

COMPARING THE INFLUENCE OF SELF-REPORTED TEACHING PRACTICES ON
THIRD GRADE ENGLISH LANGUAGE LEARNERS AND THIRD GRADE STUDENTS
WHOSE HOME LANGUAGE IS ENGLISH

By
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Edward Fox

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degree of Doctor of Philosophy

Dissertation Committee:

Chairperson: Dr. Paul Markham

Dr. William Skorupski

Dr. Matthew Reynolds

Dr. Karen Jorgensen

Dr. Barbara Bradley

Date defended

The Dissertation Committee for Edward Fox

Certifies that this is the approved version of the following dissertation:

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Chairperson: Paul Markham, Ph.D.

Date approved: _____

ABSTRACT

This research was conducted in response to the increased attention given to connecting teacher evaluations to student achievement. The literature review identifies the effective teaching practices and teacher attitudes that are consistently associated with academic achievement. Self-reported teaching practices (SRTP) from the ECLS-K were then tested for similar effects on achievement and for invariance across two language groups: students whose primary home language is English and students who are English language learners (ELLs). Through use of Structural Equation Modeling (SEM), approximately 13,000 third grade students and their teachers were tested. The findings demonstrated a significant positive correlation between the teachers' attitude (TA) and their quality of teaching, based upon teachers' self-reported teaching practices (SRTP). The effect sizes of TA on SRTP was $\beta = .23$ for English-first speakers (approaching strong) and $\beta = .33$ for ELLs (strong); these effects were invariant across groups. Teacher Attitude mediated the influence of working condition's (WC) on SRTP for both language groups ($\beta = .16$ for English and $\beta = .20$ for ELLs). The influence of SRTP on achievement (third grade reading scores) was not statistically significant from zero for either language group. Family Background's (socioeconomic status – SES) influence was non-invariant on both reading results. Its influence on 1st grade reading (previous achievement – PA) was stronger for ELLs ($\beta = .48$ vs. $\beta = .41$) But SES influence was stronger for English-first students ($\beta = .21$ vs. $\beta = .18$) in third grade reading. PA mediated the effects of family background (SES) on academic achievement (3rd Grade Reading) for both language groups. Working conditions strongly influenced teacher attitude ($\beta = .70/.60$) for native English speakers and ELLs, respectively. This study has shown that teachers' attitude toward themselves and their students

are important mediating variables between working conditions and SRTP. What this study did not show, however, is that self-reported teaching practices influence academic achievement.

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CHAPTER I

INTRODUCTION

This study is purposed as a professional development resource for its author, a classroom teacher of English language learners and who is new in the last five years to the teaching profession in K-12 public education. Upon entering the profession, I quickly learned the *No Child Left Behind Act of 2001*'s (NCLB) adequate yearly progress (AYP) measures exerted a strong influence upon my school building's and district's academic initiatives. Since then, the state's Department of Education has begun a revision of its requirements for teacher evaluation, a portion of which will rely on student achievement (KSDE, 2013). That my English language learner students are held to the same annual improvement measures as all other students has been a clarion call to equip them with skills needed to academically achieve. In addition to desiring to see my students achieve their academic targets, the close-to-home implications of student achievement as part of overall teacher job performance has underscored the need for me to learn what characteristics and practices were found in effective teachers as measured by student academic achievement. At the same time, I wondered if the same characteristics and effective practices were applicable to both a heterogeneous student population and to English language learners. My awareness of the need to identify and understand effective teaching practices and attitudes arose because of the exigency to achieve results; results which were driven, ostensibly, by the current regulatory climate, but also as a personal and professional priority.

The subsequent course of action was to research the academic literature and identify the teaching practices that consistently result in student achievement, then to determine how to measure their effects across language groups. Teachers have a very wide range of approaches or practices to choose from every day at the classroom level. Of those practices, knowing which are the most effective will result in a more efficient and effective teaching and learning experience

for all parties. In many cases, the teaching and learning skills are determined by curriculum requirements or specific learning objectives. For instance, skills required to complete a science lab are different than required for learning multiplication tables. Accordingly, the effective practices should be broad and allow teachers a range of options to accomplish their goals of instruction that results in students meeting academic goals. After examining previous effective practices research, developing a learning model that measures the effect of teaching practices on two student groups, a heterogeneous group and English language learners, could yield valuable information for classroom instruction. The model should test if the same teaching practices yield similar academic results when both groups' learning environments were substantially the same. If membership in a particular language group makes a difference in the model's results, it would suggest that different approaches should be used for each group.

Much serious research has been conducted over the last several decades identifying and measuring the factors most relevant to academic achievement; factors that educators can apply at the classroom level based upon research that has been conducted in a systematic, scientific fashion (Marzano, Pickering, & Pollock, 2001). One such study was conducted by Wang, Haertel, and Walberg (1990) where they developed a conceptual framework that both identified and quantified the practices, attitudes, and contexts of effective classroom teaching and learning. These researchers, along with a panel of experts in the field of human development and education, constructed a framework of effective teaching practices that were known to directly improve academic achievement (Wang, Haertel, & Walberg, 1993). The model consisted of six theoretical constructs which influence student learning. The constructs with the strongest influence were Student Characteristics, Classroom Practices, and Home and Community Education Contexts. The other three theoretical constructs carrying less weight on academic

achievement included State and District Governance and Organizations, Design and Delivery of Curriculum and Instruction, and School Demographics, Culture, Climate, Policies and Practices. This model demonstrated that the distal influences had the weakest effect on academic achievement which included state-, district- and school-level policy and demographics. The proximal variables whose influence was stronger included psychological (e.g. metacognitive, cognitive, and motivational), instructional (e.g., classroom behavior management, academic interactions, and social interactions and feedback), and the home environment which can support the school's learning experiences. Some of these effective practices were general in nature, applicable to any education setting, while others were subject-matter specific. In all settings this model showed, when effective practices were present, they had a direct and measurable bearing on academic achievement.

Studies conducted by Wang et al (1990, 1993) were not discordant with a large synthesis of over 800 meta-analyses documented by Hattie (2009) where his model rests on six main variables that he identified and measured - each a contributor to academic achievement: the student; home; school; curricula; the teacher; and, approaches to teaching. Because students have the ultimate say in whether and how much they learn, their effect is strong and complex; students are shaping their own educational and personal expectations against the backdrop of their interests, prior knowledge and abilities. The home's influence is characterized by high expectations for the student and parent engagement in the learning process; school effects are strongest when the climate is conducive to learning and personal safety is maintained; the curriculum's importance is found in developing learning skills and deeper understanding and developing meaning. The teacher plays two critical roles in student achievement: (a) teacher-as-leader as seen in holding high academic expectations for students, creating a favorable learning

environment, and placing high value on effort and (b) the use of effective teaching approaches, learning strategies, goal setting and two-way feedback - skillfully engage each student in the learning process.

Other scholars whose research on effective practices is examined in this present research

Table 1.1

Influences on Academic Achievement and Examples of Effective Teaching Practices

Influence on Learning	Wang, Haertel, &Walberg (1990)	Hattie (2009)	Marzano (2000)	Brophy (1986, 1999) Good & Brophy (1985)	Examples of Effective Practices
Students	○	○	○	○	▪ Feedback and reinforcement
Classroom Practices (teacher)	○	○	○	○	▪ Metacognitive strategies
Home and Community	○	○	○	○	▪ Mastery learning
School Influence	○	○	○	○	▪ Parental involvement
Design and Delivery of Curriculum	○	○	○	○	▪ Cooperative learning
State and District Policy	○				▪ Activating prior knowledge

have found similar influences in learning. Marzano (2000) categorizes learning research in three major, but interrelated elements at the school, the teacher, and the student levels. The school influences learning through leadership's focus on achievement, providing a safe and orderly atmosphere, and monitoring of student progress. The greatest differentiator both within and between schools is the individual teacher, not the particular school a student attends. The teachers' differences are found in their classroom management and instruction strategies along with effective curriculum design. The student element contains family background (socioeconomic status – SES) and student-specific aptitude, prior knowledge, and interests.

Brophy (Brophy 1986, 1999; Good & Brophy, 1985) embraces the same influences on achievement as these other researchers: the school's influence, the individual classroom teacher, and student and family factors. His process/product research identifies the effectiveness of specific teacher practices as measured by student achievement. For each of these, and other, researchers the specific effective teaching practices are discussed in greater detail in Chapter 2 and in Appendix A. Table 1.1 capsulates these influences on learning along with several examples of effective teaching practices which are shared among these researchers. Either due to semantical differences or uses in combination with other elements, curriculum is considered important to each researcher and is indicated as such.

As important as identifying and quantifying which effective practices are found in a classroom, i.e., what a teacher *does*, the expectations and attitudes which teachers hold for their students and for their own roles appears to be a precursor to a teacher demonstrating effective teaching practices. Brophy (1986) states that teacher effectiveness includes “fostering students’ affective and personal development in addition to their curriculum mastery” (p. 1069). This attitude is characterized by a strong belief held by the individual teacher that he/she makes a difference and that all students are capable of learning. His research shows that teachers’ attitudes, beliefs and expectations influence learning. In this two-way teacher-student relationship, the students expect the teachers will be helpful, compassionate, interested in them, and have an interesting and stimulating classroom (Ouzts, 1986). Cornelius-White (2007)’s meta-analytic study showed a strong correlation between a positive teacher-student relationship and student achievement and their behavior. The teachers’ ability to initially create a comfortable and positive learning environment seems to be a pre-requisite for student achievement and for maintaining an ongoing reciprocal connection between students and teacher (Cornelius-White,

2007; Whitaker, 2004). As teachers expect more, praise more, and provide more feedback, their students perform much better than in classrooms where these attitudes are not present (Bohn, Roehrig, & Pressley, 2004). For the teachers hoping for classroom effectiveness, their attitudes and high expectations, followed by effective practices will be consistently mirrored in the students' achievement and behavior. Within a positive classroom climate, the teacher's classroom management approach is a method to engage students in the learning rather than seeing his/her role as a disciplinarian; thus, not only freeing up more time for productive instruction it also reinforces the importance of the classroom as a positive learning community.

The research described thus far was based upon results from a highly heterogeneous population; none of the research was explicitly with an English language learner population. The absence of English language learner studies notwithstanding, the previously-cited researchers are confident that each of the effective practices are generalizable to all students in all learning environments. Hattie (1999) states the practices "have remarkable generality across subjects, and ages. Generality is the norm" (p.16). The meta-analyses in his studies were mainly from the United States plus several other advanced, English-speaking countries and included "most school subjects (although the majority are reading, mathematics, science, and social studies), all ages, and a myriad of comparisons" (15). Marzano et al., (2001) expounded that effective practices "could be used by teachers in K-12 classrooms" (p. 4) and "to identify those instructional strategies that have a high probability of enhancing student achievement for all students in all subjects at all grade levels" (pp. 6-7). Marzano (1998) cautioned that no single instructional strategy works equally well in all settings; examples of moderating factors include age of students and their ability level. He also advised that it is unknown how certain strategies affect students from different backgrounds. Brophy (1999)'s research took place in classrooms across

major subject areas in ordinary classroom conditions. Walberg (2003) and his colleagues' (Walberg & Paik, 2004; Wang et al., 1990, 1993) data was primarily from meta-analyses or meta-reviews of education research which included studies from pre-kindergarten to college and in some instances U.S. military personnel. The study population was highly heterogeneous which included the gifted and special needs, but no English language learner subgroups were independently evaluated. Hanushek (Hanushek, 1971) studied the general population "because of the difficulty in measuring school characteristics for..." (1971, p.5) the bilingual population. The *Handbook* (Cawelti (Ed.), 2004) documents both general effective practices and subject-specific effective practices; Calweti is confident these effective practices which are proven within heterogeneous populations, are effective with other populations of students. He cites Slavin, Kaweit, and Madden (1989) who have determined that the qualities for effective teachers are the same for the general population and for at-risk students.

For the measurement portion of this research, data from a nationwide cohort of students will be used (ECLS-K) which includes a large number of linguistically diverse (language minority) and English-first speaking students. The teaching practices from this observational study are self-reported and lack contextual description or comparative control groups that were part of the meta-analytical studies of the effective practices described above and in Chapter 2. Accordingly, the observational data in the model described in Chapters 3 through 5 is referred to as self-reported teaching practices. The data's concomitant limitations are discussed in Chapter 5 in greater detail.

Problem Statement

That there are many studies which measure effective practices is well documented; the following chapter and Appendix A in this present research describe many of these findings. Even

though the literature is clear about which practices are effective in achieving academic results and that a teacher's attitude influences students' performance, the effect of the teacher's attitude on his own teaching quality is unknown. The studies do not address the influence the teacher's attitude has on his or her own performance. Does attitude influence the quality of the teaching by the increased use of self-reported teaching practices? If so, is a good attitude found only in schools where the climate and environment are already strong? In addition, when considering these teacher attributes and practices, are there meaningful differences in academic results between the overall heterogeneous student population and the language minority students within that population?

Chang (2008) holds that ongoing research is needed to understand the dynamic of the education process for language minority students. In general, this population of students experiences lower academic achievement levels and higher dropout rates than students from the general population. The findings of the National Reading Panel (NRP) (2000) and the National Literacy Panel (NLP) (August & Shanahan, 2006a, 2006b, 2008) were consistent with each other in their findings in identifying the essential elements of effective literacy instruction for students. Both panels conducted large-scale initiatives to compile, analyze and interpret the then-current research on literacy instruction for the purpose of identifying and facilitating the most effective reading and literacy instruction approaches in the classroom. The NRP, which focused on native English speaking students, published its watershed document in 2000 concluding that phonemic awareness, phonics, reading fluency, vocabulary, and reading comprehension strategies must be present in literacy instruction. Focused on English language learners (with specific emphasis on native Spanish speakers), the NLP concluded in its 2006 report that instruction in each of the literacy elements (phonemic awareness, phonics, fluency, vocabulary, and comprehension

strategies) was beneficial to both English language learners and monolinguals. They observed that it is likely that the same instruction routines for both groups could be effective. The panel suggests that it may indeed be instructive to modify the teaching approach for the ELLs. It is highly tenable that these statements about the influence of attitude and effective teaching having a similar influence on both the general population and English language learners. But empirical studies are needed to affirm these assertions.

Purpose of Study

In light of the findings that (a) measurement of the influence of teacher attitude on their own performance has not been found in the literature, and (b) the effective practices research was conducted within the general population and not explicitly with English language learners, it is important to investigate the relationships between these variables. In addition, the NLP and other above-cited researchers are optimistic that the same instruction routines which are effective with the general student population are applicable to language minority students. A comparison of achievement results between these two student groups under the same conditions is merited. In response to these needs, the purpose of this study is to understand the relationship of teacher attitude on practices and on academic achievement. Moreover, this present study evaluates the invariance of these effects between native English speakers and English language learners.

Research Questions

This study aims to explore the relation between teacher attitude, teacher quality, and teacher practices in relation to academic achievement. In addition, the study aims to compare these relationships between the general population and language minority students. The study aims to achieve these goals by answering three main research questions which are included below based upon self-reported data from a large-scale, nationwide study in the United States:

1. What influence does teacher attitude have on self-reported teaching practices after controlling for family background, previous achievement and working conditions?
2. What effect do self-reported teaching practices have on student achievement after controlling for family background, previous achievement, working conditions, and teacher attitude?
3. Are the effects of teacher attitude and self-reported teacher practice the same for the general population as for English language learners (ELLs) after controlling for family background, previous achievement and working conditions? Or, are the effects moderated by language status?

Significance of the Study

The findings of this study will provide both theoretical insights and practical implications. Theoretically, this study will help researchers better understand the relation between the variables affecting student achievement and the teacher's attitude toward the profession, his/her perceived effectiveness, and conviction that students can learn. This study will also provide useful information to classroom teachers of English language learners and the general population. The study results should provide information on which classroom practices may impact academic achievement of both English language learners and the general student population. In addition, the teachers who wish to make a difference in whatever teaching situation they are in will benefit from a strong corpus of extant research on effective teaching practices along with the influence of teacher attitude.

That academic achievement is emphasized throughout this research does not imply that it is the highest calling of K-12 education, although it is not an insignificant element. School is more than testing; it also develops the very important dimensions of students such as social skills, a

work ethic, self-worth, behavior, responsibility, involvement in school and community, and strong personal values (Rowan, Correnti, & Miller, 2002; Whitaker, 2004). But since schools and many teachers experience accountability for students' results, focus remains on the factors influencing these results. Furthermore, this study is not a policy statement that schools should or should not tie teacher evaluation to student achievement, nor is it a statement that there should or should not be standardized testing. Its purpose is to address the current landscape in K-12 education by equipping this researcher and any other interested party with the knowledge of proven practices that are consistently associated with academic achievement.

Definitions of Important Terms

The following terms are used throughout this study and are discussed here to provide clarification of their contextual significance.

The populations studied. The effective practices research in the literature review was conducted across a heterogeneous student population which included a wide range of students in age and ability, in many different classroom settings, and in a range of geographic locations. Most of the studies took place in the United States, but some were conducted in other highly developed, mainly English-speaking countries. In some instances the studied population may be referred to as “the general population” or “heterogeneous”. Nearly all the effective practices research sources cited in Chapters 1 and 2 explicitly stated that no specific study was conducted solely with English language learners or with special needs students. If indeed members of these groups of students were studied, they were part of the “heterogeneous” or “general” population.

Language terms. Because this study compares two groups based upon their home language, a number of terms are used interchangeably within each group. For those whose first language is not English, such term include but are not limited to: language minority students,

English language learners (ELLs), English as a second language (ESL) students, or those who speak a language which is not the societal or majority language. Terms used interchangeably in this study for native English speakers include: language majority students, monolingual students, native English speakers, or English-first speakers, English-only speakers, or perhaps English speakers. Although there are differences between the various descriptions, this study's design does not require excruciating explanation each time a term is used since there are the same two language groups studied throughout. However, the terms most frequently used to differentiate for language group membership are English-first or English language learners.

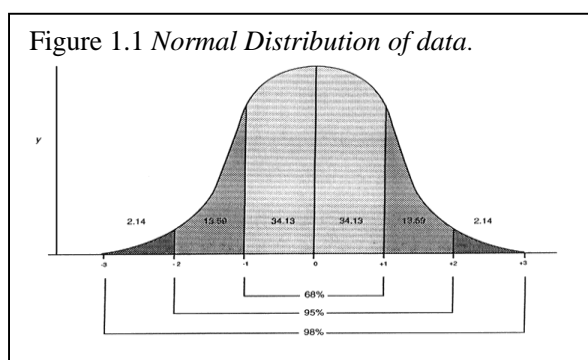
Academic achievement. In this study, academic achievement is measured by first and third grade reading scores. A lengthy list of synonyms for this dependent variable of learning is found in the literature that was reviewed in this research; many of these terms may appear throughout this document. The following terms were found through a casual perusal of the literature, and this list is by no means exhaustive nor are they in any particular order. The terms include: school achievement, learning, academic achievement, student learning, achievement of students, student achievement, achievement scores, test scores, scores, percentile gain in achievement, educational outcome, achievement level, academic progress, achievement, learning outcomes, student outcomes, progress toward desired student outcomes, intended outcomes of instruction, school learning, learning effects, academic outcomes, achievement outcomes, fluency of achievement, and cognitive student outcomes.

Measures of Influences on Learning.

Comparing different teaching practices and evaluating their overall effectiveness on learning is the substantive part of the literature review. The effect size is used to determine the

effectiveness of each practice. This section describes the concept of effect size and its role in effective practices research, with two frequently-used effect size types described. Nearly all of the findings in the effective practices literature have been from meta-analyses which permit researchers to know the overall influence of practices on achievement, based upon thousands of individual studies conducted over a number of years involving several million students using different scales and measures of academic achievement. The advantage of combining these myriad studies into meta-analyses is that no weakness or strength of an individual study can overly influence the results of the combined body of studies, thus allowing teachers and schools to make research-based decisions affecting academic achievement. Meta-analyses permits one to quantify the impact of a teaching practice on academic achievement through use of effect size. It is interesting to know whether the influence of a particular teaching practice is statistically significantly different from zero. But a researcher's work is only partially done at that point. Knowing the magnitude of a statistically significant difference has significant implications for classroom teachers. Reporting the effect size (which is measured in standard deviation (SD) units) of an influence provides such a measure.

One method of calculating effect size is found by measuring the average increase (or decrease) in achievement compared to a control group not receiving the treatment. This approach is based



upon the assumption the test score data distribution is substantially similar to that in Figure 1.1 (Marzano et al., 2001). With normally distributed data, approximately 68% of the scores are within 1 SD of the mean, 95% within 2 SD s, and about 98% within 3 SD s.

A hypothetical example of a practice resulting in a 1.0 effect size in achievement is provided. A school may wish to know the effectiveness of a certain reading program whereby students are assigned to either a control group or an experimental group. After an appropriate instruction interval, the mean score of the experimental group was compared to the distribution of the control group (see Figure 1.2). In this example the average reading score of the experimental group is equal to the 1 *SD* benchmark of the control group, i.e., the data show that the effect size of the experimental reading program was 1.0. A practical benefit of using effect sizes, or standard deviation, is its ability to express the effect in percent improvement. Because 34.1% of the scores are between the average and 1 *SD*, the experimental group's scores, on average, improved over 34% compared to the control group's average score (Hattie, 2009;

Figure 1.2 *Experimental Group Results*

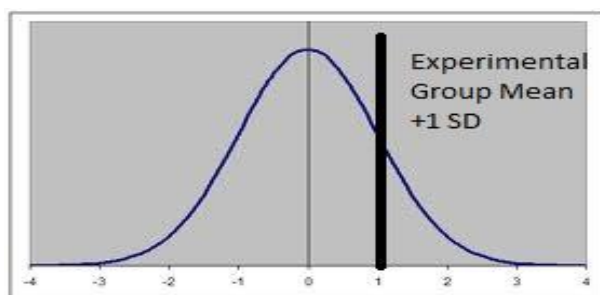


Figure 1.2 One SD higher than the control group's mean = one

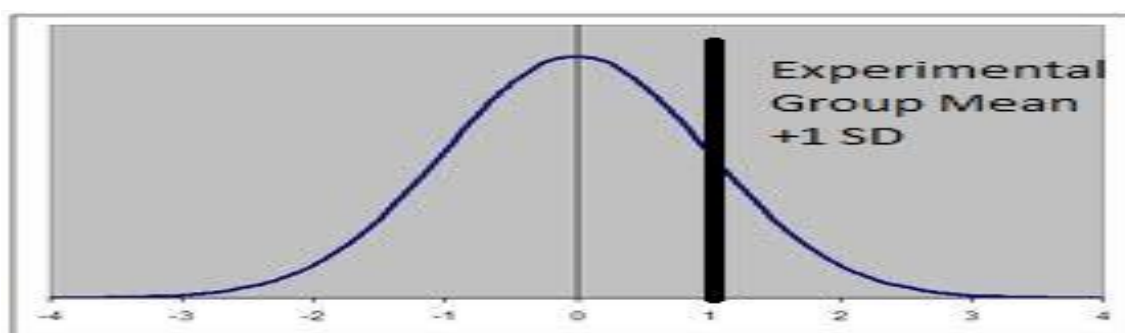
Howell, 2008; Marzano et al., 2001). In the reading study example, the experimental group's average score was 34% higher than the control group's average. Supposing the average numeric score for the control group was 70, does that mean that the average score for the

experimental group is 93.9 (34% higher than the control group's mean)? No, it does not. The 1 *SD* improvement is within the distribution of the control group's reading scores. Figure 1.3 shows a hypothetical distribution of the reading scores of the control group. In this illustration the corresponding reading score at the 1 *SD* point is a 75, which is also the mean score of the

experimental reading group. It can be said that the reading program accounted for a 1 *SD* improvement in scores or an improvement in the average reading score of 5 points in this instance. Likewise, the average student in the experimental group scored above 84% of the students in the control group.

In determining whether these group mean differences are small, medium or large, Marzano et al. (2001) reference a widely used-scale for effect size in social science research which was developed by Cohen (1988), a recognized authority for statistical measures in the social and behavioral sciences. Reference points for small, medium, and large effect sizes are .20, .50, and .80, respectively, and are accepted rule-of-thumb values in such research and are

Figure 1.3 *Example of reading score average and 1 SD increase.*



referred to as Cohen's *d* values. Putting these effect sizes in perspective, Hattie (1992) cites Cohen (1977) who describes "an effect size of 1.0 would be regarded as large, blatantly obvious and grossly perceptible" (p. 6). Hattie (1999, 2009) continues the description of effect sizes by contrasting the magnitudes of 1.0 and .31 effect sizes: "such as the difference between a person 5'3" (160 cm) and 6'0" (183 cm) – which would be visible to the naked eye" (2009, p. 8). In contrast, "[a]n effect-size of .31 would not...be perceptible to the naked observational eye, and would be approximately equivalent to the difference between the height of a 5'11" (180 cm) and

a 6'0" (182 cm) person" (1999, p. 6). This puts in perspective the importance of using proven, effective practices in the classroom when academic achievement is an objective.

In addition to mean difference effect sizes based upon group membership, correlational effect size may be found where distance or conditional differences measure the magnitude of the influence of one variable on another. For such correlational studies, Cohen's rule of thumb values are .10, .30, and .50 for small, medium, and large effects, respectively. But these are general and would be followed whenever domain-specific effect sizes are not available (Durlak, 2009). Many areas of inquiry have developed their own criteria for establishing magnitude of effects. For example, in correlational studies the effect sizes on school learning and achievement can be much lower than the rule-of-thumb values described above. Keith's (Keith, 1999, 2006; Keith & Cool, 1992) scholarship in the field has led him to conclude "that for manipulative influences on learning, paths above .05 may be considered small but meaningful influences, paths above .10 - .15 may be considered moderate influences, and paths above .25 may be considered large effects" (1999, p. 87). Both sets of effect sizes are found in this paper; the larger Cohen's *d* values are used throughout the literature review in Chapter 2, but the correlational influence values described by Keith are applicable to the Results and Discussion sections.

Effect size use permits transportability of variables' influences across multiple studies; this is a valuable feature of meta-analytic study. It is inadvisable, however, to arbitrarily rank order proven practices by effect size across studies even though the studies use the same conceptual dependent variable. There are several reasons for using effect size as a general, rather than a strict guide for low, medium and high influences. Because there are multiple ways to determine effect size, two of which are correlational and differences in means calculations, the precise calculations used are not always known; particular to school learning, effect sizes of

teaching practices vary depending whether achievement is measured by standardized tests or by teacher-created assessments. Another caution against blind ranking is the difference in study design and the way variables act within different learning models; Chapter 2 contains examples of the same teaching practice having different effect sizes across studies.

Chapter Summary

This chapter described an overview of the study. That there are proven and effective practices and attitudes whereby classroom teachers can affect academic achievement is well documented in research. Nearly all such research has been conducted in a heterogeneous K-12 student population, but the need exists to further measure the applicability of these practices and attitudes within an English language learner population and compare it to the general population. Thus, this study is purposed to explore those issues and connect them to language development of English language learners in the same settings as the general population.

CHAPTER II

LITERATURE REVIEW

Today much of the research in teaching is characterized by sound, systematic scientific methods. But this has been the case only in the last 40 to 50 years. Perhaps the watershed event that heightened the stakes in education research and its concomitant quality was the 1966 *Equality of Educational Opportunity (EEO)* report, also known as the Coleman report (Coleman et al., 1966). The Coleman report not only had a significant impact upon how policy makers, educators, and the public viewed the role of public education, but it also resulted in a large body of education research on the “science of teaching” (Marzano et al., 2001, p.1). For a 40 year period the Coleman report saw over 2,700 citations in academic journals; even during the first six years of the new millennium it averaged over 55 citations per year which is an indicator that it still influences research on schools and student achievement (Gamoran & Long, 2006).

The Coleman Report

The context in which the Coleman study was generated was ostensibly about equality of opportunity for racial minorities and the economically disadvantaged. This had been an ongoing ideological issue in the U.S. from its early settlement and significantly intensifying during the decades following WWII. A strong sentiment prevailed in the country that the public schools would be the vehicle whereby such inequality could be combated. As part of *The Civil Rights Act of 1964*, Congress ordered the Commissioner of Education to conduct a nationwide study of the “availability of equal educational opportunities (Madaus, Airasian, & Kellaghan, 1980, p.12).” The issue of whether, or to what extent, school resources factored into the low academic performance of the then-labeled poor and minority students was to be addressed by the *EEO*

study and subsequent report. The wording of the 1964 Act itself appears to assume that inequality was a foregone conclusion and the survey and report would confirm it:

Sec. 402. The Commissioner shall conduct a survey and make a report to the President and the Congress, within two years of the enactment of this title, concerning the *lack of availability of equal educational opportunities* [emphasis added] for individuals by reason of race, color, religion, or national origin in public educational institutions at all level in the United States, its territories and possessions, and the District of Columbia. (Mosteller & Moynihan, 1972, pp.4-5)

During this two year period a large-scale, nationwide research project took place and involved testing some 570,000 students in grades 1, 3, 6, 9 and 12 within six ethnic and cultural groups. All teachers in these schools, some 60,000 in all, were tested and surveyed about their backgrounds and training in addition to gathering detailed information about 4,000 school facilities (Marzano, 2000; Mosteller & Moynihan, 1972). Teacher data included education levels, education philosophy, teaching experience, salary, mother's education level, and scores on a 30-word vocabulary test. Pupil data included family SES information, parent education, certain items in the home (e.g., encyclopedias, magazines, etc.), and students' academic aspirations (Coleman et al., 1966). The key finding about the effects of school were summarized in the following paragraph from the report:

Taking all these results together, one implication stands above all: that schools bring little influence to bear on a child's achievement that is independent of his background and general social context; and that this very lack of an independent effect means that the inequalities imposed on children by their home, neighborhood, and peer environment are carried along to become the inequalities with which they confront adult life at the end of school. (p.325)

For those who believed that schools would be the focus of equalizing the economic and racial disparity, the findings were astonishing. Mosteller and Moynihan (1972) described the findings "to constitute the most powerful empirical critique of the myths...of American education ever produced. It was the most important source of data on the sociology of American

education yet to appear.”(p. 5) In addition to dispelling these assumptions of the role of school, it also raised questions about the need for current and future levels of funding for public education. According to Coleman’s analysis, about 10 percent of the variance in student achievement was attributable to schools; the other 90 percent was attributable to family influence (Marzano, 2000). When taking SES into account, the data show that schools are remarkably similar in facility and in their impact on student achievement was only modest. The largest school influence on achievement (about 5%) was the presence of peers who had high academic aspirations (Coleman et al., 1966). For several years after the study, data used in the report was re-analyzed by several leading researchers including Mosteller and Moynahan (1972) in *A Pathbreaking Report*, and Jencks (1972) in *The Coleman Report and the Conventional Wisdom*; both reached the same general conclusion as Coleman - that schools were not the main source of disparity in academic achievement.

Many education researchers were not content in accepting of this belief about schools’ low impact on student achievement. Predictably, many subsequent studies identified and measured the elements that affected academic achievement, an activity that continues to the present day. The research examined and measured aspects of the highly-interdependent major elements that influence academic achievement: families, students, schools, and teachers. Even though this present research initiative is primarily concerned with the classroom teacher’s effect on learning, I will describe some research findings regarding the influence of family, students and schools since each of these factors are highly interdependent in the learning process.

Family Effects

The family-related elements that affect students’ academic achievement the most are its socio-economic status and the parent/family participation in the child’s schooling process and

experience. But even within the family background (SES), certain family values strongly influence achievement.

Socio-Economic Status (SES). Hattie (2009) describes SES as a measure of one's "relative position in the social hierarchy and directly relates to the resources in the home [such as] parental income, parental education, and parental occupation as three main indicators of SES" (pp. 61-62). The Coleman report's (Coleman et al., 1966) conclusion about the role of the family and in particular SES in explaining academic achievement became the new "self-evident" standard for many researchers and educators. Such reification is reflected in the following citations found in White (1982), as he describes the academic and social context within which his research was done and why his findings are important to research today.

The family characteristic that is the most powerful predictor of school performance is socioeconomic status (SES): the higher the SES of the student's family, the higher his academic achievement. This relationship has been documented in countless studies and seems to hold no matter what measure of status is used (occupation of principal breadwinner, family income, parents' education, or some combination of these). (Boocock, 1972, p. 32)

To categorize youth according to the social class position of their parents is to order them on the extent of their participation and degree of success in the American Educational System. This has been so consistently confirmed by research that it can now be regarded as an empirical law. . . . SES predicts grades, achievement and intelligence test scores, retentions at grade level, course failures, truancy, suspensions from school, high school dropouts, plans for college attendance, and total amount of formal schooling. (Charters, 1963, pp.739-740)

The positive association between school completion, family socioeconomic status, and measured ability is well known. (Welch, 1974, p. 32)

After stating that the relation between SES and "almost any type of school behavior" was so well documented that it "had become axiomatic to social scientists," St. John (1970) concluded:

So powerful is the apparent effect of social class, that the influence of other background and school factors can be detected only if socioeconomic status (SES) is first neutralized through matching or statistical control. Accurate measurement of SES, therefore is crucial to any social research in schools. (p. 255)

White's research (1982) provided greater insight into which elements of SES influenced learning. In developing his meta-analysis of the use of SES in education research, he found that multiple variables were used to describe SES; he documented that over 70 different variables describing SES were used either alone or in some combinations. He observed that the unit of

Table 2.1

Correlation Between Student-level SES and Achievement

<u>SES Indicator</u>	<u>Pearson's <i>r</i></u>	<u>Cohen's <i>d</i></u>
Income only	.315	.67
Education only	.185	.38
Occupation only	.201	.42
Home atmosphere only	.577	1.42
Income and education	.230	.47
Income and occupation	.332	.70
Education and occupation	.325	.69
Income, education, and occupation	.318	.66

Note. Included in home atmosphere are variables such as parents' attitude toward education, aspirations for their children, and cultural and intellectual activities of the family. White (1982) measured the strength of the type of SES indicators and the effects on academic achievement using the mean correlation value (Pearson's *r*). Marzano (2000) further converted these values into an effect size measure.

analysis strongly influences the strength of SES on achievement. For instance, if SES is aggregated at a school or district level, its correlation to achievement is much stronger vis-à-vis analysis of SES at the student level. When measured at the student level,

SES explains about 5% of academic achievement. In the majority of studies, the researcher determines what variables are included in measuring SES; the specific measures used to determine SES hold an important influence over the strength of the relationship between SES and academic achievement. When evaluating the strength of the type of measure used in determining the correlation between SES and achievement, White (1982) found that the influence of home atmosphere was stronger than traditionally-used measures. Table 2.1 shows these correlations of the student-level components on learning. Included in home atmosphere are variables such as parents' attitude toward education, aspirations for their children, and cultural and intellectual activities of the family.

Indeed, there is a relationship between SES and academic achievement. In the amalgamation of elements found in SES measures, the home atmosphere, characterized by such attributes as parental or family expectations and encouragement, is the most influential SES-type factor on academic achievement. Iverson and Walberg (1982) concluded that the influence of the social-psychological environment of the home on academic achievement is stronger than parental indicators of occupation and education. Although specific measures were not defined by Jeynes (2007), he asserts that SES's influence can be overestimated as a mediating variable. When SES was filtered in his study, the results, while positive, were not significant in all measures and frequently lacked a strong correlation to standardized test results. Both White (1982) and Hattie (2009) instruct researchers to be clear and selective in what SES measures one uses, e.g. home atmosphere, employment, etc., as it directly impacts the outcome of the measurement. Defining SES is important and it is recommended to substitute or, at a minimum, clarify the term with variables such as income, occupation, atmosphere, and be specific how the variable is measured. It is important to note that even though this dimension of family influence strongly affects a student's school readiness or starting point, the SES component has a diminishing effect over time (Coleman et al., 1966; White, 1982).

In light of the multifaceted family dynamic and its influence on academic achievement, White (1982) quotes Jencks and colleagues (Jencks, Smith, Acland, & Bard, 1972) as he provides insight about using SES in the proper context:

The term "family background" can itself be somewhat misleading since differences between families derive not just from differences in home environment but from differences between neighborhoods, regions, schools, and all other experiences that are the same for children in the same family. . . , Social scientists often use the terms "family background," "social class," and "economic status" almost interchangeably. We think this is a mistake. . . . The way a family brings up its children is obviously influenced by its economic position. The extent of such influence is, however, a problem for investigation, not a matter of definition. (pp. 462-463)

Hattie's (2009) word to researchers when using SES is to "consider the influences of these various sub-components of SES before discussing its effects as if it were a unidimensional notion." (p. 62)

Parental involvement and expectations. A family's influence on academic achievement is consistently positive when parents participate in their child's schooling process and experiences. The strongest positive effects on achievement are found in parental aspirations they hold for their children (Hong & Ho, 2005). "Parental expectations are far more powerful than many of the structural factors of the home. [But] the beliefs and expectations of the adults in the home ... contribute most to achievement" (Hattie, 2009, p. 71). When Jeynes (2007) quantified the various parental influences on learning, the most influential variable of the entire study (.88 effect size) was associated with parental expectations.

Parental participation of both urban secondary students (Jeynes, 2007) and of urban primary students (Jeynes, 2005) positively influenced academic achievement. Students' educational outcomes included an overall achievement component, grades, standardized tests, and a component including teacher rating scales on the student and indices of students' attitudes regarding academics and a behavior score. Jeynes' (2007) study found significance in parent involvement in each of his measures, holding true across different races and across gender. The effect sizes ranged from .38 to .53 depending upon the specific percentage of minority students measured; even higher effect sizes (.70 to .75) were found among urban elementary students. When schools offered parental involvement programs, whether attended voluntarily or involuntarily, their students' academic achievement was positively affected.

Other parental factors with positive effects on achievement include family communication about homework, parenting style and cooperating with the school. Parent participation in a positive fashion (Rosenzweig, 2001) and good parent-student communications (Fan & Chen, 2001) also influence learning. In the early primary grades, parents could strongly affect student learning by teaching literacy skills and when the children read aloud rather than being read to. Included in the marginally useful or negatively effective family approaches are monitoring homework, television time, and time out with friends; a controlling and disciplining parenting style (compared to encouraging and holding high aspirations), external rewards, and punishment for low grades (Hong & Ho, 2005) did not contribute to achievement. When families understand the elements of the schooling process, the students learn more. Clinton, Hattie, and Dixon (2007) report improvement in both academic scores and in overall home-school relations where the school system initiated a liaison program in a very low SES school district. Parents learned essential skills to help with homework and to more efficiently communicate with the school and their students' teachers.

The influences of the home and social background carry a significant role in determining a student's starting point (i.e., his/her status or intercept point) in the education process when measuring improvement over time. Rowan et al. (2002) demonstrated this using longitudinal data with two different cohorts of students measuring their academic achievement in both math and reading. The home and background variables that were measured for influences included: a) gender, b) SES, c) minority status, d) number of siblings, e) family marital status, and f) parental expectations for a student's educational attainment. Although these variables strongly influenced a student's intercept point, they "became relatively insignificant predictors of academic development" (p. 13). Accordingly, the home significantly forms the initial academic contour of

individuals. Walberg (Walberg, 2003; Walberg & Paik, 2004) describes in a section below how effective schools and specifically classroom teachers can shrink these achievement gaps.

Student Effects

Prior achievement and self-efficacy. Prior achievement is known to be an important measure to predict future academic success. This holds true for predicting preschoolers' success onto early school years, to college grades, and onto success in the work force. Even the successes of toddler-aged children were useful predictors of success in their adult years (Feinstein, 2003). Regardless of the SES or racial composition of a school, prior achievement was a meaningful predictor of academic achievement in a state-wide study of Michigan's elementary schools (Goddard, Salloum, & Berebitsky, 2009). Multiple factors determine prior achievement such as family influence, genetic and perhaps preschool. Although these genetic factors and family background elements affect school readiness, student contributions that influence academic achievement are largely under the control of the individual student. But as commonplace as previous achievement is in studies, Hattie (2009) reports it explains only about 50% of the change in achievement, leaving room for influences from teachers and other sources to influence learning.

A student's attitude and disposition include influential personality traits such as self-concept, motivation, time-on-task, and conscientiousness. Each shows a relationship to academic achievement. "In contrast to cognitive abilities which indicate what a person can do, such personality traits are associated with what a person will do" (Hattie, 2009 p. 45). A sense of confidence or of self-efficacy is very powerful in relation to achievement along with a student's sense of the cost-benefit of effort toward learning. Goddard, Hoy, and Hoy (2000) cite Bandura (1997) to clarify that self-efficacy and internal locus of control are not the same concepts. Self-

efficacy is the “[b]elief about one’s capability to produce certain actions...” a result of “construct[ing] beliefs about their capacity to perform at a given level of competence... the level of effort expended... how long they will persist in the face of difficulties, their resilience in dealing with failures, and the stress they experience in coping with demanding situations” (p. 481). Internal locus of control, in comparison, relates to “causal beliefs about the relationship between actions and outcomes, not with personal efficacy” (p. 481). If a student is perceived by others as someone willing to engage in her own learning and achieving success from effort vs. ability, this perception is also a key attribute to academic success (Hattie, 2009).

A student’s interests. As one’s effort and interests increase, so does student achievement. A student’s interest in a topic correlates strongly with achievement, therefore a connection may be found between interest and efficacy (Schiefele & Csikszentmihalyi, 1994). In addition, a moderate to strong effect size of interest on learning is present as students’ mastery in a domain of knowledge increases, implying that competence and interests are interdependent (Alexander, Kulikowich, & Schulze, 1994).

Prior knowledge. Prior knowledge or prior achievement has strong positive effects on academic achievement (Dochy, Segers, & Buehl, 1999). Alexander and Judy (1988) found that establishing a strong base of learned domain knowledge is a prerequisite to developing strategic higher order thinking skills. Rolfhus and Ackerman (1999)’s study further established that strong academic results have their foundation “in a common core of knowledge... that a strong general knowledge base enhances academic achievement.” Walberg (2003) states “students’ prior knowledge has a huge predictive and possibly causal effect, perhaps since knowledgeable students can increase their learning from a bigger base” (p. 18). Accordingly, prior knowledge in

the form of a strong base of general knowledge is essential to academic achievement and the subsequent development of higher level thinking skills.

Aptitude. This is frequently synonymous with intelligence or native ability. When confounding effects such as access to knowledge, interest, and other school-, classroom-, and home-level elements are set aside, it is found to have a small to moderate effect on achievement (Madaus, Kellaghan, Rakow, & King, 1979). Just as the influence of prior knowledge of academic achievement is dependent upon a strong general knowledge base, the same may be said about aptitude's influence on academic achievement.

Trust. This topic could easily be included in the family influence discussion, further attestation to the interdependence of these influences on academic achievement. A student's level of trust in the teacher is an antecedent to academic motivation (Adams, 2010) and is a positive influence on academic achievement (Bryk & Schneider, 2002). Higher levels of trust were found in academically-improving schools than were found in schools that remained low. Bryk and Schneider (2002)'s study of high-poverty elementary schools showed as faculty's trust in students increased by 1 *SD*, it had a multiplier effect (1.2 *SDs*) on the level of trust the students placed in their teachers. In addition to the teachers affecting student trust, the emphasis on academics from the home was found to be a significant contributor to achievement with those same students. As home academic emphasis increases by 1 *SD*, the student-teacher trust level increased by 2.7 *SDs*. This family-by-family trust measure did not vary according to the school building the student attended; the trust measure remained strong regardless of any racial and/or SES levels which may have varied from building to building. Adam (2010)'s research showed the interdependence of the faculty, family, student, and school management in establishing mutual trust in order for the school and community to work together for common goals. Goddard

et al. (2009) posit that regardless of a school's context (SES, racial composition, or size), trust is a strong predictor of academic achievement. The path analysis used in their study showed SES and racial composition directly affecting students' state-wide math and reading test scores. But when the trust element was included in the model, neither SES nor race had a direct effect on academic achievement, but were replaced by trust's direct effect on achievement. Because these school conditions were mediated by the level of trust held in the schools, they concluded "...trust seems to make a difference above and beyond the influence of school context."

School Effects

When comparing the influences of family, student, schools and teachers' on learning, the school's impact is the lowest. When between-school influence is measured, its influence is between zero and in some instances as high as twenty percent (Alton-Lee, 2003; Hattie, 2009; Scheerens, Vermeulen, & Pelgrum, 1989). But on average, school influence (excluding teacher influence) explains about 7 percent of learning (Marzano, 2000).

During the 1970's and 80's, a key figure in the school effectiveness movement was Ronald Edmonds. Edmonds' research gave credibility to the role of the school in the learning process and established that some schools and teachers are more effective than others. Many of the school improvement initiatives were strongly influenced by the variables Edmonds showed correlating to academic achievement (Edmonds, 1979) (see Table 2.2). Good and Brophy (1985), in their comprehensive review of school effectiveness and improvement research, claimed Edmonds' work "demonstrat[ed] that schools are not interchangeable and that some schools have much more impact than others with similar resources serving similar populations" (p. 37). Subsequent research by Scheerens and Bosker (1997), as reported in Marzano (2000), identified key school-level variables which contributed to achievement; these variables are closely aligned

to those which Edmonds posited (Table 2.2). Hattie (2009) also identified school-level variables which contribute to academic achievement; these school effectiveness research findings are fairly consistent regarding characteristics of successful schools and are also included in Table 2.2.

Among the conditions attributable to an effective school are cooperation, a positive climate, and leadership whose focus is on the quality of the classroom. Cooperation is present

Table 2.2

Research On School-Level Impact on Academic Achievement

Edmonds (1979)	Scheerens & Bosker (1997) - with effect size	Hattie (2009)
<ul style="list-style-type: none"> • Strong administrative leadership • High expectations for student achievement • An orderly atmosphere conducive to learning • An emphasis on basic skill acquisition • Frequent monitoring of student progress 	<ul style="list-style-type: none"> • Cooperation .06 • School leadership .10 • School climate .22 • Opportunity to learn .88 • Pressure to achieve .27 • Monitoring .30 • Parental involvement .26 • Time .39 	<ul style="list-style-type: none"> • Attributes of schools (e.g., finances, types of schools); • School compositional effects (e.g., school size, mobility, mainstreaming); • Leadership; • Classroom compositional effects (e.g., class size, ability grouping, retention); • School curriculum effects (e.g., acceleration, enrichment)

when staff members are supportive of one another and is manifested through frequent scheduled and non-scheduled contacts, sharing ideas and resources and a consensus-based approach to critical decisions (Marzano, 2000). When clearly articulated rules and procedures take place against a backdrop of a positive teacher-student setting, these characteristics of a positive school climate are recognized by both students and staff. Leadership's style and focus determines the academic effectiveness of a school. Hattie (2009) reports a principal's influence on learning depends upon his/her management style. The effects of an instructional leader ($d = .57$) are found in "principals who have their major focus on creating a learning climate free of disruption, a system of clear teaching objectives, and high teacher expectations for teachers and students (p. 83)." In contrast to instructional leadership, transformational leaders ($d = .36$) "engage with their

teaching staff in ways that inspire them to new levels of energy, commitment, and moral purpose such that they work collaboratively to overcome challenges and reach ambitious goals (p. 83).”

The type of leaders needed for successful academic achievement are those who make changes in the organization structure, and who maintain a priority of the quality of the learning process for both students and staff members (Sparks, 2004). Schools and their leadership are indeed important, but overall, is only one of the key elements of learning.

Teacher Effects

Expanding upon the school effectiveness work of Edmonds, Scott and Walberg (1979) held that increased learning requires more than a primary focus on school improvement alone. They likened the elements of effective education to a three-legged stool: each leg is a set “of factors that are strongly and consistently productive of academic learning... the student as an individual, the school, and the home” (p. 24). Within the school element of this research is the influence of both the school and the teacher, and in most instances the influence of each is easily distinguishable. This section will focus on the teacher portion of the school influence.

The largest differences in influences on achievement are from within school rather than between schools; “that the teachers students are assigned to may be more important than the schools they attend” (Konstantopoulos, 2005, p. 36). An effective teacher’s influence on learning can be very high. Analysis shows that the difference between teachers can be “non-trivial” with regard to affecting a student’s achievement growth in a school year. Rowan et al. (2002) attribute the difference in teachers for as much as 60% to 78% of achievement in reading and math scores according to data from a large-scale study of two primary school cohorts. In Marzano (2000)’s analysis of teacher effects, he reports that a teacher’s effect size is about twice as large as the school’s influence. Hattie (2009)’s meta-analyses results show that quality of

teaching can affect academic achievement at a $d = .77$ effect size which is well into the excellent range by social science standards. In analyzing the data from the Second International Mathematics Study, Scheerens et al. (1989) found the between-teacher or between-class variance accounted for 42 percent of the differences in achievement.

Harvard University and Columbia University economists (Chetty, Friedman, & Rockoff, 2011) conducted a quasi-experimental study by measuring the social and economic impacts of both highly effective and ineffective teachers on students. By matching teacher assignments and math and reading test scores of 3rd through 8th grade students with their subsequent federal tax records, early adult information for these students such as colleges attended, careers, and savings amounts along with parent data such as income and certain savings were among the measures used in the study. The data show that any students fortunate to have one exceptional teacher between 4th and 8th grade, in addition to achieving significantly higher test scores for up to three years in the future, they “are more likely to attend college, attend higher ranked colleges, earn higher salaries, live in higher SES neighborhoods, and save more for retirement ... [and] less likely to have children as teenagers (abstract).” Conversely, if a poor teacher from the bottom 5% of the teachers’ population was replaced by an average teacher, it would prevent those students from missing substantial lifetime earnings. In other words, students with an exceptional teacher reap additional financial benefits while one bad teacher costs his/her students substantial lifetime earnings.

Wright, Horn, and Sanders (1997) clearly state their conclusions regarding the quality of teaching and the difference he/she makes in achievement.

...the results of this study well document that the most important factor affecting student learning is the teacher. In addition, the results show wide variation in effectiveness among teachers. The immediate and clear implication of this finding is that seemingly more can be done to improve education by improving the effectiveness of teachers than by any

other single factor. *Effective teachers appear to be effective with students of all achievement levels, regardless of the level of heterogeneity in their classrooms* [emphasis in original]. If the teacher is ineffective, students under that teacher's tutelage will achieve inadequate progress academically, regardless of how similar or different they are regarding their academic achievement. (p. 63)

The National Commission on Teaching and America's Future acknowledged the importance of an effective teacher in its 1996 Report. Its two year study concluded that America's schools cannot improve without excellent teachers along with a supportive infrastructure for recruiting, developing, and retaining them. The report states that "a caring, competent, and qualified teacher for every child is the most important ingredient in education reform..." (p. 3). From several decades of research, it has been established that it matters more for a student of what classroom he is in than what building or district attended.

Teacher expectations and attitudes affect learning. Although it may not be practicable to assign a precise effect size to teachers' influence on achievement, the message from these findings is that some teachers matter more. What the teacher does which results in academic achievement is described in terms of effective teaching practices and will be discussed in the next section of this chapter. The precursor to exhibiting effective practices is a teacher holding to the conviction of high expectations for his or her role, and high expectations for the students, and to establish a healthy teacher-student relationship (Cornelius-White, 2007). Combined, those elements influence the quality of teaching. These high expectations are a prerequisite to students sharing that teacher's expectations for themselves, and are more readily shared in a student-focused context. Different researchers describe this dynamic in a variety of ways. Hattie (2009)'s teacher-as-leader fulfills this role through holding high student expectations "that *all* students can progress, that achievement for *all* is changeable (and not fixed), and that progress for *all* is understood and articulated" [emphasis in original] (p. 35). These conceptions strongly influence a teacher's success. Brophy (1986) avers that such affective development by a teacher is a key

part of a student's overall subject-level mastery. He maintains that without a teacher holding to convictions that his/her role is essential and that he/she can make classroom-level management and instructional decisions, it will be reflected in a diminution of that person's teaching effectiveness. Ouzts (1986) describes high achieving classrooms as characterized by a two-way teacher-student relationship, and that the teacher can be trusted to be helpful and encouraging while having high academic expectations for the students.

These views are consistent with Cornelius-White (2007) who posits that high student achievement and positive behavior cannot be detached from a positive student-teacher relationship. Whitaker (2004) articulates that any academic relationship with students must be preceded by an emotional connection, "[g]reat educators understand that behaviors and beliefs are tied to emotions (p. 122)." Siler (Taylor University, 2012), while maintaining the importance of pedagogy and knowing content, also stresses the importance of "establish[ing] a really meaningful relationship with kids" (p. 23). Herrera (2010) describes the attributes of a community-oriented classroom as "a culture that values the strengths of all participants and respects their interests, abilities, languages, and dialects" (p. 72); additionally, she observes that improved classroom management is an added benefit of a positive classroom culture when students' contributions are valued. Rosenthal (1997) reported that teacher expectations strongly moderate student behavior in that students will reach their "expected" behavior; this was evidenced with the strong effect size of expectations to behavior ($d = .70$). Hattie (2009) emphasizes the importance of a person-centered teacher as "there is more engagement, more respect of self and others, there are fewer resistant behaviours, there is greater non-directivity (student-initiated and student-regulated activities), and there are higher achievement outcomes" (p. 119). In a qualitative study comparing effective and less effective teachers (Bohn et al.,

2004), from the very first days of school the superior teachers' approaches were characterized by high student expectations, enthusiasm for students and the content areas; the teacher-student exchanges were replete with feedback, praise, and encouragement. The students in these classrooms were performing at a greater level of academic achievement throughout the school year compared to classrooms of less engaging teachers.

Unvarnished self-fulfilling expectations were on display in a three-year longitudinal study conducted in an inner city St. Louis, MO district (Rist, 2000). In the early weeks of kindergarten, the teacher segmented the students according to her subjective perception of which ones had what it took to succeed in life. These variables followed typical SES categories of family income, education level and family size along with student appearance, hygiene, verbal skills and early-observed academic performance. After the teacher identified the students with these attributes, they were "ability grouped." From that time on, this higher group received more teacher interaction than the other students, a gap that widened each subsequent school year of the study. By not having high expectations for the perceived-to-be less talented students, the teachers excluded them from opportunity – not because good teaching was unavailable, but to the contrary; the research was complimentary of the ability of the teachers. The irony was that good teaching was fully available to the higher students, but was not equally accessible to the lower cadre of students in the same classroom. Thus, this teacher subjectivity created an achievement caste system within the same room, obviating the need to search for any between-classroom teacher differences.

Because of the NCLB's explicit accountability requirement for academic achievement for all students and all schools, the proverbial pay-me-now or pay-me-later scenario is being played out. Today, districts do not have the option to de-select groups of students from any expected

academic success, and are “discovering” that many of the perennially underachieving students can learn. Cawelti (2004) describes the serious commitment to academic achievement found in a number of chronically low performing schools across the country (measured by standardized reading and math test scores) and the resulting improvements in achievement. He gives an account of several separate school reform models, each of which included improvement initiatives across multiple districts. Common across each district was the explicit and expressed belief that *all* [emphasis added] students can learn, including students of color and those who are poor. When this expectation is held by district leaders and is found throughout much of an organization, academic achievement measures improved. Quality of instruction at the classroom level was the specific focus in each district-wide improvement model. One initiative “focused on student learning and guiding instructional improvement” (p. 21). Data-driven resource deployment characterized a number of districts; whether or not a student achieved mastery of his objective determined where additional support was needed. At one historically low performing district, Cawelti remarked about an impressive attitude of “earnestness with which teachers and principals were seeking strategies that worked in helping students to achieve better. At the heart of the strategy was “use of direct instructional techniques plus considerable ... time spent directly preparing students for the tests” (pp. 17-18). More than anecdotal, these scenarios found in low performing schools are further attestation to teachers’ expectations and the concomitant tone that is set in the classroom – whether positive or negative.

Effective practices research

That teachers contribute to academic achievement has never been a secret. The post-Coleman studies built upon the foundations of education research by a number of scholars who had documented the contributions of good teaching; one of the more prominent of these

researchers was John Carroll. Carroll's (Carroll, 1989; Carroll & Spearitt, 1967) contribution contrasted the effects on achievement of good and bad classroom instruction. He showed the efficient use of active learning time was directly attributable to effective classroom management and quality instruction. Other researchers continued to quantify the actual effects of the overall school influence and in particular teachers' practices, qualifications, background, attitudes, etc. on learning. Using student-level first and third grade reading scores from Stanford Achievement Tests within a large California school system, Hanushek (1971) quantified the difference that teachers make in student achievement. His research also showed that holding or earning an advanced degree has no bearing on students' learning; but, the recentness of a teacher's educational experience positively impacts student achievement. For example, in this study if a second or third grade teacher had received professional training within the last year, it equated to .2 to .3 years of reading achievement for a given third grader. Another significant (negative) teacher factor was discipline time; the more time spent in this role, academic results diminished. Accordingly, effective classroom management is, in effect, making time available for quality instruction. In addition to insights gained from these teacher characteristics, Haunshek (1971) acknowledged in regard to his early research on teacher effectiveness, that the field of research on good measures of teachers is still nascent, and that his particular study "is best looked upon as being suggestive rather than definitive; as being a prototype rather than a final analysis" (p. 233). From the nascent state of teacher effectiveness research described by Hanushek on up to the present day, a significant amount of research has identified and measured elements of instruction and the value that is added by an effective teacher.

As mentioned in Chapter 1, much serious research has been conducted over the last several decades identifying and measuring factors most relevant to academic achievement.

Leading figures in this effective teaching research are Hattie (Hattie, 1992, 1999, 2009; Hattie & Timperely, 2007), Walberg (Walberg, 2003; Walberg & Paik, 2004; Wang et al., 1990, 1993), Brophy (Brophy, 1986, 1999; Good & Brophy, 1985), and Marzano (Marzano, 1998, 2000, 2007; Marzano et al., 2001), each of whom has been prolific in the publication of educational research. Not surprisingly, the research of these scholars shares a number of practices which have proven to be highly effective for learning. In some cases, the researcher has included the effect size of the teaching practice variable.

John Hattie, through his insightful synthesizing of the main ideas of myriad meta-analyses, has contributed significantly to defining and measuring school-, teacher-, and student-level variables which contribute to achievement. His *Visible Learning* (2009) contains the synthesis of his extensive analysis of over 800 meta-

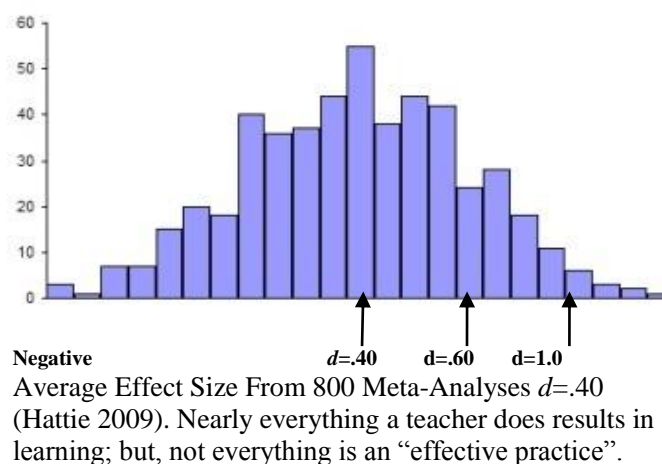
Table 2.3	
	<i>d</i>
<i>Effect Sizes for Effective Teaching (Hattie, 2009)</i>	
Reciprocal teaching	.74
Providing feedback	.72
Meta-cognition strategies	.67
Teaching self-verbalization	.67
Direct instruction	.59
Mastery learning	.57

analyses conducted among heterogeneous student populations, each of which was related to academic achievement. Examples of effective teacher influences that directly affect academic performance are listed in Table 2.3 with greater explanation found in Table A1 of Appendix A. Hattie (2009) not only identified the effective strategies and their effect sizes, but he also documented that each influence on academic achievement discussed in *Visible Learning* falls along a continuum that ranges from negative effectiveness (disruptive students) to highly effective practices. He posits that virtually anything a teacher does to bring students along in the learning process will result in additional learning, but not everything done by a teacher is “an effective practice” (p. 18). To illustrate this claim, Figure 2.1 represents the effect size quantities

and strengths of Hattie's findings from the 800 meta-analyses studied in *Visible Learning*. The *Y* axis represents the number of effect sizes within the 800 studies, and the *X* axis represents the ranges of the effect sizes. The mean effect size is $d = .40$. Hattie refers to this $d = .40$ value as the hinge, or h-point. Achieving high

academic outcomes is a result of several factors. A student's average academic growth through maturation alone accounts for about $d = .10$ to $.15$ of the improvement. Having an experienced teacher present in a classroom does not automatically equate to high academic achievement. The average teacher

Figure 2.1 Distribution of effect sizes of teaching practices



effect, not based on innovation, is between $d = .15$ to $.24$. Hence, any teacher-related effect size of $d = .40$ or greater ($d = .60$ is considered excellent) must be present for students to see above-average academic growth. For meaningful growth to occur, “[s]ome deliberate attempt to change, improve, plan, modify, and innovate is involved” (Hattie, 2009, p. 7). An effective teacher is one who finds ways to not only use these proven, above average effective practices in the classroom, but also finds different ways and settings in which to adapt the teaching to be more effective.

Walberg's contributions to effective practices are well documented in his role as a leader in the psychology of learning; about him, Marzano (2000) writes: “It is probably safe to say that Walberg has been one of the most prominent figures in the last 20 years relative to attempts to

identify those factors that most strongly influence school learning” (p. 22). Walberg’s 2003

publication, <i>Improving</i>	Table 2.4	
<i>Educational Productivity,</i>	<i>General –Effective Methods and Effect Size d (Walberg, 2003)</i>	<i>General- Effective Methods (Walberg & Paik, 2004)</i>
is a succinct report on the	Fundamental Psychological Variables in Learning	○ Parental Involvement
causes of academic	Cues (1.25)	○ Graded Homework
achievement, beginning	Reinforcement (1.17)	○ Aligned Time on Task
with the premise that the	Corrective Feedback (.94)	○ Advance Organizers
largest and most	○ Goal Setting (.40)	○ Teaching and Learning Strategies
consistently influential	○ Adjunct Questions (.40)	○ Tutoring
sources of academic	○ Explanatory Graphics (.75)	○ Direct Teaching
achievement are the home	○ Frequent Testing (.49)	○ Mastery Learning
environment and direct	○ Pretests (.48)	○ Cooperative Learning
influence from educators.	Engagement (.88)	○ Adaptive Education
	○ Homework w/tchr Comments (.83)	
	○ Graded Homework (.78)	
	○ Assigned Homework (.28)	
	Mastery Learning (.73)	
	Computer-Assisted Instruction	
	○ For Early Elementary Students (1.05)	
	○ For Handicapped Students (.66)	
	Direct Instruction (.71)	
	Comprehension Instruction (.55)	

Up to age 18 of a student, the home and other non-school influences are very strong because students spend over 90% of their time outside of school. Walberg gives evidence that the schools’ influence, specifically that of the classroom teachers, is capable of raising achievement and shrinking ability gaps for all students. He references several elements of instruction which he described as “the most fundamental psychological variables in learning” (p. 15). These include cues, reinforcement, corrective feedback and student engagement. Important aspects of these variables include goal setting, adjunct questions, explanatory graphics, frequency of testing, and graded homework with teacher comments. Mastery learning, a feedback-rich approach to learning, requires students to learn units or blocks of information before moving onto subsequent

learning. Each of these elements of quality instruction includes an effect size with all elements averaging $d = .72$.

Walberg and Paik (2004) outlined ten general effective practices that are applicable across all subject matter in K-12. The practices discussed in their publication are an accumulation of several decades of research in school systems in the U.S. and other highly

Table 2.5

General Effective Teaching Practices – (Brophy, 1999).

▪ A Supportive Classroom Climate	▪ Establishing Learning Orientations	▪ Practice and Application Activities	▪ Cooperative Learning
▪ Opportunity to Learn	▪ Coherent Content	▪ Scaffolding Students' Task Engagement	▪ Goal-oriented Assessment
▪ Curricular Alignment	▪ Thoughtful Discourse	▪ Strategy Teaching	▪ Achievement Expectations

developed countries in Europe and East Asia. These general practices describe effective ways which engage the student in the learning process. Techniques include practices such as Direct Teaching, quality homework assignments with parental involvement, cooperative learning and aligning effort with well-developed learning goals. Feedback-based practices such as graded homework, mastery learning and tutoring have proven track records. When background knowledge is actuated through use of learning strategies and advance organizers, students' progress is measurably better. An effective teacher has knowledge of what approaches to use and when, as the context, the needs, and the goals shape the classroom learning environment. Table 2.4 lists these general methods and many of their effect sizes. Table A1 and Table A3 found in Appendix A, contain more detailed descriptions of each practice.

Brophy (Brophy, 1986, 1999; Good & Brophy, 1985) made significant contributions in education research; his process/product research identified and measured the relationship between teaching practices and academic achievement. His *Teaching* (1999) booklet documents

twelve general practices and beliefs that directly affect academic achievement and are consistently found in effective teachers and apply to students across the range of ages and

Table 2.6

Effective Teaching Strategies and Effect Size d
(Marzano et al., 2001)

Identifying similarities and differences (1.61)

Summarizing and note taking (1.0)

Reinforcing effort and providing recognition (.80)

Homework and practice (.77)

Nonlinguistic representations (.75)

Cooperative learning (.73)

Setting objectives and providing feedback (.61)

Generating and testing hypotheses (.61)

Questions, Cues, and Advance Organizers
(activating prior knowledge) (.59)

subjects found within a heterogeneous K-12

student body. The general principles in *Teaching*

rest on the assumptions that the curriculum

determines what teaching method is employed in

the classroom. Different learning objectives

should be accompanied by a range of teaching

methods. That the type of learning dictates

teaching options is also true with the students'

development level. As the students' academic needs change, so should the means of satisfying them change. Additionally, as educators expect students to master the material, they must maintain a balance of offering a challenge but playing a needed role with students as they move within their changing zone of proximal development. A brief description of Brophy's twelve general effective teaching practices is found in Table 2.5 and an expanded explanation in Table A4.

Marzano claims an impressive resume as an internationally known researcher, trainer, and speaker. He has developed programs that translate research and theory into practical tools for K-12 teachers and administrators. He has written extensively on such topics as reading and writing instruction, thinking skills, school effectiveness, assessment, and standards implementation (Holt-McDougal, 2012). He and two other researchers (Marzano et al., 2001) published *Classroom Instruction that Works: Research-Based Strategies for Increasing Student Achievement* that describes nine high-probability teaching strategies, each of which has proven

learning results. The work was based upon meta-analyses conducted over the last several decades. Marzano (Marzano, 1998; Marzano et al., 2001, 2007) cautions the reader that, although the strategies have been proven in a large number of settings, they are not a one-size-fits-all solution to achievement, and advises that any individual strategy likely does not work equally well in all classroom settings, but that it is incumbent on each educator to learn where these strategies are most effective, such as with particular student groups, age groups, or content areas. Table 2.6 lists these teaching strategies with their effect sizes; Table A5 contains a more descriptive overview of each of these teaching strategies.

In addition to the generalized findings documented by the above individuals, meaningful research of effective teaching practices has been conducted in specific content areas. Research within many of these content areas is found in the *Handbook* (Cawelti, 2004). Specifically, separate chapters of effective practices are found for individual disciplines such as the arts, foreign languages, health education, language arts (Table A6), oral communications (Table A7), mathematics, physical education, science and social studies. Walberg and Paik (2004) emphasize that the general practices found in Table 2.4 and Table A3 are complementary to and not a substitute for the high-quality discipline-specific practices.

Effective teaching practices

This section highlights several effective teaching practices that are consistently associated with academic achievement.

Feedback. Effective teachers must first build on the foundation of high expectations and student-teacher trust as they develop and implement use of proven practices. These practices take on two general roles. One is the enhancing or engaging the cognitive skills of the students, and the other addresses students' attitudes and beliefs (Marzano et al., 2001). The former is

ostensibly the active engagement in learning through such activities as thought-provoking discussions, cooperative learning, advance organizers, note taking, reciprocal teaching, tutoring, and the like. The latter, an affective role, is feedback- and reinforcement-based and is most effective when the classroom climate fosters an acceptance of feedback (bi-directionally between students and teacher) and allows for learning from mistakes (Hattie & Timperley, 2007). Proven affective methods include graded homework with teacher comments, formative or goal-oriented assessments, reinforcing effort and providing, objective setting and recognition are common examples of feedback-based practices that are essential to academic achievement. Although engaging cognitive skills and the affective role of feedback differ in form, they are inexorably linked in their function of supporting learning. When examining the effective student cognitive-engagement practices, it is discovered that many contain an important element of feedback. Feedback is an indispensable common element that is found in both cognitive engagement and in the shaping of students' expectations.

Feedback, in its different forms is perhaps the most pervasive practice that effective teachers use in their students' development. It's primary purpose "is to reduce discrepancies between current understandings and performance and a goal" (Hattie & Timperley, 2007, p. 86). But for feedback to be of benefit, it must follow some initial instruction; hence, feedback is a consequence of student effort. The effect sizes of teaching practices associated with feedback/reinforcement are consistently among the highest of all effective practices. This may be observed in Table 2.6 (Reinforcing effort and providing recognition $d = .80$; Setting objectives and providing feedback $d = .61$), Table 2.4 (Reinforcement $d = 1.17$; corrective feedback $d = .94$; Frequent Testing and Pretesting $d = .49$ and $d = .48$, respectively; Homework with teacher

comments $d = .83$; Graded homework $d = .78$), and Table 2.3 (Providing feedback $d = .72$).

These are not unimportant impacts on learning.

In *Measuring the Effects of Schooling*, Hattie (1992) explains the importance of feedback and reinforcement:

...the most powerful single moderator that enhances achievement is feedback. The simplest prescription for improving education must be ‘dollops of feedback’. The effect-size for reinforcement is 1.13, remediation and feedback .65, mastery learning (which is based on feedback) .50; more specifically, homework with feedback is much more effective than homework without feedback, and recent reviews point to the power of feedback as a discriminator between more and less effective uses of computers in classrooms. This does not mean using many tests and providing over-prescriptive directions; it means providing information on how and why the child understands and misunderstands, and what directions the student must take to improve. (p. 9)

Over half of the effective teaching practices listed in Table 2.3 through Table 2.6 involve an element of feedback/reinforcement. In some instances feedback/reinforcement is the explicit practice; whereas, in the other practices feedback is a key element in a teaching/learning approach. Hattie’s above explanation of feedback’s importance includes three feedback approaches found elsewhere in the literature (e.g., reinforcement, $d = 1.13$; remediation and feedback, $d = .65$; and feedback-based mastery learning $d = .50$). He also mentions the importance of homework with feedback. Walberg (2003) also places high importance on reinforcement and corrective feedback. Its function is to provide “direction and redirection...[and] provides encouragement and information that learning is correct” (p. 15). Walberg, as does Hattie, considers feedback as an integral part of mastery learning when the students have greater opportunity for use of learning strategies (cues) and reinforcement. Even direct instruction includes feedback and reinforcement as one of its phases. In their description of effective general practices, Walberg and Paik (2004) include graded homework; when comparing it to assigned homework with limited feedback, “[t]he effects are almost tripled when teachers take time to grade the work, make corrections and specific comments on improvements that can

be made, and discuss problems and remedies with individual students or the whole class” (p. 28). The effect size for these contrasting homework efforts is $d = .28$ and $d = .83$, respectively, ranging from barely effective well into the excellent level (Walberg, 2003). Feedback-based mastery learning is also included as an effective general practice. Brophy (1999) includes several feedback-based practices in his description of effective practices: The Practice and Application Activities involves improvement-oriented feedback so that the practiced skills will result in mastery and automaticity; scaffolded instruction can only succeed with accurate and corrective feedback as students increase their expertise at each development level; Goal-oriented assessment, also a form of feedback, includes both formative and summative assessments on a range of learning goals. Feedback is by no means instruction’s “silver bullet.” However, feedback and reinforcement should be regularly-used staples of an effective educator’s classroom practice. When present, the benefits to learning are very high.

Teaching and learning strategies. In addition to the importance of using feedback, a number of other tools of effective teaching are described in both general and content-specific settings. Virtually every source of effective teaching practices referenced in the research places a high value on teachers’ modeling learning strategies. Both Marzano et al. (2001)’s and Walberg (2003)’s descriptions of effective practices consist of proven instruction or learning strategies. Walberg and Paik (2004) and Hattie (2009) highlight the importance for students to inculcate learning the strategies of metacognition to foster their self-monitoring skills. Including explicit instruction on strategic reading and writing activities is an essential element of Language Arts teaching (Squire, 2004). In addition to improved comprehension and an overall increase in the amount of reading students do, students are also better equipped to articulate their meaning-making skills in writing. Squire emphasizes that “modeling of the strategy for students is an

important component of instruction” (129). Perry (2004) outlined several approaches to effectively educate students in oral communications, basing them on sound teaching/learning strategies. For example, reducing oral communication anxiety is based upon proven strategies of developing one’s skills through goal setting, confronting irrational beliefs about their skills, observing good role models, and practicing speaking in settings where the chance of success is very high. Brophy (1999) highlights the importance of actively teaching self-regulating learning strategies to less able students since they may not otherwise have the tools to reflect on their learning processes. Several researchers (Hattie 1992, 2009; Marzano et al., 2001; Walberg, 2003) have quantified the effect size of many key learning or teaching strategies and have found them to significantly impact learning. Herrera (2010) emphasized the importance of using the appropriate learning strategy with culturally and linguistically diverse students, informed by the culture-shaping learning biographies of each student. A skilled teacher can “create conditions” (p. 50) where a strategy best aligns with a given learning style.

Classroom management. Effective classroom management is a contributor to learning. Within a well-managed classroom the teacher is able to maximize the opportunity for students to cognitively engage the material and receive appropriate feedback. John Carroll (Carroll, 1989; Carroll & Spearitt, 1967) established the important connection between classroom management and academic achievement. Wiley and Harnischfeger (1974)’s work was influenced by Carroll’s theory of time spent in productive learning activities. Because a student must be present to experience active learning time, not just total school time, they believed that school attendance, specifically student absenteeism, should be treated as a mediating variable for academic outcome rather than treating attendance as a family background factor (Wiley & Harnischfeger, 1974). Wang et al. (1990) in their meta-review “highlight[ed] the importance of maintaining an orderly

classroom environment” (p. 35) in affecting learning. Bloom (1974) showed the value of effective classroom management as it affected students’ mastery of content. Brophy (1999) describes a well-run class and a positive classroom climate go hand in hand. In such a setting, effective and successful teachers share certain traits such as “convey[ing] a sense of purposefulness of schooling and the importance of getting the most out of available time” and being “clear and consistent in articulating their expectations” (p. 11). This starts early in the school year and the teacher monitors the class’s progress and equips students with processes and strategies to negotiate learning activities. Effective teachers’ time is spent “actively instructing by elaborating content for students and helping them to interpret and respond to it... [with m]ost of their instruction occur[ing] during interactive discourse with students rather than during extended lecture presentations” (p. 11). Walberg and Paik (2004) refer to effective classroom management and instruction time as Aligned Time on Task (Table A3). When students are actively engaged in learning, they make measurable progress toward achieving specific instruction goals. During a given class period, more academic-oriented teacher-student interaction is found in contrast to independent student learning environments; the teacher presents information, ensures learning goals are met and provides appropriate feedback and challenges.

There are many teaching practices with proven results and a number of them have been discussed in this present research. A successful classroom teacher knows that teaching is very dynamic. The key to academic achievement “is what teachers get the students to do in the class that emerged as the strongest component of the accomplished teachers’ repertoire, rather than what the teacher, specifically, does” (Hattie, 2009, p. 35). Brophy (1986) describes this as active teaching, which results in the highest level of student achievement.

National Reading Panel (NRP) and National Literacy Panel (NLP)

This section summarizes key findings from the National Reading Panel (Report by the Panel, 2000; Reports by the Subgroups, 2000) and the National Literacy Panel (August & Shanahan, 2006a, 2006b, 2008). Both panels conducted large-scale research initiatives to compile, analyze and interpret the then-current research on literacy instruction for the purpose of identifying and facilitating the most effective reading and literacy instruction approaches in the classroom. The NRP's focus, in response to its 1997 Congressional charge, was on effective reading instruction for native English speakers. Because of the enormity of the NRP's task to analyze data for English speakers, it intentionally did not address literacy issues for students whose first language was not English. In 2002, the National Literacy Panel (NLP) on Language Minority Children and Youth was formed to examine research on literacy development of children whose first language was not English; its primary focus was on students whose first language was Spanish. The NLP was created by the U.S. Department of Education's Institute of Education Sciences (August & Shanahan, 2006a).

The NRP published in 2000 what became a watershed body of research by identifying the essential elements of effective literacy instruction for students and the effectiveness of various approaches to teaching children to read whose first language is English. The NRP identified five elements of literacy instruction that need to be present in order for students to acquire high-level, life-long literacy skills. These five literacy elements essential to instruction for native English speakers includes phonemic awareness, phonics, reading fluency, vocabulary, and reading comprehension strategies. These findings influenced the NLP's research topics as it set out to examine the factors that were influential in shaping the contours of literacy learning for the English language learner. The NLP's research included several broad topics which are: a) the

Development of Literacy in Second Language Learners; b) Cross-Linguistic Relationships in Second-Language Learners; c) Sociocultural Contexts and Literacy Development for Language-Minority Students; d) Educating Language Minority Students: Instructional Approaches and Professional Development; and e) Language and Literacy Assessment of Language-Minority Students. Subsequent discussion on the NLP's findings will focus primarily on the first and fourth topics, beginning with a description of the literacy elements and their place in the development of native English speakers and English language learners.

Word-level skills. The foundational building block of any language is the individual sounds which make up words and their subsequent meanings. Phonological awareness skills are those which are independent of print. Examples include isolation of beginning, middle, or ending sounds of words along with combining or blending separate sounds in a word. These are examples of phonemic awareness which focus on individual, isolated sounds. Phonemic awareness is subsumed by phonological awareness which is a broader sound-based study such as word rhyming, syllable identification, blends of sounds, and onsets and rimes of one-syllable words. The mastery of these skills is foundational to successful word reading. Stanovich (1993), a literacy scholar, considers phonemic awareness skill mastery a better predictor of early reading acquisition than a student's IQ. For both English-only and English language learners, phonological awareness is an accurate predictor of a child's future English reading and spelling skills. Phonological awareness equips students with skills for subsequent phonics instruction by knowing that sounds and letters are related in predictable ways. The mutual influences which affect the development of highly correlated word reading and spelling skills are shared between monolingual and second language learners. These influences include phonological awareness, sound-symbol correspondence rules and letter (orthographic) knowledge. The NLP confers the

importance of phonological processing skills since they act as a mediating effect on second language oral and writing skills (August & Shanahan, 2008).

Effective phonics instruction accomplishes an understanding of the system that connects sounds to the printed word. Typically, phonics instruction begins in kindergarten or first grade and its duration is about two years. Reading achievement of students who have had systematic and explicit phonics instruction is superior to students who did not receive it. Other benefits of phonics instruction include improved word recognition, spelling and reading comprehension. Phonics instruction is beneficial to students from all SES levels, and is especially effective with students who experience current and potentially future reading difficulties (Armbruster & Osborn, 2003). Print awareness and word reading skills are developed at the same skill level for English language learners as monolinguals, provided the English language learners have had sufficient exposure to word-level practice and instruction. The language minority students lag in the oral language skills such as syntactic awareness and vocabulary, but were similar in skill mastery to native English speakers in word identification and word reading accuracy. Little difference is seen between the development of monolingual students and second language learners in spelling. The material difference between the groups was the second language learners required more time to achieve similar results. The NLP's and NRP's findings were consistent in determining that instruction in the elements of literacy, both word- and text-level, are beneficial for both monolingual and second language learners (August & Shanahan, 2008).

Text-level skills. When analyzing the differences and similarities between the language groups in each of the literacy elements, they were essentially indistinguishable in word-level development. The difference between the two language groups in text-level skills pointed out the deficiency of second language learners. This is not surprising because these text-level skills of

second language learners “rarely approach the levels achieved by monolingual students” (August & Shanahan, 2008, p. 7). The text-based skills such as reading comprehension showed stark differences. Influential factors on reading comprehension for English language learners are found in two categories: a) individual skills which include readiness, word-level fluency, effective decoding skills, background knowledge, first language reading skills, and motivation and b) contextual items such as SES, the text type, and quality of instruction. The text-level skill of writing requires a host of skills activated concurrently starting with automaticity of vocabulary, letter production, cognitive abilities and higher order thinking skills. The English language learner must be aware of writing conventions in English and how they may differ from those observed in the host language (August & Shanahan, 2008).

Fluency Instruction. Armbruster and Osborn (2003) define fluency as “the ability to read a text accurately and quickly” (p. 22). As students master the word-level skills learned through phonology and phonics instruction, reading fluency allows readers to concentrate on the meaning of the texts that they read without thinking about decoding the words. A reader who is fluent can process word meaning and comprehend text at the same time, and when reading orally, it is effortless and with good expression. The NRP reports a close relationship between reading fluency and reading comprehension. But even mastery of decoding skills does not equate to good reading fluency. Armbruster and Osborn (2003) point out that “fluency develops gradually over considerable time and through substantial practice” (p. 23). The optimal way to develop fluency is for a teacher or other experienced reader to model it and for students to receive feedback as they read out loud. The NRP describes several effective ways to practice oral reading and has determined that the teacher’s direct involvement in students’ fluency development yields the optimum results, especially for struggling readers.

Vocabulary instruction. This ongoing element of vocabulary instruction is important because individuals cannot understand anything unless the meaning of the words and concepts are known. Possessing the appropriate vocabulary is critical to comprehension whether the student is reading, writing, listening or speaking. Most vocabulary for native English speakers is learned indirectly, but a portion of vocabulary development must be taught directly. Direct vocabulary instruction involves both specific word instruction and word learning strategies. When teaching individual words, teaching meaning before the word is encountered in text is beneficial. When students encounter new words multiple times and in multiple contexts, it has proven to increase vocabulary learning. Word-parts learning highlights how word meaning and usage is affected by different affixes and their relation to the base or root word; most Latin- and Greek-based words in English lend themselves to this analysis. With monolinguals and English language learners both, vocabulary instruction positively affects reading comprehension.

Text comprehension instruction. To comprehend is the purpose of reading. Text comprehension can be improved through using proven comprehension strategies where the reader consciously interacts with the text which is frequently referred to as meta-cognition or thinking about thinking. The NLP determined that ELLs benefitted from reading comprehension strategy instruction as well as from structured writing procedures, findings which are consistent for first language learners. The NLP emphasized that attention to building background knowledge, along with language skills and comprehension skills will benefit text-level development. Instruction in the five literacy elements is beneficial to both monolinguals and English language learners, with the latter group typically matching achievement levels with the former in the word-level skills. But, this parity is rarely achieved between the two groups at the text level which includes reading comprehension and writing.

Understanding the factors affecting the literacy development of both monolinguals and English language learners defines what course of action educators and policy makers should take. Proper focus may be given when remediation is needed, and knowing what normal developmental progress should look like is fundamental to setting realistic expectations. This understanding starts before the children enter school as they become familiar with sounds, how sounds form words and perhaps learning some relationship between sound and print. This may include directionality of reading, concept of word, and some basic letter sound relationships – all skills which are part of mastering the sound and word learning-to-read skills found in phonemic/phonological awareness and phonics instruction. Subsequent text-level, or reading-to-learn skills, are the fluency, vocabulary and reading comprehension elements of literacy; the writing process involves implementing word- and text-level skills along with high level cognitive processing. The NLP advised that, although each of these elements is necessary for proper literacy development, they are manifested in learners at different rates and at different levels of mastery, and that appropriate instruction is essential no matter what level of development a second language learner has achieved in comparison to his/her first language peers. The different learning rates of individuals notwithstanding, both the monolingual students and second language learners benefit from the same sequence of teaching as successful text level skills rest upon the pilaster of word-level skill mastery (August & Shanahan, 2006a).

Other findings from the NLP study

There are other meaningful conclusions made by the NLP that may be useful to practitioners and policy makers. Several of these are highlighted below.

Reading disabilities. The NLP also researched if reading disability occurrences and characteristics were similar across language groups. Their findings showed that reading disability

occurrences and characteristics were substantially similar between the language groups, and that “teachers should be able to reliably identify disabled readers among second-language learners” (August & Shanahan, 2008, p. 39).

Teacher education. Although not explicitly explored by the NLP but presumably applicable across groups, the NRP investigated the effectiveness of teacher training, or pre-service, along with subsequent in-service professional development. Because the professional development research could be tied to student achievement, unlike pre-service research, it showed “that in-service professional development produced significantly higher student achievement” (Report of the Panel, 2000, p. 21). Due to the dearth of available research, informative insights into the specific content of in-service instruction were lacking, an area where subsequent research is needed.

Transferable skills. When English language learners possess these same oral language skills along with word level skills in their first language, the skills are highly transferrable to their second language in most instances. The Panel chose to investigate cross-linguistic relationships in second-language learners by dedicating a separate sub-group and an entire chapter to its findings. The research showed that the cross-linguistic element can influence – sometimes strongly - second language acquisition. But the influence does not vary depending upon a student’s first language. This should be informative to classroom teachers when they have knowledge of each student’s literacy development level in his/her heritage language. This will inform the starting point of instruction and the rate of progression for instruction in English.

Language of instruction. The research showed that bilingual instruction had an advantage over English-only environments. This held true across age and ability levels of

students. Bilingual instruction permits development in language skills in both languages at the same time.

Similarities in language development and literacy instruction. Second language learner studies that instruction in each of the literacy elements (phonemic awareness, phonics, fluency, vocabulary, and comprehension strategies) was beneficial to both English language learners and monolinguals. Teaching reading comprehension strategies and writing skill instruction to second language learners is beneficial. The NLP's research showed the effect sizes of the five literacy elements for the monolinguals were somewhat higher in each category with the exception of vocabulary instruction; explicit vocabulary instruction was more beneficial to second language learners. But the NLP adds to be mindful to adjust instructional approaches to optimally meet learning needs because varying progress is made in different elements of literacy development: "the progress is not uniform, with the same instructional program producing different student outcomes" (August & Shanahan, 2008, p. 155). Language minority groups are highly heterogeneous and instruction approaches need to fit the developmental level of the students. Consistency between the Panels' findings was manifest in the instructional outcomes of both groups of learners for each of the five elements of literacy. The benefits of writing instruction for native English speakers and English language learners were also consistent. The NLP (2008) concluded that instruction in these literacy elements was beneficial to second language learners.

...that [the small number of] studies yielded results that are largely consistent with the finding for native-speaking populations. Although these results are insufficient to prove that the same instructional routines found to benefit native speakers are equally effective with English-language learners, they in no way contradict this idea. (p. 145)

Summary

This chapter is a review of literature that describes the major influences on academic achievement: the home, the student, the school, but with special emphasis on the influence of the teacher. The teachers' high expectations are not reserved for students only, but also held for themselves. High expectations and proven practices are pilasters to the success of an effective teacher. School/classroom effectiveness research has also provided insights into how teachers think about their students, how teachers perceive their own roles and profession, and attitudes about their work environment. Each of the practices discussed in this section are practices over which the teacher has control and do not require additional budgeting; they simply involve different ways of perceiving students and one's role as teacher and of teaching. Teachers can control their own performance. This research establishes the context within which a comparison of the effects of teacher attitude and practices on general and language minority student achievement can be explored. The chapter also described many of the similarities and some differences between the findings of the National Reading Panel and the National Literacy Panel. In general, first and second language learners learn in the same sequence from the sound and word level to the text level; instruction on the elements of literacy is beneficial to both language groups. Both language groups can achieve parity in word-level skill mastery; but, additional attention on oral language skill development for second language learners is necessary to their reading comprehension and writing development. The next chapter describes how the measurement of these teacher attitudes and instruction approaches compare across language groups.

CHAPTER III

METHOD

Introduction

This chapter describes the rationale and steps taken to create a learning model that measures the effects of teacher attitude on teaching quality and the effects of self-reported (SRTP) teaching practices on academic achievement across both language groups. This model, using data from a nationwide cohort of students assumes both language groups are in similar classroom scenarios, exposed to the same teacher attitudes and teaching practices, and achievement is assessed by the same instruments. This chapter first looks at the theory-driven learning model and its elements that will be used to measure these effects. Next is a cursory overview of structural equation modeling (SEM) that explains why its features are conducive for analysis of the cross-sectional, multivariate, multi-source, multi-group, non-experimental research design of the study. Then a description of the large-scale data source and the nationwide study participants is provided.

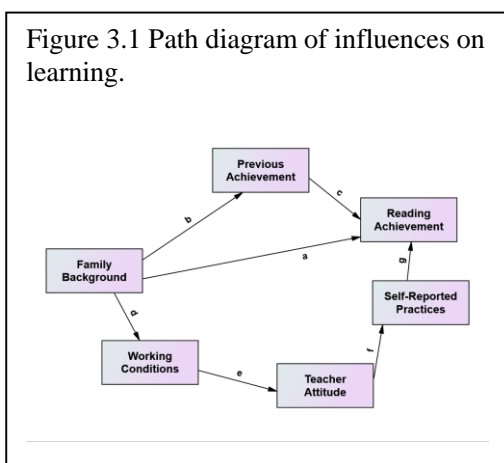
Learning Model Overview

This overview of the learning model used in this study includes a brief description of the variables and their expected influences on each other and on the ultimate outcome variable – third grade reading achievement. A rudimentary learning process model is represented in Figure 3.1 and represents a chronological account of the learning process with a more detailed version of the proposed model found in Figure 3.3. The influence of a student's socioeconomic status (SES) is taken into account and is represented by the exogenous Family Background measure. Although still highly malleable, the contours of learning for students entering school have been

shaped by their family background factors such as parent education, occupation and household income. Students' Previous (academic) Achievement influences their later academic successes and is represented by direct cognitive measures in reading in the first grade. Teachers' Working Conditions are adjusted for prior to measuring Teachers' Attitude toward their students and toward their own teaching career. The model then measures the influence of the Teachers' Attitude on their Self-Reported Teaching Practices. By the time Third Grade Reading is measured, it has been adjusted for the influence of Family Background, Previous Achievement, Working Conditions, Teacher Attitude, and Self-Reported Practices. The path arrows used for illustration purposes in Figure 3.1 show the directionality of each variable's regression-like influence on other measures within the model.

Structural Equation Modeling (SEM) Overview

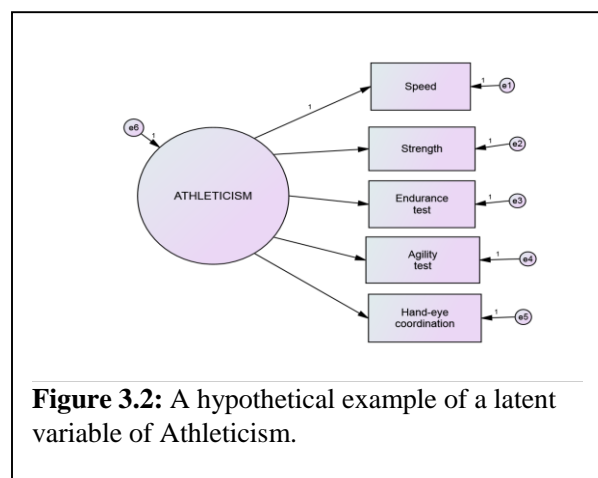
Before proceeding into a more detailed analysis of this study's variables, a brief explanation of symbols and analysis features found in SEM models is provided along with comments explaining features of SEM as they are used in this present study. In an SEM diagram each symbol conveys meaningful information. Although the path analysis in Figure 3.1 only includes rectangles for illustrative purposes, a typical SEM model includes both circles and rectangles. Rectangles represent manifest variables (i.e., measured or observed events) such as test scores,



responses to surveys, or a record of the frequency of the observance of an activity, etc. These measures may be ordinal, interval, or ratio, and are referred to as items, manifest variables, indicators, or in some instances as parcels. Categorical or nominal variables may also be represented by a rectangle. In contrast to dealing

exclusively with manifest variables, many research endeavors deal with influences or variables which cannot be directly measured but represent a real influence nevertheless. Such influences are called latent variables which are “theoretical constructs that cannot be observed directly” (Byrne, 2010, p. 4). These latent variables are also referred to as factors, or sometimes as constructs and are represented by a circle. Because they are subject to neither direct observation nor direct measure, they are nearly always found in an SEM model associated with manifest variables.

An example of a hypothetical latent variable of measuring one’s athleticism is provided. In this example (Figure 3.2), it is assumed that research and established theory report that athleticism is represented by a combination of speed, strength, endurance, agility, and hand-eye coordination. As athleticism increases, each of these items also increases in value. The direction of the arrows indicates the latent variable’s influence on the manifest variables; hence, these value changes are “caused” by a change in the latent variable. The larger the manifest variables’



loading value on the latent variable, the more of the change in the manifest variable is explained by the latent variable (Kline, 2011).

Figure 3.2 also shows the presence of other (smaller) circles which are connected to each variable. These circles represent additional influences on the variables which are not directly

measurable. The source of these additional influences may be measurement error, or they may be the influence of other variables which are not included in the model, or both. Known as disturbances or residuals, they correct for errors which impact the reliability of the

measurements. SEM's ability to minimize the influence of error on the variables and relationships of interest increases the overall accuracy of the model's estimates, a benefit to researchers which cannot be overstated.

Inclusion of multiple variables is easily accommodated in SEM. In a multivariate model such as the one used in this research, SEM's capability of quantifying whether and how much influence each variable has is an indispensable feature. The effects that one variable exerts on another may be direct or indirect. In Figure 3.1 the direct influence of Family Background on Reading Achievement is depicted by the arrow (path *a*). Its indirect effect reaches Reading Achievement through Previous Achievement via paths *b* and *c* and via the paths (*d-e-f-g*) which traverse through Working Conditions, Teacher Attitude and Self-Reported Practices. By combining direct and indirect effects, any variable's total effect is readily known. This multivariate feature of SEM provides the means to answer the first two questions regarding the influence of Teacher Attitude on Self-Reported Practices and of Self-Reported Practices on Academic Achievement.

In the more detailed model used in his research, several of the manifest variables seen in Figure 3.1 are latent variables in Figure 3.3. SEM is primarily a means to model and analyze relationships between these latent variables (Little, 2013). SEM allows for time precedence to be taken into account if one variable has a presumed cause or influence on another variable. The chronology of learning events may be accounted for as their influences are felt at different times and on different variables. For example, Prior Achievement in the first grade influences test score results measured two years later. Family Background, a variable largely established before a student enters school, exerts influence on achievement over the course of students' schooling. SEM provides the ability to simultaneously test hypotheses about the relationship between the

latent and manifest variables and the relationship between the latent variables, i.e. measurement and structural relationships. Using the multi-group feature of SEM allows the researcher to know whether the students in both language groups in this learning model are affected in the same manner. And, it allows you to know which latent construct(s) and which structural paths are invariant between groups; this test of structural path invariance is sometimes referred to as a test of moderation or interaction (Kline, 2011).

ECLS-K Data

The present study uses a nationwide longitudinal data set for its measures. The U.S. Department of Education, National Center for Education Statistics (NCES), sponsored the *Early Childhood Longitudinal Study, Kindergarten Class 1998-99* or “ECLS-K.” The ECLS-K consisted of a nationally representative cohort of children who entered kindergarten in the fall of 1998 and who were followed longitudinally from kindergarten to eighth grade. In the base year, students were selected using a dual-frame, multistage sample design in which the first-stage units were geographic areas consisting of counties or groups of counties, the second-stage units were schools in sampled counties, and the final-stage units were students in schools (Tourangeau et al., 2006). Through this process a sample of 22,782 demographically heterogeneous students from 1,277 schools was conducted. The data allows for analysis by sub-groups such as geographic location, urban or rural setting, school size, SES levels, and primary language spoken in the home, to name a few of the moderating variables. Because of the ECLS-K’s study design, students did not have an equal opportunity to be included in the study, plus a disproportionately higher number of students from minority groups were sampled in order to ensure a large enough number for reliable study results. The ECLS-K permits the use of sampling weights to

compensate for the differential probabilities of selection and non-response. In this study, the actual unweighted sampled data will be used.

The ECLS-K provides seven waves of assessment of the cognitive growth of children from kindergarten through Grade 8, from 1998 to 2007 (Table 3.1). Sampled children were tested in reading, math, and science (starting at third grade) at each wave along with collecting data from their families, teachers, and schools. The child-level data in this study came from direct child assessments, teacher questionnaires, and direct parent interviews. The parent interview for the spring-third grade data collection asked approximately 500 questions covering third grade school experiences, child care, parent characteristics, child health, and parent income, employment and education. Parent data were collected using computer-assisted

interviewing for parent interviews. The parent interview was conducted primarily in English, but provisions were made to interview parents who spoke other languages

Table 3.1

ECLS-K Data Collection Waves

<u>Grade</u>	<u>Year</u>	<u>Sampling</u>
Fall – Kindergarten	1998	Full
Spring – Kindergarten	1999	Full
Fall – First grade	1999	30%
Spring – First grade	2000	Full
Spring – Third grade	2002	Full
Spring – Fifth grade	2004	Full
Spring – Eighth grade	2007	Full

with bilingual English–Spanish interviewers or interpreters for other languages. Most of the interviews were conducted by telephone, but a small percentage (2%) was conducted in person. Home language was determined during the parent interviews by the question, “What is the primary language spoken in your home?” If the response was any other language than English, an ECLS-K indicator of language minority status was added to that student.

Third grade teacher data used in this study were obtained through questionnaires which were distributed to the schools in February 2002; 91% were completed between April and May, and the remaining 9% in June. The questionnaire completion rate was approximately 63%; teachers

were paid \$7 for each form they filled out. The surveys contained questions that measured a number of indices such as teacher attitudes toward their job, peers, students, administration, and general working conditions. Most all responses were measured via a four or five point Likert scale. No indication was given in the ECLS-K support material that teaching data was recorded throughout the year; accordingly, the information is considered “one-shot” survey data (Tourangeau et al., 2004).

Several qualities make these data conducive for the current study: detailed information about language-minority status; large sample sizes of language-minority students; and, measures for studying academic progress over time, which are the direct cognitive measures of reading, math, and science each sample period. The nationwide data collection includes students from a wide range of geographic, socioeconomic and racial/ethnic backgrounds. The multifaceted data collected across the years allow researchers and policymakers to study how various child, home, classroom, school, and community factors at various points in the child's life relate to cognitive and social development.

Participants

In this cross-sectional study, third grade students are the participants. The cohort is divided into two groups according to the language primarily spoken at home - one group whose primary language is English and the other group's primary language spoken at home is a language other than English. As mentioned, the language distinction is made based upon a parent interview response to the question: “What is the primary language spoken in your home?” If the response was any other language than English, that student gains language minority or English learner

status. The group of students identified as language minority may be found by using the variable WKLANGST. The data are from the 5th round of sampling when the preponderance of the participants is in the third grade (Pollack, Rock, & Weiss, 2005).

Table 3.2 contains both demographic and achievement data for students in each language group. Because this study measures reading in both first and third grades, achievement data is available at both assessment periods for highest proficiency level mastered (defined in Table 3.4) along with SES and ages of students. First and third grade IRT scores may be found in Table 4.1. The age at the time of assessment is reported for first grade in actual months; but for third grade, ordinal age ranges were used with the mean age between 111 and less than 114 months. The preponderance of reading assessments were given during the months of April and May in both testing periods; accordingly, the assumption is made that students were approximately 24 months older at the third grade assessment.

Variables in Study

Table 3.2

Demographic Information for Two Language Groups

Descriptive Data	Language Group	N	Mean	Std. Deviation
3rd Grade SES	English	11,316	.08	.78
	ELL	1,712	-.48	.80
1st grade highest proficiency level mastered	English	12,776	4.40	1.25
	ELL	1,732	4.08	1.26
3rd grade highest proficiency level mastered	English	10,790	6.51	1.26
	ELL	1,832	5.88	1.25
Age in months at 1st grade assessment	English	13,475	86.94	4.57
	ELL	2,121	86.45	4.85
Age in months at 3rd grade assessment. See note.	English	11,593	3.53	1.41
	ELL	1,832	3.37	1.43

Note. First grade age data at assessment was recorded in actual months.

Third grade assessment-age range averaged between 111 to less than 114 months. Assuming assessments were 24 months apart. 3rd grade

Family background. An important contextual variable for student academic performance – the student’s family background – is controlled for in this study. This is a broad measure created by the developers of the ECLS-K and is computed at the household level using data for the set of parents who completed the parent interview in Spring-third grade. The components used to create family background include: father/male guardian’s education;

mother/female guardian’s education;

father/male guardian’s occupation;

mother/female guardian’s occupation; and

household income (Table 3.3). The occupational portion of Family Background is a

numeric rating from the General Social Survey

prestige scores which are derived from the U.S.

Census occupational categories (Tourangeau et

Table 3.3.

Description of Family Background, Previous Achievement, and Dependent Variables

<u>Variable</u>	<u>ECLS-K Name</u>
Family Background SES Continuous Variable; developed by ECLS-K researchers	W3SESL
Previous Achievement First Grade IRT Reading Score; continuous variable	C4R4RSCL
Direct Cognitive Measure Third Grade IRT Reading Score; continuous variable	C5R4RSCL

al., 2004). The household income range element of family background was attained directly from the student’s family during the parent interview. The overall Family Background value is a continuous variable (W3SESL) composite of up to five elements with a mean of zero and a standard deviation of 1 that ranges from -2.49 to 2.58.

The influence of Family Background is adjusted for because of its influence on academic achievement. Adjusting for it is particularly useful when measuring its effect on second language learners’ achievement. In general, language-minority students achieve at lower language levels than other children at the same grade level. By adjusting for Family Background, its effect on

other factors such as language differences and even inter-sociocultural group differences is less likely to be confounded with a student's family, economic, and education status (August & Shanahan, 2008).

Prior achievement. Prior achievement is an important predictor variable in a school learning model. It is an indicator of current achievement as it sets a baseline for a student's future learning. The first grade IRT reading score is the direct cognitive measure used for Previous

Table 3.4

Reading Proficiency Levels in ECLS-K Database.

Level	Skill Mastery
1	Letter recognition: identifying upper- and lower-case letters by name
2	Beginning sounds: associating letters with sounds at the beginning of words
3	Ending sounds: associating letters with sounds at the end of words
4	Sight words: recognizing common "sight" words
5	Comprehension of words in context: reading words in context
6	Literal inference: making inferences using cues that are directly stated with key words in text (for example, recognizing the comparison being made in a simile)
7	Extrapolation: identifying clues used to make inferences, and using background knowledge combined with cues in a sentence to understand use of homonyms
8	Evaluation: demonstrating understanding of author's craft (how does the author let you know...) and making connections between a problem in the narrative and similar life problems
9	Evaluating nonfiction: critically evaluating, comparing and contrasting, and understanding the effect of features of expository and biographical texts
10	Evaluating complex syntax: evaluating complex syntax and understanding high-level nuanced vocabulary in biographical text.

Achievement. By including the most recently available scores, the change in achievement from first to third grade allows the model to measure the influences that affect reading achievement at third grade. Using such gains is an effective way to measure the influence of variables on learning (Rowan et al., 2002). Both the first and third grade reading scores appraise the students in each language group according to their mastery of the literacy development stages which are outlined in Table 3.4. These IRT criterion-referenced scores provide specificity of what the child can and cannot do, i.e., what mastery level an individual or a subgroup has attained (Tourangeau, Nord, Le, Sorongon, & Najarian, 2009). Plus, it is possible to know where these gains are made

across groups. More detail is provided on each group's first and third grade reading levels in the descriptive data section of the next chapter.

Language screening

A language screening assessment was given in the first grade for those children identified as a language minority student. Prior to administering the direct cognitive math, reading, and general knowledge assessments in kindergarten and first grade, the researchers used an Oral Language Development Scale (OLDS) to determine if a student's English language was strong enough to receive the subsequent direct cognitive assessments in English. The OLDS assessment, based upon the preLAS 2000 assessment, measured three dimensions of English language development: listening comprehension, vocabulary, and ability to understand and produce language. Children who passed this language screener received the full English direct assessment. During the spring first grade assessment, less than six percent of all students received the OLDS screening and two-thirds of them exceeded the cut score and took the full English direct assessment (Tourangeau et al., 2001).

Parcels

The latent variables in SEM include manifest variables which share its commonalities. The manifest variables may consist of a single measured item (e.g., a test score or an individual question from a survey response), or parcels which are a combination (usually an average) of several related items. Parcels are an average of two or more items which become the manifest indicator of a latent construct (Little, 2013). The individual items which compose a parcel must be homogeneous in order for the latent variable to represent a single construct. If such unidimensionality cannot be assumed in parcel compilation, parceling is not recommended (Kline, 2011). The parcels used in this study are averaged with items measured on diverse Likert

scales. In order to establish a consistent scale across diverse measures, this study uses the percent of maximum possible score (POMP) method. Briefly, when producing a common scale among diversely-scaled measures, POMP has proven to be very useful in many instances. The formula for calculation appears as: $[(\text{Likert value} - 1)/(\text{maximum Likert scale score} - 1)] * 100$. This scaling was used for each parcel throughout the study. For more detail on POMP scaling, please refer to Cohen, Cohen, Aiken, and West (1999). Parcel use in the latent variables are described in the subsequent sections.

Working Conditions

The Working Conditions latent variable consists of two manifest variables or parcels comprising eight and five items, respectively. These two parcels were based upon school-level research which described schools that are characterized by good levels of academic achievement (Marzano, 2000). A good school environment is created when strong and consistent leadership is present, academic achievement is stressed, and student behavior is not disruptive. The school's climate is characterized by strong peer (teacher) cooperation, congeniality between peers and good parental support. These school-level influences, supported in the literature (Edmonds, 1979; Marzano, 2000; Scheerens & Bosker, 1997), are consistent with third grade questionnaire responses regarding the extent teachers agree with school environment and climate characteristics in their buildings. The survey questions are found in Table 3.5 and the responses were based upon a five point Likert scale with choices of strongly disagree, agree, neither, agree, or strongly agree. Several responses were reverse coded to ensure the most positive response had the highest score. The school-level Working Conditions construct is assumed to influence Teachers Attitude which are classroom-level matters and are discussed in the next section.

Teacher Attitude

Teacher Attitude is the presumed link in the learning process that is the precursor to good teaching practices, and which is necessary to establish the connection with the students whereby they set high academic expectations for themselves. The Teacher Attitude latent variable consists

Table 3.5

Latent Variable: Working Conditions

<u>Parcel Components</u>	<u>Latent Variable</u>	<u>ECLS-K</u>
Working Conditions		
School Environment Parcel		
The academic standards at this school are too low. (reverse coded)		B5STNDLO
There is broad agreement among the entire school faculty about the central mission of the school.		B5MISSIO
The school administrator knows what kind of school he/she wants and has communicated it to the staff.		B5ALLKNO
The school administrator deals effectively with pressures from outside the school (for example, budget, parents, school board) that might otherwise affect my teaching.		B5PRESSU
The school administrator sets priorities, makes plans, and sees that they are carried out.		B5PRIORI
The school administration's behavior toward the staff is supportive and encouraging.		B5ENCOUR
Physical conflicts among children are a serious problem in this school. (reverse coded)		B5PHSCNF
Children bullying other children is a serious problem in this school. (reverse coded)		B5BULLY
School Climate Parcel		
Staff members in this school generally have school spirit.		B5SCHSPR
The level of child misbehavior (for example, noise, horseplay, or fighting in the halls or cafeteria) in this school interferes with my teaching. (reverse coded)		B5MISBHV
I feel accepted and respected as a colleague by most staff members.		B5ACCPTD
Teachers in this school are continually learning and seeking new ideas.		B5CNTNLR
Parents are supportive of school staff.		B5PSUPP

of two parcels which are comprised of a number of item-level teacher questionnaire responses.

The classroom environment parcel is characterized by teachers' beliefs that all his/her students are capable of learning, they have the latitude to adopt instruction and manage the classroom to optimize learning, classroom working conditions are amenable to learning, and are confident in their ability and qualifications to meet a range of student needs. The literature describes such classrooms as student centered with constructive teacher-student relationships (Bohn et al., 2004; Cornelius-White, 2007; Hattie, 2009; Whitaker, 2004). The classroom environment parcel

reflects the tone-setting role of the teacher. The beliefs-about-teaching parcel reflect the beliefs teachers hold about their profession and their effectiveness as teachers. This measure complements the classroom-level environment parcel. The specific items from teacher questionnaires in each parcel are found in Table 3.6. Adjusted for Working Conditions, this model presumes that Teacher Attitude affects the quality of what a teacher does in the classroom.

Self-Reported Teaching Practices

The composition of this construct was informed by the effective practices findings from the literature review. Because reading achievement is the dependent variable, subject-specific self-reported practices used by the third grade reading teachers comprise the manifest variables. The Teaching Practices construct was developed from self-reported teacher questionnaire responses which was a nation-wide representation of third grade teachers in different school sizes, locations, and experiences levels. The topics from the questionnaires include classroom and student characteristics; teacher instructional activities; curricular focus; and, specific language arts instruction information. Using the self-reported responses and through confirmatory factor analysis, items were identified that measured good relationships with the Self-Reported Teaching Practices construct; from that, parcels of reading instruction and writing practices were developed. Table 3.7 describes the elements of self-reported teaching practices include in this construct.

Direct cognitive measure – third grade reading

Students' third grade IRT reading scores are used as the ultimate outcome variable in this study (Table 3.3). These criterion-based, direct cognitive assessment scores reflect each student's ability level as defined by the proficiency levels in Table 3.4. The criterion-referenced IRT assessment scores place students on a continuous ability scale through tracking the patterns of correctly and incorrectly

answered items on the reading	Table 3.6		
assessment. The reading	<i>Latent Variable: Teacher Attitude</i>		
assessment reflects the	<u>Parcel Components</u>	<u>Latent Variable</u>	<u>ECLS-K</u>
student's level of mastery	Teacher Attitude		
within the ten building block	Classroom Environment Parcel		
elements (Table 3.4)	Many of the children I teach are not capable of learning the material I am supposed to teach them (reverse coded)		B5NOTCAP
necessary for establishing	How much control do you feel you have in your classroom over such areas as selecting skills to be taught, deciding about teaching techniques, and disciplining children?		B5CNTRLC
sound literacy development	At this point in the school year how would you rate the behavior in your class?		A5BEHVR
(Tourangeau et al., 2009).	I am satisfied with my class size.		B5CLSZOK
Criterion-referenced scores	I worry about the security of my job because of the performance of the children in my class(es) on state or local tests.		B5JOBSTST
provide specificity of what the	I am adequately prepared to teach reading to the children who are in my class		B5PRREAD
child can and cannot do	I am adequately prepared to assist children who are experiencing difficulties in reading		B5RPPROB
regarding his or her language	I am adequately trained to teach children in my class who have limited English proficiency (LEP).		B5LEPTRN
development. In addition,	Inclusion of limited English proficient children in my class has worked well		B5LEPINC
these IRT scores permit	Beliefs About Teaching Parcel		
measurement of change of	I really enjoy my present teaching job.		B5ENJOY
growth along these ten levels of proficiency over time (Pollack et al., 2005).	I am certain I am making a difference in the lives of the children I teach.		B5MKDIFF
	If I could start over, I would choose teaching again as my career.		B5TEACH

No English language OLDS screening was performed prior to the administration of the third grade direct cognitive assessment because a very small number of language minority students (approximately 2%) fell below the English proficiency threshold in the first grade screening. Accordingly, it was assumed that the number of students two years later in the third grade who may be below the threshold was so small that the OLDS screening would be unnecessary.

Statistical Analysis

In this study, the analysis is done with *IBM® SPSS® Statistics Premium Grad Pack 21.0*, and *IBM® SPSS® Amos Grad Pack 21.0*, © IBM Corporation and other(s) 2012. The measurement and structural equation model uses Maximum Likelihood (ML) as its estimator. The data used in this model were raw data from the ECLS-K database, and direct ML was used with missing data under the assumption that data were missing at random.

Goodness of fit measures

How closely the researcher-developed model represents the actual sampled data determines the overall validity of that research initiative. Goodness-of-fit statistics measure how accurately a

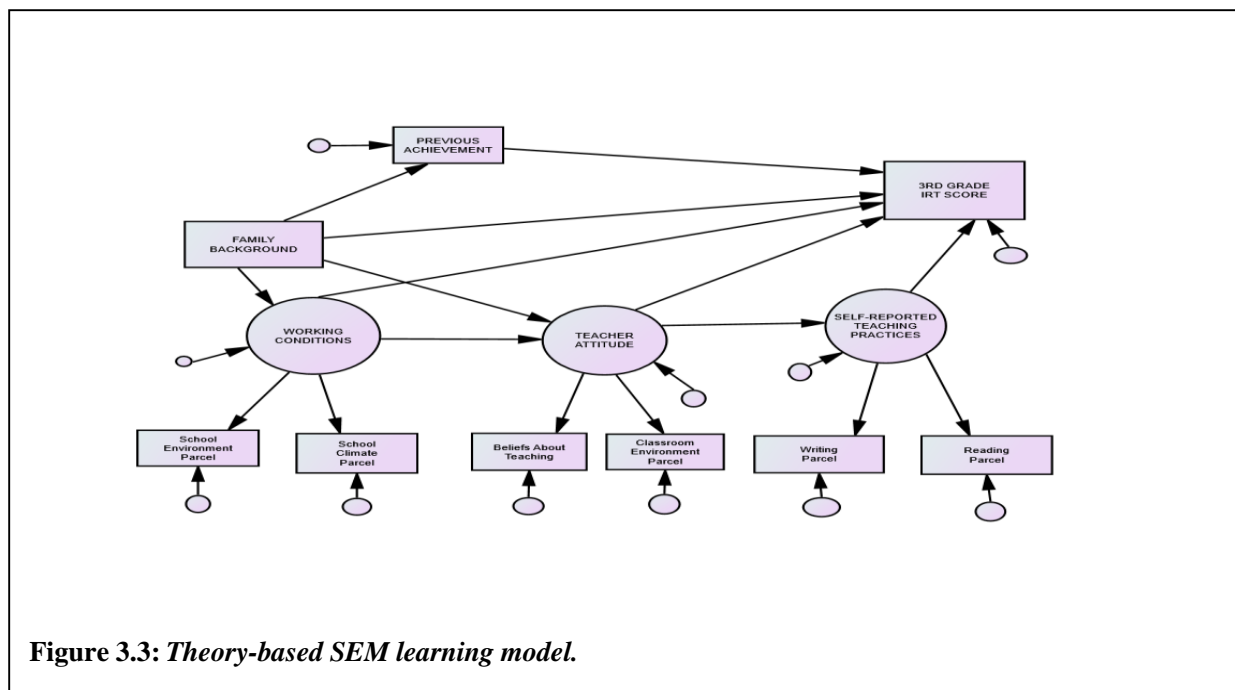
Table 3.7

Latent Variable: Self-Reported Teaching Practices

<u>Parcel and item components</u>	<u>ECLS-K</u>
Reading Practices Parcel: Frequency or proportion of time your class engages in the activity: (4-point Likert – all reverse coded)	
Discuss new or difficult vocabulary	A5NWDFVO
Talk with each other about what they have read	A5TALKRD
Write about something they have read	A5WRITRD
Do a group activity or project about what they have read	A5RDPROJ
Discuss different interpretations of what they have read	A5INTERP
Explain or support their understanding of what they have read	A5UNDSTD
Reading to gain information (science articles, historical sources, etc.)	A5RDINFO
Writing Practices Parcel: Frequency or proportion of time your class engages in the activity: (3-point Likert – all reverse coded)	
Write more than one draft of a paper.	A5DRAFTS
Talk to you about their writing while they are working on it.	A5TLKYOU
Discuss or comment on what other children wrote.	A5DISOTH
Check for proper spelling, grammar, and punctuation themselves.	A5CHKSPL

model reflects that data and are an indispensable element of determining model fit at several stages of analysis. Howell (2008) defines the purpose of goodness-of-fit testing as “comparing observed frequencies with theoretically predicted frequencies” (p. 464). Brown (2006) describes three typologies of fit indices: absolute fit, parsimony correction, and comparative or incremental fit; he advises researchers to include an index from each category when reporting model fit.

Commonly-used measures are chi-square (χ^2), RMSEA (root mean square of error approximation) along with CFI (comparative fit index) and TLI (Tucker-Lewis index). The χ^2 measures an absolute fit of a model compared to the sampled data (i.e., whether the model (Σ) is an exact representation of the population (S)), without taking into account sample size or other factors. Because χ^2 is a powerful test and produces poor model fit whenever the sample size is very large, it should be complemented with other measures of fit. A very popular parsimony correction measure used in SEM is RMSEA which is not sensitive to sample size because it considers the quantity of a model’s freely-estimated parameters; hence, its values reflect parsimony correction. RMSEA is a measure of reasonableness of model fit within the population



data. Comparative or incremental fit measures include CFI and TLI, which compare a given model configuration to another model – typically a nested model or the independence model (Brown, 2006).

General agreement among quantitative specialists is found for interpreting these goodness-of-fit measures (Brown, 2006; Byrne, 2010; Keith, 2006; Kline, 2011). An RMSEA model fit value of .08 to 1.0 is a mediocre fit; $<.08$ is an adequate model fit; and, $<.05$ is a good model fit. But if the value is ≥ 0.1 , then the model should be rejected. An RMSEA 90% confidence interval (CI) is also interpreted (Brown, 2006). A good index value for CFI and TLI measures should approximate .95 or higher. Any value between .90 and .95 is acceptable, but the closer to a 1.0 value, the better the model fit (Brown, 2006; Byrne, 2010; Keith, 2006; Kline, 2011).

Model identification

As the model is developed, model identification must also be established. Model identification is accomplished when the number of free parameters in the model is less than or equal to the number of observations. In addition, every latent variable must have a scale. Assigning one loading in each latent construct with a value of “1” is the most frequently used method to do this and is followed in this model.

Chapter Summary

This chapter introduced the structural equation model that will be used for subsequent analysis. The ECLS-K data source which will be used for this study was described. The nationwide data study will focus on third grade students - approximately 13,000 students whose dominant language is English, and over 2,700 students whose dominant language is something other than English. A brief overview of Structured Equation Modeling (SEM) was provided using a basic path diagram for illustrative purposes along with an example of a latent variable

construct. This chapter also described the variables and components of each latent variable in the model, and goodness-of-fit expectations.

CHAPTER IV

RESULTS

This chapter is a quantitative reporting of elements of this research initiative. The purpose of this study was to identify effective teaching practices and teacher attitudes and measure their effects on teaching quality and academic achievement across two language groups. The chapter begins with the descriptive data from each parcel and other measured variables and is followed by descriptive data of reading level mastery from the first and third grade reading assessments. Then, the results of single- and multi-group model testing are reported. After that the results of the three research questions are presented through analyzing the effects of structural paths. The chapter ends with reporting of other inter-variable relations in the model.

Descriptive Statistics

Manifest variables

This section comments on statistics found in Table 4.1 which are data from each of the parcels and other measured variables in the model. Because teacher survey completion is the source of all parcel data, the slight variations in sample size across parcels is explained by the quantity of completed surveys. The Family Background data source is the direct parent interview that is conducted in accordance with the data collection timetables found in Table 3.1 and reflects the success rate of that portion of ECLS-K data collection. The sample size of the Previous Achievement variable is the quantity of students to which the direct cognitive reading assessment was given in the first grade. The English language learner quantity of 1,883 reflects those who were considered language minority students by the ECLS-K. As discussed in the previous chapter, two percent of this group did not exceed the cut score of the OLDS language

screening test for reading. The third grade IRT reading scores reflect the number of students who were given this direct cognitive reading test two years later. The lower quantity of language

Table 4.1

Descriptive Data of Parcels and Other Measured Variables

<u>Latent Construct</u>	<u>N</u>		<u>Mean-SD</u>				<u>Skewness</u>		<u>Kurtosis</u>		<u>α</u>	
	Eng	ELL	Eng	SD	ELL	SD	Engl.	ELL	Engl.	ELL	Engl.	ELL
Working Conditions												
School Environ. Prcl.	11,699	1,527	.74	.16	.73	.16	-.64	-.64	.47	.38	.82	.82
School Climate Parcel	11,676	1,525	.76	.14	.76	.14	-.70	-.69	.84	1.38	.68	.67
Teacher Attitude												
Teaching Beliefs Prcl.	11,693	1,525	.82	.16	.81	.18	-.87	-.90	.93	.49	.72	.75
Class Environ. Parcel	11,813	1,532	.69	.12	.93	.19	-.30	-.21	.49	-.01	.55	.58
Self-reported Practices												
Writing Parcel	11,519	1,501	1.41	.37	1.43	.35	-.20	-.11	-.24	-.44	.64	.64
Reading Parcel	11,511	1,509	.67	.15	.68	.15	-.31	-.13	.21	-.09	.73	.71
Other Measured Variables												
Family Bkgd. - SES	13,489	1,712	.00	.81	-.48	.80	.28	1.00	-.07	1.02	n/a	n/a
Prev. Ach - 1 st Gr. IRT	16,336	1,883	77.36	23.87	72.14	23.10	.74	.97	.51	1.14	n/a	n/a
3rd Grade IRT	14,280	1,960	126.67	28.04	115.19	27.09	-.17	.14	-.51	-.48	n/a	n/a

majority students compared to the first grade number is presumably due to attrition. Since no OLDS language screening occurred in the third grade, a greater number of language minority students were given the direct cognitive assessment than in the first grade. Means and standard deviations for each item are also reported in Table 4.1. The SES composite is a continuous variable with a mean of zero and a standard deviation of 1.0.

The reliability (alpha) estimates based on interrelatedness of the items within the parcels for the samples were calculated in SPSS. Within each parcel, there are three or more questionnaire responses that presumably measure the same underlying dimension. The survey questions that best represent the constructs in this model are used in the parcels. Regarding the reliability scores for the first and third grade IRT reading scale scores, they were calculated by the ECLS-K and

are .96 and .94, respectively (Tourangeau et al., 2004). The skewness and kurtoses values are also included to assess the normality of each indicator item since ML estimation is used to estimate model data and its relationships. Because ML assumes normal data distribution for each variable, the skewness and kurtosis values indicate the data meet this requirement. All skewness values are $< \pm 3.0$ and all kurtosis values are $< \pm 10.0$ as specified by Kline (2011).

Reading mastery levels

This section provides greater description of the first and third grade IRT reading scores by analyzing the reading mastery achievement levels by language group. These 10 achievement levels are hierarchical in nature and follow a phonics-based approach to reading instruction; the assumption is the lower levels must be mastered before achievement is accomplished in the higher ones. These 10 levels are treated as ordinal as there is no consistent interval between each step in either time or level of difficulty of proficiency level mastery. A general guideline of reading development typically places the first three levels (letter recognition, beginning and ending sounds) in a pre-reading stage. Initial reading or word-level stages include levels 4 (sight words) and 5 (words in context) which is a transition state as students move from word-level to text-level skills. For mastery of levels 6 through 10, individuals must possess text-level skills (Bear, Invernizzi, Templeton, & Johnston, 2008). Both the NRP (2000) and NLP (August & Shanahan, 2006b) use these three stages in their descriptions of language development. At each assessment point English learners lagged their counterparts in language mastery skills (Table 4.2). A larger percent of first grade English learners (27%) were at the pre-reading stage than English-first readers (20%). At some of the literacy development stages, both language groups are fairly close, but cumulatively, a larger percentage of ELLs lag their counterparts in language development.

The preponderance of both language groups (66% and 62% for English-first and ELLs, respectively) was at the word level in first grade. Third grade assessment results saw greater gaps

Table 4.2

Highest Reading Proficiency Level Mastered by Percent of Total Language Group.

		First Grade Reading				Third Grade Reading			
		<u>English <i>n</i> = 15,226</u>		<u>ELL <i>n</i> = 1,732</u>		<u>English <i>n</i> = 13,292</u>		<u>ELL <i>n</i> = 1,832</u>	
Level	Reading Proficiency Skills	% Students	% Cum.	% Students	% Cum.	% Students	% Cum.	% Students	% Cum.
<u>Pre-reading skills</u>									
0	Non-mastery of lowest proficiency level	0.6	0.6	0.7	0.7	-	-	-	-
1	Letter recognition	2.1	2.7	2.0	2.7	-	-	-	-
2	Beginning sounds	4.4	7.0	7.3	10.0	0.1	0.1	0.1	0.1
3	Ending sounds	<u>13.1</u>	20.1	<u>17.0</u>	27.0	<u>1.4</u>	1.5	<u>2.4</u>	2.5
	% at reading level:	20%		27%		2%		3%	
<u>Word-level skills</u>									
4	Sight words	34.2	54.3	38.5	65.4	4.4	6.0	9.2	11.7
5	Comprehension of words in context	<u>31.5</u>	85.8	<u>23.6</u>	89.0	<u>20.3</u>	26.3	<u>28.9</u>	40.6
	% at reading level:	66%		62%		25%		38%	
<u>Text-level skills</u>									
6	Literal inference	10.4	96.1	8.1	97.1	24.9	51.2	28.8	69.3
7	Extrapolation	3.1	99.3	2.6	99.7	26.0	77.2	19.8	89.1
8	Evaluation	0.7	100.0	0.3	100.0	20.8	98.0	9.8	98.9
9	Evaluation nonfiction	0.0	0.0	0.0	100.0	1.9	99.9	1.0	99.9
10	Evaluation complex syntax	<u>0.0</u>	0.0	<u>0.0</u>	100.0	<u>0.1</u>	100.0	<u>0.1</u>	100.0
	% at reading level:	14%		11%		74%		60%	

between the groups. By third grade the majority of both groups (74% English-first and 60% for

between the groups. By third grade the majority of both groups (74% English-first and 60% for ELLs) was found at the text-level. However, nearly 70 percent (69.3%) of all ELLs were at or below the very lowest text level (level 6) compared to about half (48.8%) of English-first students who had mastered level 6 or higher. About 41 percent (40.6%) of the English learners

had only mastered word-level skills (levels 1 through 5). For English-first students, most were beyond mastery of word-level skills since only 25 percent were at levels 1 through 5. A larger cumulative percent of third grade English learners were at lower proficiency mastery levels than their counterparts; as a group, both first and third grade English learners lagged in language development.

Effect size

Keith, a leader in the field of school learning and achievement measures, has determined the effect size values of paths as .05 is small but meaningful, above .10 to .15 are moderate and paths above .25, large (see Table 4.3). Over the years of working with these models he has determined these to be reliable indicators (personal communication, September 26, 2013) and may be found in his research in learning models (Keith, 1999, 2006; Keith & Cool, 1992).

Table 4.3

Effect Sizes for School Learning and Achievement Models.

Size	Small but meaningful	Moderate	Large
β	0.05	>.10	>.25

Source: Keith (2006)

Configural and measurement models

Single-group testing

This section briefly describes the steps taken to analyze the model in Figure 3.3 and, if needed, change its configuration to one which is an acceptable measurement model for the data. The first step was to test the model against the data for each language group. In addition to overall goodness of fit, model acceptability was determined by statistical significance and overall meaningfulness of each element.

Beginning with the English learner population, the goodness-of-fit measures indicate the initial model fit was strong: RMSEA is $< .06$, and both TLI and CFI $> .95$; but, not all the paths were statistically significant. Neither of the direct effects to 3rd grade reading from Teacher Attitude and Working Conditions were significant; both paths were removed from the model. The direct effect from Family Background to Working Conditions was not statistically significant and was also removed from the model. As each of these paths was removed, a $\Delta\chi^2$ test was conducted and no significant change resulted in the model. With these three paths removed in the English learner model, the goodness-of-fit values still met the above benchmarks.

The English-first model test reflected the same non-significant influences of the direct effects

Table 4.4

Model Test for English-First and English Language Learners

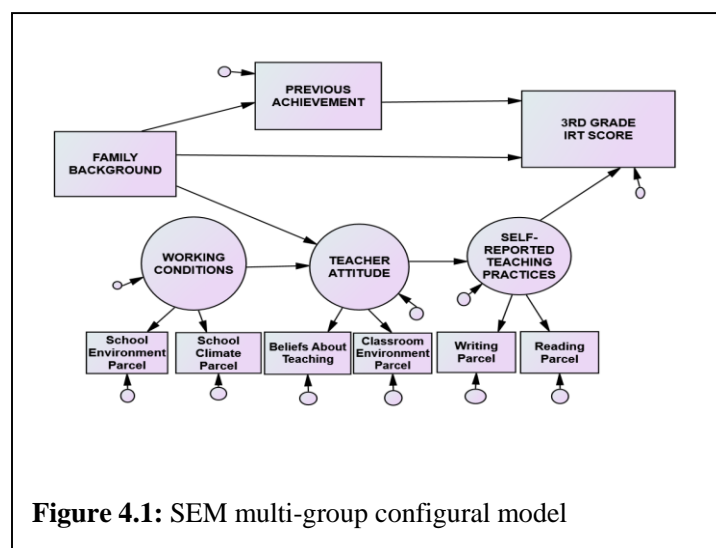
<u>Description</u>	<u>χ^2</u>	<u>df</u>	<u>$\Delta\chi^2$</u>	<u>Δdf</u>	<u>Sig.</u>	<u>$\Delta\chi^2$ SIG.</u>	<u>CFI</u>	<u>ΔCFI</u>	<u>SIG.</u>	<u>RMSEA</u>	<u>TLI</u>
Testing Figure 3.3 <u>ELL Only</u>	64.1	20.0					0.987			0.028	0.970
No TA-3R	66.3	21	2.2	1.0	0.137	n.s.	0.986	0.001	n.s.	0.028	0.971
No WC-3R	67.8	22	3.7	2.0	0.156	n.s.	0.986	0.001	n.s.	0.027	0.972
No FB-WC	68.1	23	4.0	3.0	0.261	n.s.	0.987	0.000	n.s.	0.027	0.974
Testing Figure 3.3 <u>English Only</u>	162.2	20.0					0.995			0.013	0.988
No TA-3R	163.6	21	1.4	1.0	0.237	n.s.	0.995	-0.008	n.s.	0.013	0.988
No WC-3R	166.0	22	3.8	2.0	0.152	n.s.	0.994	-0.007	n.s.	0.012	0.989
No FB-WC	170.5	23	8.3	3.0	0.041	sig	0.994	-0.007	n.s.	0.012	0.989

on 3rd Grade Reading from both Working Conditions and Teacher Attitude and were removed from the model; $\Delta\chi^2$ tests in each configuration were not significant. The direct effect from Family Background to Working Conditions was statistically significant according to the $\Delta\chi^2$, but the effect size was very small $\beta = -.028$; its statistical significance is very likely attributable to the very large sample size for the English-first group compared to the English learners. Its negative correlation lacked the “substantive meaningfulness” that Byrne (2010, p. 199) describes

since theory is lacking to support the idea that school-level Working Conditions worsen as the students' SES increased. Accordingly, there was no empirical or practical basis for keeping this path in the English-first model. With this path removed, the models for both language groups are identical and may be seen in Figure 4.1. The $\Delta\chi^2$ tests and goodness-of-fit statistics for these steps are found in Table 4.4.

Multi-group testing.

Subsequent to establishing the individual group models for each language group, one-step model testing was used to establish a multi-group measurement and structural model which is reported in this section. Two-step modeling was also performed, but the results are not reported because, except for some differences due to rounding, identical results were achieved by both methods. Because the goodness-of-fit measures were very strong, the one-step method is described. This multi-group testing begins with a comparison of the number of constructs and the number of indicators between groups for the purpose of establishing a configural model. At this



point of testing, no elements of the language group models were held equal to one another (other than the paths between constructs that were fixed to zero across groups). The goodness-of-fit statistics were used as a measure of the two models' overall fit to the observed data. In this configural model

the fit values for the configural model (RMSEA = .010; CFI = .993; and TLI = .987) suggested a good fit and may be found in Table 4.6. It is this model against which the rest of the invariance

testing will be measured. To ensure the integrity of the calculations which are used in a multi-group model, Keith (2006), in citing Steiger (1998), advises to multiply the RMSEA value by the square root of the number of groups in the model. This calculation is needed because Amos does not correct for multiple groups; the adjusted RMSEA (0.014) is closer to the average of the RMSEA values (0.027 and 0.012) which is 0.020.

Using the configural model as the baseline, the measurement model (Model 2, Table 4.6) was established as the corresponding factor loadings were held equal across groups and the non-

Table 4.5 *Regression weights for configural and partially invariant structural models.*

Regression Weights	Model 1 - Configural Invariance						Model 10 - Partial Structural Invariance					
	ENGLISH			ELL			ENGLISH			ELL		
	Est.	S.E.	p	STD.	Est.	S.E.	p	STD.	Est.	S.E.	p	STD.
TA <FB-SES	0.01	0.00	0.00	0.04	0.02	0.01	***	0.11	0.01	0.00	***	0.04
TA <WC	0.65	0.02	***	0.70	0.76	0.06	***	0.63	0.65	0.02	***	0.60
PA <FB-SES	12.12	0.23	***	0.41	14.05	0.62	***	0.48	12.12	0.23	***	0.48
SRTP <TA	0.39	0.04	***	0.23	0.32	0.09	***	0.32	0.37	0.04	***	0.33
3READ <SRTP	-0.88	1.75	0.61	-0.01	1.33	6.93	0.85	0.01	-0.73	1.71	0.67	0.00
CEP <TA	0.76	0.02	***	0.70	0.70	0.05	***	0.73	0.75	0.02	***	0.75
TBP <TA	1.00			0.65	1.00			0.72	1.00			0.69
SCP <WC	1.00			0.82	1.00			0.76	1.00			0.80
SEP <WC	1.02	0.02	***	0.75	1.16	0.07	***	0.75	1.04	0.02	***	0.72
3READ <PA	0.76	0.01	***	0.65	0.78	0.02	***	0.67	0.76	0.01	***	0.66
3READ <FB-SES	7.36	0.22	***	0.21	5.76	0.64	***	0.17	7.34	0.22	***	0.18
RP <SRTP	0.53	0.06	***	0.61	0.64	0.19	***	0.56	0.55	0.06	***	0.53
WP <SRTP	1.00			0.48	1.00			0.36	1.00			0.39

Note. TA-Teacher Attitude; PA-Previous Achievement (1st Gr. IRT reading); SRTP-Self-Reported Teaching Practices; 3READ-3rd Gr. IRT reading; CEP-Classroom Environment Parcel; TBP-Teacher Beliefs Parcel; SCP-School Climate Parcel; SEP-School Environment Parcel; RP-Reading Parcel; WP-Writing Parcel; Est.-Unstandardized loading; STD-Standardized loading.
***; $p = < .001$

significant $\Delta\chi^2$ results evidenced measurement invariance ($\Delta\chi^2$ [3] = 5.6, $p = .130$). The factor loadings associated with the latent variables were proportionally equal across groups. Following establishment of a measurement model, tests for structural invariance followed. After holding the structural paths equal across groups, non-invariance was found as the $\Delta\chi^2$ was significant ($\Delta\chi^2$ [10] = 25.1, $p = .005$) as shown for model 3 in Table 4.6. After the one-at-a-time individual path-constraining process was completed, two separate structural paths were found to be non-invariant: the two that originate at Family Background and terminate at 3rd Grade Reading and Previous Achievement, respectively. Table 4.6 displays the $\Delta\chi^2$ and corresponding Δdf and p values associated with those non-invariant paths. In those two paths, group membership resulted in an interaction with or a moderating effect on the behavior of the variables. The model fit (model 10) of this partially constrained structural model is shown to be good with RMSEA at .009, TLI at .989 and CFI equaling .993.

Research question one

Table 4.6

Results of Measurement Model and Structural Model Invariance Testing.

Model description	Comparative model	χ^2	df	$\Delta\chi^2$	Δdf	Sig.	Sig/ n.s.	CFI	ΔCFI	Sig/ n.s.	RMSEA	TLI
<u>Configural model</u>												
Model 1 No equal loadings	-	237.9	46					0.993			0.010	0.987
<u>Measurement model</u>												
Model 2 loadings eq.	Model 2 v. 1	243.5	49	5.6	3.0	0.130	n.s.	0.993	0.000	n.s.	0.009	0.988
<u>Structural Model</u>												
Model 3 Structural Paths	Model 3 v.1	263.0	56	25.1	10.0	0.005	sig.	0.993	0.000	n.s.	0.009	0.989
Model 4 WC-TA	Model 4 v.1	244.1	50	6.2	4.0	0.181	n.s.	0.993	0.000	n.s.	0.009	0.988
Model 5 TA-ETP	Model 5 v.1	244.1	51	6.3	5.0	0.280	n.s.	0.993	0.000	n.s.	0.009	0.988
Model 6 ETP-3R	Model 6 v. 1	244.4	52	6.5	6.0	0.370	n.s.	0.993	0.000	n.s.	0.009	0.989
Model 7 FB-TA	Model 7 v. 1	249.7	53	11.8	7.0	0.106	n.s.	0.993	0.000	n.s.	0.009	0.989
Model 8 FB-3R	Model 8 v. 1	255.1	54	17.3	8.0	0.027	sig.	0.993	0.000	n.s.	0.009	0.989
Model 9 FB-PA	Model 9 v. 1	258.1	54	20.2	8.0	0.010	sig.	0.993	0.000	n.s.	0.009	0.988
Model 10 PA-3R	Model 10 v. 1	250.2	54	12.3	8.0	0.138	n.s.	0.993	0.000	n.s.	0.009	0.989

What influence does teacher attitude have on self-reported teaching practices after controlling for family background, previous achievement and working conditions? This was

Table 4.7

Standardized (β) Direct, Indirect and Total Influence of Variables

Model 10 Language Group	Family Background			Working Conditions			Teacher Attitude			Previous Achievement		Effective Practices	
<u>ENGLISH</u>	Dir.	Ind.	Tot.	Dir.	Ind.	Tot.	Dir.	Ind.	Tot.	Dir.	Tot.	Dir.	Tot.
Teacher Attitude	0.05	-	0.05	0.70	-	0.70	-	-	-	-	-	-	-
Previous Achievement	0.41	-	0.41	-	-	-	-	-	-	-	-	-	-
Effective Practices	-	0.01	0.01	-	0.16	0.16	0.23	-	0.23	-	-	-	-
3rd Grade Reading	0.21	0.27	0.48	-	-0.001	-0.001	-	-0.001	-0.001	0.65	0.65	-0.004	-0.004
<u>ELL</u>	Dir.	Ind.	Tot.	Dir.	Ind.	Tot.	Dir.	Ind.	Tot.	Dir.	Tot.	Dir.	Tot.
Teacher Attitude	0.04	-	0.04	0.60	-	0.60	-	-	-	-	-	-	-
Previous Achievement	0.48	-	0.48	-	-	-	-	-	-	-	-	-	-
Effective Practices	-	0.01	0.01	-	0.20	0.20	0.33	-	0.33	-	-	-	-
3rd Grade Reading	0.18	0.32	0.50	-	-0.001	-0.001	-	-0.001	-0.001	0.66	0.66	-0.004	-0.004

purposed to find whether Teacher Attitude influences Self-Reported Teaching Practices. The short answer is yes, and the influences were the same across groups. Standardized coefficients showed that the influence was approaching large ($\beta = .23$) for English-first and large for English learners ($\beta = .33$). For each standard deviation (SD) increase in Teacher Attitude, a .23 SD increase occurs in Self-Reported Practices for English-first students, and for each SD increase of Teacher Attitude, a .33 SD increase occurred in Self-Reported Practices for English learners. Working Conditions and other variables also influenced Self-Reported Teaching Practices; Working Condition's total effect on Self-Reported Practices was moderate ($\beta = .16/.20$) as it was mediated by Teacher Attitude. Working Conditions exerts a large, direct influence ($\beta = .70/.60$) on Teacher Attitude. Better working conditions were associated with better teacher attitudes, which in turn was associated with a higher frequency of use of self-reported teaching practices.

A variable's squared multiple correlation value is the estimated amount of variance that the predictors explain (see Table 4.8). The amount of variance in Self-Reported Teaching Practices explained by Family Background, Working Conditions, and Teacher Attitude combined is no more than 11 percent for either language group (5% for English-first and 11% for English learners). This means that about 89% or more of the variance is explained by other influences on this latent variable which are not explicitly measured in the model.

Research question two

What effect do Self-Reported Teaching Practices have on student achievement after

Table 4.8

Squared Multiple Correlations

<u>Model 10</u>	<u>English</u>	<u>ELL</u>
<u>Latent Variables and IRT Scores</u>		
Teacher Attitude	0.49	0.37
3 rd Grade Reading	0.58	0.58
Previous Achievement	0.17	0.23
Self-Reported Practices	0.05	0.11
<u>Parcels</u>		
School Climate Prcl.	0.66	0.64
School Environ. Prcl.	0.56	0.51
Classrm Environ. Prcl.	0.49	0.56
Teaching Beliefs Prcl.	0.43	0.48
Reading Prcl.	0.38	0.28
Writing Prcl.	0.22	0.15

controlling for Family Background, Previous

Achievement, Working Conditions, and Teacher

Attitude? The focus of the second research

question was on the degree of influence that Self-

Reported Teaching Practices exerts on third grade

reading achievement. For both language groups,

the regression weights were not statistically

significantly different from zero, and their effect

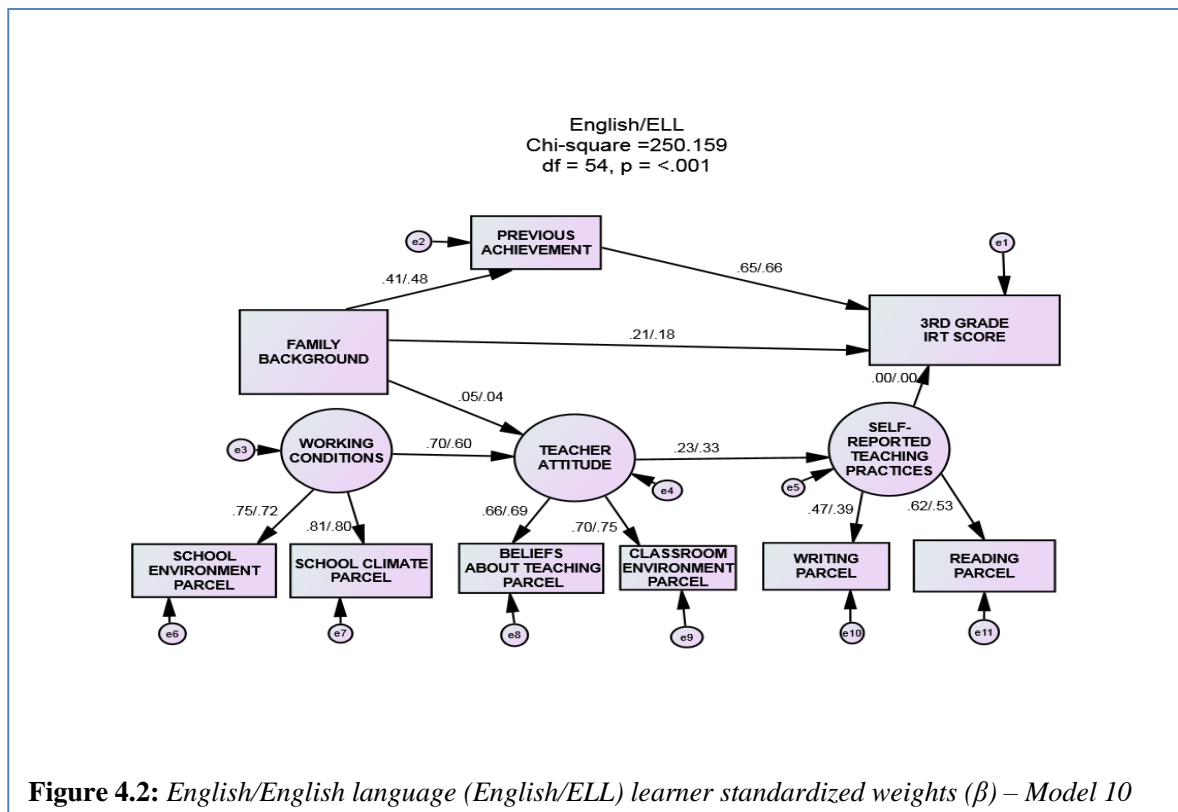
size was $\beta = .00$.

Although Self-Reported Practices exert no influence on 3rd grade reading in this model, other variables within the model do. Third Grade Reading's squared multiple correlation is 58 percent (Table 4.8), meaning over half of its variance is explained by predictor variables in the model. A review of Table 4.7 and Figure 4.2 shows those variables to be Family Background and Previous Achievement. Previous Achievement exerts a large direct influence - even after two years - on the 3rd Grade Reading ($\beta = .65/.66$). Family Background exerts direct influences on

both Previous Achievement ($\beta = .41/.48$) and on 3rd Grade Reading ($\beta = .21/.18$). Its indirect influence ($\beta = .27/.32$) on 3rd Grade Reading is mediated by Previous Achievement. The standardized total effect of Family Background on 3rd Grade Reading is very influential at $\beta = .48$ for English-first and $\beta = .50$ for English learners. Due to both unmediated and mediated effects of Family Background on 3rd Grade Reading, when Family Background goes up by 1 standard deviation, 3rd Grade Reading goes up by .48 and .50 standard deviations for English-first and English learners, respectively. This result is consistent with theory that higher SES measures are associated with higher academic achievement.

Research question three

The third research question explored whether the effects of Teacher Attitude on Self-Reported Teaching Practices, and the effects of Self-Reported Practices on 3rd Grade Reading are invariant (the same) for both language groups. The influence of Teacher Attitude on Self-



Reported Teaching Practices is the same for both language groups. When the path between Teacher Attitude and Self-Reported Teaching Practices is constrained to be equal across groups, the more constrained model (model 5 in Table 4.6) did not lead to a statistically significant $\Delta\chi^2$. The effect of Teacher Attitude on Self-Reported Teaching Practices was about the same for students in both language groups. The unstandardized loadings of Teacher Attitude on Self-Reported Teaching Practices (Table 4.5, Model 1) in the least restrictive model were nearly the same: $b = .39$ for English-first and $b = .32$ for ELLs. The freely estimated standardized effect sizes in the models showed different values within each language group: $\beta = .23$ for English-first and $\beta = .33$ for ELLs, but when compared across groups for invariance, the effect of Teacher Attitude on Self-Reported Teaching Practices is essentially the same. Therefore, there is no advantage (or disadvantage) of language group membership and the effect of Teacher Attitude on Self-Reported Teaching Practices.

The data that explain the second part of question three leads to the same conclusion that group membership makes no difference in the effect of Self-Reported Teaching Practices on 3rd Grade Reading. When the path was constrained equal between both groups, the resulting $\Delta\chi^2$ test was not significant. There is no interaction between language group membership and the effect of Self-Reported Teaching Practices on 3rd Grade Reading; language status does not have a moderating effect on the structural paths between these variables.

Other interrelated variables

Because Family Background holds a small but positive effect on Teacher Attitude, it may be presumed that most of Teacher Attitude is shaped by within-school factors rather than by the exogenous SES level of the students. The effect size of this influence was nearly identical between groups and is too small to be considered important ($\beta = .05/.04$).

Other invariance tests

Non-invariance was found between language groups relating to the influence of Family Background on reading scores in both first and third grade. Models 8 and 9 of Table 4.6 report this non-invariance. This means that Family Background interacts with language status on its effect on reading scores. When comparing the β values of the paths of Family Background to Previous Achievement ($\beta = .41/.48$) and Family Background to 3rd Grade Reading ($\beta = .21/.18$), they are nearly identical (Table 4.5, Model 10). But comparison of the unstandardized b values shows differences in slope in each of these paths between language groups, thus explaining the non-invariance. Regression of Previous Achievement on Family Background shows a slope of $b = 12.12$ for English-first and $b = 14.06$ for English learners. The first grade English language learners' reading scores are more sensitive to changes in Family Background than English-first students. Group non-invariance between Family Background's direct influence on third Grade Reading is evidenced by regression loadings are $b = 7.34$ and 6.00 for English-first and ELL respectively. ELLs have a less rapid rate of improvement in reading scores than English-first students in the third grade with corresponding increases in Family Background.

Chapter Summary

This chapter covered a broad range of analytical topics. Beginning with descriptive statistics of the measured variables in the model, establishment of the configural and measurement models followed. After that a detailed description of the direct, indirect and total influences allowed insights into the interrelatedness of the variables within the model. Data from the first research question demonstrated that Teacher Attitude exerted a large effect on Self-Reported Teaching Practices and the third question results established that the influence was invariant across groups. The data for the second research question showed the self-reported practices exerted no

statistically significant influence on achievement that was different from zero for either language group. Analysis of reading proficiency mastery levels showed that the English learners lagged in their overall literacy skills at both the first and third grade assessment point. The next chapter will discuss the implications of these findings.

CHAPTER V

DISCUSSION

This research is intended as a personal and professional development opportunity to better understand the influence a teacher has on his/her students' learning, and in particular students whose first language is not English. The research comprised two major elements. The first part of this study was to learn what teaching practices and teacher attitudes are consistently associated with academic achievement. The second part, using a publically available data base, was to test the influences that the elements of learning have on each other within each language group. The influence of each variable was then tested for invariance between language groups. These tests were conducted through multi-group modeling using Structural Equation Modeling (SEM). In the literature review, the effective practices were documented based on robust research which had been conducted within heterogeneous student populations, over a number of years, in different settings, and across a range of subject areas, ages and ability levels of students. The measurement of influences on learning, including the Self-Reported Teaching Practices, was accomplished by examining and comparing the effects of these proven practices across a national sample of two student groups: one whose language spoken at home was English and the other which spoke a language at home other than English.

The first element examined and documented the effective practices that are tied to academic achievement. Although its effect was not quantified in the literature, the teachers who create a positive learning environment and hold high expectations for students may then open the door to access the wealth of proven practices and subsequent academic achievement. The second portion of this research included the establishment of a learning model, using the ECLS-K data, which

measured the variables in a multi-group setting between the two language groups. The below research questions were addressed in this portion of the study:

1. What influence does teacher attitude have on self-reported teaching practices after controlling for family background, previous achievement and working conditions?
2. What effect do self-reported teaching practices have on student achievement after controlling for family background, previous achievement, working conditions, and teacher attitude?
3. Are the effects of teacher attitude and self-reported teacher practices the same for the general population as for English language learners (ELLs) after controlling for family background, previous achievement and working conditions?

The intention of the first question was to quantify what was stated in the literature about the effect of a teacher's attitude. Does a better attitude result in a measurably better quality of teaching? The second and third research questions were not intended to evaluate the already-proven effective practices per se, but to understand if membership in a language group had a moderating effect on the way the Self-Reported Teaching Practices construct or any other variables within the model acted. The first question confirmed that Teacher Attitude had a positive effect on teacher quality. The second question showed a statistically insignificant relationship between the Self-Reported Teaching Practices construct and 3rd Grade Reading.

Discussion of the Findings

Research question one

Teacher Attitude had a positive effect on Self-Reported Teaching Practices when adjusted for Working Conditions for both language groups. The influence of Teacher Attitude on Self-Reported Practices was strong (.23 for English-first, and .33 for English learners) and was consistent with the literature (Brophy, 1986, 1999; Good & Brophy, 1985; Hattie, 1992, 1999, 2009; Hattie & Timperely, 2007; Marzano 1998, 2000; Marzano et al., 2001, 2007; Walberg 2003; Walberg & Paik, 2004; Wang et al., 1990, 1993). As Teacher Attitude increased, greater

use of Self-Reported practices occurred. It can be assumed that the teachers' beliefs in students' capabilities and their own effectiveness tend to result in engaging in a higher frequency of self-reported teaching practices which increases the quality of their classroom instruction. What teachers do and think that result in achievement is what should be cultivated and valued. Teacher Attitude is one such attribute.

The third research question sought to investigate invariances of the paths between Teacher Attitude and Self-Reported Teaching Practices. This path was invariant between groups, which means group membership did not moderate the influence of Teacher Attitude on the model's teaching practices.

Research question two

It was expected that the Self-Reported Teaching Practices construct would influence student achievement in a positive and highly effective manner as was generally found in the literature. The results, however, were such that no statistically significant relation was found between Self-Reported Teaching Practices and 3rd Grade Reading for either language group. These results may be attributable to two possible explanations: a) the model was an accurate measure of the influences on learning and the results simply did not show a correlation between effective practices and achievement beyond the other variables in the model; b) the other scenario describes possible deficiencies in the model which, if rectifiable, would more likely show the important influence of Self-Reported Practices on achievement – consistent with the literature. These two scenarios are discussed below; the second scenario is described within the study limitations heading.

It can be argued in favor of the model's soundness as it contained measures of the main influences on learning: the family, student, school, and teacher. These influences were

represented by Family Background, Previous Achievement, Working Conditions, and Attitude and Self-Reported Practices. The specific influences of Teacher Attitude and Self-Reported Practices was available by controlling for other variables in the model. Except for Self-Reported Teaching Practice's influence on Achievement, the overall behavior of the model was consistent with research. The positive influences of Family Background on Previous Achievement for both language groups showed higher SES is associated with higher academic achievement. The influence of Working Conditions on Teacher Attitude held no surprises since, as described in the literature, a teacher's attitude toward students through holding high expectations for them and for him/herself affects their teaching quality. As Teacher Attitude increased, the frequency of Self-Reported Practices increased.

Another factor in support of the validity of the model and the results of this empirical study is the large sample size of students within both language groups. The study population was of a national database of students who attended a range of school sizes, locations, and heterogenetic in their demographics. That no significance was found between Self-Reported Teaching Practices and achievement is not to say that effective practices are not important to learning, nor does it say that the findings of this study contravene the research found in Chapter 2. I hold that not all teaching practices are equal in their impact on learning. Hattie (2009) states this by saying all practices results in learning, but they are not all equally effective. It may be concluded that the self-reported teaching practices included in this model may not be appropriate examples of practices that influenced third grade reading scores.

Without casting dispersions whatsoever on the quality of the research reported in the literature and its implications on learning, its "...large, blatantly obvious and grossly perceptible" (Hattie, 1992, p. 6) effect sizes creates a high expectation that this model will generate similar

results. This expectation may be in part be attributable to the “file drawer effect” or publication bias. This bias occurs when the preponderance of published studies show research results that are stronger or better than previously-reported results (Phillips, 2004). It is feasible that the quantity and strength of non-published studies showing low or non-significant impacts of the same practices would be just as informative as those discussed in the literature. Furthermore, a form of bias may exist with the need to exceed the $d = .40$ hinge point for a practice to be considered “effective” (Hattie, 2009). Although Hattie was transparent in his rationale for selecting that hinge point, he could have selected a higher d value at, for example, 1 *SD* above the mean of all his studies as the hinge point. If that were the case, the number of effective practices would be much smaller. If this model lacked any of those practices, it would be a tenable explanation for non-significance. Because this study may contain effect-less self-reported practices, it may be an explanation for a file drawer effect it may possess in the future.

An additional explanation for Self-Reported Teaching Practices non-significant influence is that most of the variance in Third Grade Reading was explained by Family Background and Previous Achievement (squared multiple correlation = 58%; Table 4.8). This leaves the remaining approximately 40% to be explained by all other variances including school and teacher influences. The unstandardized correlation between Previous Achievement and Third Grade Reading is nearly .80 for both language groups (.76 for English-first and .78 for ELLs; Table 4.5). With that high correlation explained by Previous Achievement alone, not much variance remains to be explained by Self-Reported Practices or any other variables in the model. Inasmuch as the research has described the importance of an effective teacher, according to this model’s results, teachers influence a smaller but not unimportant portion of learning.

One may also suggest that with so many variables in the Self-Reported Teaching Practices construct that most of the model's real variances were explained by the other variables; hence, nothing was left but small variances. If this were true, then direct paths from Working Conditions and/or Teacher Attitude to Third Grade Reading would show an influence. The analysis behind Figure 4.1 shows no such influence in either language group (Table 4.4).

Limitations of study

The model deficiency explanation for non-significance explores several possibilities. Many of these are considered study limitations. The assumption was that the findings reported in Chapter 2 was the result of work from a number of researchers over several decades; the research having met robust research standards, and the compilation of effective practices was proven through a wide range of settings. These proven practices may not have been adequately represented in this model to legitimately measure them. The ECLS-K's self-reported teacher surveys included information about classroom and student characteristics, instructional activities, curricular focus and specific questions about language arts instruction. But, as representative of the population that the ECLS-K may be, the teacher survey data may not have been as suitably situated for creating the Self-Reported Teaching Construct as hoped. For example, the literature review showed the importance of feedback and affirmation, metacognitive skills, mastery learning, and instruction strategies. Unfortunately, none of the survey responses addressed those highly-valued practices.

The nature of data collection may have resulted in dilution of self-reported effective teaching results. The surveys were largely completed at the end of the school year in April and May and were responses of a teacher's on-the-spot recall of what they had done over the entire school year. Such one-shot survey responses in a similar large-scale study was the suspected source of

diluting the effect sizes of teaching processes and learning outcomes (Rowan et al., 2002). These researchers aver that although such measures can be useful in determining relations between teaching practices and achievement, these rather crude means of data gathering result in them having reservations about the validity and reliability of the results. When comparing teachers' daily logs of their practices to one-shot survey collection data, results were "only moderately correlated" (p. 26).

Respondent bias is a potential source of error in the Self-Reported Teaching Practices portion of the model. A study conducted by the U.S. Department of Education (Germino-Hauksen, Walston, & Rathbun, 2004) using the same ECLS-K database, suspected this source of error which could be manifest in the form "when respondents systematically misreport (intentionally or unintentionally) information in a study... for social desirability [purposes]... [f]or example, teachers may report that they spend more time with their students in teacher-directed individualized instruction than might be obtained through classroom observation (p. 41)." It is unknown if such error influence was present in this study, but such data collection methods do have limitations from mis-estimations due to inaccurate recall of teaching practices.

The suitability of the ECLS-K data was much stronger for the Working Conditions and Teacher Attitude Constructs than for Self-Reported Teaching Practices. The survey questions that comprised the Working Conditions and Teacher Attitude parcels were teachers' opinions (Table 3.5 and Table 3.6). In contrast, Self-Reported Practices were based upon teachers' recall of the entire school year's instructional activities. When considering the overall numeric strength of these three constructs, Self-Reported Teaching Practices parcels' squared multiple correlations were the lowest ranging from .15 to .38 (Table 4.8), meaning that latent variable explained only a small portion of the parcels' variance.

Study design may also have contributed to the non-significant findings. The source of differentiation between the languages groups was family-reported information of whether English was the primary language spoken at home. This study did not take into account the English learner students who may have possessed near or actual native English language skills; it may be safe to say that a portion of them did. Even though the English learners lagged in development as a group, a portion mastered every language level as did the English-first students. By including these more accomplished English learners in the English-first group, it is possible a greater inter-group difference would be seen in portions of the multi-group SEM model and more could be learned about effects of influences on learning between groups.

In my estimation, the model deficiencies explanations provide a more tenable scenario for non-significance. Except for the path in question, the model's overall inter-variable dynamic was consistent with the research. I suspect that even though many of the same practices were used by most all teachers, different academic outcomes resulted. One of the messages from the literature review was the importance of how and when a given practice was used. This present study only measured the frequency of use. The ECLS-K database lacked some highly effective practices such as feedback, mastery learning, and a range of instruction strategies, to name a few. For the practices that were included in the Self-Reported Teaching Practices construct, it was not known when and why they were used.

Relationships of other variables

Family background influence

Family Background is a good predictor of student achievement. The results of the model's measurements are consistent with White (1982)'s and Jeynes (2007)'s research that higher family SES levels are typically associated with the higher achievement. The effect sizes of SES's

direct influence on Previous Achievement is strong ($\beta = .41/.48$). Its total influence on Third Grade Reading ($\beta = .48/.50$) is very strong, a combination of both direct ($\beta = .21/.18$) and indirect ($\beta = .27/.32$). The direct paths from Family Background to each reading measure were not invariant; meaning, although still positive for both groups, the language groups differ in their rate of reading achievement. The effect of Family Background depends upon the language group, i.e., a change in SES in one group does not affect reading results the same as a similar SES increase in the other language group. Based upon the well-known effect that a family's background has on achievement, the findings in this study were one more affirmation of that knowledge, thus adding nothing new to the field with that result.

Family Background also exerts a direct, but small, influence on Teacher Attitude. There was no discussion of the relationship between Family Background and its influence on learning found in this literature review. Taking the findings at face value, it appears that whether a teacher's student are from high or low SES families, it is substantially less of an influence in shaping Teacher Attitude than the quality of building leadership and co-workers. That is affirmation to school leadership that management style and trust between employees are of great importance in every school building.

Working Conditions' influence

In the model, both Family Background and Working Conditions have a direct effect on Teacher Attitude. Based upon Teacher Attitude's squared multiple correlation values (.49 and .37 for English learner and English-first, respectively), this school-level effect strongly shapes teacher attitude and is further attestation that the elements which compose good working conditions are manifest in the attitudes of the workers. Marzano (2000) describes good working conditions to include staff cooperation, formal and informal meetings, idea sharing and mutual

support between individuals. Hattie (2009) contrasts school leadership styles and finds the successful schools have leaders whose focus is the learning environment without distractions, clear goals and high expectations for teachers and students. The manifest variables in the Working Conditions construct reflect these attributes of the school leadership and co-workers (Table 3.5). Working Conditions is a strong predictor of Teacher Attitude. The implication is that attitudes of teachers in schools with a good environment and a good climate register stronger in their beliefs and classroom atmosphere indices; essentially, all of the 49 to 37 percent of the variance in Teacher Attitude is explained by the influence of Working Conditions. Based on this model, a significant portion of Teacher's Attitude is shaped by the level of trust teachers have in their administrator and in their peers.

Previous achievement's influence

Previous Achievement's influence on subsequent academic achievement (third grade reading scores) was consistent with its important predictive role that Goddard et al. (2009) identified. Even in a toddler development stage, Feinstein (2003) documents previous achievement's predictor of success in later years. In addition to Previous Achievement's direct influence, it played a mediating role in affecting the outcome (3rd Reading) variable. Because the purpose of this study is to find the effects of what teachers think and do, maintaining high expectations for students should add to their overall achievement gains each year. Similar to the observations made about Family Background's effect on achievement, these findings of Previous Achievement as a strong predictor of future achievement are unremarkable with regard to shedding new light to the field of study.

Reading proficiency levels

The English-first and English learner groups were measured in their respective language mastery skills according to a hierarchical process outlined in Table 4.2. The findings were consistent with the National Literacy Panel's (2006b, 2008) research. Overall, the English learners lagged in their development at both first and third grade assessment occasions. The English learners did show increasing levels of mastery particularly at the word level skills. The NLP research observed that English learners' mastery of word level skills equaled that of native speakers, but their text-level skills "rarely approached the levels achieved by monolingual students" (August & Shanahan, 2008, p. 7). The data in the study supports these statements. In first grade the percentage of each group at word level mastery was practically even at 66% and 62%.

The curricular content of the elements necessary for literacy development is the same for both language groups: phonological awareness, phonics, fluency, vocabulary and comprehension skills (August & Shanahan, 2008). For English language learners, the NLP advises teachers that although the five elements must be present in learning, they are learned at different rates and at different level of mastery as confirmed by the data in this study. These highest proficiency level descriptive statistics prove useful in knowing what portion of each language group has achieved mastery at a given proficiency level at each round of data collection. This information is useful for measuring achievement and examining how and where different readers change over time.

Practical Implications

A distinctive feature of this research is the quantification of the effect of Teacher Attitude on the quality of teaching. The effect size for English-first students is approaching large ($\beta = .23$) and large ($\beta = .33$) for English learners. These are very meaningful effects substantiating the claims that a teacher's effectiveness is strongly influenced by his/her beliefs in themselves and in

the students (Bohn et al., 2004; Brophy, 1986; Cornelius-White, 2007; Ouzts, 1986; Taylor, 2012; Whitaker, 2004). The research was clear that teacher attitude was reflected in the quality of classroom instruction. This research not only confirms the finding in literature, it adds to the research by quantifying it.

Assuming the model limitations could be ameliorated and Self-Reported Practices exerted a strong, non-invariant influence on learning, the study would carry direct implications for both K-12 classroom instruction and for higher education teacher training. But because a relation between self-reported practices and achievement was not found in this model, any implications must be drawn from research in the literature. On the other hand, taking the model at face value that the data show no relation between what a teacher does in the classroom and academic achievement, any such analysis would be a question-begging exercise by making conclusions in contravention to the data. That said, following are several implications from the effective practices research found in the literature review.

Because this study was purposed as a personal development opportunity, its implications may go beyond benefitting this researcher as these findings may be beneficial to other individuals who teach English learners, and to teachers of the general population. In addition to providing a meaningful classroom experience to students, a common denominator for K-12 educators may very well be the measure of accountability for student achievement. In the state where this researcher teaches, an evaluation system is being developed where “teacher and principal evaluation systems... include student growth as a significant factor” (KNEA, 2013, p.4). A practical application of this research is the practices from the literature review are proven and if skillfully used, a teacher puts him/herself in a better position to increase the achievement of students and enjoy an evaluation that reflects student success. Chapter 2 is replete with

effective practices that are beneficial to students' achievement. If the teacher is better equipped for moving the students to higher achievement levels, the students should be better equipped for further education and/or the workplace; other stakeholders such as families and future employers should benefit.

An effective teacher finds ways to adapt to situations, is innovative, and may find that what resulted in significant learning at one time with a group of students may be a roadblock at another time. Just by being an experienced teacher and making a good effort does not ensure academic achievement. Neither does the presence of an effective practice in a classroom guarantee achievement. Flexibility and mastery of as many effective practices as practicable increases meaningful learning experiences (Hattie, 2009). These same skills and mindsets are necessary when English language learners are involved. Regarding instructional approaches with English language learners, the National Literacy Panel (2006) stressed the necessity of being mindful to adjust instructional approaches to optimally meet learning needs because varying progress is made in different elements of literacy development: "the progress is not uniform, with the same instructional program producing different student outcomes" (August & Shanahan, 2008, p. 155). Language minority groups are highly heterogeneous and instruction approaches need to fit the developmental level of the students. Within the research of both the NRP and NLP, consistency was found in the instructional outcomes of both language groups of learners for the need to include each of the five elements of literacy. English language learners learn English in the same sequence as native speakers and must learn the same building blocks of the language. A competent teacher will know what learning approach to use, when to use it, and why.

At higher education levels, teacher training should include a large exposure to and development in effective practices, and with attention given to the importance of a teacher's attitude. In-service training has proven to result in academic achievement. The National Reading Panel (2000) concluded that professional (in-service) development can be tied to academic achievement. The Panel also stated that further research is needed to identify training content that was most closely tied to achievement. Hanushek (1971) asserted that teacher training can be tied to achievement. His research found a positive relationship of recentness of training to achievement where the benefits of extra training within the last five years for primary-level teachers resulted in .2 to .3 years of reading improvement for a given third grade student. The rationale may encourage or require teachers to return to school periodically. With the additional emphasis on student achievement and its impact on teacher evaluations, ongoing, meaningful training should be expected. Individuals in the field of education have range of institutions to choose from to further their formal education. A competitive advantage is held by the schools of education that can substantiate the claim that its teachers excel at creating positive learning environments and that their student students consistently achieve academically.

Suggestions for Future Research

One area of future research is to study the impact of specific effective practices on English learners compared to other groups. The effective practices research reported in Chapter 2 was done in robust conditions but with heterogeneous populations. Specific studies of English language learners at different language development stages that evaluate the effectiveness of select proven practices could be very beneficial to educators, particularly in an environment where student achievement has greater implications.

It would be instructive to expand this present research into a longitudinal study to examine the invariance of the constructs' and measurements' influences on academic achievement over time. Knowing the predictive value of certain variables or their influence for change on academic achievement could have both practical and theoretical applications for classroom teachers. It would be instructive to see the predictive value of early achievement on academic achievement for fifth and eighth grade students within the ECLS-K dataset.

Chapter Summary

This chapter discussed and interpreted the major findings of the present study in connection with relevant previous research. These effective teaching practices are applicable and effective for both language groups according to the literature. The model, however, showed no significant influence from Self-Reported Teaching Practices on learning, presumably due to limitations within that portion of the model. Also consistent with research were the findings that English language learners mastery of language skills follow the same development stages as native English speakers, but at a slower rate. Confirmed too are the effects of SES on achievement, and previous achievement on subsequent academic accomplishment. The effects of SES on both first and third grade reading were non-invariant between groups. The practical applications of this study may be a resource for educators in general as new accountability measures for students' results becomes part of the K-12 landscape. This chapter provided suggestions for future research in effective practices and teacher impact on achievement.

Conclusions

This study identified and summarized findings from a large body of research that had identified effective teaching practices in K-12 education. The result of several decades of scientifically-based research has quantified for the field of education, practices that have been

proven to result in academic achievement (Brophy, 1986, 1999; Good & Brophy, 1985; Hattie, 1992, 1999, 2009; Hattie & Timperely, 2007; Marzano 1998, 2000; Marzano et al., 2001, 2007; Walberg 2003; Walberg & Paik, 2004; Wang et al., 1990, 1993). The achievement improvements are more than just modest incremental changes; they in many instances have had “large, blatantly obvious and grossly perceptible” effects on achievement (Hattie, 1999, p.4). The SEM learning model confirmed and quantified the importance of Teacher Attitude in its impact on quality teaching. The research shows that better working conditions are associated with better teacher attitudes, which in turn are associated with an increased use of self-reported teaching practices. Therefore, it has shown that teacher attitudes are important mediating variables between working conditions teaching practices. What this study did not show, however, is that self-reported teaching practices influence academic achievement.

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APPENDIX A

Effective Teaching Strategies

Table A1

Effect Sizes for Teacher as Activator and Teaching Strategies (Hattie, 2009)

Effective Practices - <i>d</i>	Description
Reciprocal teaching .74	A teaching strategy that develops students' ability to use cognitive strategies such as summarizing, questioning, clarifying, and predicting. These skills are first modeled by the teacher and followed by student use. Scaffolding occurs as the students use these skills in their role as teacher over material they're learning. This strategy is effective at all grade levels and particularly useful for text comprehension (pp. 203-204).
Providing feedback .72	Feedback reduces discrepancies between current understandings and performance and a goal, and is most effective when it is bi-directional between students and teachers, but only after instruction has first taken place. Rich feedback is more than informing students about correctness; it informs instruction and is a dialogue between teacher and learner. Effective feedback must be clear, purposeful, meaningful and compatible with student's prior knowledge, and to provide logical connections to the work (pp. 173-178).
Meta-cognition strategies .67	Is the knowledge about one's own cognitive process (knowledge) and the monitoring of these processes (skillfulness). Self-regulation of one's learning aids in comprehension and higher level learning. Metacognition skills equip a person to monitor his own learning strategy; this higher order thinking involves actual control over the cognitive processes engaged in learning and includes practices such as study skills, self-verbalization, self-questioning, aptitude treatment interactions, matching learning styles and individualized instruction. Metacognitive strategies have proven effective for reading comprehension and are suitable for students in higher grades and best implemented in small groups instruction (pp. 188-189).
Teaching students self-verbalization .67	A specific metacognitive strategy which is most effective for task-oriented skills such as writing or math. This skill is helpful in increasing students' understanding of material and is more effective for students in the early to intermediate phase of skill acquisition and for those of lower to middle ability (pp. 192-193).

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Table A1 (Continued)

Effect Sizes for Teacher as Activator and Teaching Strategies (Hattie, 2009)

Effective Practices - <i>d</i>	Description
Direct instruction .59	DI is <i>not</i> transmission teaching where the teacher is in front of the class doing all the talking and the students listen. DI's focus is the learning intention of the curriculum and everyone knowing the success criteria of performance by which students are measured with the expectation they are fully engaged in the learning process. The teacher engages the class with appropriate media while modeling the desired outcome; the emphasis is on students' learning and using proper practices and demonstrating they're beginning to master the material while the teacher provides feedback. Lessons end with clarifying key points and tying them together into a coherent whole followed by the important step of student practice of skills to be mastered to the extent that they may be used in multiple contexts. DI has proven success in: teaching phonics skills; math and algebra instruction at elementary and high school levels; creative thinking programs; both general and special education settings; all curricular domains; and placing teachers in an active role compared to passive and minimally guided teaching approaches (pp. 204-207).
Mastery learning .57	The premise of ML is that all children can learn when provided with clear explanations of what it means to "master" the material being taught. Important for success is a classroom atmosphere with high levels of cooperation between students; ongoing teacher feedback; frequent formative and summative assessments; and corrections conversations. Instruction is given in variable lengths as students progress to the next level only after mastery has occurred. Additional time is given whenever needed. ML is effective at all levels of schooling, i.e. elementary, secondary, and college, and is particularly effective for lower-level students (pp. 170-171) .

Table A2

Selected Effects of Quality of Instruction (Walberg, 2003, pp.14-16; 50).

General Methods (<i>d</i> = effect size)	Description
Fundamental Psychological Variables in Learning	Cues, Reinforcement, Corrective Feedback, and Engagement can be considered the most fundamental psychological variables in learning.
Cues (1.25)	Cues present what is to be learned and how to learn it. The highly effective practice of reinforcement
Reinforcement (1.17)	provides encouragement and information that learning is correct. Similarly, corrective feedback
Corrective Feedback (.94)	signals mistakes and furnishes redirection. Instructional techniques which such cues, reinforcement, and corrective feedback include
○ Goal Setting (.40)	goal setting, adjunct questions, explanatory graphics, and frequent testing.
○ Adjunct Questions (.40)	
○ Explanatory Graphics (.75)	
○ Frequent Testing (.49)	
○ Pretests (.48)	
Engagement (.88)	Engagement is the degree to which learners actively participate. Homework, graded and with teacher comments , are optimal sources of Engagement. Conversely, assigned homework with no feedback or grade is a below average source of engagement.
○ Homework With Teacher Comments (.83)	
○ Graded Homework (.78)	
○ Assigned Homework (.28)	
Mastery Learning (.73)	Mastery Learning combines the elements of instruction and requires mastery of learning units before students proceed to the next unit of instruction. In particular, it allows some students as much as five times more instructional time and additional cues, corrective feedback, and reinforcement. CA instruction can provide the elements of mastery learning to each student individually. Though beneficial to students in general, even college students, it appears particularly effective in developing skills among handicapped students and those in the early grades.
○ Computer-Assisted Instruction	
○ For Early Elementary Students (1.05)	
○ For Handicapped Students (.66)	

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Table A2 (Continued)

Selected Effects of Quality of Instruction (Walberg, 2003, pp.14-16; 50).

Direct Instruction (.71)	Direct Instruction can be viewed as traditional or conventional whole-group teaching done well. Specifically, it consists of phases: (a) daily review, homework check, and, if necessary, re-teaching; (b) rapid presentation of new content and skills in small steps; (c) guided student practice with close monitoring by teachers; (d) corrective feedback and instructional reinforcement; (e) independent practice in seatwork and homework with high, more than 90 percent, success rates; and (f) weekly and monthly reviews.
Comprehension Instruction (.55)	Comprehension Instruction is similar to DI and consists of three phases: (a) modeling, in which the teacher exhibits the desired behavior; (b) guided practice, where the students perform with help from the teachers; and (c) application, in which the student performs independently.

Table A3

Effective General Teaching Practices (Walberg & Paik, 2004)

Effective Practice	Description
Parental Involvement	Learning is enhanced when schools encourage parents to stimulate their children's intellectual development. In school system in leading countries throughout the world, it's known that the home environment powerfully influences what children and youth learn within and outside school (p. 27).
Graded Homework	Students learn more when they complete homework that is graded, commented upon, and discussed by their teachers. The effects of completed homework are compounded when teachers take time to grade the work, make corrections and specific comments on improvements that can be made, etc. (p. 28).
Aligned Time on Task	Students who are actively focused on educational goals do best in mastering the subject matter. Study time alone does not suffice. Learning activities should reflect educational goals (p. 29).
Direct Teaching	Direct teaching is most effective when it exhibits key features and follows systematic steps such as systematic sequencing of lessons, presenting new content and skills, guided student practice, the use of feedback, and independent practice by students. Traits of effective teachers include clarity, task orientation, enthusiasm, and flexibility (p. 30).
Advance Organizers	Showing students the relationships between past learning and present learning increases its depth and breadth (p. 31).
Teaching and Learning Strategies	Delegating some control to students for the learning goals and the monitoring of personal progress in achieving them yields learning gains. The learner's monitoring and management of his or her own learning is paramount to successful academic outcomes (p. 32).
Tutoring	Teaching one student or a small number with the same abilities and instructional needs can be remarkably effective. Tutoring's individualized assessment and follow-up is its greatest virtue (p. 33).
Mastery Learning	In subject matter to be learned in a sequence, thorough mastery of each step is optimal. Ensuring students achieve master of initial steps in the sequence helps to ensure they will make satisfactory progress in subsequent, more advanced steps (p. 34).
Cooperative Learning	Students in small, self-instructing groups can support and increase each other's learning. When students work in groups of two to four, each group member can participate extensively, individual problems are more likely to become clear and to be remedied (sometimes with the teacher's assistance), and learning can accelerate (p. 35).
Adaptive Education	Employing a variety of instructional techniques to adapt lessons to individual students and small groups raises achievement. It is a comprehensive program for the whole school day rather than a single method requiring simple integration into one subject or into a single teacher's repertoire. A student with special needs or experiencing academic difficulties becomes the shared responsibility of a team of teachers and specialists (p. 36).

Table A4

General Effective Teaching Practices (Brophy, 1999)

Effective Practice	Description
A Supportive Classroom Climate	Students learn best within cohesive and caring learning communities. Productive contexts for learning feature an ethic of caring that pervades teacher/student and student/student interactions and transcends any student differences. Students are encouraged to work collaboratively and to help one another (pp. 8-9).
Opportunity to Learn	Students learn more when most of the available time is allocated to curriculum-related activities and the classroom management system emphasizes maintaining their engagement in those activities. Successful teachers approach classroom management as a process of establishing an effective learning environment vis-à-vis a role of disciplinarian, and spend more time in interactive discourse and less time on solitary seatwork. Most of their instruction occurs during interactive discourse with students rather than during extended lecture presentations (pp.10-12).
Curricular Alignment	All components of the curriculum are aligned to create a cohesive program for accomplishing instructional purposes and goals. Curriculum and instruction must emphasize goals of understanding, appreciation and life application. Understanding means that students learn both the individual elements in a network of related content and the connections among them, so that they can explain the content in their own words and connect it to their prior knowledge. Appreciation means that students value what they are learning because they understand that there are good reasons for learning it. Life application means that students retain their learning in a form that makes it usable when needed in other contexts (pp. 13-14).
Establishing Learning Orientations	Teachers can prepare student for learning by providing an initial structure to clarify intended outcomes and cue desired learning strategies. Before beginning any lesson or activity, the teacher should ensure that students know what they will be learning and why it is important for them to learn it (pp.15-16).
Coherent Content	To facilitate meaningful learning and retention, content is explained clearly and developed with emphasis on its structure and connections. Networks of connected knowledge structured around powerful ideas can be learned with understanding and retained in forms that make them accessible for application. When making presentations, providing explanations or giving demonstrations, effective teachers project enthusiasm for the content and organize and sequence it so as to maximize its clarity and coherence. As part of instruction, teachers should follow up with authentic learning activities and assessment measures that provide students with opportunities to develop and display learning that reflects the intended outcomes of the instruction (pp. 17-18).

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Table A4 (Continued)

General Effective Teaching Practices (Brophy, 1999)

Effective Practice	Description
Thoughtful Discourse	Questions are planned to engage students in sustained discourse structured around powerful ideas. Effective teachers structure a great deal of content-based discourse. They use questions to stimulate students to process and reflect on content, recognize relationships among and implications of its key ideas, think critically about it, and use it in problem solving, decision making or other higher-order applications (pp. 19-20).
Practice and Application Activities	Students need sufficient opportunities to practice and apply what they are learning, and to receive improvement-oriented feedback. Skills practiced to a peak of smoothness and automaticity tend to be retained indefinitely. Most skills included in school curricula are learned best when practice is distributed across time and embedded within a variety of tasks. To be useful, practice must involve opportunities not only to apply skills but also to receive timely feedback. Feedback should be informative rather than evaluative, helping students to assess their progress with respect to major goals and to understand and correct errors or misconceptions (pp 21-22).
Scaffolding Students' Task Engagement	The teacher provides whatever assistance students need to enable them to engage in learning activities productively. Teaching within students' zones of proximal development implies that students will need explanation, modeling, coaching and other forms of assistance from their teachers, but also that this teacher structuring and scaffolding will be faded as the students' expertise develops. Most assignments will not have their full effects unless they are followed by reflection or debriefing activities in which the teacher reviews the task with the students, provides general feedback about performance, and reinforces main ideas as they relate to overall goals (pp. 23-24).
Strategy Teaching	The teacher models and instructs students in learning and self-regulation strategies. General learning and study skills as well as domain-specific skills are most likely to be learned thoroughly and become accessible for application if they are taught as strategies to be brought to bear purposefully and implemented with metacognitive awareness and self-regulation. This requires comprehensive instruction that includes attention to propositional knowledge (what to do), procedural knowledge (how to do it) and conditional knowledge (when and why to do it) (25-26).

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Table A4 (Continued)

General Effective Teaching Practices (Brophy, 1999)

Effective Practice	Description
Cooperative Learning	Students often benefit from working in pairs or small groups to construct understandings or help one another master skills. There is often much to be gained by arranging for students to collaborate in pairs or small groups as they work on activities and assignments. Co-operative learning promotes affective and social benefits such as increased student interest in and valuing of subject matter, and increases in positive attitudes and social interactions among students (pp. 27-28).
Goal-oriented Assessment	The teacher uses a variety of formal and informal assessment methods to monitor progress towards learning goals. Effective teachers routinely monitor their students' progress in information as well as in their reasoning and problem-solving skills by using both formal tests or performance evaluations and informal assessments of students' contributions to lessons and work on assignments. Good assessment includes data from many sources besides paper-and-pencil tests, and it addresses the full range of goals or intended outcomes (29-30).
Achievement Expectations	The teacher establishes and follows through on appropriate expectations for learning outcomes. Teachers who elicit strong achievement gains accept responsibility for doing so. They believe that their students are capable of learning and that they (the teachers) are capable of and responsible for teaching them successfully. If students do not learn something the first time, they teach it again, and if the regular curriculum materials do not do the job, they find or develop others that will. Teachers' expectations concerning what their students are capable of accomplishing (with teacher help) tend to shape both what teachers attempt to elicit from their students and what the students come to expect from themselves (31-32).

Table A5

Categories of Instructional Strategies That Affect Student Achievement (Marzano et al., 2001)

Instruction Strategy (<i>d</i> = effect size)	Description
Identifying similarities and differences (1.61)	The students' ability to use knowledge in comparative formats. These activities may be teacher- or student-directed. Graphic illustrations of these similarities and differences are a key element to its effectiveness as seen in student understanding of content. Common illustrative tools may include Venn diagrams, a comparison matrix, and a wide range of graphic organizers. Great latitude is afforded in the categories available to classify information. Examples include comparing, classifying, creating metaphors, and creating analogies (pp. 13-28).
Summarizing and note taking (1.0)	These similar skills require students to "distill information into a parsimonious, synthesized form (30)." Three learning generalizations characterize summarization : 1) students must substitute, delete, and keep some information; 2) to do the first skill, analyze the information at a fairly deep level; 3) awareness of the explicit structure of information. Note taking requires knowing what is most important and stating it in a succinct fashion. 1) verbatim note taking is less efficient than summarizing analysis of information; 2) add to notes as knowledge about the topic increases; 3) notes are study guides for tests; 4) more notes correlate to higher grades (pp. 29-48).
Reinforcing effort and providing recognition (.80)	Effort consistently produces achievement more so than ability, other people, or luck. Because many students are not aware of the benefits of effort, teachers can reinforce the attribute of effort. Recognition is most effective when given in the form of verbal praise that is connected with accomplishing specific performance goals. Tangible rewards have a place, but longer-term benefits are realized with other forms of recognition (pp. 49-59).
Homework and practice (.77)	Homework 's benefits increase with the age of the student; hw is for both practice and for gaining general knowledge; commenting on and grading hw yields direct academic benefits to the students. Practice is for the purpose of mastering knowledge or a skill; mastery is gained after many practice sessions and a deep conceptual understanding behind their skills (pp. 60-71).

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Table A5 (Continued)

Categories of Instructional Strategies That Affect Student Achievement (Marzano et al., 2001)

Instruction Strategy (<i>d</i> = effect size)	Description
Nonlinguistic representations (.75)	Most new information presented to students is linguistic or semantic; students also learn through visual images or nonlinguistic representations ; both are essential to thinking about and recalling information. Teachers should generate nonlinguistic representations of knowledge in the minds of students for the purpose of elaboration of knowledge and thus, reinforcing that knowledge. Effective activities to develop nonlinguistic representations include: graphic representations, making physical models, generating mental pictures, drawing pictures & pictographs, and engaging in kinesthetic activity (pp. 72-83).
Cooperative learning (.73)	Definition: grouping smaller numbers of students in a heterogeneous classroom for students to assimilate and present ideas by explaining various aspects of material to one another. Research shows students' effort is higher, academic achievement increases as material is retained longer and higher learning skills are employed. Optimal results are found when groups are heterogeneous with ability grouping used sparingly, are smaller (3-4 members), and consistently applied but not overused. Three types of groups are commonly found: 1) informal (pair-share, shoulder buddy); 2) formal groups may be project-based and last from days to weeks; 3) longer term base groups for the purpose of supporting students for a semester or a year (pp. 84-91).
Setting objectives and providing feedback (.61)	Goals should be sufficiently broad so that information may have contextual significance; behavior objectives are often too narrow and inhibit the constructivist nature of the learning process. Characteristics of effective feedback include: 1) "corrective", i.e., explaining what is right and inaccurate; 2) timely – immediately after a test or assignment; and 3) criterion-oriented which tells a student where they stand relative to specific knowledge or skills (pp. 92-102).
Generating and testing hypotheses (.61)	This strategy involves the application of knowledge through a deductive or inductive reasoning approach. Students should clearly explain their hypothesis and conclusions – preferably in writing. A variety of structured tasks can be used in this strategy: scientific method; systems analysis; problem solving; historical investigation; invention; experimental inquiry; and, decision making (pp. 103-110).

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Table A5 (Continued)

Categories of Instructional Strategies That Affect Student Achievement (Marzano et al., 2001)

Instruction Strategy (<i>d</i> = effect size)	Description
Questions, Cues, and Advance Organizers (activating prior knowledge) (.59)	All are effective in activating prior knowledge; cues (hints of what students are about to experience) and questions are substantially similar and are at the heart of classroom practice. Guidelines for use: 1) focus on what's important, not what's unusual; greater knowledge leads to greater interest which yields greater achievement; 2) higher level questions require students to restructure information or apply knowledge in some way; 3) wait time increases answer quality, student discourse, and more student-to-student interaction; 4) higher level questions <i>before</i> the learning experience produces deeper levels of learning. Advance Organizers are closely related to cues and questions. In addition to their attributes described in 1, 2, and 4 above, they are useful for poorly organized information, plus different types of adv. organizers produce different results. Their uses are tangential to the above nonlinguistic representations strategy (pp. 111-120).

Table A6

Effective Practices in Language Arts (Squire, 2004)

Effective Language Arts Practices	Description
Extensive Reading	Extensive reading of material of many kinds, both in school and outside, results in substantial growth in vocabulary and comprehension abilities and in the information base of students. Students with both high and low literacy skills benefit from time spent reading; a results is vocabulary learned from context and comprehension is improved if the difficulty of the material presented is appropriate to the current reading level (p. 126).
Extension of Background Knowledge	Reading comprehension is enhanced when readers extend their experience and background knowledge and develop their sensitivity to increasingly difficult concepts and complex patterns of language. Students who have low basic skills but high background knowledge about the topic being discussed may be able to understand what the author intended even if the words used are difficult (p. 128).
Instruction in Strategic Reading and Writing	Activities that enable students to apply meaning-making skills and strategies such as summarizing, questioning, and interpreting contribute to improved reading comprehension and written composition. Good readers spontaneously use a wide range of strategies when unfamiliar text or tasks are encountered, while poor readers are unlikely to do so (p. 129).
Interrelated Activities	Organizing instruction into broad, thematically based clusters of work through which reading, writing, and speaking activities are interrelated promotes understanding of the connections among activities and ideas (p. 130).
Teaching Critical Reading/Writing Skills	The teaching of critical skills such as word attack or grammar in reading and writing helps students develop competence in such skills within a reasonable period of time. Such instruction may be embedded in the total context of language learning or may be presented directly by the teacher. Many children will not automatically acquire all the basic skills needed for reading and writing, and so may have to be taught some of them through direct instruction. There is a need, however, for a balance between instruction in basic skills and instruction in context even for poor readers or writers (p. 131).
Discussion and Analysis	Instruction emphasizing discussion and analysis rather than rote memory contributes most effectively to development of students' thinking abilities. Most young people will reach their potential in developing higher though processes only if these processes are taught and practiced. Ability to recall information may also improve as the student creates a context in which to remember facts (p. 132).

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Table A6 (continued)

Effective Practices in Language Arts (Squire, 2004)

Emphasis on the Writing Process	Stressing the processes of composing (planning, drafting, revising, sharing, and publishing) contributes to improved competence in writing. Long-range improvement in writing competence depends in good measure on students' understanding of the processes in which they engage (p. 133).
Balanced Reading and Writing	Programs that provide balanced attention to both imaginative and informative reading, writing, and speaking promote competence in handling discourse of many kinds (p. 134).
Early Intervention	Carefully designed early intervention for children who experience difficulty in learning to read and write can produce significant long-term improvement (p. 135).
Exposure to a Range of Literature	Reading and reflecting on a range of selected literary works can help young people learn about the ideas and values of their own and diverse cultures as well as about the experiences of different groups (p. 136).
Appropriate Assessment	Assessment focusing on what is being taught in a school's curriculum and on the modes of instruction used in the curriculum promotes learners' growth toward curricular goals (p. 137).

Table A7

Effective Oral Communication Practices (Perry, 2004)

Effective Oral Communications Practice	Description
Improving Oral Communication Competence	Students who are given opportunities to improve their oral communication competence demonstrate improvement in their speaking presentation, as well as in vocabulary, organization, and writing skills (p. 143).
Addressing Voice and Articulation	Providing students with instruction in how the vocal mechanism works and in methods of pronunciation and articulation will help students: 1) develop awareness of the need for appropriate articulation and pronunciation; and 2) learn to fit their language to match the context of the communication situation (pp. 144-145).
Reducing Oral Communication Anxiety	Students who are provided with methods for overcoming anxiety about oral communication demonstrate improved coherence and confidence when giving a speech and in other oral communication situations (pp.146-147).
Emphasizing Communication Ethics	Instruction in standards for ethical communication, as well as the role of culture in the communication process, will provide students with the necessary strategies for maximizing competent communication and avoiding miscommunication in today's culturally and technologically complex world (pp. 148-149).
Facilitating Interpersonal and Small-Group Communication	Providing students with models of competent interpersonal and small-group communication behaviors, as well as opportunities to practice these behaviors, will help them become more effective learners across the curriculum (pp. 150-151).