage of reading strategies but also includes students with high reported

usage of reading strategies. The implications are that the frequent use of low level

reading strategies of the *strategy users/poor perceivers* group could contribute to poor

perception of the usefulness of metacognitive strategies and/or this group may not know

the appropriate strategies to access to aid in comprehension. For the *minimal strategy*

users/poor perceivers group, this could mean that they do not have functional strategy awareness or simply choose not to use reading strategies. In this study, students differed in their understanding of the usefulness of metacognitive reading strategies; these differences were associated with differences in reading achievement. These findings highlight the importance of incorporating instructional practices that include prolonged, explicit instruction that includes declarative, procedural and conditional strategy use for adolescent Hispanic ELs.

Gutierrez-Clellen (1999) suggests an integrated approach to mediating literacy skills which includes incorporating native language into modeling reading strategies. Additionally, researchers such as Pritchard and O'Hara (2008) and Jiménez et al. (1996) report that Spanish speaking students use more metacognitive strategies when reading in their native language. Importantly, these researchers indicate that these strategies are transferrable from Spanish to English. Because the use of higher level strategies has greater impact on this population, consideration should be given to teaching these strategies in conjunction with reading in the students' native language to develop initial expertise, and then to facilitate the transfer of the appropriate use of higher level strategies to reading texts in English.

Although not a primary variable examined in this study, it is important to recognize that gender was a delineating factor with respect to cluster membership. Members of the most successful reading cluster, *strategy users/accurate* perceivers were predominantly female. This finding is useful in providing evidence that there are differences in reading strategy use of male and female adolescent Hispanic ELs within

United States' schools that necessitate further study. Researchers such as Brozo (2006) suggest using strategies that engage males by capitalizing on their competencies with familiar texts, personal interests and connections with caring adults. Brozo further adds that utilizing these types of innovative strategies, that address the unique interests and literacy behaviors of male students, can help to reduce reading achievement disparities between genders.

Learning Contexts and Patterns of Strategy Use

Within the scope of this study, learning contexts were comprised of teacher behaviors that included student and principal/designee perceptions of student-teacher relationship, teacher expectations and supportive instruction. These factors were found to function together to discriminate between the student clusters that reported moderate to high use of reading strategies and the *minimal strategy users/poor perceivers* cluster that reported very low usage of reading strategies, the *minimal strategy users/poor perceivers*. Within this Hispanic EL population, students in the *minimal strategy users/poor perceivers* cluster were weakly differentiated from the other two clusters by lower scores on the learning context scales. The implications are that these students may report very low usage of reading strategies and inaccurately perceive the usefulness of reading strategies because (a) within the learning context, students perceive that teachers are not providing supportive instruction that could facilitate their knowledge of and usefulness of these strategies, (b) they perceive that the relationship with their teacher does not support their learning, or (c) for other reasons not considered in this study.

As strategy use is associated with reading achievement (Park, 2010) student-teacher relationships can also be predictive of reading achievement (Hughes et al., 2012; Lopez, 2012). Additionally, minority students have been found to be among those who are most affected by the quality of relationships with their teachers (Ferlazzo, 2012; Hughes & Kwok, 2007). Within this population of adolescent Hispanic ELs, student perceptions of student-teacher relationship were predictive of cluster membership. When comparing the *minimal strategy users/poor perceivers* cluster with the *strategy users/accurate perceivers* cluster, the odds of students in the *minimal strategy users/poor perceivers* belonging to the *strategy users/accurate perceivers* increased by 23.9 percent for each point increase in the scale score of student-teacher relationship. These results align with the reported research that positive student-teacher relationships are associated with positive reading outcomes. This is an important finding as there are significant differences in the reading achievement outcomes between the *minimal strategy users/poor perceivers* and the *strategy users/accurate perceivers* cluster.

Implications of these findings are that learning contexts do matter with regard to reading strategy use. Further, learning contexts that include positive perceptions of student-teacher relationships and supportive instruction serve to differentiate between students who use strategies moderately and those who use them minimally. The manner in which perceptions of positive student-teacher relationships impact reading achievement is not clear, based on an analysis of data for this study, although it appears to serve as a positive differentiating factor of reading strategy use. It is not clear how

these perceived positive relationships interact with perceived supportive instruction to increase strategy use and reading achievement.

Recommendations

Recommendations to help close the reading achievement gap between adolescent White students and Hispanic ELs necessitate a multi-tiered approach. These recommendations encompass not only federal support, but include recommendations for state and local constituencies of educators, parents, and other stakeholders. The recommendations that follow are part of holistic approach; however, these recommendations should not be interpreted as an all or nothing course of action. Reauthorization of ESEA which includes salient elements of the LEARN Act (H.R. 858, 2015) that are germane to adolescent literacy education or grant funding that is provided by the SRCL Program (U.S. Department of Education, Striving Readers Comprehensive Literacy Program, 2012) can act as stimuli to proceed toward closing this achievement gap. However, in absence of reauthorization of ESEA or the failure to receive SRCL program grant funding these recommendations may stimulate meaningful policy change.

Recommendations for Federal Policymakers

Until ESEA is reauthorized, we will continue to operate under NCLB. Within NCLB, funding for reading is primarily limited to serving very young students. ESEA is due for reauthorization, and at the time of this writing there have been four bills proposed for reauthorization. The first was released by republican Senator Alexander, a discussion draft titled the Every Child Ready for College or Career Act of 2015 (Every Child Ready for College or Career Act of 2015, 2015), the second was proposed by republican

Congressman Kline, the Student Success Act (H.R. 5, 2015), and the third, democratic Congressman Scott's Substitute Amendment to H.R. 5 (Substitute Amendment to H.R. 5, 2015). Lastly, as a bipartisan effort by the Senate Health Education Labor and Pensions Committee (HELP) republican Chairman Senator Alexander and democratic Ranking Member Senator Murray introduced the Every Child Achieves Act of 2015 (2015).

To date, the Senate HELP committee has held three hearings on the Alexander discussion draft, the Kline and Scott bills have been introduced and debated and as of this writing, left as unfinished business. None of these bills includes provisions for comprehensive literacy; however there is promise in one of the proposed amendments, the LEARN Act (H.R. 858, 2015), which was introduced in the House of Representatives by democratic Congressman Yarmuth. The LEARN Act is a comprehensive literacy initiative that provides for states to create literacy plans based on needs as determined by SEAs working in conjunction with state literacy teams. The LEARN Act calls for a continuum of literacy learning from early childhood through high school, that is directed toward the neediest population of students which includes ELs. The LEARN Act calls for quality professional development focused on preparing teachers to provide effective, evidence-based literacy instruction and allowing states to discern the specific needs, content and delivery of this instruction.

The bipartisan Every Child Achieves Act (2015) also includes provisions for adolescent literacy. The bill contains much of the language pertaining to adolescent literacy education as explicated in the LEARN Act (H.R. 858, 2015). Specifically, within the bill, Part D, Literacy Education for All, Results for the Nation (LEARN),§ 2401 –

2405 contains language calling for a comprehensive literacy initiative which, like the LEARN Act, provides for states to create literacy plans that are based on needs as determined by SEAs.

The Striving Readers Comprehensive Literacy Program (SRCL) (U.S. Department of Education, Striving Readers Comprehensive Literacy Program, 2012) is sanctioned under the Academic Improvement and Teacher Quality programs. The SRCL program is a model of the LEARN Act (H.R. 858, 2015) and includes both formula and discretionary grants that are intended to improve the literacy skills of children from birth through grade twelve. Since 2010, SRCL has shown promising results in closing literacy gaps. Within the six states that have received discretionary funding to support school districts in improving literacy instruction, all report increases in literacy achievement. For the FY 2016 budget, President Obama requested $160,000,000 to fund SRCL, which is currently unfunded (U.S. Department of Education, 2015). Absent ESEA reauthorization, which includes the LEARN Act (or salient portions of the LEARN Act), if SRCL remains unfunded there will be no funding available to specifically serve adolescent literacy needs.

There are concerns that are germane to the funding which could help ameliorate achievement gaps in literacy for Hispanic ELs. Programs such as SRCL, although showing evidence of gains in reading achievement (Abt Associates, 2010; Shanahan, 2005), are not systematic, sustainable approaches to improve reading achievement over the long term. By nature, competitive grants do not serve an entire population; states that have great need do not necessarily have the means to divert resources for grant writing.

In order to improve reading achievement and close reading achievement gaps, a dedicated funding stream for a comprehensive literacy program is needed. Like the model SRCL program, § 2401 – 2405 of the Every Child Achieves Act (2015) is also a grant structure that by nature will not serve the needs of an entire population; instead it is designed to provide federal support to SEAs by awarding state planning and implementation grants and discretionary grants in the development and implementation of comprehensive literacy plans that serve learners from birth through grade twelve. The amount of federal support for SRCL program is set at $500,000,000 for FY2016 increasing incrementally to $600,000,000 by FY 2020 (U.S. Department of Education About ED, 2015). Importantly, the bill language of Every Child Achieves (2015) would provide a dedicated funding stream containing specific provisions dedicated to adolescent literacy with a focus on the needs of the typically underserved, which includes ELs, to ensure that they have access to quality literacy instruction. Absent reauthorization of ESEA and until money for SRCL is appropriated, there is no current federal funding for adolescent literacy and no funding aimed at ameliorating the gap in reading achievement between adolescent White students and the growing population of adolescent Hispanic ELs.

Examination of long term trend NAEP data (U.S. Department of Education NCES, 2012c) indicates that overall this gap has not narrowed since the enactment of NCLB and programs funded by SRCL have shown promise in advancing the achievement of adolescent readers and ELs. Recommendations for federal policy makers are twofold. In the absence of ESEA reauthorization, which includes salient elements of

the LEARN Act (H.R. 858, 2015), authorization and appropriate funding should be provided for the SRCL program. Second ESEA should be amended to include the salient elements of the LEARN Act, which would provide dedicated, sustained funding for adolescent literacy instruction while allowing SEAs to tailor comprehensive literacy plans to meet the diverse needs of individual state populations.

Within that framework, concerns related to elements of the LEARN Act H.R. 858, 2015) of researchers such as Krashen (2010, January 31) should be tempered with measures within SEAs, LEAs, and advocacy groups. States must be vigilant to take advantage of the flexibility in the LEARN Act language. Specifically, states must ensure that their literacy plans explicate the use of evidence based practices that include higher level strategy use and incorporate culturally relevant components of comprehensive supportive literacy instruction to address the adolescent literacy needs of Hispanic ELs and other culturally diverse populations of learners.

Recommendations for State Policymakers

In all but a few states, the reading achievement gap between adolescent Hispanic students and White students has not narrowed (Hemphill & Vanneman, 2011; U.S. Department of Education NCES, 2013a). SEAs should push for reauthorization of ESEA which includes a comprehensive literacy component. Within that push, states must ensure that state literacy teams are prepared to include provisions for teacher recruitment, preparation, and in-service professional development in order to build capacity in adolescent literacy instruction for Hispanic ELs. Educators must be prepared to provide

evidence based instruction which includes explicit higher level strategy instruction that is designed to meet the needs of adolescent Hispanic ELs.

Absent reauthorization that includes provisions for adolescent literacy education, states not experiencing a narrowing of this gap should apply for SRCL Program grants (U.S. Department of Education, Striving Readers Comprehensive Literacy Program, 2012). Within the formula grant, states should include literacy team members who have the expertise in culturally relevant components of supportive literacy instruction for adolescent Hispanic ELs. The state literacy plan should include provisions for professional development for educators in supportive instruction that includes declarative, procedural and conditional reading strategy instruction or other evidence based effective reading instruction that that is tailored to meet the needs of culturally diverse students.

As states continue monitoring data that track the achievement gap between White students and adolescent Hispanic ELs, state school boards should examine gaps in the number of personnel who are highly trained to serve the literacy needs of this population. Where gaps in trained personnel are extant, state school boards should collaborate with state literacy teams, colleges of education, minority and Hispanic serving institutions, educators, LEAs, and parents to build consensus on the types of professional development needed within the pre-service and in-service educator ranks. Where possible, states should collaborate with minority serving institutions or Hispanic serving institutions to develop literacy programs aimed at ameliorating the reading achievement gap that can serve as scalable models for other state colleges of education. These

programs should be shared with other state colleges of education to ensure that at a minimum, awareness training is integrated into all colleges of education with regard to the need for specific literacy instruction for adolescent Hispanic ELs. State school boards should take an advocacy role for LEAs to ensure that there is a plan to raise awareness and build capacity to serve the literacy needs of this population.

Recommendations for Local Policymakers

At the local level, policymakers should monitor gaps in achievement between adolescent White and Hispanic EL students' reading achievement. Where problems exist, policymakers, educators, and other stakeholders should dialogue with state literacy teams to help develop actionable plans aimed at narrowing this gap. Specifically, policymakers should ensure literacy coaches, teachers, and instructional support personnel receive professional development that includes components of literacy instruction relative to adolescent Hispanic EL students. This professional development should include building an understanding of the importance of explicit, prolonged, scaffolded, higher level strategy instruction and the essential elements of declarative, procedural and conditional knowledge of strategy use. Additionally, educators should undergo awareness training on building positive student-teacher relationships as a component of reading achievement and culturally relevant instruction. Data from ongoing monitoring of changes in the gap should be used to inform modifications to be made to professional development.

Local school boards should highlight disaggregated achievement gap data that help parents and other stakeholders understand where gaps in reading achievement exist

within the district populations. Local school boards, parents and other stakeholders should engage in discussion to help to determine a course of action aimed at reducing the gaps in reading achievement, that encompass plans outside of professional development for educators. Local school boards can support efforts by parents and other stakeholders by providing a venue for ideas to be voiced within the community and facilitate the sharing of information with school leaders and educators.

Recommendations for Advocacy

The role of advocacy for Hispanic ELs in policy should not be ignored. Within the political system, the demands and supports of the education subsystem operate in a state of dynamic tension in which political actors are competing for scarce resources. According to Easton (1965), these supports and demands can either act in tandem or in opposition. The challenge is bringing together different stakeholders to inform and discuss interests and competing needs to agree upon meaningful demands and work collectively to influence decision makers.

There are numerous national advocacy and professional organizations representing a diverse group of stakeholders who explicitly support a comprehensive literacy program. In a letter dated February 2, 2015 approximately 50 groups and organizations signed onto the Advocates for Literacy letter in support of the LEARN Act (H.R. 858, 2015) calling for an increase in the federal commitment to improve literacy instruction through development, implementation, and funding of literacy initiatives within a reauthorization of ESEA. This advocacy group is working at the federal level to

address the funding needs to ensure students of all ages have access to quality literacy instruction.

As these groups and organizations coalesce around comprehensive literacy instruction, advocates from all positions along the political spectrum should voice support of ESEA reauthorization, which includes a comprehensive literacy component for adolescent learners and funding for programs such as SRCL. Additionally, advocates at all levels should continue to examine specific concerns with regard to reading achievement, adolescent learners, struggling readers, Hispanic students, ELs, and achievement gaps. This information should be used to create collective *inputs of demands* (Easton, 1965) that will exert political influence in meaningful ways that can help ameliorate the reading achievement gap between adolescent White and Hispanic students and other populations.

At the local level, this calls for educators and other stakeholders to monitor closely the achievement gaps in reading, between White students and adolescent Hispanic EL students as well as other populations. This information should be used to inform advocacy groups as to how to enter into meaningful dialogue with schools, districts parents, students, and other stakeholders. The concerns that emerge from these conversations can help to structure meaningful demands for culturally responsive reading strategy instruction that can be used to leverage policy changes aimed at addressing the needs of the population of interest at the school, district, and state level.

Armed with information about the gaps in literacy, parents have an important role in advocating for meaningful change. Parent voice at the school and district level can

help build constituency that reaches a critical mass to enact meaningful changes. Parent advocates should begin by discussing concerns with school boards to understand if there are differences across the district and then focus on solution-based dialogue for problem areas.

Concerned parents should engage in conversation with teachers and school leaders to discuss reservations related to achievement gaps and question the course of action being taken within the school and the district to ameliorate the gap. Working with school leaders, parent teacher associations, local youth clubs, religious organizations, business partners, and other stakeholders, parent constituencies should work collaboratively to develop actionable plans that include strategies for raising community awareness and campaigns aimed at making policy changes to address needs of the population of interest. Within the stakeholder population, it is important to consider students in an advocacy role. Direct input from Hispanic ELs within schools and districts can add help shape the manner in which their literacy needs are addressed. Within the systems analysis model, parents are also responsible for continually monitoring changes in the gap and continually providing feedback to help direct future activities.

Future Research

When examining the summary of research on reading behaviors in conjunction with the findings from this study, the most salient implication for future research is that there is a need to examine if there are differences in triggering mechanisms between adolescent Hispanic EL learners who use strategies frequently and those who do not. Additionally, studies of metacognitive strategy awareness may be useful to help

understand why adolescent Hispanic EL readers select particular strategies to help them comprehend text and how these differ when reading in English and Spanish. These types of studies would be important based on findings of this study that roughly 30 percent of the study population reported minimal use of reading strategies, approximately 24 percent use low level reading strategies, and 54 percent do not understand the usefulness of higher level strategies. Specifically, the information from these types of studies could lead to further developments of culturally responsive reading strategy instruction by helping to increase understanding about whether adolescent Hispanic ELs select low level strategies because they are unaware of higher level strategies, or if when reading in English they are unable to access higher level strategies. It may also prove to be helpful to include comparative age in the study design to explore the significance of age on these aspects of strategy access and use.

Within the research associated with the dimension of learning contexts, the aspects of student-teacher relationship, teacher expectations, and supportive instruction were analyzed. Hughes and Kwok (2007) found that supportive relationships with students had a direct effect on reading achievement and that this held true across all ethnicities (Hughes et al., 2012). Researchers such as Lopez (2011) and Becerra (2012) found that higher teacher expectations were associated with positive academic outcomes. Tenenbaum and Ruck (2007) found that teacher expectations differed across ethnicities with the lowest teacher expectations for Hispanic students. Additionally, other researchers found that explicit strategy instruction which included scaffolding and modelling (Brown & Breommel, 2011; Cantrell et al., 2010) was important to adolescent

readers reading achievement outcomes. Olson and Land (2007) found that explicit, prolonged, scaffolded and modeled instruction on the three aspects of strategy use that included declarative, procedural and conditional knowledge was associated with gains in reading achievement.

Results from this study do not provide clear results on how the interaction of student and principal/designee perceptions of student-teacher relationship, teacher expectations, and supportive instruction are related to effective reading strategy use and reading achievement. It is important to note that the dimensions of principal/designee perceptions of student-teacher relationship and teacher expectations were integrated into a single variable, making it impossible to analyze these two dimensions separately. Additionally, the variables used to measure supportive instruction were found to be insignificant predictors of strategy use grouping. The findings from this study do indicate that there is a need to qualitatively explore the effect of student-teacher relationship and teacher expectations on reading strategy use separating out the two dimensions. Additionally, data need to be collected from teachers in addition to the principal/designee and student perceptions of these dimensions. More data in this area would be helpful to guide policy in dimensions of culturally responsive reading strategy instruction that may otherwise escape consideration.

The vast amount of data available in data sets from international studies such as PISA offer researchers opportunities to readily access information on a variety of students of similar profiles within the United States' school population. A similar approach to this analysis could be used with PISA data to examine the general population

of low-achieving students or other subsets of students to see if similar findings emerge. Although this study has called for the need for culturally responsive strategy instruction for Hispanic EL students, secondary analysis of other subpopulations of students may prove useful to inform policies related to effective culturally responsive literacy instruction for other groups. These groups do not need to be limited by language, race or ethnicity but could be considered for the general population of low-achieving students or for specific factors such as gender, family structure, socioeconomic status, immigrant status, or other factors either alone or in combination as the primary discriminatory variables.

Data not available in the PISA data set that may also prove to be helpful to researchers is country of origin of immigrant students. Within the population of Hispanic students in the United States, the data set does not include a variable to discern country of origin for these students. This information could prove helpful to researchers who are interested in determining nuances in differences between subsets of populations, such as Hispanic ELs. Research that includes this type of nuanced information could prove helpful to districts with large populations of students who share similar characteristics, as in being Hispanic but differ in country of origin, by offering discriminatory information that could help inform professional development for educators and instruction for students.

Additionally, within this study, the findings related to student and principal/designee perceptions of student-teacher relationship and teacher expectations indicate a need to consider collecting teacher data that can be used to corroborate student

self-report data. For example, information collected by the school questionnaire asks classroom level information from principals or their designees, not teachers. Specifically the principal or their designee's are asked about teacher expectations and student-teacher relationship. Findings from research of Hughes and Kwok (2007), Ferlazzo (2012) and Tenenabaum and Ruck (2007) indicate that these factors are associated with student achievement in reading; to provide more reliable data with regard to these important factors, these data should be collected from teachers. In addition to self-report data, studies that involve direct observation of student-teacher relationships within authentic learning contexts along with data collected from teachers could serve to bolster reliability of the self-report nature of the data provided by PISA.

Limitations

Limitations of the Data Set

There are three principal concerns of note that are associated with using self-report questionnaire data from PISA and other large scale assessment (LSA) data sets. These include the use of background data in achievement estimation, the reliability of self-report data, and the validity of the self-report data. Research indicates that although similar, there are concerns for both the student and school questionnaires, which are primarily attributable to the cross-national nature of LSAs (Hamilton, 2009; Rutkowski & Rutkowski, 2010; Schulz & Fraillon, 2011).

Rutkowski and Rutkowski (2010) note that "background data play an integral role in the development of achievement scores for assessed subpopulations" (p.425) and as such, call for an awareness of limitations of the data to be acquired. The authors

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highlight problems associated with missing data, respondent misinterpretation, and low reliability on some of the background questionnaire items. Although the cautionary note is raised, Rutkowski and Rutkowski posit that these cause little concern for most OECD countries, including the United States. Schulz and Fraillon (2011) raise similar concerns regarding student questionnaires as related to the cross-national nature of the assessment. In examining student questionnaire data related to student learning strategies, Schulz and Fraillon found differences in response patterns of the questionnaire data across countries. The authors attribute these differences to the use of subjective, Likert-type scale items. The authors call for careful analyses and caution in interpreting results in cross-country comparative research. There are two items that are accessed from the data set for this study that relate to student background -- these variables were used solely to identify the target population.

Although in this study, these data are not used for comparative purposes to other populations or countries, it is important to note that although data are accessed from students who live within the United States; the target population represents students who come from other countries and also differ in other ways. Although the study population share characteristics of age, EL status, and a language other than the test being spoken at home, these students also differ. Specific differences identified in this study include immigrant status, student age, and the number of years living in United States. The fact that some of these students come from different countries (which are not identifiable in the data set) raises the potential that the target population may represent differing cultural backgrounds, which may in turn impact the reliability of the self-report data.

The overall reliability of the study sample over the entirety of the scaled indices is favorable, however. According to Tavakol and Dennick (2011), acceptable values of Cronbach's alpha can range from .70 to .95 with values above .90 indicating that redundancies may exist in the test. In examining Table 2, the reader should note that although there are no values below .70, there are several values above .90 in the United States' and study sample populations with one value exceeding the acceptable Cronbach's range suggested by Tavakol and Dennick. Rutkowski and Rutkowski (2010) have reported that the reliabilities of LSA questionnaires have typically been lower for less economically developed countries, and researchers such as Hopfenbeck and Maul (2011) have posited that these reliabilities are associated with cultural mismatches between many of the Likert-style questions and the respondents. Both Tavakol and Dennick and Hopfenbeck and Maul call for researchers and policy makers to use caution and recognize the limitations of these data for making policy decisions.

In addition to concerns about the student questionnaire, Hamilton (2009) raises concerns with regard to these PISA-type questionnaires that are completed by the principal or their designee. The primary concern is validity, specifically the interpretation of the questions in relation to the intent of the question. Hamilton suggests that this is especially relevant in PISA, because of the cross-national nature of the assessment and the linguistic and cultural differences across the nations tested. As with the student questionnaire data, a limited number of variables are being accessed from the data set and these will not be used for cross national comparisons. It is important to note again that many of the questions answered by the principal/designee regarding teacher

behaviors are a proxy for the more meaningful first-hand information from classroom teachers or, as suggested, by direct observation by researchers.

In contrast to concerns expressed with principal and designee questionnaires, Marsh, Hau, Artelt, Baumert, and Peschar (2006) defend the use of Likert-type scale items that are embedded in the Student Approaches to Learning (SAL) instrument used in the PISA student questionnaire. The SAL is specifically used to collect data on the use of learning strategies, which includes the type of data accessed in this study. Marsh et al. evaluated SAL responses finding that the "relationship among and between SAL responses and criterion variables support the construct validity of interpretations based on SAL responses" (p. 353). Samuelstuen and Braten (2007) also suggest that the self-report learning strategy scale data from PISA are valid. Samuelstuen and Braten demonstrated that task-specific self-report data corresponded well with student strategy use when tracking strategy use within student learning materials. This study was limited to a subset of the population within the United States and is not to be used for cross-country comparisons or analysis and comparisons across populations. Although Samuelstuen and Braten posit that there is validity in the strategy use questionnaire items, caution should be exercised when interpreting results and results should not be generalized to the entire PISA population.

Hopfenbeck and Maul (2011) also examined the student questionnaire data focused on measuring the use of specific learning strategies. The authors suggest that for a variety of reasons, a *non-trivial* number of lower performing students are not responding to questionnaire items in the desired manner. The Hopfenbeck and Maul

findings raise validity questions regarding the use of the SAL, which Marsh et al. (2006) report as valid. The authors however raise an important point that there are a *non-trivial* number of low performing students who show significant variation in the quality of responses attributed to misinterpretation of the questionnaire which the authors associate with lower performance on achievement scales. The authors note that correlations drawn between learning strategy scales and achievement indicators may not accurately reflect the strength of the relationship and as such, should be interpreted with caution.

In addition to concerns about the reliability and validity of self-report PISA data, there have also been questions raised regarding the 2009 U.S. PISA sample, from which the subset for this study was drawn. Carnoy and Rothstein (2013) suggest that a sampling error in the 2009 PISA assessment cycle caused an over representation of students from the most disadvantaged schools. They suggest that the oversampling of these students depressed average United States' test scores resulting in inaccurate comparisons of the United States with other nations. Andreas Schleicher (OECD Deputy Director for Education and Special Advisor on Education Policy to the OECD's Secretary-General) responded to the purported error with an explanation that the NCES data set that Carnoy and Rothstein accessed to calculate the actual percentage of students living in poverty was different from the NCES data set used to construct the United States' sample; Dana Kelley of NCES confirmed that Carnoy and Rothstein referenced the wrong NCES data in their estimation (personal communication, May 1, 2014). The correspondence does not clearly establish the magnitude of the disparity, and the two parties did not resolve the differences. These arguments call attention to the importance

of differing interpretations. The data accessed for this study was not used for cross-country comparative purposes; instead, a subset of the US 2009 PISA population who fit a narrowly defined selection criterion was used in the analysis. This study does not address comparisons of performance across the nation based on the SES status of students. However the question of over representation of low SES students should be noted and the results of the analysis should be reported with a caution.

Study Limitations

There are four principal limitations to this study. The first pertains to the use of a partial data set. The scope of this study includes a subpopulation of the PISA 2009 administration and only pertains to adolescent Hispanic EL students within United States' schools and, as such, the findings of this study are not generalizable to the entirety of the United States' student population. Further, the scope of this study does not include access to the breadth of information which is contained within the data for each student case and, therefore, did not include rich contextual factors that could be informative to understanding strategy use in relation to Hispanic ELs. Future studies of Hispanic ELs and reading strategy use could include SES factors, geographic factors and factors associated with gender, family structure and other background information to better understand how these students are clustered and how these differ with respect to reading achievement.

The second limitation is the use of self-reported data. Although there are studies that validate the use of the SAL as a valid measure of strategy use (Marsh et al., 2006), and that overall use of self-report Likert style questionnaire data is reliable within the

United States' portion of the data set (Hamilton, 2009; Rutkowski & Rutkowski, 2010; Schulz & Fraillon, 2011) the use of self-report data rely on the recall of respondents and their interest in providing accurate information. Recognizing that these data are a unique, rich source of information needed for this study, the reliability of the responses must be taken into account when considering results of the study.

The third limitation pertains to the complexity of the sample design and is related to the use of the partial data set. Because the sampling design was a multi-stage stratified sampling design, the data are nested and are not from a true random sample of the United States' population of PISA-eligible students and therefore cannot be assumed to be truly independent. Drawing a homogeneous subset from the overall sample, it is assumed, but not confirmed, that this subset of data is not truly independent. Violations of the assumption of independence do not impact the cluster analysis results but can imply that the results from both the ANOVA and the MLR analyses may have provided liberal significance values which should be considered when examining results of this study in relation to the cluster groupings. There are multiple avenues to explore the PISA data set in order to answer questions pertaining to reading strategy use and learning contexts. The methodology used in this study was used to answer the four research questions posed. Alternate approaches such as the use of hierarchical linear modeling could allow for finer manipulation of these data which could perhaps yield additional findings.

Lastly, it is important to note that the variables used to represent learning contexts merely approximate the range of teacher strategies that are used in the classroom. In the case of the principal/designee's responding to questions about student-teacher

relationship and teacher expectations, these variables are a proxy for the more meaningful first-hand information from classroom teachers. Data from these questionnaires can be helpful to researchers in interpreting student achievement results; however researchers must recognize the limitations of using these types of approximations of classroom context.

Summary and Conclusions

This study revealed that within the United States, the patterns of reading strategy use and understanding of the usefulness of metacognitive strategies of adolescent Hispanic EL students clustered into three statistically significant groups and the mean differences in the reading achievement scores also differed significantly between these clusters. These differences were important, implicating that student understanding of the usefulness of metacognitive strategies, not the frequency of use of strategies, differentiated between students whose PISA reading levels are considered to be at the baseline of reading proficiency and those who are considered more successful readers. Additionally, the study revealed that student and principal/designees perceptions of learning contexts acted functionally as discriminating factors between those who moderately use reading strategies and those who use them minimally. When separating out student-teacher relationships from the other learning contexts, student perceptions of student-teacher relationship was positively associated with, but not a proxy for, belonging to the highest performing cluster.

The Hispanic EL population is growing within the United States' schools. For the growing study population, the higher dropout rate is in part attributable to reading

achievement (Hernandez, 2012). As evidenced in this study, adolescent Hispanic ELs use strategies differently and those differences are associated with reading achievement outcomes. The literature presented provides evidence that in order to bolster the appropriate use of reading strategies, explicit, prolonged instruction is needed. Additionally this study reveals a need for culturally responsive strategy instruction for Hispanic ELs. These types of instruction are needed in order to help reduce achievement gaps between adolescent Hispanic ELs and other populations. Recommendations are that policymakers, researchers and advocacy groups at all levels work collaboratively to access dedicated funding that can stimulate the incorporation of effective instructional practices to meet the needs of this population. This will require ongoing monitoring of and response to the achievement gap through the process of inputs of demands and supports of the political system to actuate culturally relevant reading strategy instruction.

Appendix A

George Mason University HSRB Approval Letter

GEORGE MASON UNIVERSITY

Office of Research Integrity and Assurance

Research Hall, 4400 University Drive, MS 6D5, Fairfax, Virginia 22030
Phone: 703-993-5445; Fax: 703-993-9590

DATE: January 26, 2015

TO: Penny Earley, PhD
FROM: George Mason University IRB

Project Title: [703966-1] [692177-1] DIFFERENCES IN U.S. ADOLESCENT HISPANIC
                   EL READERS STRATEGY USE AND PERFORMANCE ON READING
                   ACHIEVEMENT AND THE PREDICTIVE VALUE OF LEARNING CONTEXTS

SUBMISSION TYPE: New Project

ACTION: DETERMINATION OF NOT HUMAN SUBJECT RESEARCH
DECISION DATE: January 26, 2015

Thank you for your submission of New Project materials for this project. The Office of Research Integrity & Assurance (ORIA) has determined this project does not meet the definition of human subject research under the purview of the IRB according to federal regulations.

Please remember that if you modify this project to include human subjects research activities, you are required to submit revisions to the ORIA prior to initiation.

If you have any questions, please contact Karen Motsinger at 703-993-4208 or kmotsing@gmu.edu. Please include your project title and reference number in all correspondence with this committee.

This letter has been electronically signed in accordance with all applicable regulations, and a copy is retained within George Mason University IRB's records.

- 1 -   Generated on IRBNet

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Appendix B

NAEP and PISA Proficiency Levels

Grade 8 NAEP reading achievement levels.

Grade 8

Basic (243)	Eighth-grade students performing at the *Basic* level should be able to locate information; identify statements of main idea, theme, or author's purpose; and make simple inferences from texts. They should be able to interpret the meaning of a word as it is used in the text. Students performing at this level should also be able to state judgments and give some support about content and presentation of content.
Proficient (281)	Eighth-grade students performing at the *Proficient* level should be able to provide relevant information and summarize main ideas and themes. They should be able to make and support inferences about a text, connect parts of a text, and analyze text features. Students performing at this level should also be able to fully substantiate judgments about content and presentation of content.
Advanced (323)	Eighth-grade students performing at the *Advanced* level should be able to make connections within and across texts and to explain causal relations. They should be able to evaluate and justify the strength of supporting evidence and the quality of an author's presentation. Students performing at the Advanced level also should be able to manage the processing demands of analysis and evaluation by stating, explaining, and justifying.

Source: U.S. Department of Education, National Center for Education Statistics. *NAEP Achievement Levels.* (2014). Retrieved from
http://nces.ed.gov/nationsreportcard/achievement.aspx#descriptions

Grade 12 NAEP reading achievement levels

Grade 12

Basic (265)	Twelfth-grade students performing at the *Basic* level should be able to identify elements of meaning and form and relate them to the overall meaning of the text. They should be able to make inferences, develop interpretations, make connections between texts, and draw conclusions; and they should be able to provide some support for each. They should be able to interpret the meaning of a word as it is used in the text.
Proficient (302)	Twelfth-grade students performing at the *Proficient* level should be able to locate and integrate information using sophisticated analyses of the meaning and form of the text. These students should be able to provide specific text support for inferences, interpretative statements, and comparisons within and across texts.
Advanced (346)	Twelfth-grade students performing at the *Advanced* level should be able to analyze both the meaning and the form of the text and provide complete, explicit, and precise text support for their analyses with specific example. They should be able to read across multiple texts for a variety of purposes, analyzing and evaluating them individually and as a set.

Source: U.S. Department of Education, National Center for Education Statistics. *NAEP Achievement Levels.* (2014). Retrieved from
http://nces.ed.gov/nationsreportcard/achievement.aspx#descriptions

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*Description of PISA proficiency levels on combined reading literacy scale: 2009*

Exhibit 1. Description of PISA proficiency levels on combined reading literacy scale: 2009

Proficiency level and lower cut point score	Task descriptions
Level 6 698	At level 6, tasks typically require the reader to make multiple inferences, comparisons and contrasts that are both detailed and precise. They require demonstration of a full and detailed understanding of one or more texts and may involve integrating information from more than one text. Tasks may require the reader to deal with unfamiliar ideas, in the presence of prominent competing information, and to generate abstract categories for interpretations. Reflect and evaluate tasks may require the reader to hypothesize about or critically evaluate a complex text on an unfamiliar topic, taking into account multiple criteria or perspectives, and applying sophisticated understandings from beyond the text. There are limited data about access and retrieve tasks at this level, but it appears that a salient condition is precision of analysis and fine attention to detail that is inconspicuous in the texts.
Level 5 626	At level 5, tasks involve retrieving information that require the reader to locate and organize several pieces of deeply embedded information, inferring which information in the text is relevant. Reflective tasks require critical evaluation or hypothesis, drawing on specialized knowledge. Both interpretative and reflective tasks require a full and detailed understanding of a text whose content or form is unfamiliar. For all aspects of reading, tasks at this level typically involve dealing with concepts that are contrary to expectations.
Level 4 553	At level 4, tasks involve retrieving information that require the reader to locate and organize several pieces of embedded information. Some tasks at this level require interpreting the meaning of nuances of language in a section of text by taking into account the text as a whole. Other interpretative tasks require understanding and applying categories in an unfamiliar context. Reflective tasks at this level require readers to use formal or public knowledge to hypothesize about or critically evaluate a text. Readers must demonstrate an accurate understanding of long or complex texts whose content or form may be unfamiliar.
Level 3 480	At level 3, tasks require the reader to locate, and in some cases recognize the relationship between, several pieces of information that must meet multiple conditions. Interpretative tasks at this level require the reader to integrate several parts of a text in order to identify a main idea, understand a relationship or construe the meaning of a word or phrase. They need to take into account many features in comparing, contrasting or categorizing. Often the required information is not prominent or there is much competing information; or there are other text obstacles, such as ideas that are contrary to expectation or negatively worded. Reflective tasks at this level may require connections, comparisons, and explanations, or they may require the reader to evaluate a feature of the text. Some reflective tasks require readers to demonstrate a fine understanding of the text in relation to familiar, everyday knowledge. Other tasks do not require detailed text comprehension but require the reader to draw on less common knowledge.
Level 2 407	At level 2, some tasks require the reader to locate one or more pieces of information, which may need to be inferred and may need to meet several conditions. Others require recognizing the main idea in a text, understanding relationships, or construing meaning within a limited part of the text when the information is not prominent and the reader must make low level inferences. Tasks at this level may involve comparisons or contrasts based on a single feature in the text. Typical reflective tasks at this level require readers to make a comparison or several connections between the text and outside knowledge, by drawing on personal experience and attitudes.
Level 1a 335	At level 1a, tasks require the reader to locate one or more independent pieces of explicitly stated information; to recognize the main theme or author's purpose in a text about a familiar topic, or to make a simple connection between information in the text and common, everyday knowledge. Typically the required information in the text is prominent and there is little, if any, competing information. The reader is explicitly directed to consider relevant factors in the task and in the text.
Level 1b 262	At level 1b, tasks require the reader to locate a single piece of explicitly stated information in a prominent position in a short, syntactically simple text with a familiar context and text type, such as a narrative or a simple list. The text typically provides support to the reader, such as repetition of information, pictures or familiar symbols. There is minimal competing information. In tasks requiring interpretation the reader may need to make simple connections between adjacent pieces of information.

NOTE: To reach a particular proficiency level, a student must correctly answer a majority of items at that level. Students were classified into reading literacy levels according to their scores. Cut point scores in the exhibit are rounded; exact cut point scores are provided in appendix B. Scores are reported on a scale from 0 to 1,000.
SOURCE: Organization for Economic Cooperation and Development (OECD), Program for International Student Assessment (PISA), 2009.

Source: Fleischman, H.L., Hopstock, P.J., Pelcsar, M.P., and Shelley, B.E., 2010, p.10

PISA 2009 Questionnaires

Exhibit B1: Pisa 2009 Student Questionnaire

In this booklet you will find questions about:

- You
- Your family and your home
- Your reading activities
- Learning time
- Classroom and school climate
- Your English classes
- Libraries
- Your strategies in reading and understanding texts

In some of the questions you will be asked about *reading*. What we specifically mean by reading is the skill to understand, use and think about *written* texts. This skill is needed to reach one's goals, to develop one's knowledge and potential, and to take part in society.

Please read each question carefully and answer as accurately as you can. In the test you usually circled your answers. For this questionnaire, you will normally answer by darkening a circle. For a few questions you will need to write a short answer.

If you make a mistake when darkening a circle, erase your mistake and darken the correct circle. If you make a mistake when writing an answer, simply cross it out and write the correct answer next to it.

In this questionnaire, there are no right or wrong answers. Your answers should be the ones that are right for you.

You may ask for help if you do not understand something or are not sure how to answer a question.

Your answers will be combined with others to make totals and averages in which no individual can be identified. All your answers will be kept confidential.

Q1 What grade are you in?

_____

grade

Q2 How long have you been in this school?

(Please darken only one circle.)

Less than one year	O₁
One to two years	O₂
Three to four years	O₃
More than four years	O₄

Less than one year O_1

One to two years O_2

Three to four years O_3

More than four years O_4

Q3 When were you born?

(Please write the month, day and year you were born)

_____ _____ 19___

Month   Day   Year

Q4 Are you female or male?

Female   *Male*

O_1 O_2

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Q5   **Which best describes you?**

(Please darken only one circle.)

I am Hispanic or Latino.   O₁

I am <u>not</u> Hispanic or Latino.   O₂

Q6   **Which of these categories best describes your race?**

(Please darken one or more circles.)

White   O₁

Black or African American   O₂

Asian   O₃

American Indian or Alaska Native   O₄

Native Hawaiian or Other Pacific Islander   O₅

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Q7 Did you attend pre-school?

No O_1

Yes, for one year or less O_2

Yes, for more than one year O_3

Q8 Did you attend kindergarten?

No O_1

Yes O_2

Q9 How old were you when you started first grade?

_____ *years*

Q10 Have you ever repeated a grade?

(Please darken only one circle in each row)

	No, never	Yes, once	Yes, twice or more
a) In kindergarten	O_1	O_2	O_3
b) In grades 1-6	O_1	O_2	O_3
c) In grades 7-9	O_1	O_2	O_3
d) In grades 10-12	O_1	O_2	O_3

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Q11 What is the highest grade or level of school you expect to complete?

(Please darken only one circle.)

Less than high school	O_1
High school	O_2
Vocational or technical certificate (such as cosmetology or auto mechanics)	O_3
Associate's degree (2-year degree from a community college)	O_4
Bachelor's degree (4-year college degree)	O_5
Master's degree	O_6
Doctoral or professional degree such as medicine or law	O_7

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SECTION 2: YOUR FAMILY AND YOUR HOME

In this section you will be asked some questions about your family and your home.

Some of the following questions are about your mother and father or those persons who are like a mother or father to you — for example, guardians, step-parents, foster parents, etc.

If you share your time with more than one set of parents or guardians, please answer the following questions for those parents/guardians you spend the most time with.

Q12   Who usually lives at home with you?

(Please darken one circle in each row)

	Yes	No
a) Mother (including stepmother or foster mother)	O_1	O_2
b) Father (including stepfather or foster father)	O_1	O_2
c) Brother(s) (including stepbrothers)	O_1	O_2
d) Sister(s) (including stepsisters)	O_1	O_2
e) Grandparent(s)	O_1	O_2
f) Others (e.g., cousin)	O_1	O_2

Q13a What is your mother's main job?
(e.g., school teacher, cook, sales manager)

(If she is not working now, please tell us her last main job)

Please write in the job title. _____

Q13b What does your mother do in her main job?
(e.g., teaches high school students, helps prepare meals in a restaurant, manages a sales team)

Please use a sentence to describe the kind of work she does or did in that job.

_____

Q14 What is the highest level of schooling (not including college) completed by your mother?

If you are not sure which circle to choose, please ask the test administrator for help.

(Please darken only one circle)

She completed grade 12 (high school diploma or GED).	O_1
She completed grade 9.	O_2
She completed grade 6.	O_3
She did not complete grade 6.	O_4

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Q15 Does your mother have any of the following degrees, certificates or diplomas?

If you are not sure how to answer this question, please ask the test administrator for help.

(Please darken one circle in each row)

	Yes	No
a) Master's, doctoral, or professional degree such as medicine or law	O_1	O_2
b) Bachelor's degree (4-year college degree)	O_1	O_2
c) Associate's degree (2-year degree from a community college)	O_1	O_2
d) Vocational or technical certificate/diploma after high school (such as cosmetology or auto mechanics)	O_1	O_2

Q16 What is your mother currently doing?

(Please darken only one circle)

Working full-time for pay O_1

Working part-time for pay O_2

Not working, but looking for a job O_3

Other (e.g., home duties, retired) O_4

Q17a **What is your father's main job?**
(e.g., school teacher, cook, sales manager)

(If he is not working now, please tell us his last main job)

Please write in the job title. _____

Q17b **What does your father do in his main job?**
(e.g., teaches high school students, helps prepare meals in a restaurant, manages a sales team)

Please use a sentence to describe the kind of work he does or did in that job.

_____

Q18 **What is the highest level of schooling (not including college) completed by your father?**

If you are not sure how to answer this question, please ask the test administrator for help.

(Please darken only one circle)

He completed grade 12 (high school diploma or GED).	O_1
He completed grade 9.	O_2
He completed grade 6.	O_3
He did not complete grade 6.	O_4

Q19 Does your father have any of the following degrees, certificates or diplomas?

If you are not sure which circle to choose, please ask the test administrator for help.

(Please darken one circle in each row)

	Yes	No
a) Master's, doctoral, or professional degree such as medicine or law	O₁	O₂
b) Bachelor's degree (4-year college degree)	O₁	O₂
c) Associate's degree (2-year degree from a community college)	O₁	O₂
d) Vocational or technical certificate/diploma after high school (such as cosmetology or auto mechanics)	O₁	O₂

Q20 What is your father currently doing?

(Please darken only one circle)

Working full-time for pay	O₁
Working part-time for pay	O₂
Not working, but looking for a job	O₃
Other (e.g., home duties, retired)	O₄

Q21 In what country were you and your parents born?

(Please darken one circle in each column)

	You	Mother	Father
United States*	O	O	O
Other country	O	O	O

*NOTE: the "United States" refers to the 50 states, District of Columbia, and U.S. military bases abroad.

Q22 If <u>you</u> were NOT born in the United States, how old were you when you arrived in the United States?

If you were less than 12 months old, please write zero (0).

If you were born in the United States please skip this question and go to Q23.

_____ years

Q23 What language do you speak at home most of the time?

(Please darken only one circle)

English	O
Spanish	O
Other language	O

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Q24 Which of the following are in your home?

(Please darken one circle in each row)

	Yes	No
a) A desk to study at	O_1	O_2
b) A room of your own	O_1	O_2
c) A quiet place to study	O_1	O_2
d) A computer you can use for school work	O_1	O_2
e) Educational software	O_1	O_2
f) A link to the Internet	O_1	O_2
g) Classic literature (e.g., Shakespeare)	O_1	O_2
h) Books of poetry	O_1	O_2
i) Works of art (e.g., paintings)	O_1	O_2
j) Books to help with your school work	O_1	O_2
k) Technical reference books or manuals	O_1	O_2
l) A dictionary	O_1	O_2
m) A dishwasher	O_1	O_2
n) A DVD player	O_1	O_2
o) A guest room	O_1	O_2
p) A high-speed Internet connection	O_1	O_2
q) A musical instrument	O_1	O_2

Q25 <u>How many</u> of these are there at your home?

(Please darken only one circle in each row)

	None	One	Two	Three or more
a) Cell phones	O	O	O	O₄
b) Televisions	O	O	O	O₄
c) Computers	O	O	O	O₄
d) Cars	O	O	O	O₄
e) Bathrooms with a bathtub or shower	O	O	O	O₄

Q26 How many books are there in your home?

There are usually about 15 books per foot of shelving. Do not include magazines, newspapers, or your schoolbooks.

(Please darken only one circle)

0-10 books	O₁
11-25 books	O₂
26-100 books	O₃
101-200 books	O₄
201-500 books	O₅
More than 500 books	O₆

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SECTION 3: YOUR READING ACTIVITIES

The questions in this section are mainly about your reading activities outside school.

Q27   **About how much time do you usually spend reading for enjoyment?**

(Please darken only one circle)

I do not read for enjoyment. O_1

30 minutes or less a day O_2

More than 30 minutes to less than
60 minutes a day O_3

1 to 2 hours a day O_4

More than 2 hours a day O_5

Q28 How much do you agree or disagree with these statements about reading?

(Please darken only one circle in each row)

	Strongly disagree	Disagree	Agree	Strongly agree
a) I read only if I have to.	O₁	O₂	O₃	O₄
b) Reading is one of my favorite hobbies.	O₁	O₂	O₃	O₄
c) I like talking about books with other people.	O₁	O₂	O₃	O₄
d) I find it hard to finish books.	O₁	O₂	O₃	O₄
e) I feel happy if I receive a book as a present.	O₁	O₂	O₃	O₄
f) For me, reading is a waste of time.	O₁	O₂	O₃	O₄
g) I enjoy going to a bookstore or a library.	O₁	O₂	O₃	O₄
h) I read only to get information that I need.	O₁	O₂	O₃	O₄
i) I cannot sit still and read for more than a few minutes.	O₁	O₂	O₃	O₄
j) I like to express my opinions about books I have read.	O₁	O₂	O₃	O₄
k) I like to exchange books with my friends.	O₁	O₂	O₃	O₄

Q29 How often do you read these materials <u>because you want to?</u>

(Please darken only one circle in each row)

	Never or almost never	A few times a year	About once a month	Several times a month	Several times a week
a) Magazines	O_1	O_2	O_3	O_4	O_5
b) Comic books	O_1	O_2	O_3	O_4	O_5
c) Fiction (e.g., novels, narratives, stories)	O_1	O_2	O_3	O_4	O_5
d) Non-fiction books	O_1	O_2	O_3	O_4	O_5
e) Newspapers	O_1	O_2	O_3	O_4	O_5

Q30 How often are you involved in the following reading activities?

(Please darken only one circle in each row. If you don't know what the activity is, darken "I don't know what it is.")

	I don't know what it is	Never or almost never	Several times a month	Several times a week	Several times a day
a) Reading emails	O_1	O_2	O_3	O_4	O_5
b) Chatting on line	O_1	O_2	O_3	O_4	O_5
c) Reading online news	O_1	O_2	O_3	O_4	O_5
d) Using an online dictionary or encyclopedia (e.g., Wikipedia®)	O_1	O_2	O_3	O_4	O_5
e) Searching online information to learn about a particular topic	O_1	O_2	O_3	O_4	O_5
f) Taking part in online group discussions or forums	O_1	O_2	O_3	O_4	O_5
g) Searching for practical information on line (e.g., schedules, events, tips, recipes)	O_1	O_2	O_3	O_4	O_5
h) Text-messaging	O_1	O_2	O_3	O_4	O_5

Q31 **When you are studying, how often do you do the following?**

(Please darken only one circle in each row)

	Almost never	Sometimes	Often	Almost always
a) When I study, I try to memorize everything that is covered in the text.	O_1	O_2	O_3	O_4
b) When I study, I start by figuring out what exactly I need to learn.	O_1	O_2	O_3	O_4
c) When I study, I try to memorize as many details as possible.	O_1	O_2	O_3	O_4
d) When I study, I try to relate new information to prior knowledge acquired in other subjects.	O_1	O_2	O_3	O_4
e) When I study, I read the text so many times that I can recite it.	O_1	O_2	O_3	O_4
f) When I study, I check if I understand what I have read.	O_1	O_2	O_3	O_4
g) When I study, I read the text over and over again.	O_1	O_2	O_3	O_4
h) When I study, I figure out how the information might be useful outside school.	O_1	O_2	O_3	O_4
i) When I study, I try to figure out which concepts I still haven't really understood.	O_1	O_2	O_3	O_4
j) When I study, I try to understand the material better by relating it to my own experiences.	O_1	O_2	O_3	O_4
k) When I study, I make sure that I remember the most important points in the text.	O_1	O_2	O_3	O_4
l) When I study, I figure out how the text information fits in with what happens in real life.	O_1	O_2	O_3	O_4
m) When I study and I don't understand something, I look for additional information to clarify this.	O_1	O_2	O_3	O_4

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SECTION 4: LEARNING TIME

Q32 How many minutes, on average, are there in a class period for the following subjects?

Minutes in a class period in English (English classes may include those in literature, creative writing, journalism, etc.): _____ Minutes

Minutes in a class period in mathematics: _____ Minutes

Minutes in a class period in science: _____ Minutes

Q33 How many class periods per week do you typically have for the following subjects?

Number of class periods per week in English: _____ class periods

Number of class periods per week in mathematics: _____ class periods

Number of class periods per week in science: _____ class periods

Q34 In a normal, full week at school, how many class periods do you have in total?

Number of ALL class periods: _____ class periods

Q35   What type of out-of-school-time lessons do you attend
       currently?

*These are only lessons in subjects that you are also learning at school,
that you spend extra time learning outside of normal school hours. The
lessons may be given at your school, at your home or somewhere else.*

(Please darken only one circle in each row)

	Yes	No
a) Enrichment lessons in English	O_1	O_2
b) Enrichment lessons in mathematics	O_1	O_2
c) Enrichment lessons in science	O_1	O_2
d) Enrichment lessons in other school subjects	O_1	O_2
e) Remedial lessons in English	O_1	O_2
f) Remedial lessons in mathematics	O_1	O_2
g) Remedial lessons in science	O_1	O_2
h) Remedial lessons in other school subjects	O_1	O_2
i) Lessons to improve your study skills	O_1	O_2

Q36 How many hours do you typically spend per week attending out-of-school-time lessons in the following subjects (at school, at home or somewhere else)?

These are only lessons in subjects that you are also learning at school, that you spend extra time learning outside of normal school hours. The lessons may be given at your school, at your home or somewhere else.

(Please darken one circle in each column)

	English	Mathematics	Science	Other subjects
I do not attend out-of-school-time lessons in these subjects.	O_1	O_1	O_1	O_1
Less than 2 hours a week	O_2	O_2	O_2	O_2
2 or more but less than 4 hours a week	O_3	O_3	O_3	O_3
4 or more but less than 6 hours a week	O_4	O_4	O_4	O_4
6 or more hours a week	O_5	O_5	O_5	O_5

SECTION 5: YOUR SCHOOL

Q37   *Thinking about what you have learned in school:* To what extent do you agree or disagree with the following statements?

(Please darken only one circle in each row)

	Strongly disagree	Disagree	Agree	Strongly agree
a) School has done little to prepare me for adult life when I leave school.	O_1	O_2	O_3	O_4
b) School has been a waste of time.	O_1	O_2	O_3	O_4
c) School has helped give me confidence to make decisions.	O_1	O_2	O_3	O_4
d) School has taught me things which could be useful in a job.	O_1	O_2	O_3	O_4

Q38 How much do you disagree or agree with each of the following statements about teachers at your school?

(Please darken only one circle in each row.)

	Strongly disagree	Disagree	Agree	Strongly agree
a) I get along well with most of my teachers.	O_1	O_2	O_3	O_4
b) Most of my teachers are interested in my well-being.	O_1	O_2	O_3	O_4
c) Most of my teachers really listen to what I have to say.	O_1	O_2	O_3	O_4
d) If I need extra help, I will receive it from my teachers.	O_1	O_2	O_3	O_4
e) Most of my teachers treat me fairly.	O_1	O_2	O_3	O_4

SECTION 6: YOUR ENGLISH CLASSES

Q39   On average, about how many students attend your
       English class(es)?

       _____ students

Q40   How often do these things happen in your English
       classes?

       (Please darken only one circle in each row)

	Never or hardly ever	In some classes	In most classes	In all classes
a) Students don't listen to what the teacher says.	O_1	O_2	O_3	O_4
b) There is noise and disorder.	O_1	O_2	O_3	O_4
c) The teacher has to wait a long time for the students to quiet down.	O_1	O_2	O_3	O_4
d) Students cannot work well.	O_1	O_2	O_3	O_4
e) Students don't start working for a long time after the class begins.	O_1	O_2	O_3	O_4

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Q41 In your English classes, how often does the following occur?

(Please darken only one circle in each row)

	Never or hardly ever	In some classes	In most classes	In all classes
a) The teacher asks students to explain the meaning of a text.	O_1	O_2	O_3	O_4
b) The teacher asks questions that challenge students to get a better understanding of a text.	O_1	O_2	O_3	O_4
c) The teacher gives students enough time to think about their answers.	O_1	O_2	O_3	O_4
d) The teacher recommends a book or author to read.	O_1	O_2	O_3	O_4
e) The teacher encourages students to express their opinions about a text.	O_1	O_2	O_3	O_4
f) The teacher helps students relate the stories they read to their lives.	O_1	O_2	O_3	O_4
g) The teacher shows students how the information in texts builds on what they already know.	O_1	O_2	O_3	O_4

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Q42　In your English classes, how often does the following occur?

(Please darken only one circle in each row)

	Never or hardly ever	In some classes	In most classes	In all classes
a) The teacher explains beforehand what is expected of the students.	O_1	O_2	O_3	O_4
b) The teacher checks that students are concentrating while working on the reading assignment.	O_1	O_2	O_3	O_4
c) The teacher discusses students' work, after they have finished the reading assignment.	O_1	O_2	O_3	O_4
d) The teacher tells students in advance how their work is going to be judged.	O_1	O_2	O_3	O_4
e) The teacher asks whether every student has understood how to complete the reading assignment.	O_1	O_2	O_3	O_4
f) The teacher grades students' work.	O_1	O_2	O_3	O_4
g) The teacher gives students the chance to ask questions about the reading assignment.	O_1	O_2	O_3	O_4
h) The teacher poses questions that motivate students to participate actively.	O_1	O_2	O_3	O_4
i) The teacher tells students how well they did on the reading assignment immediately after.	O_1	O_2	O_3	O_4

SECTION 7: LIBRARIES

In this section you are asked questions about libraries. These may be in your school and/or outside your school.

Q43 How often do you visit a library for the following activities?

(Please darken only one circle in each row)

	Never	A few times a year	About once a month	Several times a month	Several times a week
a) Borrow books to read for pleasure	O₁	O₂	O₃	O₄	O₅
b) Borrow books for school work	O₁	O₂	O₃	O₄	O₅
c) Work on homework, course assignments or research papers	O₁	O₂	O₃	O₄	O₅
d) Read magazines or newspapers	O₁	O₂	O₃	O₄	O₅
e) Read books for fun	O₁	O₂	O₃	O₄	O₅
f) Learn about things that are not course-related, such as sports, hobbies, people or music	O₁	O₂	O₃	O₄	O₅
g) Use the Internet	O₁	O₂	O₃	O₄	O₅

Q44 Does your school have a school library?

No   O₁

Yes   O₂

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SECTION 8: YOUR STRATEGIES IN READING AND UNDERSTANDING TEXTS

There are several approaches to studying and understanding texts. Some of them are more useful than others, depending on the kind of reading task. The next two questions present two reading tasks, followed by a list of these approaches or "strategies." We want to know your opinion about the usefulness of these strategies for the different reading tasks.

Both questions begin with a short description of a particular reading task. Then several possible reading strategies are listed. Think about the usefulness of each of the strategies in relation to the given reading task only. Some strategies may be useful for one reading task but not for another.

Give a score between 1 and 6 to each strategy. A score of 1 means you think it is not a useful strategy at all for this reading task. A score of 6 means you think it is a very useful strategy for this reading task.

You can use the same score more than once if you think two or more strategies are similarly useful, but please darken only one circle in each row.

Here is an example question that a student has completed. (This example is about playing table tennis, not reading.)

Example Question

Task: You want to improve at playing table tennis so you can win a local competition.
How do you rate the usefulness of the following strategies for improving at playing table tennis?

Possible strategy	Score Not useful at all (1)	(2)	(3)	(4)	(5)	Very useful (6)
a) I read a book about table tennis technique.	○	●	○	○	○	○
b) I practice playing table tennis against a friend as often as possible.	○	○	○	○	○	●
c) I do general fitness exercises every morning.	○	○	○	●	○	○
d) I watch expert players and try to figure out their techniques.	○	○	○	●	○	○

Q45 Reading task: You have to understand and remember the information in a text.

How do you rate the usefulness of the following strategies for understanding and memorizing the text?

Possible strategy	Score					
	Not useful at all					Very useful
	(1)	(2)	(3)	(4)	(5)	(6)
a) I concentrate on the parts of the text that are easy to understand.	O₁	O₂	O₃	O₄	O₅	O₆
b) I quickly read through the text twice.	O₁	O₂	O₃	O₄	O₅	O₆
c) After reading the text, I discuss its content with other people.	O₁	O₂	O₃	O₄	O₅	O₆
d) I underline important parts of the text.	O₁	O₂	O₃	O₄	O₅	O₆
e) I summarize the text in my own words.	O₁	O₂	O₃	O₄	O₅	O₆
f) I read the text aloud to another person.	O₁	O₂	O₃	O₄	O₅	O₆

Q46   Reading task: You have just read a long and rather difficult two-page text about fluctuations in the water level of a lake in Africa. You have to write a summary.

How do you rate the usefulness of the following strategies for writing a summary of this two-page text?

Possible strategy	Score Not useful at all					Very useful
	(1)	(2)	(3)	(4)	(5)	(6)
a) I write a summary. Then I check that each paragraph is covered in the summary, because the content of each paragraph should be included.	O₁	O₂	O₃	O₄	O₅	O₆
b) I try to copy out accurately as many sentences as possible.	O₁	O₂	O₃	O₄	O₅	O₆
c) Before writing the summary, I read the text as many times as possible.	O₁	O₂	O₃	O₄	O₅	O₆
d) I carefully check whether the most important facts in the text are represented in the summary.	O₁	O₂	O₃	O₄	O₅	O₆
e) I read through the text, underlining the most important sentences. Then I write them in my own words as a summary.	O₁	O₂	O₃	O₄	O₅	O₆

Thank you very much for your cooperation in completing this questionnaire!

Exhibit B2: Pisa 2009 School Questionnaire

This questionnaire asks for information including:
- The structure and organization of the school;
- The student body and teachers;
- The school's resources;
- The school's instruction, curriculum and assessment;
- The school climate;
- The school policies and practices;
- The characteristics of the principal or designee.

This information helps illustrate the similarities and differences between groups of schools in order to better establish the context for students' test results.

The questionnaire should be completed by the principal or designee.
It should take about 30 minutes to complete.

For some questions, specific expertise may be needed. You may consult experts to help you answer these questions.

If you do not know an answer precisely, your best estimate will be adequate for the purposes of the study.

Some questions ask about 10th grade or 10th graders. If you do not have a 10th grade in your school, then answer these questions for the grade in your school that contains the most 15-year-olds.

Your answers will be kept confidential. They will be combined with answers from other principals to calculate totals and averages in which no one school can be identified.

SECTION A: THE STRUCTURE AND ORGANIZATION OF THE SCHOOL

Q1   Do you have the following grade levels in your school?

(Please check one box in each row)

	Yes	No
a) Grade 1	☐₁	☐₂
b) Grade 2	☐₁	☐₂
c) Grade 3	☐₁	☐₂
d) Grade 4	☐₁	☐₂
e) Grade 5	☐₁	☐₂
f) Grade 6	☐₁	☐₂
g) Grade 7	☐₁	☐₂
h) Grade 8	☐₁	☐₂
i) Grade 9	☐₁	☐₂
j) Grade 10	☐₁	☐₂
k) Grade 11	☐₁	☐₂
l) Grade 12	☐₁	☐₂
m) Ungraded school	☐₁	☐₂

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Q2 **Is your school a public or a private school?**

(Please check only one box)

A public school ☐₁

A private school ☐₂

Q3 **About what percentage of your total funding for a typical school year comes from the following sources?**

(Please write a number in each row. Write 0 (zero) if no funding comes from that source.)

	%
a) Government (includes local, state and federal)	_____
b) Tuition, student fees, or school charges paid by parents	_____
c) Benefactors, donations, bequests, sponsorships, parent fundraising	_____
d) Other	_____
Total	100%

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Q4 Which of the following definitions best describes the community in which your school is located?

(Please check only one box)

A village, hamlet or rural area (fewer than 3,000 people) ☐₁

A small town (3,000 to about 15,000 people) ☐₂

A town (15,000 to about 100,000 people) ☐₃

A city (100,000 to about 1,000,000 people) ☐₄

A large city (with over 1,000,000 people) ☐₅

Q5a *We are interested in the options parents have when choosing a school for their children.*

Which of the following statements best describes the schooling available to students in your location?

(Please check only one box)

There are two or more other schools in this area that compete for our students. ☐₁

There is one other school in this area that competes for our students. ☐₂

There are no other schools in this area that compete for our students. ☐₃

Q5b Other than your school, how many public and private schools in this area compete for your students?

(Please write a number in each line. Write 0 (zero) if there are none.)

a) Number of public schools: _____

b) Number of private schools: _____

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SECTION B: THE STUDENT BODY AND TEACHERS

Q6 **As of September 1, 2009, what was the total school enrollment (number of students)?**

(Please write a number in each line. Write 0 (zero) if there are none.)

a) Number of boys: _____

b) Number of girls: _____

Q7 **About what percentage of students in your school repeated a grade, at these levels, last academic year?**

(Please write a number in each row. Write 0 (zero) if nobody repeated a grade. Check the 'not available' box if the level does not exist in your school.)

	%	Level not available in this school
a) The approximate percentage of students repeating a grade at the middle/junior high school level (grades 7-9) in this school last year was:	_____	☐
b) The approximate percentage of students repeating a grade at the high school level (grades 10-12) in this school last year was:	_____	☐

Q8 **About how many students in the 10th grade in your school have a first language that is not English?**

(Please check only one box)

60% or more	☐₁
40% or more but less than 60%	☐₂
20% or more but less than 40%	☐₃
10% or more but less than 20%	☐₄
More than 0%, but less than 10%	☐₅
None	☐₆

Q9 **How many of the following teachers are on the staff of your school?**

Include both full-time and part-time teachers. A full-time teacher is employed at least 90% of the time as a teacher for the full school year. All other teachers should be considered part-time.

(Please write a number in each space provided. Write 0 (zero) if there are none.)

	Full-time	Part-time
a) Teachers in TOTAL	____	____
b) Teachers fully certified by the state in the main assignment field	____	____
c) Teachers with at least a bachelor's degree	____	____

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SECTION C: THE SCHOOL'S RESOURCES

The goal of the following set of four questions is to gather information about the student-computer ratio for students in the 10th grade at your school.

Number

Q10a At your school, what is the total number of students in the 10th grade?

_____

Q10b Approximately, how many computers are available for these students for educational purposes?

_____

Q10c Approximately, how many of the computers listed in Question 10b are connected to the Internet/World Wide Web?

_____

Q10d Approximately, how many computers are available for all students in your school for educational purposes?

_____

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Q11 **Is your school's capacity to provide instruction hindered by any of the following issues?**

(Please check one box in each row)

	Not at all	Very little	To some extent	A lot
a) A lack of qualified science teachers	☐₁	☐₂	☐₃	☐₄
b) A lack of qualified mathematics teachers	☐₁	☐₂	☐₃	☐₄
c) A lack of qualified English teachers	☐₁	☐₂	☐₃	☐₄
d) A lack of qualified teachers of other subjects	☐₁	☐₂	☐₃	☐₄
e) A lack of library staff	☐₁	☐₂	☐₃	☐₄
f) A lack of other support personnel	☐₁	☐₂	☐₃	☐₄
g) Shortage or inadequacy of science laboratory equipment	☐₁	☐₂	☐₃	☐₄
h) Shortage or inadequacy of instructional materials (e.g., textbooks)	☐₁	☐₂	☐₃	☐₄
i) Shortage or inadequacy of computers for instruction	☐₁	☐₂	☐₃	☐₄
j) Lack or inadequacy of Internet connectivity	☐₁	☐₂	☐₃	☐₄
k) Shortage or inadequacy of computer software for instruction	☐₁	☐₂	☐₃	☐₄
l) Shortage or inadequacy of library materials	☐₁	☐₂	☐₃	☐₄
m) Shortage or inadequacy of audio-visual resources	☐₁	☐₂	☐₃	☐₄

SECTION D: SCHOOL CURRICULUM AND ASSESSMENT

Q12 *Some schools organize instruction differently for students with different abilities.* **What is your school's policy about this for students in the 10th grade?**

(Please check one box in each row)

	For all subjects	For some subjects	Not for any subject
a) Students are grouped by ability into different classes.	☐₁	☐₂	☐₃
b) Students are grouped by ability within their classes.	☐₁	☐₂	☐₃

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Q13   In this academic year, which of the following activities does your school offer to students in the 10th grade?

(Please check one box in each row)

	Yes	No
a) Band, orchestra or choir	☐₁	☐₂
b) School play or school musical	☐₁	☐₂
c) School yearbook, newspaper or magazine	☐₁	☐₂
d) Volunteer or service activities	☐₁	☐₂
e) Book club	☐₁	☐₂
f) Debate club or debating activities	☐₁	☐₂
g) School club or school competition for foreign language, mathematics or science	☐₁	☐₂
h) Academic club (e.g., honor society)	☐₁	☐₂
i) Art club or art activities	☐₁	☐₂
j) Sports team or sports activities	☐₁	☐₂
k) Lectures and/or seminars (e.g., guest speakers such as writers or journalists)	☐₁	☐₂
l) Collaboration with local libraries	☐₁	☐₂
m) Collaboration with local newspapers	☐₁	☐₂
n) School-wide scheduled reading periods	☐₁	☐₂

Q14 Does your school offer any of the following options to students in the 10th grade whose first language is not English?

(Please check one box in each row)

	Yes	No
a) These students attend regular classes and receive additional periods of instruction aimed at developing English skills (e.g., reading literacy, grammar, vocabulary, communication).	☐₁	☐₂
b) Before transferring to regular classes, these students attend a preparatory program aimed at developing English skills (e.g., reading literacy, grammar, vocabulary, communication).	☐₁	☐₂
c) Before transferring to regular classes, these students receive some instruction in school subjects through their first language.	☐₁	☐₂
d) These students receive significant amounts of instruction in their first language aimed at developing proficiency in both languages.	☐₁	☐₂
e) Class size is reduced to cater to the special needs of these students.	☐₁	☐₂

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Q15 **Generally, in your school, how often are students in the 10th grade assessed using the following methods?**

(Please check only one box in each row)

	Never	1–2 times a year	3–5 times a year	Monthly	More than once a month
a) Standardized tests	☐₁	☐₂	☐₃	☐₄	☐₅
b) Teacher-developed tests	☐₁	☐₂	☐₃	☐₄	☐₅
c) Teachers' judgmental ratings	☐₁	☐₂	☐₃	☐₄	☐₅
d) Student portfolios	☐₁	☐₂	☐₃	☐₄	☐₅
e) Student assignments/ projects/homework	☐₁	☐₂	☐₃	☐₄	☐₅

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Q16 In your school, are assessments of students in the 10th grade used for any of the following purposes?

(Please check only one box in each row)

	Yes	No
a) To inform parents about their child's progress	☐₁	☐₂
b) To make decisions about students' retention or promotion	☐₁	☐₂
c) To group students for instructional purposes	☐₁	☐₂
d) To compare the school to district, state, or national performance	☐₁	☐₂
e) To monitor the school's progress from year to year	☐₁	☐₂
f) To make judgments about teachers' effectiveness	☐₁	☐₂
g) To identify aspects of instruction or the curriculum that could be improved	☐₁	☐₂
h) To compare the school with other schools	☐₁	☐₂

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Q17 In your school, to what extent is the learning of students hindered by the following phenomena?

(Please check one box in each row)

	Not at all	Very little	To some extent	A lot
a) Teachers' low expectations of students	☐₁	☐₂	☐₃	☐₄
b) Student absenteeism	☐₁	☐₂	☐₃	☐₄
c) Poor student-teacher relations	☐₁	☐₂	☐₃	☐₄
d) Disruption of classes by students	☐₁	☐₂	☐₃	☐₄
e) Teachers not meeting individual students' needs	☐₁	☐₂	☐₃	☐₄
f) Teacher absenteeism	☐₁	☐₂	☐₃	☐₄
g) Students skipping classes	☐₁	☐₂	☐₃	☐₄
h) Students lacking respect for teachers	☐₁	☐₂	☐₃	☐₄
i) Staff resisting change	☐₁	☐₂	☐₃	☐₄
j) Student use of alcohol or illegal drugs	☐₁	☐₂	☐₃	☐₄
k) Teachers being too strict with students	☐₁	☐₂	☐₃	☐₄
l) Students intimidating or bullying other students	☐₁	☐₂	☐₃	☐₄
m) Students not being encouraged to achieve their full potential	☐₁	☐₂	☐₃	☐₄

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Q18 **Which statement below best characterizes parental expectations towards your school?**

(Please check only one box)

There is *constant pressure* from many parents, who expect our school to set very high academic standards and to have our students achieve them. □₁

Pressure on the school to achieve higher academic standards among students comes from a *minority of parents*. □₂

Pressure from parents on the school to achieve higher academic standards among students is *largely absent*. □₃

SECTION F: SCHOOL POLICIES AND PRACTICES

Q19   How often are the following factors considered when students are admitted to your school?

(Please check one box in each row)

	Never	Sometimes	Always
a) Residence in a particular area	☐₁	☐₂	☐₃
b) Student's record of academic performance (including placement tests)	☐₁	☐₂	☐₃
c) Recommendation of feeder schools	☐₁	☐₂	☐₃
d) Parents' endorsement of the instructional or religious philosophy of the school	☐₁	☐₂	☐₃
e) Whether the student requires, or is interested in, a special program	☐₁	☐₂	☐₃
f) Preference given to family members of current or former students	☐₁	☐₂	☐₃
g) Other	☐₁	☐₂	☐₃

Q20 In your school, how likely is it that a student in the 10th grade would be transferred to another school because of the following reasons?

(Please check one box in each row)

If students are never transferred, go to Q21.

	Not likely	Likely	Very likely
a) Low academic achievement	☐₁	☐₂	☐₃
b) High academic achievement	☐₁	☐₂	☐₃
c) Behavioral problems	☐₁	☐₂	☐₃
d) Special learning needs	☐₁	☐₂	☐₃
e) Parents' or guardians' request	☐₁	☐₂	☐₃
f) Other	☐₁	☐₂	☐₃

Q21 This set of questions explores aspects of the school's accountability to parents.

(Please check one box in each row)

	Yes	No
a) Does your school provide information to parents of students in the 10th grade on their child's academic performance relative to other students in the 10th grade in your school?	☐₁	☐₂
b) Does your school provide information to parents of students in the 10th grade on their child's academic performance relative to national or state benchmarks?	☐₁	☐₂
c) Does your school provide information to parents on the academic performance of students in the 10th grade as a group relative to students in the same grade in other schools?	☐₁	☐₂

Q22   In your school, are achievement data used in any of the following ways?

*Achievement data include **aggregated** school or grade-level test scores or grades, or graduation rates.*

(Please check one box in each row)

	Yes	No
a) Achievement data are posted publicly (e.g., in the media).	☐₁	☐₂
b) Achievement data are used in evaluation of the principal's performance.	☐₁	☐₂
c) Achievement data are used in evaluation of teachers' performances.	☐₁	☐₂
d) Achievement data are used in decisions about instructional resource allocation to the school.	☐₁	☐₂
e) Achievement data are tracked over time by an administrative authority (such as a district, state, or federal education agency).	☐₁	☐₂

Q23   During the last year, have any of the following methods been used to monitor the practice of English teachers at your school?

(Please check one box in each row)

	Yes	No
a) Tests or assessments of student achievement	☐₁	☐₂
b) Teacher peer review (of lesson plans, assessment instruments, lessons)	☐₁	☐₂
c) Principal or senior staff observations of lessons	☐₁	☐₂
d) Observation of classes by other persons external to the school	☐₁	☐₂

Q24 **Regarding your school, who has a considerable responsibility for the following tasks?**

(Please check as many boxes as appropriate in each row)

	Principals	Teachers	School-level governing board	State or local education agency	U.S. Department of Education
a) Selecting teachers for hire	☐	☐	☐	☐	☐
b) Firing teachers	☐	☐	☐	☐	☐
c) Establishing teachers' starting salaries	☐	☐	☐	☐	☐
d) Determining teachers' salary increases	☐	☐	☐	☐	☐
e) Formulating the school budget	☐	☐	☐	☐	☐
f) Deciding on budget allocations within the school	☐	☐	☐	☐	☐
g) Establishing student disciplinary policies	☐	☐	☐	☐	☐
h) Establishing student assessment policies	☐	☐	☐	☐	☐
i) Approving students for admission to the school	☐	☐	☐	☐	☐
j) Choosing which textbooks are used	☐	☐	☐	☐	☐
k) Determining course content	☐	☐	☐	☐	☐
l) Deciding which courses are offered	☐	☐	☐	☐	☐

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Q25 Regarding your school, which of the following bodies exert a direct influence on decision making about staffing, budgeting, instructional content and assessment practices?

(Please check as many boxes as apply)

	Area of Influence			
	Staffing	*Budgeting*	*Instructional content*	*Assessment practices*
a) State or federal education agencies (e.g., state education department)	☐	☐	☐	☐
b) Local education agency or local school board	☐	☐	☐	☐
c) School-level governing board	☐	☐	☐	☐
d) Parent groups	☐	☐	☐	☐
e) Teacher groups (e.g., staff association, curriculum committees, trade union)	☐	☐	☐	☐
f) Student groups (e.g., student association, youth organization)	☐	☐	☐	☐
g) External examination boards	☐	☐	☐	☐

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Q26 Below you can find statements about your management of this school. Please indicate the frequency of the following activities and behaviors in your school during <u>the last school year</u>.

(Please check only one box in each row)

	Never	Seldom	Quite often	Very often
a) I make sure that the professional development activities of teachers are in accordance with the teaching goals of the school.	☐₁	☐₂	☐₃	☐₄
b) I ensure that teachers work according to the school's educational goals.	☐₁	☐₂	☐₃	☐₄
c) I observe instruction in classrooms.	☐₁	☐₂	☐₃	☐₄
d) I use student performance results to develop the school's educational goals.	☐₁	☐₂	☐₃	☐₄
e) I give teachers suggestions as to how they can improve their teaching.	☐₁	☐₂	☐₃	☐₄
f) I monitor students' work.	☐₁	☐₂	☐₃	☐₄
g) When a teacher has problems in his/her classroom, I take the initiative to discuss matters.	☐₁	☐₂	☐₃	☐₄
h) I inform teachers about possibilities for updating their knowledge and skills.	☐₁	☐₂	☐₃	☐₄

	Never	Seldom	Quite often	Very often
i) I check to see whether classroom activities are in keeping with our educational goals.	□₁	□₂	□₃	□₄
j) I take exam results into account in decisions regarding curriculum development.	□₁	□₂	□₃	□₄
k) I ensure that there is clarity concerning the responsibility for coordinating the curriculum.	□₁	□₂	□₃	□₄
l) When a teacher brings up a classroom problem, we solve the problem together.	□₁	□₂	□₃	□₄
m) I pay attention to disruptive behavior in classrooms.	□₁	□₂	□₃	□₄
n) I take over lessons from teachers who are unexpectedly absent.	□₁	□₂	□₃	□₄

Q27   Approximately what percentage of students at this school last year were eligible for free- or reduced-price lunches through the National School Lunch Program?

(Please write a number on the line. Write 0 (zero) if there are none.)

Percentage of students eligible   _____

SECTION G: ABOUT YOU

Q28   Are you female or male?

Female   Male

☐₁   ☐₂

Thank you very much for your cooperation in completing this questionnaire!

Appendix D

Missing Values

Table C1

Comparison of missing values between United States' Student Population and Target Population for student questionnaire responses to memorization (MEMOR) strategies

Reading Strategies Indices Scale			U.S. Population		Target Population	
	Question	Response[a]	N[b]	Percent[c]	N[b]	Percent[c]
MEMOR	ST27Q01	1	623	11.9	55	11.2
		2	2177	41.6	212	43.2
		3	1533	29.3	151	30.8
		4	824	15.7	69	14.1
		7	16	0.3	0	0.0
		8	2	0.0	1	0.2
		9	58	1.1	3	0.6
	ST27Q03	1	389	7.4	36	7.3
		2	1365	26.1	132	26.9
		3	1951	37.3	191	38.9
		4	1414	27.0	123	25.1
		7	16	.3	0	0.0
		8	2	0.0	0	0.0
		9	96	1.8	9	1.8
	ST27Q05	1	1944	37.1	162	33.0
		2	1952	37.3	197	40.1
		3	862	16.5	93	18.9
		4	392	7.5	34	6.9
		7	16	0.3	0	0.0
		8	4	0.1	2	0.4
		9	63	1.2	3	0.6
	ST27Q07	1	905	17.3	100	20.4
		2	1880	35.9	176	35.8
		3	1440	27.5	136	27.7
		4	904	17.3	75	15.3
		7	16	0.3	0	0.0
		8	1	0.0	0	0.0
		9	87	1.7	4	0.8

[a]Responses as follows: (1) Almost never, (2) Sometimes, (3) Often, (4) Almost always, (7) Not applicable, (8) Invalid, (9) Missing. [b]Number of respondents within specific population selecting response; for U.S., total number of respondents N=5233, for target population, N=491. [c]Percentage of specific population selecting response.

Table C2

Comparison of missing values between United States' Student Population and Target Population for student questionnaire responses to elaboration (ELAB) strategies

Reading Strategies Indices Scale			U.S. Population		Target Population	
	Question	Response[a]	N[b]	Percent[c]	N[b]	Percent[c]
ELAB	ST27Q04	1	771	14.7	82	16.7
		2	1785	34.1	180	36.7
		3	1708	32.6	178	36.3
		4	890	17.0	48	9.8
		7	16	0.3	0	0.0
		8	0	0.0	0	0.0
		9	63	1.2	3	.6
	ST27Q08	1	1867	35.7	151	30.8
		2	1970	37.6	218	44.4
		3	909	17.4	86	17.5
		4	388	704	30	6.1
		7	16	0.3	1	.2
		8	1	0.0	5	1.0
		9	82	1.6		22.0
	ST27Q10	1	1264	24.2	108	41.3
		2	1929	36.9	203	25.7
		3	1313	25.1	126	10.0
		4	625	11.9	49	0.0
		7	16	.3	1	.2
		8	4	.1	4	.8
		9	82	1.6		
	ST27Q12	1	1281	24.5	119	24.2
		2	2068	39.5	199	40.5
		3	1256	24.0	118	24.0
		4	525	10.0	47	9.7
		7	16	.3	0	0.0
		8	2	0.0	2	.4
		9	85	1.6	6	1.2

[a]Responses as follows: (1) Almost never, (2) Sometimes, (3) Often, (4) Almost a0lways, (7) Not applicable, (8) Invalid, (9) Missing.
[b]Number of respondents within specific population selecting response; for U.S., total number of respondents *N*=5233, for target population, *N*=491.
[c]Percentage of specific population selecting response.

Table C3

Comparison of missing values between United States' Student Population and Target Population for student questionnaire responses to control strategies (CSTRAT) strategies

Reading Strategies Indices Scale			U.S. Population		Target Population	
	Question	Response[a]	N[b]	Percent[c]	N[b]	Percent[c]
CSTRAT	ST27Q02	1	320	6.1	35	7.1
		2	1257	24.0	138	28.1
		3	2117	40.5	191	38.9
		4	1457	27.8	122	24.8
		7	16	.3	0	0.0
		8	0	0.0	0	0.0
		9	66	1.3	5	1.0
	ST27Q06	1	481	9.2	50	10.2
		2	1657	31.7	171	34.8
		3	1864	35.6	168	34.2
		4	1137	21.7	94	19.1
		7	16	.3	0	0.0
		8	1	0.0	1	.2
		9	77	1.5	7	1.4
	ST27Q9	1	573	10.9	65	13.2
		2	1813	34.6	193	39.3
		3	1843	35.2	162	33.0
		4	889	17.0	63	12.8
		7	16	.3	0	0.0
		8	1	0.0	0	0.0
		9	98	1.9	8	1.6
	ST27Q11	1	313	6	35	7.1
		2	1055	20.2	119	24.2
		3	1874	35.8	197	40.1
		4	1887	36.1	136	27.7
		7	16	.3	0	0.0
		8	2	0.0	0	0.0
		9	86	1.6	4	.8
	ST27Q13	1	697	13.3	75	15.3
		2	1801	34.4	194	39.5
		3	1647	31.5	138	28.1
		4	986	18.8	78	15.9
		7	16	.3	0	0.0
		8	3	.1	1	.2
		9	83	1.6	5	1.0

[a]Responses as follows: (1) Almost never, (2) Sometimes, (3) Often, (4) Almost always, (7) Not applicable, (8) Invalid, (9) Missing.
[b]Number of respondents within specific population selecting response; for U.S., total number of respondents $N = 5233$, for target population, $N = 491$.
[c]Percentage of specific population selecting response.

Table C4

Comparison of missing values between United States' Student Population and Target Population for student questionnaire responses to student relationship (STUDREL) indices.

Classroom and Climate Indices			U.S. Population		Target Population	
	Question	Response[a]	N[b]	Percent[c]	N[b]	Percent[c]
STUDREL	ST34Q01	1	152	2.9	10	2.0
		2	388	7.4	49	10.0
		3	3202	61.2	321	65.4
		4	1401	26.8	104	21.2
		7	16	0.3	0	0.0
		8	3	0.1	0	0.0
		9	71	1.4	7	1.4
	ST34Q02	1	177	3.4	14	2.9
		2	823	15.7	85	17.3
		3	3239	61.9	318	64.8
		4	891	17.0	64	13.0
		7	16	0.3	0	0.0
		8	0	0.0	0	0.0
		9	87	1.7	10	2.0
	ST34Q03	1	261	5.0	20	4.1
		2	1129	21.6	105	21.4
		3	2958	56.5	304	61.9
		4	783	15.0	54	11.0
		7	16	0.3	0	0.0
		8	2	0.0	0	0.0
		9	84	1.6	8	1.6
	ST34Q04	1	149	2.8	12	2.4
		2	463	8.8	44	9.0
		3	3182	60.8	313	63.7
		4	1329	25.4	114	23.2
		7	16	0.3	0	0.0
		8	4	0.1	0	0.0
		9	90	1.7	8	1.6
	ST34Q05	1	157	3.0	13	2.6
		2	443	8.5	57	11.6
		3	3317	63.4	316	64.4
		4	1207	23.1	96	19.6
		7	16	0.3	0	0.0
		8	2	0.0	0	0.0
		9	91	1.7	9	1.8

[a]Responses as follows: (1) Almost never, (2) Sometimes, (3) Often, (4) Almost always, (7) Not applicable, (8) Invalid, (9) Missing. [b]Number of respondents within specific population selecting response; for U.S., total number of respondents $N = 5233$, for target population, $N = 491$. [c]Percentage of specific population selecting response.

Table C5

Comparison of missing values between United States' Student Population and Target Population for student questionnaire responses to stimulation of reading (STIMREAD) indices.

Classroom and Climate Indices			U.S. Population		Target Population	
	Question	Response[a]	N^b	Percent[c]	N^b	Percent[c]
STIMREAD	ST37Q01	1	255	4.9	27	5.5
		2	1350	25.8	136	27.7
		3	2194	41.9	202	41.1
		4	1298	24.8	117	23.8
		7	16	0.3	0	0.0
		8	0	0.0	0	0.0
		9	120	2.3	9	1.8
	ST37Q02	1	184	3.5	13	2.6
		2	1187	22.7	134	27.3
		3	2289	43.7	206	42.0
		4	1426	27.3	128	26.1
		7	16	0.3	0	0.0
		8	0	0.0	0	0.0
		9	131	2.5	10	2.0
	ST37Q03	1	238	4.5	22	4.5
		2	1306	25	131	26.7
		3	2182	41.7	211	43.0
		4	1349	25.8	117	23.8
		7	16	0.3	0	0.0
		8	0	0.0	0	0.0
		9	142	2.7	10	2.0
	ST37Q04	1	976	18.7	80	16.3
		2	1910	36.5	174	35.4
		3	1417	27.1	150	30.5
		4	780	14.9	76	15.5
		7	16	0.3	0	0.0
		8	0	0.0	0	0.0
		9	134	2.6	11	2.2
	ST37Q05	1	347	6.6	36	7.3
		2	1405	26.8	133	27.1
		3	1947	37.2	187	38.1
		4	1380	26.4	124	25.3
		7	16	.3	0	0.0
		8	0	0.0	0	0.0
		9	138	2.6	11	2.2
	ST37Q06	1	670	12.8	59	12.0
		2	1834	35.0	179	36.5
		3	1685	32.2	161	32.8
		4	88	16.8	80	16.3
		7	16	0.3	0	0.0
		8	2	0.0	1	.2
		9	145	2.8	11	2.2

TableC5

Classroom and Climate Indices			U.S. Population		Target Population	
	Question	Response[a]	N[b]	Percent[c]	N[b]	Percent[c]
STIMREAD	ST37Q07	1	420	8.0	42	8.6
		2	1667	31.9	156	31.8
		3	1878	35.9	189	38.5
		4	1109	21.2	95	19.3
		7	16	0.3	0	0.0
		8	0	0.0	0	0.0
		9	143	2.7	9	1.8

[a]Responses as follows: (1) Almost never, (2) Sometimes, (3) Often, (4) Almost always, (7) Not applicable, (8) Invalid, (9) Missing. [b]Number of respondents within specific population selecting response; for U.S., total number of respondents $N = 5233$, for target population, $N = 491$. [c]Percentage of specific population selecting response.

Table C6

Comparison of missing values between United States' Student Population and Target Population for student questionnaire responses to structuring and scaffolding (STRSTRAT) indices.

Classroom and Climate Indices			U.S. Population		Target Population	
	Question	Response[a]	N[b]	Percent[c]	N[b]	Percent[c]
STRSTRAT	ST38Q01	1	214	4.1	23	4.7
		2	1186	22.7	134	27.3
		3	1871	35.8	164	33.4
		4	1794	34.3	157	32.0
		7	16	0.3	0	0.0
		8	1	0.0	0	0.0
		9	151	2.9	13	2.6
	ST38Q02	1	240	4.6	18	3.7
		2	1258	24.0	123	25.1
		3	2215	42.3	194	39.5
		4	1332	25.5	143	29.1
		7	16	.3	0	0.0
		8	1	0.0	0	0.0
		9	171	3.3	13	2.6
	ST38Q03	1	221	4.2	17	3.5
		2	1285	24.6	124	25.3
		3	2145	41.0	206	42
		4	1381	26.4	130	26.5
		7	16	0.3	0	0.0
		8	2	0.0	0	0.0
		9	183	3.5	14	2.9
	ST38Q04	1	284	5.4	34	6.9
		2	1250	23.9	120	24.4
		3	1949	37.2	178	36.3
		4	1549	29.6	145	29.5
		7	16	0.3	0	0.0
		8	2	0.0	0	0.0
		9	183	3.5	14	2.9
	ST38Q05	1	237	4.5	19	3.9
		2	1216	23.2	110	22.4
		3	1984	37.9	184	37.5
		4	1589	30.4	164	33.4
		7	16	0.3	0	0.0
		8	5	0.1	0	0.0
		9	186	3.6	14	2.9
	ST38Q06	1	104	2.0	9	1.8
		2	577	11.0	60	12.2
		3	1310	25.0	133	27.1
		4	3043	58.2	276	56.2
		7	16	0.3	0	0.0
		8	3	0.1	0	0.0
		9	180	3.4	13	2.6

Classroom and Climate Indices			U.S. Population		Target Population	
	Question	Response[a]	N[b]	Percent[c]	N[b]	Percent[c]
CSTRAT	ST38Q07	1	126	2.4	8	1.6
		2	867	16.6	89	18.1
		3	1886	36.0	169	34.4
		4	2134	40.8	210	42.8
		7	16	.3	0	0.0
		8	1	0.0	1	.2
		9	203	3.9	14	2.9
	ST38Q08	1	272	5.2	29	5.9
		2	1270	24.3	123	25.1
		3	2068	39.5	205	41.8
		4	1416	27.1	118	24.0
		7	16	.3	0	0.0
		8	1	0.0	1	.2
		9	190	3.6	15	3.1
	ST38Q09	1	712	13.6	59	12.0
		2	1870	35.7	170	34.6
		3	1606	30.7	154	31.4
		4	837	16.0	94	19.1
		7	16	.3	0	0.0
		8	1	0.0	0	0.0
		9	191	3.6	14	2.9

[a]Responses as follows: (1) Almost never, (2) Sometimes, (3) Often, (4) Almost always, (7) Not applicable, (8) Invalid, (9) Missing. [b]Number of respondents within specific population selecting response; for U.S., total number of respondents $N = 5233$, for target population, $N = 491$. [c]Percentage of specific population selecting response.

Table C7

Comparison of missing values between United States' Student Population and Target Population for student questionnaire responses to understanding and remembering (UNDREM) indices.

Metacognition Indices			U.S. Population		Target Population	
	Question	Response[a]	N^b	Percent[c]	N^b	Percent[c]
UNDREM	ST41Q01	1	266	5.1	38	5.7
		2	483	9.2	34	6.9
		3	1163	22.2	129	26.3
		4	1379	26.4	142	28.9
		5	860	16.4	67	13.6
		6	311	17.4	80	16.3
		7	16	0.3	0	0.0
		8	0	0.0	0	0.0
		9	155	3.0	11	2.2
	ST41Q02	1	832	15.9	79	16.1
		2	1133	21.7	88	17.9
		3	1176	22.5	117	23.8
		4	929	17.8	95	19.3
		5	547	10.5	55	11.2
		6	435	8.3	46	9.4
		7	16	0.3	0	0.0
		8	4	0.1	0	0.0
		9	161	3.1	11	2.2
	ST41Q03	1	547	10.5	72	14.7
		2	660	12.6	79	16.1
		3	940	18.0	76	15.5
		4	1105	21.1	107	21.8
		5	993	19.0	85	17.3
		6	803	15.3	57	11.6
		7	16	0.3	0	0.0
		8	3	0.1	0	0.0
		9	166	3.2	13	2.6
	ST41Q04	1	448	8.6	41	8.4
		2	466	8.9	34	6.9
		3	680	13.0	71	14.5
		4	900	17.2	90	18.3
		5	1181	22.6	104	21.2
		6	1374	26.3	140	28.5
		7	16	0.3	0	0.0
		8	1	0.0	0	0.0
		9	167	3.2	11	2.2
	ST41Q05	1	360	6.9	32	6.5
		2	485	9.3	63	12.8
		3	786	15.0	81	16.5
		4	1043	19.9	94	19.1
		5	1161	22.2	96	19.6
		6	1214	23.2	113	23.0
		7	16	0.3	0	0.0
		8	0	0.0	0	0.0
		9	168	3.2	12	2.4

Table C7

Metacognition Indices			U.S. Population		Target Population	
	Question	Response[a]	N[b]	Percent[c]	N[b]	Percent[c]
UNDREM	ST41Q06	1	1115	21.3	109	22.2
		2	1007	19.2	91	18.5
		3	982	18.8	94	19.1
		4	837	16.0	76	15.5
		5	586	11.2	61	12.4
		6	516	9.9	48	9.8
		7	16	.3	0	0.0
		8	1	0.0	0	0.0
		9	173	3.3	12	2.4

[a]Responses based on continuous scale with (1) Not useful at all and (6) Very useful, with respondents choosing value including and between 1 and 6. The remaining values represent (7) Not applicable, (8) Invalid, (9) Missing. [b]Number of respondents within specific population selecting response; for U.S., total number of respondents $N = 5233$, for target population, $N = 491$. [c]Percentage of specific population selecting response.

Table C8
Comparison of missing values between United States' Student Population and Target Population for student questionnaire responses to summarizing (METASUM) indices.

Metacognition Indices			U.S. Population		Target Population	
	Question	Response[a]	N[b]	Percent[c]	N[b]	Percent[c]
METASUM	ST42Q01	1	526	10.1	59	12.0
		2	586	11.2	55	11.2
		3	1084	20.4	119	24.2
		4	1125	21.5	107	21.8
		5	858	16.4	69	14.1
		6	828	15.8	64	13.0
		7	16	0.3	0	0.0
		8	1	0	1	.2
		9	209	4.0	17	3.5
	ST42Q02	1	979	18.7	83	16.9
		2	1188	22.7	116	23.6
		3	1160	22.2	103	21.0
		4	871	16.6	91	18.5
		5	497	9.5	51	10.4
		6	310	5.9	32	6.5
		7	16	0.3	0	0.0
		8	3	0.1	0	0.0
		9	209	4.0	15	3.1
	ST42Q03	1	439	8.4	43	8.8
		2	680	13.0	51	10.4
		3	1089	20.8	108	22.0
		4	1145	21.9	113	23.0
		5	935	17.9	89	18.1
		6	713	13.6	71	14.5
		7	16	.3	0	0.0
		8	1	0.0	0	0.0
		9	215	4.1	16	3.3
	ST42Q04	1	224	4.3	21	4.3
		2	293	5.6	38	7.7
		3	635	12.1	77	15.7
		4	952	18.2	100	20.4
		5	1343	25.7	125	25.5
		6	1547	29.6	113	23.0
		7	16	.3	0	0.0
		8	1	0.0	1	.2
		9	222	4.2	16	3.3

Table C8

Metacognition Indices			U.S. Population		Target Population	
	Question	Response[a]	N[b]	Percent[c]	N[b]	Percent[c]
METASUM	ST42Q05	1	355	6.8	33	6.7
		2	407	7.8	36	7.3
		3	669	12.8	68	13.8
		4	858	16.4	102	20.8
		5	1059	20.7	100	20.4
		6	1659	31.7	136	27.7
		7	16	.3	0	0.0
		8	0	0.0	0	0.0
		9	210	4.0	16	3.3

[a]Responses based on continuous scale with (1) Not useful at all and (6) Very useful, with respondents choosing value including and between 1 and 6. The remaining values represent (7) Not applicable, (8) Invalid, (9) Missing.
[b]Number of respondents within specific population selecting response; for U.S., total number of respondents $N = 5233$, for target population, $N = 491$.
[c]Percentage of specific population selecting response.

Table C9

Comparison of missing values between United States' Student Population and Target Population for student questionnaire responses to specific teacher behaviors (TEACBEHA) indices.

School Variables			U.S. Population		Target Population	
	Question	Response[a]	N[b]	Percent[c]	N[b]	Percent[c]
TEACBEHAV	SC17Q01	1	39	23.6	39	23.5
		2	86	52.1	86	52.1
		3	36	21.8	36	21.8
		4	4	2.4	4	2.4
		7	0	0.0	0	0.0
		8	0	0.0	0	0.0
		9	0	0.0	0	0.0
	SC17Q03	1	35	21.2	35	21.2
		2	111	67.3	111	67.3
		3	16	9.7	16	9.7
		4	3	1.8	3	1.8
		7	0	0.0	0	0.0
		8	0	0.0	0	0.0
		9	0	0.0	0	0.0
	SC17Q05	1	18	10.9	18	10.9
		2	102	61.8	102	61.8
		3	41	24.8	41	24.8
		4	2	1.2	2	1.2
		7	0	0.0	0	0.0
		8	0	0.0	0	0.0
		9	2	1.2	2	1.2
	SC17Q08	1	21	12.7	21	12.7
		2	103	62.4	103	62.4
		3	37	22.4	37	22.4
		4	3	1.8	3	1.8
		7	0	0.0	0	0.0
		8	0	0.0	0	0.0
		9	1	.6	0	0.0
	SC17Q13	1	48	29.1	48	29.1
		2	88	53.3	88	53.3
		3	28	17.0	28	17.0
		4	0	0.0	0	0.0
		7	0	0.0	0	0.0
		8	0	0.0	0	0.0
		9	1	0.6	1	0.6

[a]Responses as follows: (1) Not at all, (2) Very little, (3) To some extent, (4) A lot, (7) Not applicable, (8) Invalid, (9) Missing. [b]Number of respondents within population of schools selecting response; total U.S. respondents, $N = 165$, total target population respondents, $N = 90$. [c]Percentage of population selecting response.

Appendix E

DFA Territorial Map

Canonical Discriminant
Function 2

```
        -4.0   -3.0   -2.0   -1.0    .0    1.0   2.0   3.0   4.0
       +---------+---------+---------+---------+---------+---------+---------+---------+
  4.0 +               31                          +
  I                   31                          I
  I                   31                          I
  I                   31                          I
  I                   31                          I
  I                   31                          I
  3.0 +     +     +     +   31  +     +     +     +     +
  I                   31                          I
  I                   31                          I
  I                   31                          I
  I                   31                          I
  I                   31                          I
  2.0 +     +     +     +   31  +     +     +     +     +
  I                   31                          I
  I                   31                          I
  I                   31                          I
  I                    31                         I
  I                    31                         I
  1.0 +     +     +     +    31+     +     +     +     +
  I                    31                         I
  I                    31                         I
  I                    31                         I
  I                    31   *                     I
  I                  *   3211                      I
   .0 +     +     +     +   32+2211   +     +     +     +
  I                  32 * 22111                    I
  I                  32    22211                   I
  I                  32      2211                   I
  I                  32       22111                 I
  I                 32         22211                I
 -1.0 +     +     +   + 32  +     +   22111+     +     +
  I                 32           22211             I
  I                 32            2211             I
  I                32              22111            I
  I                32               22211           I
  I               32                 2211    I
 -2.0 +     +     +   32  +     +     +    22111     +
  I               32                   22211   I
  I               32                    2211  I
  I               32                     22111I
  I               32                      222I
  I               32                      I
 -3.0 +     +     +  32  +     +     +     +     +     +
  I              32                           I
  I              32                           I
  I             32                            I
  I             32                            I
  I            32                             I
 -4.0 +          32                            +
       +---------+---------+---------+---------+---------+---------+---------+---------+
        -4.0   -3.0   -2.0   -1.0    .0    1.0   2.0   3.0   4.0
```
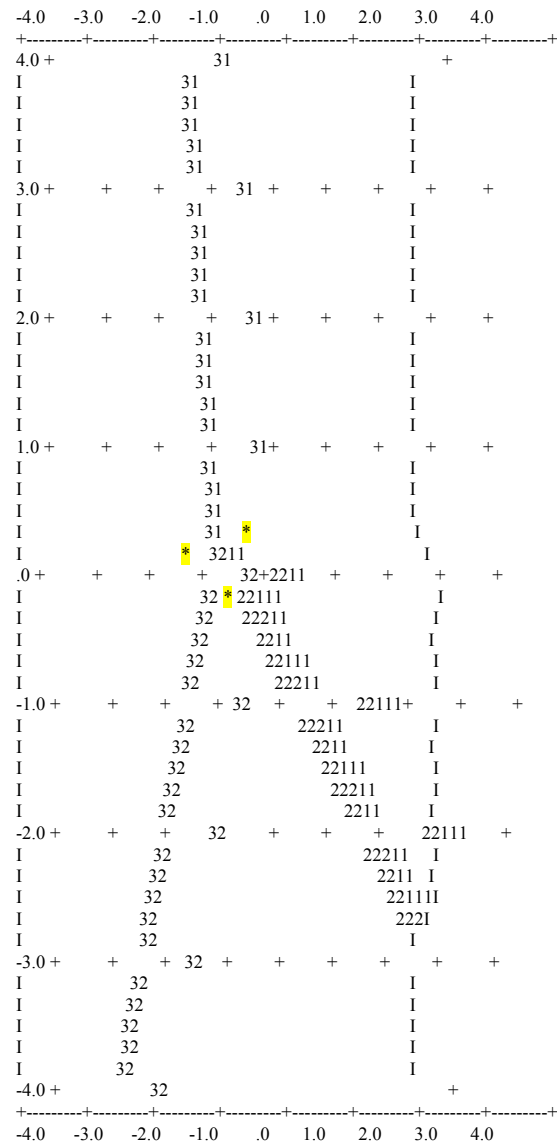
Canonical Discriminant Function 1

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