ACHIEVEMENT IN THE CLASSROOM:

WHAT TEACHERS CAN DO TO INCREASE STUDENT LEARNING AND

REDUCE ACHIEVEMENT GAPS

by

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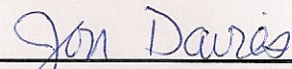This Project for the Master in Teaching Degree

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I wish to thank everyone who has helped me along this journey…

Calder, I did this for you, and without your love, help and support I never could have made it.

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To all of my family, thank you for the love and support, the phone calls, the visits, the food, the money, and for the encouragement when I needed it most. I love you all!

ABSTRACT

This paper examines the strategies teachers can use in the classroom to eliminate

achievement gaps. An examination of the history of achievement shows that in spite of

No Child Left Behind and similar legislation aimed toward increased student learning,

gaps in student achievement remain. A critical review of the literature shows there is no

one factor, or set of factors that affect achievement, however there are several common

themes including: culturally relevant teaching, trust between teachers and students, and

detracking and enriched curriculum for all students. The implications for teaching are

that teachers need to get to know their students. Careful observation of the needs in each

classroom, the needs of students and teachers, will yield insight into finding ways to close

the achievement gap. Areas for future research include identifying the degree to which

each variable explored here affects achievement, and which combinations have the

strongest impact on student achievement.

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CHAPTER 1: INTRODUCTION

Introduction

I grew up with the belief that life is about learning. As Dewey (1997) wrote, "The most important attitude that can be formed is that of desire to go on learning" (p. 48). Recent experiences in the classroom, however, contradicted that belief. Teachers espoused reasons why all students are not capable of learning, vocalizing the belief that many students were too "low, low, low" to learn. Students were regularly categorized as lazy if they didn't have high test scores, and dismissed as incapable of learning if they couldn't make sense of the curriculum given a single type of instruction. The same students had their "low" status described to them repeatedly by teachers. So where does a belief in learning fit in with these experiences? How are students able to achieve their full potential if their guide doesn't believe it is possible? If these students really are so "low, low, low," I want to know what can be done to change the situation. What can teachers in the classroom do to eliminate achievement gaps? Further rationale behind the exploration of this topic will be given in the next section, followed by controversies surrounding the topic, definitions and limitations related to the question, followed by a summary of each section.

Rationale

The previous section discussed the importance of promoting a desire to continue learning, however what that learning entails and the measurement of learning remain an issue. Student achievement remains a primary focus in school administrative and legislative decisions. The No Child Left Behind Act (NCLB) of 2001 requires that all schools be held accountable for student progress. The purpose of the NCLB Act "is to

ensure that all children have a fair, equal, and significant opportunity to obtain a high-quality education and reach, at minimum, proficiency on challenging state academic achievement standards and state academic assessments" (as cited in Duffy, Diordano, Farrell, Paneque, & Crump, 2008, p. 53). In spite of NCLB and similar legislation aimed toward increased student learning, gaps in student achievement remain. Minority students and students living in poverty continue to demonstrate lower academic achievement than their peers, particularly when living in urban areas. According to Mac Iver, M. and Mac Iver, D. (2008), based on the National Assessment of Educational Progress (NAEP) "results in the trial urban assessment indicate that half of public-schooled eighth-grade students in large central city areas score below basic level in mathematics (compared with one third nationwide)" (p. 223). This variation in achievement exists in other subject areas as well. In order for all students to meet NCLB standards, meeting proficiency on challenging academic standards and assessments, it is imperative that teacher practices work to eliminate achievement gaps.

In their book *Listening to Urban Kids*, Wilson and Corbett wrote, "'All children can succeed' has become the rhetorical banner of current reform efforts" (2001, p. 117). Although educators everywhere espouse the belief that all children can succeed, not all teacher practices support those ends. In addition, many elements related to student achievement, neighborhood, socioeconomic status (SES), and family background among others, might appear to be beyond the control of a teacher. The research in chapter three explores many of the factors that influence student achievement in order to identify strategies teachers can use in the classroom to increase student achievement.

The goal of the current NCLB Act is to ensure every student obtains a high-quality education, achieving proficiency on challenging state standards. In spite of similar ongoing legislature, achievement gaps exist between many students. Reform efforts embrace the idea that all children can succeed, but many educators do not know how to turn the idea into reality. In order to increase student achievement, teachers must determine classroom strategies that eliminate gaps. The following section outlines several controversies related to eliminating achievement gaps.

Controversies

The previous section in this chapter explored the rational behind exploring the question "what can teachers do in their classroom to reduce achievement gaps?" In order to examine this question more fully it is necessary to acknowledge the controversies surrounding the subject. This section explores the primary conflicts related to identifying and measuring achievement, and funding and resources.

There is a great deal of controversy surrounding the identification and measurement of academic achievement. The NCLB Act requires that states, districts and schools are held accountable for student achievement, with punitive measures in place for those found lacking. State standardized tests have become the accepted measurement of this achievement. The controversies surrounding the subject are vast and varied. Many educators acknowledge that some form of accountability is necessary, to make sure that districts, their schools and teachers are doing their best for all students. The form that accountability takes is, in many minds, still in question.

Many opponents of standardized tests question the content of the tests, and whether they represent an accurate assessment of student learning or knowledge. Much

of the question content is based on middle class white American experiences, so students living in poverty, or whose family traditions are outside the typical middle class white family, may lack the prior knowledge necessary to achieve well on such tests. English language learners might have the knowledge to pass a standardized test, but are at a disadvantage if the test is in a language with which they lack fluency. In addition, the test does not measure student learning or growth, only how a student performs a specific test at a specific moment in time.

Due to the punitive measures of NCLB, there is a great deal of pressure on students, teachers and schools to perform well on the tests. Many districts, schools and teachers have begun "teaching to the test," emphasizing curriculums that promise to increase student test scores while reducing the time spent on subject areas outside those tested. Opponents of teaching to the test argue that these curriculums and increased test scores don't necessarily equal increased student learning, since many standardized tests involve multiple choice questions that reward memorization skills over thinking and analysis skills. In addition, students miss out on subject areas that aren't tested.

In addition to issues related to identifying and measuring achievement, there are controversies related to funding and resources for students at home and at school. All students taking a standardized achievement test are measured based on the same criteria, regardless of access to resources at home and at school. This is a controversial subject for many since schools are not funded equally, nor are students exposed to the same socioeconomic backgrounds and resources at home. Some feel this is a system set up to maintain the status quo, ensuring that students living in poverty continue to do so, finding it difficult to improve their prospects through education. Wildhagen (2009) suggested

that, "socioeconomic inequality in secondary education is 'effectively maintained,' meaning that students from advantaged backgrounds have qualitatively better experiences in high school than do their less-advantaged peers" (p, 173). Teachers need to implement strategies that remove these barriers to equitable schooling and reduce gaps in achievement.

The rationale introduced NCLB and the desire for all students to achieve proficiency on challenging state standards, in addition to the belief that all students are able to succeed. The controversies described above explain why those goals have not yet been achieved. While accountability is necessary, it is questionable whether standardized tests actually assess student learning or knowledge. Due to differences in school and family resources, the type of knowledge on the test may not be accessible to all students, and may work to actively exclude many. In addition, teaching to the test may limit the type of learning available to students, and subjects open to study. For teachers to ensure that all students truly obtain a high-quality education it is important to recognize these controversies, and discover strategies to increase student learning, while reducing the achievement gap.

<center>Definitions</center>

The previous section discussed the controversy surrounding identifying and measuring achievement. Considering achievement is one of the main topics of this paper, it is worth noting that nearly every study in chapter three defined achievement using standardized state or national test scores. In only a couple of studies were grades included as a measure of achievement.

One measure included in many studies is socioeconomic status (SES), which refers to the wealth in which a student or family lives. In nearly every study included in chapter three, SES status is defined by whether a student receives free and reduced price meals at school. This definition of SES is widely understood to be an inadequate and inaccurate measure of SES, but is widely used because the data is readily available. A more accurate indication of SES includes parental income, parental education, and parental occupation (Sirin, 2005).

Limitations

As with any literature review, the studies selected limit the review. Many of these studies used data from national databases for analysis; these analyses were limited by the data available. In several cases data was unavailable for specific variables, which limited the author's exploration.

In some cases my fledgling skill at locating studies limits this review. Studies related to social and cultural capital were difficult to locate, though each has a relationship with SES and is therefore likely related to student achievement. In addition, the variables selected to represent each form of capital in the studies that do explore social and cultural capital need to be explored and developed further.

Another subject area limited by my fledgling skill at locating articles is that of instructional pedagogy. Two studies reviewed in chapter three were wide in scope, and both found that instructional pedagogy does not have a significant impact on student achievement. I was unable to explore this topic more directly in studies with this subject as the focus. Further exploration on the topic of instructional pedagogy might yield similar results, however I am aware of one study (not yet published unfortunately) that

found significant increases in student achievement based on instructional pedagogy. So again, I must assume that I was limited by my search abilities.

Summary

The introduction brought forth the idea that a desire to continue learning is important in education, but is often contradicted by teaching practices. The rationale introduced the purpose of the NCLB Act, granting students fair and equal access to high-quality education, and achieving proficiency on challenging state standards. In spite of legislation and reform beliefs that all children can succeed, gaps in achievement continue. The controversies section explored conflicts related to indentifying and measuring achievement using standardized tests, in addition to issues related to funding and resources. The definitions section introduced important terms used throughout this paper, and the limitations discussed the limits of the studies regarding the question of what teachers can do to reduce achievement gaps.

CHAPTER TWO: HISTORICAL BACKGROUND

Introduction

The previous chapter introduced the idea that a desire to continue learning is

important in education, but is often contradicted by teaching practices. Also introduced

was the purpose of the NCLB Act as granting all students fair and equal access to high-

quality education, in order to achieve proficiency on challenging state standards. It

explored controversies surrounding the need for accountability, the standardized tests

developed for this purpose, and the teaching to the test that followed, in addition to issues

related to learning vs. achievement, and inequalities in resources and funding that affect a

teacher's ability to teach students effectively. Chapter two explains the development of

the accountability movement in the United States in two sections: the history of

accountability, and No Child Left Behind.

The History of Accountability

This section explores the history of accountability beginning with Lyndon

Johnson's *War on Poverty* in 1964, and the *Elementary and Secondary Education Act*

(ESEA) of 1965, continuing through the development of the 1983 report A Nation at

Risk, and the *Goals 2000 Educate America Act* in 1994. Each of these topics will be

explored in order to understand the need for achievement measures, in addition to

funding and resource issues that correspond with achievement gaps.

Lyndon Johnson's *War on Poverty* hoped to reduce rates of poverty and increase

living standards for those living in poverty. He believed this would happen through

education (Spring, 2005) and signed the *Elementary and Secondary Education Act*

(ESEA) in 1965, the intent of which was to assist educationally disadvantaged students in

areas with high concentrations of poverty. In order to focus attention on low income students and to increase the types and levels of services provided for those students, the Title I program was developed, and according to Spring (2005) "the most important section of the ESEA was Title I, which provided funds for improved educational programs for children designated as educationally deprived" (p. 392). In order for Title I to pass legislation, the formula defining recipients of funds was designed so the majority of school districts received assistance from the program (McDonnell, 2005).

Initially, Title I operated separately from the main instruction in schools, students received their supplemental services in pull out classes. In addition, because there was no pressure to define how districts spent their money, many spent it as general aid and more than 15% of Title I funds were misused (McDonnell, 2005). Over the next 15 years Title I legislation was amended four times, each time specifying its original intent of providing services for underachieving students in poor areas, each time granting funds for special purposes in order to gain legislative support (Spring, 2005). However, the program funding never matched the need. By 1980 states and districts were required to demonstrate that money was spent on supplemental services for eligible students.

In the 1980s, promises Reagan made to limit federal involvement in education (Spring, 2005), put more authority and responsibility on states and districts. This was reflected in the Education Consolidation and Improvement Act of 1981 (ECIA), which turned Title I into Chapter I, with the same focus but with relaxed regulations. It also reduced federal funding which meant that fewer students were served and federal aid was a smaller part of local school budgets.

In 1983 the report *A Nation at Risk* was produced. This report was embraced by the White House as the basis for a number of recommendations for increasing high school graduation requirements, higher standards, longer school days and years, however these recommendations called on state and local agencies to enact reforms. With the decrease in federal budget, down from a maximum of 10.6% of the total K-12 education expenditures in 1976 and more funding coming from local states and districts, there was an increased call for education to provide students with the knowledge they needed to compete in the global job market. This shifted the focus of the reform agenda to higher achievement.

The push for higher standards continued during the presidency of George W. Bush with the legislation of America 2000. This would have funded "world class standards" in five core subjects: English, math, science, history and geography in addition to schools with new organizational designs, however it died in the Senate due to republicans who opposed an increase in the federal role in schools. In spite of the desire for a limited federal role, the education reform agenda continued moving closer to the instructional core of schooling, in policy if not in funding. By the mid-1990s the federal contribution to K-12 schooling had dropped to 7.2% of total school revenues (McDonnell, 2005). Local educators, unwilling or unable to act consistently with state policy, limited state policymakers. Standardized tests were introduced with the belief that if states set high academic content and performance standards for all students, gaps in achievement between students of different ethnicity and SES would narrow. By the mid-1990s all but a few states began using state assessment systems and by 1994 the

ESEA reauthorization required states to establish reading and math content and performance expectations and to design assessments in line with those.

The Clinton administration supported standards based reforms, continuing in the belief that higher expectations would result in improved educational quality despite uneven and unequal funding. The focus was on student achievement with an emphasis on challenging academic standards, a desire to extend these to all students, and a reliance on achievement testing to continue reforms and monitor their impact. The *Goals 2000 Educate America Act* became law in 1994 and was the first policy to promote this approach. It was the first legislation of the standards based approach and led to the *Improving America's Schools Act* (IASA) whose message was that in order to receive Title I funds states needed to make sure that students were taught state content standards and they should meet those standards and be given means to do so.

In an effort to decrease poverty through education, Lyndon Johnson's *War on Poverty*, and the *Elementary and Secondary Education Act* (ESEA) of 1965, gave rise to accountability. The ESEA led to the development of the Title I program in order to provide funds for children in poverty. In addition to problems regarding misuse of funds in schools, program funding never matched need. In the 1980s promises made by Reagan decreased federal funding for schools and limited the federal role in education, while simultaneously calling for higher academic achievement in response to the report *A Nation at Risk*. Standardized tests were introduced in the mid-1990s with the expectation that high academic content standards and performance standards would reduce achievement gaps. The emphasis on high academic standards continued with the *Goals 2000 Educate America Act*, which led to the IASA which stated that in order to receive

Title I funds, states had to make sure students were taught state content standards and should be given the means to meet those standards.

No Child Left Behind

The previous section explained the rise of accountability through Johnson's *War on Poverty* and ESEA, the development of Title I, and the lessening federal role and federal funding in education while calling for academic excellence. This section focuses on 2002s No Child Left Behind (NCLB), which was implemented as a direct descendent of ESEA and IASA. It will look at the history of NCLB and the impact it had on student achievement, and on teachers in the classroom.

By 2001 only 17 states met the deadline for testing all students in reading and math at least once in elementary, middle and secondary grades. In addition, states had different expectations of who needed to meet the state definition of proficiency, some states required 50% while others required 90-100%. States also defined adequately yearly progress (AYP) differently, and varied in their ability to implement the standards and accountability specified in IASA (McDonnell, 2005). In 2002 No Child Left Behind (NCLB) was implemented as an attempt to fix Title I's past shortcomings and in response to the slow implementation of IASA and variation in implementation between states. NCLB continued expanding the role of federal government in education "granting it authority to determine appropriateness of state standards and accountability systems" (Duffy, Giordano, Farrell, Paneque, & Crump, 2008, p. 57). In addition, the federal government established a timeline for reaching achievement goals, and consequences for not meeting the timeline.

As with its predecessors, NCLB's defining goal is to provide greater opportunities for low income and educationally disadvantaged students. The federal government offers financial assistance on the condition that state and local agencies follow specific guidelines that include using programs that have been scientifically proven to produce positive effects on student performance (Duffy, Giordano, Farrell, Paneque, & Crump, 2008). While intended as positive, the requirement of scientifically based research has limited the type of programs available to educators in the classroom. Although not defined as such by NCLB, acceptable research tends to consist of quantitative research and quantitative individual assessment, with a lack of research focused on "meaning and understanding and that integrate individual, cultural, and other contextual differences" (2008, p. 59). If the intent of NCLB is to provide opportunities for low-income students, they remain at a disadvantage when this research is unavailable for implementation by teachers in the classroom.

In addition to limitations placed on classroom practices by acceptable scientific research, the NCLB focus is on reading, literacy and computational skills. "This narrowing of options for curriculum development and teaching that excludes acknowledgment of the cultural and contextual factors of the particular classroom or school setting is one of the difficulties with the NCLB" (Duffy, Giordano, Farrell, Paneque, & Crump, 2008, p. 59). The narrow focus frequently results in less time learning subject areas outside those tested. In addition, time itself frequently becomes the focus in schools as opposed to learning, basic skills become emphasized over student thinking and sense making, and achievement gaps still exist between more and less advantaged students.

The curriculum is based on scientific research, the subjects are selected, and the standardized tests are prepared, now what can teachers really do in the classroom to increase learning and reduce achievement gaps? No Child Left Behind was implemented as a solution to the shortcomings of the *Improving America's Schools Act* (IASA). It granted the federal government the authority to approve state standards and accountability measures. It required classroom curriculums be research based, which had the unintended consequence of excluding research most relevant to disadvantaged students. NCLB also narrowed academic focus to reading, literacy and computational skills, inadvertently eliminating many subject areas from classrooms due to a lack of time. Given the realities of NCLB and standardized testing, what can teachers in the classroom do to increase student learning and reduce achievement gaps?

Summary

The history of accountability section explained the rise of accountability through Johnson's *War on Poverty* and ESEA. The development of the *Elementary and Secondary Education Act* (ESEA) led to Title I, which provided funds for students in need. Underfunding and misuses of funds plagued Title I from the start. The report *A Nation at Risk* prompted academic focus to shift from equity and access to excellence, and prompted the development of high academic content standards and standardized tests in an effort to reduce achievement gaps. The focus on content standards continued with Improving America's Schools Act (IASA) which stated that students must be taught state content standards and given the means to meet those standards for schools to receive Title I funding.

The No Child Left Behind section examined how NCLB was implemented, similar to previous efforts, in order to provide access to high academic standards and achievement. It place power back in the hands of the federal government, granting approval over school standards. It required classroom curriculums be scientifically research based, which had the unintended consequence of excluding research most relevant to disadvantaged students. NCLB also narrowed academic focus to reading, literacy and computational skills, inadvertently eliminating many subject areas from classrooms, and with an unintentional shift toward basic skills over thinking and sense making. Chapter three reviews the research about what teachers in the classroom can do to increase student learning and reduce achievement gaps.

CHAPTER 3: CRITICAL REVIEW OF THE LITERATURE

Introduction

Chapter one discussed the purpose of NCLB, granting students fair and equal access to high-quality education, and asked how teachers could help students learn while reducing gaps in achievement. In spite of legislation and reform beliefs that all children can succeed, these gaps continue. It examined conflicts related to identification and measurement of achievement using standardized tests, in addition to the impact of funds and resources on achievement. Chapter two explained the history of the accountability movement in the United States. It outlined the legislation leading from Johnson's *War on Poverty* to No Child Left Behind, described the development of state standards and standardized testing, and discussed the unintended consequences of the NCLB requirement that classroom programs be scientifically based, which is that academically underprivileged students frequently do not experience curriculums that value the resources they bring to the classroom. Chapter three reviews the research about student achievement. The research used in this chapter is organized into seven sections: social and cultural capital, family, an overview of practices, enrichment, differentiation and reform, an examination of teaching strategies, trust, and SES and physical capital. Each of these studies are summarized and analyzed, based on the conclusions provided. The research is reviewed to examine how teachers in the classroom can improve student achievement.

Social and Cultural Capital

In spite of legislation promoting academic excellence for all students, aimed specifically at academically disadvantaged students, achievement gaps exist. Chapters

one and two suggested that this might be related to a lack of social and cultural capital. The initial four studies in this section analyze the relationships of social and cultural capital, and academic achievement. Moon, Hegar, and Page (2009) analyzed whether ethnicity and TANF status relate to initial school achievement scores and developmental trajectories. Nonoyama-Tarumi (2008) examined whether the effect of family background on student achievement is sensitive to the measure of family background. Wildhagen (2009) tested whether students' cultural capital affects their relationships with their teachers, and what role that plays in student achievement. Boykin, Tyler, and Miller (2005) continued the exploration of cultural capital with a study that examined the types of cultural values present in pedagogical practices and classrooms serving low-income African American students.

The quantitative study by Moon et al. (2009) used data from the Early Childhood Longitudinal Study-Kindergarten (ECLS-K), a three-year multi-site study of a nationally representative sample of children who began full day and part day kindergarten programs in public and private schools during the 1998/99 school year. The subjects of this study included 8,798 white students, 2,214 black students, 1344 Hispanic students, and 1006 Asian students. These students were randomly selected for participation in the ECLS-K study. About 51% of the students were male, and 49% were female. Not all of the students were available for analysis due to missing data for key variables.

The data used in this study was collected by the National Center for Education Statistics (NCES), and included information from parents, teachers, school administrators and the children, about home environment, school and classroom environment, parents' school involvement, and teachers' qualifications and expectations, in addition to

children's cognitive, social, emotional and physical development. This information was gathered at five different points between fall 1998 and spring 2002, through phone interviews with parents, teachers' questionnaires, and direct cognitive assessments of children.

The authors posed the following research questions for this analysis: 1) What individual variations exist in initial school achievement scores? 2) How do children develop in reading, math and general knowledge over a three-year period? 3) What individual differences emerge in developmental trajectories for achievement scores in three academic areas? 4) Do children's reading, mathematics, and general knowledge scores differ by ethnicity and TANF status? 5) How are race or ethnicity and TANF status related to initial scores and developmental trajectories of school achievement? 6) How do other economic predictors including poverty and parents' employment status account for variations in the parameters of the latent growth curve (LGC) model of school achievement?

The major findings of this study were that children from all ethnic or racial groups show substantial variation in initial level of achievement in reading, mathematics and general knowledge. Children in general showed marked progress in each area over the three-year period. In addition, children followed significantly different developmental trajectories for all three areas of knowledge. Children's reading, mathematics and general knowledge scores differed by ethnicity and gender, while economic factors such as poverty, parents' employment status, and TANF status, are statistically significant predictors of both initial achievement and developmental trajectories for all three areas of knowledge.

Children from families that received TANF started school with marked disadvantages in learning, when compared with children of the same ethnicity who are not TANF recipients. In addition, kindergarten students in families who received TANF continued to lag behind their peers in academic achievement over the next three years of school.

By third grade, Hispanic and Asian children from TANF families scored better than black TANF students in reading, math and general knowledge, despite having started kindergarten with markedly lower scores in each area. Among students receiving TANF, general knowledge scores of Asians and Hispanics continued to lag behind white students. Black students from families receiving TANF showed the lowest rate of improvement in reading and math scores over the three-year test period.

The IRT scores used as assessment scores in reading, math and general knowledge have good construct validity. In addition, the analyses performed were tested for reliability. The analyses are limited by the data collected by the ECLS-K study. In addition, only one cohort of kindergarteners was selected for analysis, as opposed to following several different cohorts.

The study by Nonoyama-Tarumi (2008) compared the effect of a multidimensional socio-economic status (SES) measure with a standard SES measure across countries. The subjects of this study consisted of 15-year-old students from forty-three countries. This study is quantitative in design and used data from the Programme for International Student Assessment (PISA) 2000 to examine whether the influence of family background on educational achievement is sensitive to different measures of the family's SES.

The assessment data was available in reading, mathematics and scientific literacy. The assessment looked at students' ability to use their knowledge and skills in real-life situations. Also included in the data were questionnaires that included information on students' family, home environment, reading habits, and school and everyday activities. Schools filled out questionnaires on school demographics, staffing, environment, human and material resources, educational and decision making policies, and selection and transfer policies.

SES measures consisted of parental education and occupation, home educational resources, possessions related to classical culture, and number of books, and family wealth. These items were reported on student questionnaires. Family wealth was based on the availability in the home of a dishwasher, a room of their own, educational software, and a link to the internet, in addition to the number of cell phones, television sets, computers, cars and bathrooms at home.

The effect size of the multidimensional SES was larger than the effect size of the standard SES across all countries except Indonesia and Peru, so the estimated family effect is consistently larger when taking into account cultural resources at home in addition to parent education and occupation. In addition, the estimated standard error is reduced in over half of the countries when the multidimensional SES is used.

The number of books in the home did not fully account for the effect of family background, although it is frequently used as a proxy for income or cultural resources. Also, although parental occupation is sometimes ignored since there is less variation in less developed countries, leaving out parental occupation reduced the predicted effect as well as the explanatory power of SES.

Wealth only increased the magnitude of SES in a few countries. In many countries the inclusion of wealth actually reduced the explanatory power of SES and introduced error. Also, although possessions in the home are one part of family wealth, the same items do not represent wealth in every country, so the items used to represent family wealth did not accurately represent many countries.

The multidimensional SES had a stronger effect on reading achievement in a rural setting in all countries tested except Indonesia and Hong Kong. This measure helps explain the achievement gap between students in high and low SES families in rural settings as well.

The overall finding that the multidimensional SES measure had a stronger explanatory power in identifying a family background and student achievement association implies that family effects in past cross-national education achievement studies may have been under estimated. It also suggest that schools need to consider that students of low-status families may lack the educational environment outside of schools, which may impact the educational opportunities of middle-class children. In addition, it is important for schools to consider family-school partnerships to allow for the voices of all families, not allowing high-status voices to dominate.

One strength of this study is that it was global in scope. It highlighted some global patterns in the research. Another strength is that this study considered a broader vision of SES, not only considering family income. One weakness in this study were the items chosen to represent family wealth: the availability in the home of a dishwasher, a room of their own, educational software, and a link to the internet, in addition to the number of cell phones, television sets, computers, cars and bathrooms at home. Not all

of these items signify wealth in every country so analyses of these items may not have resulted in accurate information.

Given the weakness of the study, the measures of family wealth, it is unclear how much effect this may have on student achievement. Given the strengths of this study, the research supports the connection between families' cultural capital and student achievement. It then becomes important to create opportunities in the classroom that support different types of cultural capital, as opposed to only the single definition of the dominant culture.

The previous study examined the impact of a multidimensional definition of SES on student achievement. In this quantitative study, Wildhagen (2009) tested whether students' cultural capital affects their relationships with their teachers, and if so, whether this relationship mediates any of the association between cultural capital and academic performance. The author used National Education Longitudinal Study (NELS) data to estimate structural equation models in order to empirically assess the extent to which teachers' perceptions of students and educational expectations acted as mechanisms of the cultural capital effect on grades and standardized test scores.

The subjects in this study consist of 12,949 students surveyed by NELS in 8th grade in 1988, and resurveyed in 10th and 12th grades in 1990 and 1992 respectively. The author used NELS data for the analyses in this study, which is nationally representative and longitudinal in design, allowing the study of long-term effects of cultural capital on academic performance. Three separate measures of 12th grade academic performance were used as outcome variables: GPA from high school transcript, the score on NELS reading test, and the score on NELS math test. The item response theory (IRT) scores

were used on the two tests in order to take into account students' overall pattern of correct and incorrect answers.

The high-status cultural capital measures available in NELS data included taking cultural classes outside of school, and attending museums on occasions that are unrelated to school. Educational expectations were measured as years of education expected and college completion expected. In addition, there were three causal indicators: mother's, father's, and friends' educational expectations for the student. The teachers' perceptions latent variable was measured using responses to the following questions on the NELS follow up teachers' survey: How often is the student attentive in class? How often does the student complete his or her homework? How often does the student try as hard as he or she can in class?

The control variables used included family resources, student ability and motivation. Family resources controlled for parent education, logged family income, two-parent family, and number of siblings. Also controlled for was the number of hours the student spent reading outside of school and schoolwork.

Using this data three separate structural equation models (SEM) were created using each of the three outcome variables: GPA, reading scores and math scores. The measurement model created suggested that the concepts were reliably measured. The structural model showed that students' scores on the cultural capital variable vary by parent education. The association between parent education and cultural capital remained even when the effects of other variables were controlled. Both parent education and family income have positive effects on students' levels of cultural capital. The same analysis held students' academic ability constant, indicated that even when students of equal ability levels are

compared, their socioeconomic status affected the extent to which they are involved in cultural activities. Even with family income held constant, parental education has a positive effect on cultural capital.

This examination of the effects of cultural capital on each of the three outcomes indicate that cultural capital does not influence teachers' perceptions of students' effort, however teachers' perceptions do have a positive effect on all three indicators of academic performance. Improved perceptions of students by teachers are associated with increases in GPA, and reading and math scores.

Cultural capital appeared to have a positive effect on students' educational expectations. Holding all other variables constant, an extra unit of cultural capital is associated with a .035 unit increase in educational expectations, which is equal to a .04 standard deviation increase. This is weaker than the effect of parent education, but similar to that of income. Increased educational expectations have positive effects on all three measures of academic performance, and acts as a mechanism for the cultural capital effect on grades and reading scores.

In an additional analysis the author tested whether teachers' perceptions of students were affected by a broader definition of cultural capital where "any set of 'attitudes, preferences, formal knowledge, behaviors, goods and credentials'" (p. 192) are rewarded by a school's evaluation criteria. Measures of student conduct and preparation for class were added to the grades tested earlier. Preparation and student conduct both had significant positive effects on teachers' perceptions, even controlling for all of the same variables used previously. This implies that students whose behavior complies with

dominant norms are more readily accepted by their teachers, and seen in a more positive light than students that exhibit behavior outside social norms.

The research design and analyses of this study appear strong. The author performed several analyses to support the SEM and findings. The main weakness appears to be the definition of cultural capital, in addition to limitations based on available data as to which elements of cultural capital were available to be measured and analyzed. As noted at the end of the findings, when the definition of cultural capital was expanded to include behavior and attitude in analyses, there was a strong relationship between those variables and teacher perception, whereas there was no relationship between cultural capital and teacher perception in earlier models.

The previous study tested the relationship between cultural capital, teacher relationships, and academic performance. This qualitative ethnographic study by Boykin, Tyler, and Miller (2005) examined the types of distinct cultural values are present in the varying pedagogical practices and classroom ecologies serving low-income African American students. Boykin et al. used classroom observations to collect data and perform data analysis. The subjects were six elementary schools in predominantly lower income African American communities in an urban city in Midwestern US. Each school had between 450-550 students, with about 90% of students qualified for free and reduced lunch programs. About 95% of the students in each school were African American. Twenty-one classrooms from 1st-5th grades were observed. All classroom teachers were African American.

Boykin at al. (2005) identified 10 cultural themes for investigation, five of which are consistent with mainstream cultural ethos (individualism, competition, object

orientation, priority placed on cognition over affective expression, and bureaucracy orientation) and the five cultural themes that remain are consistent with an Afrocultural ethos (movement expressiveness, verve, affect, orality and communalism). Boykin at al. constructed a descriptive analytical framework and coding system consistent with these cultural themes, and trained six African American graduate student research assistants to determine their presence and manifestation. After training, the research assistants conducted classroom observations in both morning and afternoon sessions. A total of 52 observational sessions (26 morning and 26 afternoon) were conducted. Each session lasted about three hours, totaling more than 150 hours of classroom observations. Each observer wrote down everything they saw in the classroom, there were no tapes or recordings made at the observations. Each research assistant independently rated the observed in class statements and activities and there was 100% agreement on what activities and statements could be considered codable units. Only those codable units agreed on by at least two of the three coders would be included in the findings. The coded responses were compiled and analyzed for: frequency of observation, reaction by teacher and/or student (positive, negative, neutral), who initiated behaviors, dimension of classroom life associated with each cultural expression.

There were a total of 5,530 codable units throughout all of the protocols across all classrooms participating in the study. Of these, 460 (8%) were identified as cultural behaviors and/or expressions by the coders. Four of the cultural themes combined accounted for only 31 (7%) of the 460 observances (affect, orality, cognition, and object orientation). The other six themes are the only ones presented in the article. 381 (89%) of cultural observations were in reference to the three Anglocultural themes, and the

remaining 48 (11%) were in reference to the three Afrocultural themes. The movement

expressiveness cultural theme was observed 27 (6%) times, of those, 19 (70%) were

displays of movement by student. Communalism was observed 13 (3%) times where the

student was helping another student (six times [46%]) or when the teacher encouraged

children to help each other (five times [38%]). Verve was observed eight times (<2%)

and seven of these (87%) were initiated by students. Individualism occurred most

frequently, 201 times (47%), of these 133 (66%) were teacher initiated, and 56 (28%)

were neutral student responses to teacher. Competition was observed 113 times (26%),

32 (28%) initiated by teacher and 69 (61%) were neutral responses by students to teacher

instructions or directions. Bureaucracy orientation was observed 67 times (15%), 31

(46%) were in reference to statements made by teacher to students in regard to rules in

classroom. The themes related to the mainstream cultural ethos were more prevalent than

ones associated with Afrocultural ethos, and were more likely to be initiated by the

teacher. Students were more likely to initiate cultural expressions consistent with

Afrocultural ethos.

Strengths of the study were the clear descriptions of cultural themes coded.

Research assistants received 16 hours of training to become coders. Coders were given

practice protocols to code, after which they were calibrated and discussed until at least

five of six agreed on how to score consistently. Three research assistants coded each

protocol and at least two of three coders had to agree on code for it to be included in the

findings. Weaknesses included discerning differences between the teacher and student

reactions to initiated displays. This was difficult for researchers because data didn't

consistently specify the reactions to these cultural expressions. The coding system didn't

differentiate between negative reactions to Afrocultural behavior and negative reactions to an absence of Anglocultural behavior. Coding behavior as teacher and/or student initiated was ultimately subjected, and may have been inaccurate due to ongoing classroom patterns and relationships. Another weakness includes the inability to account for such a large number of culturally uncodable themes in the classroom, out of 5,530 units only 460 were deemed cultural expressions. Also, some recorded events may not have been instances of fundamental culture, but of adaptive culture (group's response to collective history and current contextual demands of a given environment).

The analysis of research in social and cultural capital suggests that both types of capital play a large role in student achievement. Moon et al. (2009) found that factors such as poverty, parents' employment status, and TANF status are statistically significant predictors of both initial achievement and developmental trajectories for all three areas of knowledge (reading, mathematics and general knowledge). In addition, children from families that received TANF started school with disadvantages in learning compared with students of the same ethnicity who are not TANF recipients. The study by Nonoyama-Tarumi (2008) discovered that a multidimensional measure of SES had a larger effect size on the relationship between SES and achievement than the standard SES measure in every country but two. This measure added a family effect, and took cultural resources at home into consideration. The final two studies examined the effect of cultural capital in schools. Wildhagen (2009) found that parent education has a positive effect on students' levels of cultural capital, which in turn had a positive effect on students' educational expectations. In addition, students who behave in compliance with dominant norms are more readily accepted by their teachers, and seen in a more positive light than students

who exhibit behavior outside those norms. This theme reappeared in the study by Boykin et al. (2005), which analyzed cultural values present in the classroom. The following section looks at the role family plays in student achievement.

<div style="text-align:center">Family</div>

The last section demonstrated the relationship between social and cultural capital and academic achievement. This section explores the relationship between family and achievement more deeply. Milne and Plourde (2006) examined the common factors of low-SES homes where children achieve academic success. Pong, Hao and Gardner (2005) investigated how parenting practices relate to adolescents' school performance and whether these practices account for variations in achievement among ethnic generation groups. Lee and Kushner (2008) examined adolescents who live with same gender single parents, and the effects on achievement.

The qualitative ethnographic study by Milne and Plourde (2006) examined the common factors of low-SES homes from which children are able to achieve academic success and asked whether some low-SES children succeed simply because they are resilient and would succeed no matter what type of home they were in. The study took place in a Central Washington school, and included six second grade students between the ages of seven and eight, qualified for the free and reduced lunch program, with high academic success. The students were defined as being at least one trimester above grade level in reading according to District Reading Assessment (DRA) scores.

Milne and Plourde (2006) conducted interviews of students' primary care providers in homes and at school, wherever they were most comfortable, with a list of 20 semi-structured questions designed to get them talking about their lives at home. The list

of questions was the same for each interview, but some interviews included additional questions, or questions asked in different ways.

There were four common themes within the homes and attitudes of the participants' caretakers: 1) In each home the caretakers had educational resources and materials available for students to use and all caretakers spoke of having specified time each day for educational activities. Also, all six students attended preschool before entering kindergarten. Caretakers took advantage of available resources to make sure their children were ready to start school. 2) Every caretaker had at least completed 10th grade in school, none seemed overly confident in their own education, but all stress the importance of education to their children. 3) Family structure varied for all participants (one single mother, never married, one child; two single mothers, divorced, three children, one married, blended family, three children, two married, one with two children, the other with three) however all caretakers spent large amounts of time with their children, spoke about clear definitions of parent and child, time spent talking and having discussions with their children, and having a support system available as a resource. 4) All caretakers spoke of need for support and guidance at home, stressed the importance of education to their children, and setting clear boundaries about schoolwork (it came first).

Strengths of the study included the use of caretakers as interview sources, a common questionnaire to all caretakers, and that the same researchers administered all questionnaires. The weaknesses included the use of free and reduced price lunch (FRPL) data, which may have left out some low-SES high achieving students. It is possible that because these families did not apply for the FRPL program, there may have

been other differences present in the achievement of these students. In addition, the interviewer adjusted and added questions during interviews, there may be some inconsistencies and/or researcher bias as far as which topics led researchers to add questions and which situations caused them to change questions. Also, because caretakers were the sole source of information, their responses were subjective and may have been affected by any number of factors (discomfort with question, interviewer etc.).

The previous study identified factors in the lives of low-SES, high achieving students. The quantitative research study by Pong, Hao, and Gardner (2005) investigated how parenting practices are related to adolescents' school performance and whether parenting practices account for differences in school performance among ethnic generation groups. The subjects in this study are 17,996 adolescents in 130 schools, and were in grades 7-12 when they were surveyed in 1995. Pong at al. (2005) used data from the Adolescent Health Survey to analyze students' grade point averages, then compared three generations of Asian students and three generations of Hispanic students to the third generation white students. The analyses were performed using GPA (the mean of math, science and English grades) as the dependent variable.

Decision making within the family was coded as joint decisions (shared between parents and adolescents), unilateral youth decisions (adolescents making most of the decisions on their own), unilateral parent decisions (parents make most of the decisions) and ambiguous parenting (neither adolescents nor parents made many decisions). In addition, the average closeness of the mother, and of the father was measured.

Social capital was measured as parent child communication and parent involvement. Other forms of social capital represented in this investigation are parents'

educational expectation, parent trust, and intergenerational closure which was measured by the number of times parents spoke to the parents of their adolescents' friends.

The analysis compared the school grades across six ethnic and generational groups of children. The first, second and third generations of Hispanic students were compared with the first, second and third generations of Asian students, and both Hispanic and Asian students were compared with the third generation non-Hispanic white group as a reference.

Hispanic adolescents are economically disadvantaged, and are significantly more likely to have less educated parents, lower household incomes, and two parents present than white students. Asian youth have more educated parents and higher household incomes than white students, and are also the most likely to live with both parents.

Hispanic students appear to achieve upward mobility, with household income increasing for each generation. This trend is also seen in Asian families, however both third generation Hispanics and Asians are less likely to live in two parent households. There was no significant ethnic difference between the third generations in terms of closeness to parents.

Hispanic students have less parent involvement in their communities and schools, while more Asian parents are involved in the PTA than any other group. All foreign born minority parents had higher educational expectations for students than white parents. Ambiguous decision making was related to the worst grade point average (GPA) outcome, while parents sharing decision making with their children was associated with students' success in school. Students who reported closer relationships with their parents

earned significantly higher GPAs than other students. The effects of parenting styles were independent of the effects of parental involvement.

Intergenerational closure, parental expectation and trust were significantly and positively related to GPA. Parental expectation and trust were the strongest predictors of all parenting practice variables, these two were the most important in boosting school performance.

Hispanic students have a lower GPA than white youth, which can be largely explained by the disadvantaged family background of foreign born Hispanic students. The first and second generation Asian students have higher GPAs than both whites and Hispanics. In contrast to the upward mobility experienced by Asians with income, there is a generational decline in GPA between second and third generation. This decline remained across all models. For the most part Asian students' achievement is not related to family background, parenting style or social capital measures. Hispanic students also experience a decline in GPA across generations, however their decline occurs between first and second generation.

The parenting variables failed to provide adequate explanation for the generational differences of Asian students. This may be due to the smaller sample size of Asian students as compared with white and Hispanic students.

One strength in this study was the use of dummy variables to adjust for variation in GPA between schools. One possible weakness of this study was the smaller sample size of Asian students as compared with Hispanic and white students. Out of nearly 18,000 students fewer than 1200 were Asian. Another possible weakness is the lack of standardized scoring available for comparison of student achievement between schools.

Another weakness, common to this type of study, is the limitation caused by available data.

Based on the analyses of this study it seems reasonable to infer that socioeconomic status has a great deal to do with academic success of immigrant students. It also seems reasonable to assume that there are variables that have not been adequately explored, or that are missing entirely, that would help to explain the generational decline in GPA that occurs in both Hispanic and Asian students. It also seems that there may be other variables that need to be explored in order to fully understand the impact of parental influences and social capital on the academic success of immigrant children.

The previous study explored whether a ethnic generational status influenced students' academic achievement. The current qualitative study by Lee and Kushner (2008) examined whether living with same gender single parents, or opposite gender single parents plays a role in student achievement. The subjects in this study included data for 1755 high school sophomores (150 male and 99 female students living with a single father, and 706 male and 800 female students living with a single mother) gathered from the database of the Educational Longitudinal Study. The students were approximately 61.3% White, non-Hispanic, 10.2% Black, non-Hispanic, 10% Asian or Pacific Islander, .7% American Indian or Alaska Native, 12.8% Hispanic or Latino (any race) and 5% Multiracial. Approximately 37.5% were from southern USA, 14.9% were from the northeast, 25.2% were from the north central region, and 22.4% were from the western US. About 26.5% of students were from urban areas, 32.4% from suburban, and 42.1% from rural areas.

Lee and Kushner (2008) used four research variables: single parent status, SES, academic achievement and English and math teachers' evaluations to identify 10th graders (14-15 years old with completed data on these variables) in the first year of data collected in the US Educational Longitudinal Study. This data consisted of sons living in single father and single mother homes, and daughters living in single father and single mother homes. Measures of SES included the father's education, mother's education, family income, father's occupation and mother's occupation. The measure of achievement was based on math and reading test scores from tests all 10th graders took. Also collected were teacher questionnaires completed by English and math teachers.

Daughters living with single fathers had higher scores on three dependent variables (the math test score, English teachers' evaluation and math teachers' evaluation) than daughters living in single mother homes. There was no significant difference between sons living in single father and single mother homes on four of the dependent variables (the reading test score, math test score, English teachers' evaluation and math teachers' evaluation). Daughters living with single fathers had higher achievement than any other group. 73% of the daughters in single father families had higher scores then the means of the sons in single mother family homes on English and math teachers' evaluations.

Strengths of the study include the use of the national database as a source for data, in addition to the fact that Lee and Kushner (2008) used several different methods to analyze the data in order to test the accuracy of results. Weaknesses of the study include the pre-existing source of data, which limited the effects measured due to availability of data. Lee and Kushner could not measure the reasons for single parent households

(divorce, never married, widowed etc.) to see the effects of each, they also did not know how long students had lived in single parent households, or the timing of when it happened. This study measured only 10th grade student data, so these findings might not be true for younger students. It is possible the variables Lee and Kushner chose to exclude could have been stronger predictors of achievement than the included variables. There is no comparison between students in single father and mother households to those in two parent homes, which could represent a reference point.

The studies on family showed there are many similarities between measurements of family and those of social and cultural capital. The difference in the sections here is in the variables researchers chose to investigate. The study by Milne and Plourde (2006) discovered that common themes of low-SES, high achieving students included access to resources at home, the presence in students' lives of a belief in the importance of education, positive relationships with caretakers, and support and guidance at home. Pong, Hao and Gardner (2005) study found that Asian students had higher achievement that both Hispanic and third generation white students, while white students had higher achievement than Hispanic students. Another result of this analysis was a decline across all models between the second and third generations. The Lee and Kushner (2008) study found that female students living with their fathers had higher achievement than any other students living in a single parent home. The following section will explore school and teacher practices that increase student learning and achievement.

An Overview of Practices

The previous sections on social and cultural capital and family have highlighted many of the disparities between students achieving at different academic levels. Students

who live outside mainstream society have reduced social and cultural capital, and frequently have fewer resources, which results in lower academic achievement. There are exceptions, highlighted in the section on families, where traditionally disadvantaged students attain high levels of achievement. This section on an overview of practices explores this topic more thoroughly. Each of the following studies explores school and teacher practices thought to increase achievement in all students. Brown, Anfara and Roney (2005) explored the differences between high performing suburban middle schools and low performing urban middle schools. Mosenthal, Lipson, Torncello, Russ, and Mekkelsen (2004) explored classroom practices and school factors that promote high student achievement in reading. Daeschner, Munoz, and Barnes (2004) described lessons learned related to equality and equity in education in a case study. Y. Goddard, R. Goddard, and Tschannen (2007) tested the measure of teacher collaboration for school improvement and student achievement. Gimbert, Bol, and Wallace (2007) explored whether the type of teacher training influences the academic achievement of students in math. Carbonaro (2005) explored tracking and the role it plays in student achievement.

The qualitative multisite study by Brown, Anfara, and Roney (2005) examined plausible explanations for the difference in student achievement between high performing suburban middle schools (HPS) and low performing urban middle schools (LPS). Included in the study were 12 schools in the greater Philadelphia, Pennsylvania area, six HPS and six LPS public middle schools based on the Pennsylvania State System of Assessment (PSSA) results and information reported in "Report Card on the Schools." The HPS and LPS implemented the Turning Points' school reform recommendations and analysis showed the degree of implementation was similar in both types of schools.

Brown et al. (2005) used semi-structured interviews with each of 24 participants (two teachers from each of six HPS and six LPS), where interviews were recorded but no observations were conducted. The teacher interviews were recorded and transcribed for purposes of analysis. To ensure internal validity triangulation of interviews, presence of verbatim quotes, use of multiple researchers and audit trails were used. Two teachers from each school were interviewed in order "check" self reported nature of the data.

There were five categories of observable and measureable elements (structural, attitudinal, skill, climate and instructional features) to help define and research middle school reform components relative to academic, socioemotional and behavioral outcomes. Differences appeared in intermediate outcomes and school climate. HPS teachers felt the learning standards reflected what they already taught in classrooms, while LPS teachers felt the standards were imposed on them and that students could not meet them. HPS teachers reported being engaged in curriculum development, while LPS teachers seemed to be doing their best to keep what they had from falling apart. The HPS teachers had strong beliefs in students' ability to succeed, as opposed to LPS teachers who commented on students' inability to take tests, and poor reading abilities. Both spoke of commitment to students. HPS teachers spoke enthusiastically and positively about school climate and feelings of security, whereas LPS teachers were less positive, with similar responses when talking about collegial relationships.

Both types of schools reported similar levels of democratic leadership on the part of the principal, but HPS teachers reported more accessibility, the principal was always available, than LPS teachers who felt there were certain times they could approach the principal. HPS teachers felt the principal focus was on the bigger educational picture

concerning growth and development, whereas LPS teachers reported that focus was on the bottom line-test scores. The HPS teachers had positive things to say about available resources, while LPS teachers sometimes had adequate resources and sometimes had difficulty getting these. In addition, parent involvement was lower in the LPSs, and HPS teachers reported community support in terms of how their schools supported the community, whereas in LPSs the opposite was true.

Strengths of the study included the attempt to counter researcher bias by having interviews conducted by multiple researchers and the use of quotes to accurately represent climates and attitudes from each type of school. The fact that two teachers interviewed together at each school was a strong point in the study, and gave a more accurate representation of school climate and attitudes. Weaknesses included the fact that there were no actual observations conducted, only interviews, and that there were only two interviews conducted per school, that included only two teachers. Those two perspectives might not have been an accurate representation of teacher and administrator sentiments with regard to school environment.

Mosenthal, Lipson, Torncello, Russ, and Mekkelsen (2004) examined the classroom practices and school contextual factors that promote high student performance in reading. In particular, Mosenthal et al. (2004) wanted to know whether the factors that influenced success and promoted excellent performance varied among successful schools, depending on school characteristics. This study involved mixed methods research, with both qualitative and quantitative data gathered through observations and interviews.

In order to select high performing schools Mosenthal et al. (2004) used data from the Vermont Developmental Reading Assessment, the state reading test administered in

2nd grade, and the two reading comprehension scores on the New Standards Reference Examination administered statewide at fourth grade, both of which are standards based and criterion referenced. In successful schools, at least 80% of students at grades two and four performed at or above state standard in reading on both tests. The less successful schools had 60% or more of students score below standard. This yielded a very small number of schools from which to choose.

The subjects included two successful schools and one less successful school from each of three demographic areas: rural/poor, middle income "Main street", and well off "uptown schools" in Vermont. The rural/poor area included the schools: Carlisle (K-6, 110 students) and Sommers (K-8, 160 students) (successful) and Ellis (K-6, 163 students) (less successful), the schools on Main street included: Baxter (K-6, 167 students) and Elwood (K-6, 213 students) (successful) and Norton (K-6, 134 students) (less successful), and the uptown schools included: South Creek (K-5, 290 students) and Naples (K-5, 300 students) (successful) and Royce (K-8, 468 students) (less successful).

Observations and interviews were carried out by a team of six researchers, spending 8-15 days at each school, with single observations made of each K-4 teacher. Mosenthal et al. (2004) kept a timed running record of all activities and interactions, made maps of rooms and wrote lists of materials, and also estimated the number of books in classrooms for reading. All school administrators were interviewed (taped and transcribed), and the authors met frequently to discuss noticeable trends throughout process.

SES and nature of the literacy program did not play an explanatory role in literacy achievement test scores in the successful schools. The diversity of practices was

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evidenced across classrooms and clusters with no consistent approach to literacy instruction characteristic of the successful schools. Four common factors characterized the six successful schools: 1) There was strong administrative and curricular leadership in literacy, and the schools maintained a consistent commitment to literacy improvement for 8-10 years, 2) The school community focused on a belief in student learning with good communication among faculty, 3) The K-4 teachers had high levels of expertise, and 4) There were lots of opportunities and times available for students to read and discuss books.

Strengths in the study included the criteria for acceptance, which was clearly defined using state standardized test data. In addition, the combination of interviews and observations of all teachers and administrators in schools allowed patterns related to test data to emerge. Also, the same team of nine researchers conducted all observations and interviews, and all teaching and administrative voices were heard in each school. Weaknesses of the study were the number of schools sampled, and that the individual teachers were interviewed and observed only once.

The case study of Daeschner, Munoz, and Barnes (2004) described the lessons learned in high-poverty/racially mixed schools in the Jefferson County Public Schools (JCPS) located in Louisville, KY. In order to advance understanding of issues pertaining to equality and equity in education, the JCPS engaged in a long-term, district wide effort to improve the conditions that affect minority and low-income student learning. The district developed a support system that involved in and out of classroom elements to support improvements to minority and low-income student achievement. The district conducted extensive analyses of a variety of data in order to understand the nature of the

achievement gaps that faced the schools, and the factors that influence them. With that information they developed techniques for making teachers and counselors sensitive to issues, and looked for ways to improve the effectiveness of instruction for students with low levels of achievement.

School dialogues and a system of performance indicators were established in the district to ensure school wide support to address the achievement gap challenge. In-depth interviews with local school personnel were used as part of the district's regular process of school dialogues. These were used to investigate the instructional practices of schools in the district that were high performing and had either relatively high or low achievement gaps between African American and white/other students. In addition, the System of Performance Indicators included the following elements, each of which was examined in order to facilitate the process of continuous improvement while focusing on data to make decisions: academic achievement, communication services, community development and governmental relations, diversity, early childhood, elementary schools, exceptional child education, equity/poverty and compliance, facility usage, facilities and transportation, finance, high school, human resources, middle school, professional development, school climate, school-to-career, student assignment, and technology.

The focus of this analysis is on reading, specifically two key performance levels: the lowest level, which is Novice, and the highest level, which is proficient/distinguished. The achievement levels of the Total Academic Index and the Reading Index of the Kentucky Core Content Test (KCCT) were assessed for the JCPS in Louisville, KY, the largest school district in Kentucky and the 29th largest in the country, which serves about 96,000 students, employs nearly 6,000 teachers in 87 elementary schools, 21 high

schools, 11 special education centers and 12 alternative sites. Over 61% of students at the elementary school level qualify for free and reduced price meals. About 14,000 students receive special education services. Students are about 34% African American, 59% white, and 7% other races. More than 3,000 students are classified as ESL students. The common characteristic of these schools is the high percentage of students receiving free and reduced price meals, i.e. the schools are all low-income.

Three schools were selected and their progress tracked between 1999 and 2003, one elementary school "A," one middle school "B," and one high school "C." During that time, all three schools increased the percentage of low-income students scoring at the highest achievement levels. Through the dialogue process, the district learned that there were some shared characteristics between the high-poverty/high-achievement/low-gap schools. They have all developed a plan that addresses the unique needs of each student, there is a commitment to every student's success, and the SES barriers didn't consume more than 10% of the time during teachers' focus group discussions. Also, the teachers understand that students will learn regardless of race or income. In the high-poverty/low-achievement/high-gap schools a school plan is developed that addresses student success in general (as opposed to addressing the individual needs of students). There is also the belief that SES barriers will preclude success for many children. Teachers believe it is inequitable to hold disadvantaged students responsible for learning. In addition, the topic of SES barriers took up more than 50% of the time during teacher focus group discussions.

When a change in leadership occurred in school C in 2002 student achievement went down, which showed that these types of changes affect a school's progress. Success

in high poverty schools requires keeping high levels of school commitment combined with district support consistent over time. In keeping with high academic expectations for all students, the Daeschner et al. (2004) found that closing the achievement gap necessitated high academic standards for all students, a challenging curriculum, extra help for students who need it and the recognition that teachers are key players. Academic standards need to be high for high poverty and low poverty, high minority and low minority schools.

There was also a safety net system in place, which contributed to student success. One type of safety net is the Extended School Services (ESS) program, which assisted individual students who had difficulty in one or more content areas. These programs happened after or before school, on weekends, summers, and some requested a waiver to operate during the school day. Another type of safety net system was the Family Resource/Youth Services Centers program that removed non-cognitive barriers to student learning. This program provided resources and support to families in order to strengthen and support their growth and development. Daeschner et al. (2004) list "teaching quality as the single most important factor influencing student achievement" (p. 14). With quality teachers it is possible to help students move beyond any limitations they might otherwise encounter.

One strength of this study is the use of both quantitative and qualitative data to inform the district reforms and data/results of this case study. In addition the demographics of all three schools was similar. One weakness in this study has to do with statistical regression. Daeschner et al. (2004) focused this case study on the lowest and highest levels of reading, which means the lowest leveled readers are likely to go up since

they are already in the lowest group and are unlikely to go down, which might play a role in the observed gains in achievement. Another weakness is that the authors did not examine whether the achievement gap was already decreasing prior to the strategies the district implemented. It could be that the decreases we see in this study are not necessarily a result of the strategies implemented by the district. Another weakness is that the study only looked at reading achievement, so we do not know if these reforms have similarly affected other subject areas.

In an analytical review of literature, Y. Goddard, R. Goddard, and Tschannen (2007) tested the relationship between a theoretically driven measure of teacher collaboration for school improvement and student achievement. The primary research question addressed whether teacher collaboration positively predicts differences among schools in student achievement. The data for this study came from 2,536 fourth grade students in 47 elementary schools in one large Midwestern school district.

The student control variables used in this study were gender, race/ethnicity, free and reduced price lunch status and prior achievement. The dependent variables were the fourth grade scores from the state mandated math and reading assessments. As a statistical control, the authors used the Metropolitan Achievement Test scores in math and reading, which students took the year prior, in third grade. The missing data, due to student changes in schools mid year, was just under 14%. Teacher collaboration was measured by teacher responses to a six-item Likert like scale. About 45% of the teachers in the sampled schools turned in responses to the Likert scale, with between four and 20 responses per school. This study used hierarchical linear modeling (HLM) as the primary

analytic method, which accounted for the nested nature of the data (students nested in schools).

The analysis showed a strong and significant negative association between minority status and subsidized lunches, with mathematics and reading achievement in fourth grade. However, students' prior achievement was significantly and positively related to fourth grade achievement. Students who were new to the selected schools, and were therefore missing prior achievement data, had significantly lower current achievement scores in both reading and math.

An increase in teacher collaboration was a significant predictor of improved math and reading achievement. Even with school means adjusted for student characteristics like race, gender, SES and prior achievement, in addition to the school context like school SES, proportion of minority students and size, teacher collaboration was still a significantly positive predictor of variation in student achievement. Although teacher collaboration was found to have a positive affect, it was a moderate one, with one-standard deviation increase in the amount of collaboration resulting in a .1 SD increase in differences among schools in achievement scores.

One strength of this study is the analysis of the significance of teacher collaboration with student characteristics and school characteristics as controls. One weakness of this study is its generalizability. The population was made up of one large urban school district and that may limit the results. Another weakness is the percentage of missing data due to students entering and leaving the district over the course of the study. Given the lack of generalizability of this population, future studies need to explore

whether teacher collaboration in a variety of school demographics have a similarly positive effect on student achievement.

Gimbert, Bol, and Wallace (2007) attempted to determine whether the type of teacher training influences the academic achievement of students in mathematics, and whether it influenced the implementation of standards and the frequency with which they are used. This study used a mixed-methods comparative design. The subjects in this study were first year Algebra I teachers at the middle school or high school level. There were six teachers trained in the each teacher preparation program, the "Transition to Teaching" (TTT) and traditional programs. There were four teachers at the high school level and two at the middle school level, made up of four women and two men, in both groups of teachers. The middle and high schools were Title I schools, with about 47%-52% economically disadvantaged student population, which matched the school system's free and reduced lunch rate of 46.4%. Each middle and high school mirrored the school system's demographics with 55% African American, 35% white, and 10% Latino and/or English as a second language.

An observational tool was developed that aligned with the processes and standards of NCTM. This tool contained a total of 14 items that were related to the process standards and to the algebra content standards. Three to four classroom observations of each research participant were conducted during the second semester of the school year in 2003-2004. Five researchers completed a total of 42 observations. The duration of each observation was 30-45 min., and the observations were performed at different points of each class session to note the beginning, middle and end of a lesson.

The district administered a quarterly mathematics assessment to monitor the progress of algebra students through the year. Data was collected immediately after each quarterly test. The final data set included only students who were taught by the same TTT or non-TTT teacher for the entire year, and took all four assessments. The student attrition rate for TTT and non-TTT classrooms was 34% and the data from these students was not included in the analyses.

The type of teacher training program did not significantly influence the overall Standards of Learning (SOL) end-of-year assessment. When the affect of teacher training on achievement in subcategories of the SOL was assessed, teacher training had a significant but small influence on student achievement in the area of statistics but not in the other content areas. Students taught by traditionally trained teachers outperformed their counterparts on the first quarterly assessment but the results were reversed on the second quarterly test. By the third quarter's assessment there was no significant difference between results.

Based on the results of the classroom observations, alternatively trained teachers used the process standards more frequently in their instruction than the comparison group, but again, these differences were slight. The means for the use of instructional practices pertaining to the NCTM process standards for both groups was low. Similar results were found in regard to the use of algebra content standards in the classroom. There was slightly higher usage in the alternatively trained classrooms, but the difference was very minimal.

Contrary to expectations, while use of process standards and algebra content standards both had a significant influence on overall student achievement, it was a

negative one. Students in classrooms where the standards were used less frequently had significantly higher overall SOL scores.

Strengths of this study include the use of quantitative and qualitative data, and analyses performed. Weaknesses of this study include its small sample size and the limited amount of time it covers. As students spend more time with one type of instruction or the other, it might become possible to see greater variation in achievement. Given the data collected and analyses performed it seems reasonable to infer that alternative teacher programs can produce teachers that are just as effective as teachers who go through a traditional teaching program.

It seems strange that a higher use of standards in the classroom would be associated with lower achievement than when they are used less frequently. This may be due to variation in observations, since there were five different members conducting observations it is possible there was some variation in the frequency with which this variable was recorded.

Carbonaro (2005) attempted to determine whether student's academic effort varied across tracks, and whether variation explains differences in learning across tracks. This is a quantitative study that used longitudinal survey data. The subjects are 8,518 English students, 6,911 math students, 5,896 science students and 4,351 students who completed surveys, and had teachers complete surveys about them in the National Education Longitudinal Survey of 1988. Carbonaro used data from the 8th to 10th grade cohort of the National Education Longitudinal Survey of 1988. This data included 2 teacher reports per student in 8th and 10th grades, one teacher taught math or science, the other taught English or history, and surveys completed by students.

Carbonaro used ordinary least-squares (OLS) regression techniques to analyze the data. There are four categories of variables: background factors, measures of prior achievement, multiple measures of students' beliefs about themselves and their future, and two separate measures of intellectual stimulation, whether students felt challenged in a given subject and whether they were asked to show understanding in a given subject.

Six models were created based on the categories of variables and research questions. Model one is the "base model", Model two examined whether differences in background characteristics (SES, race, gender) explain track differences in effort, Model three added a control for 8th grade effort, Model four added the four 8th grade achievement scores as predictors of 10th grade effort, Model five examined whether changes in beliefs that are due to track placement are related to students' effort, and Model six added controls for intellectual stimulation to the model.

When background differences (race, gender, and social class) were added to Model two it explained some of the track differences in effort, but sizable statistically significant differences remained. Models three and four showed that track differences in effort are usually (the vocational track students were an exception, they were shown to exert more effort than those in higher track classes) due to the fact that students predisposed to more effort (as measured in 8th grade) are sorted into higher track classes in the 10th grade. Also, black-white and SES differences in effort were explained by differences that existed before entry into high school. Female and Asian students increased their effort in high school regardless of previous history. Controlling for beliefs decreased the track differences in effort.

Intellectual stimulation explained a small amount of the honors effect on effort, but the coefficient was still significant. "Differences in effort across tracks reflect more than simply the types of students who are sorted into different tracks, rather, students' *experiences* in their classes also partly explain why higher-track students tend to exert more effort than do lower-track students." (Carbonaro, p. 40) Regardless of students' track placement, an increase in effort results in increased learning. Males have had an advantage in learning, so females are closing the achievement gap by exerting more effort. When comparable students in lower track classes try as hard as students in higher track classes they still learn less than they would in the higher track. Intellectual stimulation was positively related to effort regardless of the track in which students were placed.

Strengths include that the study examined the effects of track placement independent of subject and the study looked at a number of useful variables to determine the effects of effort on achievement. There are two teacher perspectives for each student, in addition to student input, which is helpful considering the subjective nature of the surveys. There is a very large sample size in each subject area. Weaknesses are that the data used in this study did not include information on opportunities to learn in varied teaching styles. The author described three different types of effort, and yet was unable to examine the effects of each individually due to the available data.

The multisite study by Brown, Anfara, and Roney (2005) exposed a number of differences between high performing and low performing schools, including teacher engagement in curriculum development, use of standards, and beliefs in students' ability to succeed. These are all strategies every teacher can implement in their classroom to

positively influence student learning and achievement. Mosenthal, Lipson, Torncello, Russ, and Mekkelsen (2004) found a similar set of school practices led to literacy achievement. Those practices included the belief in students' abilities, strong administrative leadership, and teachers' level of expertise. Daeschner, Munoz, and Barnes (2004) also found that teachers' belief in students was included in the Kentucky schools' success, in addition to consistent leadership, before and after school assistance programs, community support, and the belief that all students can achieve high standards. Y. Goddard, R. Goddard, and Tschannen (2007) found that teacher collaboration was a small but significant predictor of improved math and reading achievement. Gimbert, Bol, and Wallace (2007) found the surprising result that use of content standards in the classroom had a significant and negative influence on student achievement. That contradicts the findings in the other studies included in this section. Carbonaro (2005) found that increased effort is correlated with increased achievement, but that regardless of effort, students placed in low tracks will not achieve at the levels of students in higher tracks. The following section continues to explore strategies that help students learn and increase achievement through enrichment, differentiation and reform.

<div align="center">Enrichment, Differentiation and Reform</div>

The previous section explored teacher and school practices that support learning and achievement in students. This section on enrichment, differentiation and reform continues that exploration, however these studies also incorporate elements from the section on social and cultural capital. Beecher and Sweeny (2008) examined a case study of a school that implemented school reform in a series of stages. Burris, Wiley, Welner, and Murphy (2008) is another case study that looked at how heterogeneous grouping

combined with high-track curricula affected the earning of two diplomas that represent high standards of achievement. M. Mac Iver and D. Mac Iver (2009) examined whether a National Science Foundation (NSF) supported mathematics curriculum would show greater achievement growth than other programs. Burross (2008) explored whether schools that implement comprehensive school reform models make gains that other schools don't without similar funding and programs. Balfanz and Byrnes (2007) examined the effect of school side implementation of enrichment and differentiated instruction on the school's achievement.

The case study of Beecher and Sweeny (2008) looked at how whole school reform models incorporate research based proven curricula, subject specific teacher training and professional development, teacher and classroom support and how school climate reforms affect student achievement. The reform was implemented in a series of stages, and took place at Central Elementary School, which was considered a failing school in a school in a high-performing school district. The school performed in the 30th percentile in reading, writing, and math on state and district assessments. 45% of students received free and reduced price lunch. The school had a diverse student population with 43% of all students from diverse cultures, which increased to 75% over the eight year period. About 30% of the students spoke English as their second language.

Initially the school conducted a year long review of all aspects that pointed out the school's strengths and weaknesses. This led to the establishment of 4 essential questions: 1) What must the school community collectively believe about children and what motivates children to learn and grow? 2) How does a struggling school become a successful learning community where children are actively engaged and invested in their

own learning? 3) What are the essential elements of curriculum and instruction that make this transformation from failure to success possible? 4) How can educators change the remedial instruction paradigm and stress students' strengths as a means to improving student learning and closing the achievement gap? Based on these questions a committee made up of teachers, school staff, parents and members of the community worked together to create a multiyear plan for school improvement.

The committee developed a school mission that included integration of gifted and talented strategies into the curriculum with all students, the creation of broad instructional goals, specific learning objectives, and detailed plans of action. One of the broad goals immersed students in other cultures through a social studies based global studies curriculum. The other broad goal, the enrichment program, involved a school wide enrichment team, interdisciplinary, differentiated units of study, differentiated lesson plans across the curriculum, extended day enrichment program, comprehensive staff development plan, and accountability and assessment measures.

Analysis of student achievement on state tests from 1997 to 2004 showed improvement in all subject areas and in all levels of proficiency. The gaps in achievement between students with differing socioeconomic status narrowed from 62% to 10%. All ethnic groups showed improvement in their achievement, with Asian students making the largest gains at 60%, while white and Hispanic students gained 5%. Of children with the lowest SES, those who scored in the remedial band were reduced by 28% (only 4% of those students stayed in the remedial band). Those students from higher SES than students who scored in the remedial band went down to only 3%. There were no longer any Asian or African American students in the remedial band, in contrast

to 1997 test results where 23% of the Asian students and 21% of the African American students were at the remedial level. The percentage of Hispanic students at the remedial level went from 22% to 7% and the percentage of white students went from 13% to 4%. The achievement gap was reduced in writing to 9%, in math to 7% and in reading to 30%. The total gap between students was 15%, which was better than the district gap, which was at 40%.

One strength of the study is that the data is from multiple sources. Because the data was collected for eight years, gains could not be entirely attributed to maturation over the course of the year. Weaknesses are that the results show increased test scores on the state assessment by SES and race/ethnic category, but there is no mention of how many students are in each category. If there are few students in a category with large gains that might favorably skew the data in a way that is not actually representative of the school. Also, there is no comparison made to other schools in the district, perhaps all schools had gains during these years.

In a case study, Burris, Wiley, Welner, and Murphy (2008) attempted to answer the question: How did heterogeneous grouping combined with high-track curricula affect the earning of two diplomas that represent high standards of achievement-the New York State Regents diploma and the diploma of International Baccalaureate (IB)?

The study tracked six cohorts of students entering high school in 1995, 1996 and 1997, and in 1998, 1999 and 2001. The cohorts ranged from 221-262 students with a total of 1300 individual student records included in the study. Student data was included for regular and special education cohort members, who were continuously enrolled in the school district from 9th grade through exit of high school, had a year of entry from 1995-

2001 (except 2000 when test scores were lost due to anthrax outbreak) and were not developmentally delayed. The school district is in a suburban community of 28,000 in Nassau County on Long Island and there is only the one high school in the district. The district gradually detracked high school classes starting with English, social studies and foreign language in middle school, foreign language only in 9th and 10th grades, with three tracks in math, 1995-1997. In 1998 accelerated math was available to all middle school students, with two math tracks in 9th grade, in 1999 all subjects were detracked in middle school, in 2000 science was detracked in 9th grade, and in 2001 all subjects were detracked in middle school and 9th grade. The number of Regents diplomas and IB diplomas were recorded for each graduating class.

This study used PSAT math and verbal exam scores to generate a general scholastic aptitude score to address whether the effect of detracking was constant across prior achievement levels. Variables of SES and ethnicity were recorded. Students were divided into four main groups: 1) Free or reduced price lunch (FRPL) eligible and either Latino or African American, 2) FRPL eligible and either Asian American or White, 3) Ineligible for FRPL and either Latino or African American, and 4) Ineligible for FRPL and either Asian American or White. The attainment of the two diploma types was modeled using logistic regression on independent variables: regents diploma, IB diploma, sped, aptitude, group one, two, three, or four, prepost (entering high school in 1998 or beyond). The first four models increase in complexity, adding each of the independent variables, models five to seven are a paring down of predictors to achieve parsimony and explanatory power.

The likelihood that the effect of detracking showed up due to randomness is less than one chance in one thousand according to model three. Detracking did not have a negative impact on achievement in high-aptitude students, instead it had a three-fold increase in achievement in groups two and four, and improved the odds of diploma attainment by factors of five and >26 in groups one and three respectively. Detracked students had increased likelihood of receiving Regents diploma at every level of aptitude (almost twice as much, so a detracked student in 25th percentile in aptitude would share the same Regents odds ratio as a tracked student in the 45th percentile of aptitude and so on). Being in a detracked cohort is associated with an increase of about 70% in the odds of IB diploma attainment. Detracking was associated with a decrease in dropout rate. Compared with statewide Regents diploma rates, during 2002-2004 when detracked cohorts began to graduate, statewide Regents diploma rate was 56%-57% but detracked district rate was 88%-94%. In other suburban schools with resources similar to the school of study, their Regents diploma rate increased only 1% (77%-78%) as opposed to the 6% gain the detracked school had, and Regents diplomas by African American and Latino students during those three years increased from 52% in 2002 to 83% in 2004.

A strength of the study is that researchers compared results with that from several different sources (state diplomas and other schools with similar demographics and resources) to check the validity of the results and they remained statistically significant in all cases. Weaknesses are the generalizability-this district is very wealthy, very white (75%), with a number of resources (volunteers, classroom assistants, funding for after school support programs etc.). In addition, the detracking process was a district wide reform, and involved a shift in beliefs, curriculum, pedagogy and school culture.

The quasi-experimental study of M. Mac Iver and D. Mac Iver (2009) examined whether students at schools that had implemented a National Science Foundation (NSF) supported mathematics curriculum school wide, would show greater achievement growth than students at other schools. The subjects in this study were 86 schools in Philadelphia containing eighth grade students. Included were 12 math Whole School Reform (WSR) schools in 1997-2000, which implemented an NSF supported curriculum or a partly supported, partly commercially generated hybrid curriculum. There were also 28 Comprehensive School Reform (CSR) schools in 1997-2000 that implemented a non-math focused CSR model as their WSR strategy, and 46 schools that did not have a CSR program or WSR strategy. Researchers coded these three types of schools as Math WSR, Other CSR, and No CSR. The data gathered did not indicate that the Math WSR schools had any fewer challenges than other types of schools. These schools included 9,320 students between fifth and eighth grades.

The data for this study was obtained from archival records maintained by Research for Action, and was based on Philadelphia district records which were supplemented by the records obtained from the CSR model development teams. This data included information on which WSR strategies were being used at each school and how long they had been implemented. Schools level variables were created indicating the number of years each school had implemented the math WSR or other CSR model. This variable ranged from zero through three for math WSR models and from zero through seven for other CSR models. The schools with no CSR had a code of zero.

Other school level measures included in this analysis were school type (K-8 or middle school), average achievement level of the school's entering 6th grade students

obtained from students' 5th grade spring mathematics score on the Pennsylvania System of School Assessment (PSSA), student gender, ethnicity, special education status, ELL status, and whether the student spent all three years at the same school. The dependent variable measure was achievement growth on the PSSA. Students who entered or exited the district after 5th grade were excluded from the study, as were students retained during the middle grades. Also, students with missing data on any variables were excluded from analysis.

Each student took the PSSA two times, once in 5th grade and once in 8th. Researchers modeled the initial status and growth instead of a curve. They estimated three-level growth models, specifying within-student, between-student and school-level models. At level one students' achievement growth was modeled as a function of grade with the intercept representing the prior year achievement and the slope representing growth. At level two the model took into account differences in prior achievement and achievement growth associated with student characteristics. At level three the impact of school characteristics and the duration of reform interventions were included in the analysis.

The demographic variables were significant predictors of students' achievement level entering 5th grade, and of their growth through 8th grade. In addition, student achievement gains were positively related to the number of years the schools had implemented math curriculum reform. On average students at WSR schools out gained those at non-implementing schools by .19 SD from 5th to 8th grades. Gains at Other CSR schools were not significantly higher than those at schools without a reform model in place. Gains were significantly higher at K-8 schools than in middle schools, and the

growth was higher at schools that had lower starting points. The effect of the number of years of Math WSR was significantly positive for the following math content areas: geometry, concepts of calculus, computation and estimation, and measurement.

Sustained implementation of math oriented WSRs is related to higher growth in middle grade mathematics achievement in students from a high poverty, urban district. This positive relation is found when examining whether the school implemented a WSR model, and also when analyzing the number of years the strategy or model has been in place. The relationship remained even when measures of a school's capacity and student population were included.

A strength in this study is the analyses the researchers performed. In addition to data analyzed in order to examine the hypothesis, additional analyses were performed to examine the validity of their findings. In addition, when variables were significantly correlated to each other, the duplicates were eliminated so as to not skew the results. One weakness of this study is that there could have been unmeasured pre-existing differences among schools that adopted WSR models with an NSF supported math curriculum and those that did not. These potential differences could account for the decision to adopt a program with NSF supported math curriculum. Researchers were unable to measure whether Math WSR schools had teachers with higher levels of math pedagogy and knowledge expertise than other schools, which could have explained differences in student achievement. They were also unable to measure the preexisting school culture or the level of parent and/or community involvement, both of which could have already existed to a certain extent and may have made implementation of the program easier,

with more successful results. This study is also limited by the data available in the archival records.

The quasi-experimental study by Burross (2008) examined whether schools that implemented comprehensive school reform (CSR) models would make gains beyond those expected without the funding and programs. The subjects in this study included 21 of 27 Comprehensive School Reform (CSR) schools that included third, fourth or fifth grades. A comparison group of 23 nearby non-CSE schools in the same or similar zip code, with similar grade make up, free and reduced lunch status, and size was matched to the CSR schools. Another group of 21 schools were selected based on the same criteria except these schools were low-poverty schools and had less than 10% of students qualified for free and reduced price lunch in 2000. The CSR schools averaged 79.8% free and reduced lunch recipients, the matched non-CSR averaged 72.3% and the low poverty schools averaged 6.2% across the eight years of the study.

Data was collected from the norm-referenced test used for third through fifth grades. Until 2003 this test was the Stanford Achievement Test (SAT-9). This test and the current norm-referenced test, the TerraNova (TN) have content area that includes math, reading and language, and both tests use multiple choice formats. The results of these tests were reported as national percentile ranks of the mean. Third and fifth grades were also assessed by the criterion-referenced test AIMS since 1999 and fourth grade testing began in 2005. This test included math, reading and writing content areas, the determination of falling below, approaching, meeting and exceeding standards changes from year to year, and from grade to grade on this test. Data that gives the percentage of students in each category was reported online through the state's website, students that

exceed or meet the standard are considered "passing." The data from these tests was collected from 2000-2007 and used to compare achievement over time.

In order to compare achievement between groups of students, researchers created four cohorts of third grade in 2000, 2003, 2004 and 2005. Analysis of variance allowed for examination of three aspects: the main effect of school type (CSR, non-CSR, and low poverty), changes over time, and the interaction of school type with time. These analyses were run separately for AIMS and SAT-9/TN data.

The correlation between test scores and free/reduced lunch percentages was strong between and across all years for both tests ($p<.01$). It was a negative correlation that stemmed from the fact that schools with lower percentages of students who received free/reduced lunches had higher standardized test scores. When the low-poverty group was removed from the analysis, the relationship between test scores and poverty still existed ($p<.05$) between the CSR and non-CSR schools took the SAT-9, but the AIMS results were not significant at $p<.06$.

The CSR schools increased two to eight percentiles on average between 2000-2007. The low-poverty samples dropped by about the same amount over the same time period. In comparing achievement between groups of students there were no interaction effects of school type with time, so the relative standing of these school types did not change over time. Each cohort tended to make gains in some content areas in fourth grade only to drop in either the same or different areas in fourth and fifth grades. There was even more variability in the AIMS data.

Although gains were shown for schools that received CSR funds, their gains were similar to both high and low poverty schools that received no funding. One strength is

that all students took the same test and with the exception of the low poverty school, had similar demographics. The CSR schools had 10% and 21% of students passing the AIMS in third and fifth grades, while the low poverty schools had 83% and 67% passing. Because of the analysis of very high and very low scores, the results are subject to statistical regression.

Given the strengths of the study, it does not appear that implementing a CSR program is enough to increase test scores beyond schools that do not implement this type of program. Given the weaknesses of the study, I would make the same claims as above. Any gains that do appear, appear in both the CSR and non-CSR groups, whereas the low poverty school drops. This could be due to statistical regression. Comparison results support this, and show the gains in all three groups were similar.

The previous study specifically looked at the impact of math based NSF approved CSR programs and compared that with non-math CSR programs in addition to schools that did not adopt CSR programs. Similar to that study the results did not show much difference between non-math CSR programs and schools with no CSR programs. The results did show improved achievement in the math-based programs. This study supports the finding that there was no difference in improvement between the non-math CSR programs and non-CSR schools.

Balfanz and Byrnes (2007) examined whether school wide implementation of enrichment and differentiated instruction have an effect on the school's achievement. The subjects were three middle schools: Central East Middle School (CEMS), Cooke, and Beeber. These were democratically representative of district's other high-poverty, high-

minority schools. Balfanz and Byrnes (2007) looked at a total of 1,233 students from four cohorts of 5th-8th graders at the three schools.

Data was collected in the Philadelphia School District over a six-year period from 1996-2003. Students were included in analysis if data was available from pretest, posttest, gender, race, school, cohort, effort (survey), behavior, and attendance. Data used was provided by the Philadelphia City School District and supplemented by additional testing and surveying done by the Talent Development program. Cohorts two, three and four were measured through grades five through seven in CEMS and Cooke, and only grades six through seven in Beeber. Cohort one was measured through grades five through eight in CEMS, grades six through eight in Cooke, and not at all in Beeber. Most cohorts were pretested in spring, but cohorts two, three and four in Beeber and cohort one in Cooke were all pretested in fall. Logistic regression analysis was used to determine impact of enabling and constraining factors. The outcome measured was whether students were catching up during middle school years based on how many grade equivalents (GEs) students gained on the SAT-9 standardized test than time spent in school.

Each cohort stayed on course, gaining as much as is expected by national standards and more in some cases. In the three schools that implemented the comprehensive whole-school reform model (TDMS), on the PSSA 33% gained more than 10 state percentiles while 24% in the districts other schools gained as much. An average of 42% of students caught up on the SAT-9 though those who caught up did not gain consistently each year. No one single factor was more predictive of these gains than another but all are highly significant in a student's ability to catch up within his or her

middle school years. There was a 37% difference in the probability of catching up between students who went through no high-gain homerooms and students who had all high-gain homerooms. There was a 20% difference in the probability of catching up for a student who had a 60% attendance rate versus a student who attended every day of school during the three to four years measured. A student who said they "worked as hard as they could" had a 19% greater probability of catching up than did students who said they were "not working hard at all" in math class. There was a 22% difference in the probability of catching up for students who averaged behavior marks of excellent compared to those who averaged unsatisfactory marks. Of students who had at least ⅔ of homerooms high-gain, had attendance rates of 95% or higher, averaged behavior marks around "Excellent" and put forth greater effort in math, 77% were catching up during middle school. The odds of students having high-gain classrooms throughout middle school was not anywhere near 75%, they actually experienced few if any.

A strength of the study is that schools with similar demographics did not undergo reform, and were available in order to compare data. A weakness is that many students had very low test scores to begin with so improvement may be due to statistical regression, though while some students' test scores went up, there were others who went down. The only students included in this study were those who had existing data in every area the researchers collected so students who had lower attendance rates were not included in this study. This may skew findings since it might have impacted test results and improvements in achievement.

Beecher and Sweeny (2008) found that integration of gifted and talented strategies, broad instructional goals, specific learning objectives and detailed plans of

action were all strategies that led to the elimination of achievement gaps at one school. Burris, Wiley, Welner, and Murphy (2008) also found that implementation of high track curriculum improved student achievement. In this study, the high track curriculum was combined with heterogeneous grouping of students as tracks were eliminated. M. Mac Iver and D. Mac Iver (2009) demonstrated that the Whole School Reform (WSR) schools that implemented a math based curriculum school wide made gains in student achievement that were not experienced by schools without a reform model or by schools that implemented a Comprehensive School Reform (CSR) model. The schools that implemented the CSR model did not see gains beyond those schools without a model. Burross (2008) also found that CSR models were not correlated with an increase in achievement. The study by Balfanz and Byrnes (2007) explored the benefits of WSR and found that similar to M. Mac Iver and D. Mac Iver (2009), the implementation of WSR resulted in significant increases in student achievement. The following section examines a number of specific teaching strategies in order to identify those most likely to help teachers increase student learning and reduce achievement gaps.

An Examination of Teaching Strategies

The previous section identified the integration of gifted and talented, or high track strategies as one plan of action to eliminate achievement gaps. This section continues the exploration of specific teacher strategies that can be used to increase student learning and decrease achievement gaps. Santamaria (2008) focused on the elements that make up complementary practices for all students. The strategies explored include culturally responsive teaching and differentiated instruction. Cooper and Schleser (2006) explored the hypothesis that African American children will remain in the preoperational stage of

development than their same age Caucasian peers. Kamii, rummelsburg, and Kari (2005) explored students who engage in physical knowledge games will do better by the end of first grade than those who are given traditional exercises focused narrowly on number. Minotti (2005) examined whether homework prescriptions significantly affected the achievement and attitudes of middle level students when compared to the use of traditional study strategies.

Santamaria's (2009) qualitative case study focused on the desire to assist the educational community in its ability to recognize pedagogical differences. Included in the focus was the desire to find common ground in the identification of practices that support culturally diverse students and English language learners (ELLs). Culturally responsive teaching (CRT) and differentiated instruction (DI) provided frameworks for finding best practices while working with diverse students in complex multidimensional classrooms. The subjects of this case study include two pre-K-5 schools in the same North San Diego County, California school district, Bienvenidos Elementary and Xavier Elementary. Both schools are reaching high levels of academic achievement and are closing achievement gaps.

Bienvenidos had 318 students, 47.3% of which are from low SES households and 32.7% of which are enrolled in free and reduced price lunch programs. 41.2% of the students are Latino of Mexican descent, and 18.6% are considered ELL. 5.1% of the student population is Asian/Pacific Islander, and 4.7% are African American.

Xavier has a total student enrollment of 499, and is a neighborhood school. 68% of students are considered low-SES, and ½ are enrolled in the free and reduced price lunch program. 70.1% of students are Latino of Mexican descent, 1.2% are Asian/Pacific

Islander and 1.2% are African American. The ELLs and culturally and linguistically diverse (CLD) learners at both schools have exceeded minimum annual yearly progress targets on state and national standardized assessments and have shown a steady increase in grade-level proficiency, as have all other subgroups at the school.

Santamaria (2009) spent time at Bienvenidos in the 2002-2003 school year, the average was one day a week over the course of the year. Observations at Xavier were done from 2004-2006, on average four hours a week were spent at the site over two academic years.

Observations, recorded conversations among teachers, administrators, students and parents, and supporting documents collected from both schools were initially coded by reading through responses and documents. Codes were generated through the identification of data relevant to the general features of differentiated instruction (DI) and culturally relevant teaching (CRT). Over time, codes were organized into larger themes identified and grounded by DI and CRT literature.

Over the course of five years, overall student achievement improved based on pre- and post-assessment data. This was seen as steady increases in grade-level proficiencies over the years in all subgroups. The preliminary findings indicate a strong case for the use of DI and CRT as complimentary teaching practices. Using assessment as a teaching tool is one of the most important guidelines for DI that is not addressed in CRT. The best teaching practices are those that consider all students in the classroom and pay attention to differences in academic, cultural, linguistic and socioeconomic diversity in order to determine the needs of each student.

Strengths of this study include the depth of the notes and interviews, in addition to the clear connections with CRT and DI pedagogy. It is possible that because this study happened over time, improvements in student achievement may have happened for reasons other than the implementation of these hybrid pedagogies. There is no comparison with the achievement scores of schools outside this case study.

Given the strengths of the study is seems likely that instituting hybrid pedagogies may have a positive impact on student achievement in some areas where singular pedagogies are not as effective. There was no comparison with the achievement at other schools during this same period of time and it is possible doing so would show similar improvement in achievement without the implementation of these hybrid pedagogies. In addition, there are no comparisons to other pedagogies, so it is not yet known whether this particular hybrid might be more conducive to student achievement.

Cooper and Schleser (2006) explored the following three hypotheses: African American children will perform significantly lower than Caucasian children on tests of mathematical achievement, proportionally more African American children will remain in the preoperational stage of development than their same age Caucasian peers, and the achievement gap in mathematics will dissipate when cognitive development level (CDL) is held constant. This study involved gathering quantitative and qualitative data, and consisted of a one group pretest/posttest design.

The subjects of this study included 26 kindergartners and 30 first graders from a public elementary school located in a suburb of Chicago. Sixteen students were African American and 40 students were Caucasian. The children ranged from six to eight years old. The average ages of African American and Caucasian students were not

significantly different. The cognitive developmental level included preoperational, transitional and concrete operational students.

Three math subtests of the *Woodcock Johnson Tests of Achievement*, 3rd Edition were administered. A Calculation subtest measured student's ability to perform math computations including writing numbers and completing addition, subtraction and multiplication problems. A Math Fluency subtest had children do as many single-digit addition, subtraction, and multiplication problems as possible in three minutes. An Applied Problems subtest had students perform math calculations in response to orally presented word problems. A standard score was obtained by summing the scaled scores of the subtests.

CDL was determined by two Conservation of Number tasks which asked students to rearrange the same number of objects into different patterns, then asked whether the number of objects was the same or different, and one Conservation of Substance task that had students work with play-doh, in order to make different shapes, followed by questions about whether there was the same amount of play-doh in each shape. A total conservation task score was tallied for each child ranging from zero through six (six meaning the child successfully completed all conservation tasks and is operating at a concrete operational level, a zero means the child is operating at a preoperational level, and one through five indicates the child is in transition between the two).

Children whose parents consented to the study participation were removed from the classroom and tested over the period of about an hour. The order of measures was randomized to ensure minimal bias on the part of the test administrator. At the end of each assessment children were rewarded with a sticker and taken back to the classroom.

African American students scored significantly lower than white students on mathematics achievement. White students scored 10.81 points higher on the Math Fluency subtest and 12.15 points higher on the Applied Problems subtest than African American students on average. Contrary to the hypothesis, there were no differences on math computation skills between African American and white students.

Ethnicity and cognitive development level were significantly related, with more African American children remaining in the preoperational stage then their same age white peers. The results of an analysis of a correlation between CDL and math achievement indicated that CDL was not significantly correlated. The transitional group scored lower than both the preoperational and concrete operational groups. When this group was removed from analysis, leaving only the preoperational and operational groups, the correlation between CDL and math achievement was significant but modest.

Strengths of this study include the student interviews, in addition to the data analysis. One weakness of this study is the small sample size, especially the small number of African American students. In addition, all of the students included in this study had high math achievement to begin with. Given the strengths and weaknesses of the study there needs to be more research into whether African American students of a similar age as their white peers, operate at a lower CDL.

Given the small sample size, and the high achievement level of the students included in this study, it would be valuable to examine more closely the findings that students in transition between the preoperational and operational stages had lower achievement than students operating in either stage. In addition, it would be valuable to see if a larger sample size with students of varying ability produced similar findings.

Kamii, Rummelsburg, and Kari (2005) explored whether physical knowledge games played during math hour would assist low performing, low-SES first graders to strengthen their logico-mathematical foundation for arithmetic, and whether the children who engage in physical-knowledge activities will do better in arithmetic by the end of first grade than those who are given traditional exercises focusing narrowly on number. This study was quantitative in design and involved a pretest/posttest control group design. The subjects of this study included twenty-six low performing first graders at a low-SES Title I school in California receiving a constructivist curriculum, and Twenty low performing first graders in a comparison school (also Title I) in the same low-SES neighborhood receiving a traditional curriculum. All of the students in the Traditional sample, and 77% of those in the Constructivist sample were receiving free or reduced price lunches.

The pretest was a traditional readiness test administered in September 2002 to all first graders in the Title I schools in the district. It was a multiple choice group test administered orally, and published by Houghton Mifflin. The posttest was given in individual interviews in May 2003. It was made up of mental arithmetic and word problems. For the mental arithmetic the interviewer had a form with 17 problems printed on it. The child was asked to answer each question orally and the interviewer recorded how many seconds it took to answer. In the word problem section each problem was printed on a separate piece of paper. Students were told they could draw or write anything they needed to solve the problem.

Students were given four word problems, which were read aloud to students as many times as they wanted. The problems were: 1) People started to get in line to go to

lunch. I was standing in line and counted three people in front of me and six people in back of me. How many people were in line altogether at that time? 2) I am getting soup ready for four people. So I have four bowls. If I want to put two crackers in each bowl, how many crackers do I need? 3) There are three children. There are six cookies for them to share. How many cookies will each child get? 4) Let's pretend that I had 12 pieces of candy. If I gave two pieces to my mother, two pieces to my father, and two pieces to my sister, how many pieces would I have left?

At the Constructivist school, the low-performing students engaged daily in a variety of physical knowledge games during the first half of the year. After winter break, the teachers of the Constructivist group began to introduce easy addition games to find out which children seemed "ready" for arithmetic. If a child played this game easily and eagerly they went on to arithmetic with games and word problems. If not, the child continued to play physical knowledge games. By February, most of the low-performing first graders were solving word problems and playing card games, board games, or physical knowledge games that involved arithmetic. All teachers in the Constructivist school used math games instead of worksheets, and teacher created word problems instead of a textbook. In the Traditional school the students stayed in their classes during the math our and were instructed using the state-approved textbook and workbook supplemented by manipulatives and activities focusing on number concepts.

The constructivist and traditional groups were essentially at the same level at the beginning of first grade with a mean of 78.6% correct and 79.38% correct respectively. On the posttest the results show that the Constructivist group did better on almost all of the mental math problems and the differences between the two groups were significant on

eight of the 17 problems. The Constructivist group did better on all of the word problems and the differences were highly significant on two of them. Of the problems without significance, both were too difficult for both groups. On one, two children in the Constructivist group and no one in the Traditional group had correct answers, and on the other problem, 19% of the Constructivist group and 5% of the Traditional group had the correct answer. In the third problem half of the Constructivist group and none of the Traditional students achieved the correct answer. In the final problem 73% of the Constructivist group and 25% of the Traditional group found the correct answer.

One strength is the similarity between samples, all students were from low performing students from low-income schools. One weakness is the transferability of this study. This research took place within very specific demographics and similar results may not be found in different circumstances. Given the similarities between students at the start of the year, including the similarities in their initial test results, it seems reasonable to infer that the constructivist learning did allow students to make more progress than the traditional classroom instruction. Given the limited transferability it would be beneficial to explore whether those findings can be reproduced in other schools under a variety of circumstances. It would also be valuable to explore whether these results are irrespective of race and ethnicity, in addition to SES and grade level.

Minotti (2005) examined whether the use of homework prescriptions significantly affected the achievement and attitudes of middle level students when compared to the use of traditional study strategies. It was a quantitative study of the ROXO experimental pretest/posttest control group design. The subjects were students from 6th, 7th and 8th grades from an urban, parochial elementary school in New York City. The majority of

students were from a low SES background. The school population was about 57% Hispanic, 39% African American, 4% Caucasian. 167 out of 181 6th-8th graders consented to the program. There was a fairly even distribution of male and female students-48.3% and 52.7% respectively.

A convenience sample of preformed classes was used from which students were assigned randomly to the experimental and control groups. The demographics of both groups were comparable. Students were administered a pretest on their knowledge of learning styles and two attitude surveys. The first measured students' attitudes toward learning styles, and the second measured their attitudes toward studying and completing homework. All three tests were administered in one session. Each of the six classes that participated was tested separately in a vacant, climate controlled computer lab. On the second day the experimental group received an introduction presentation on learning styles while the control group received a presentation on traditional homework approaches. Both presentations were animated and computerized slide shows. After the presentations a test was administered to the experimental group testing for students' individual learning style preferences and based on these results homework prescriptions were computer generated. These were explained to the experimental group, with suggestions for studying and doing homework for the two week period. The control group received similar information on studying using traditional methods.

All parents received the same information as students and were asked to sign off on student study logs each night, students were asked to record the protocols they followed and any variations in their study routines. After the last session the control group was administered a posttest to measure their attitudes toward studying and

completing homework. The teachers in the classes participating in this investigation administered unit tests on the content covered in language arts, math, science and social studies during the two week period, these were provided by the textbook publishers based on chapters taught. These scores were used as posttest measures of achievement. The six participating teachers did not know which students were assigned to the experimental and control groups. The learning style based homework prescriptions were designed to respond to characteristics of both global and analytical learners through the *Learning Styles: The Clue to You* program.

Both groups had similar results for pretests in knowledge of learning styles, in reading, math, science and social studies. In all posttests, although both groups had gains, the experimental group had significantly higher gains. In reading achievement the control group had a marginal gain of less than 1 point, from an average pretest score of 82.46 to an average score of 83.03 while the experimental group increased from a mean score of 81.29 to 88.86 after using homework prescriptions (with a significance level of $p<.001$). In math the mean scores for the control group was 81.85 before treatment and 82.45 afterward, while the experimental group average score went from 82.00 to 88.87. In science the control group average score went from 81.81 to 82.56 and the experimental group average score went from 81.79 to 88.80. The mean social studies score in the control group increased from 81.38 to 81.96 while in the experimental group it increased from 81.46 to 88.68. MANOVA results showed significant main effects for mean achievement pretest to posttest measures for reading, math, science and social studies indicating a moderate to strong interaction. There was also a significant pretest to posttest interaction signifying both groups learned at different rates. In the control group

attitude toward homework increased from a mean of 45.87 to 48.44 while the experimental group increased from 46.02 to 56.81.

A strength was the experimental design: with random selection to experimental and control groups and a control for teacher influence. A weakness is that the school demographics are distinct and not necessarily transferable.

An examination of teaching strategies shows that more than one strategy is effective at improving student achievement. Santamaria (2008) focused on culturally responsive teaching and differentiated instruction. The students involved in this study benefitted. Over the course of five years there were steady increases in assessment data. Cooper and Schleser (2006) examined African American cognitive development level compared to their same aged white peers and found that achievement on computational problems were similar, however African American students scored significantly lower on the applied problems, which signified that these students were still in the pre-operational stage of development. Kamii, Rummelsburg, and Kari (2005) found that when first grade students learned in a constructivist classroom where they played physical knowledge games over the course of the year, student achievement was much higher than in students from traditional first grade classrooms. In the final article Minotti (2005) found that when learning styles and attitudes toward homework were taken into consideration while designing the homework approach there was a significant increase in achievement over students that used traditional study methods. The following section examines the role of trust in student learning.

Trust

The previous section discussed specific teaching strategies to use in a classroom in order to increase student learning and reduce achievement gaps. As mentioned in discussions on social and cultural capital, students whose life experiences are outside the status quo frequently find they are at a disadvantage. Their cultural capital isn't recognized. When this happens it creates an atmosphere of mistrust between students and others. The following studies examine the role trust plays in student achievement, and identify factors that help build trust in schools. Skaggs and Bodenhorn (2006) explored relationship between character education programs in school achievement. Johnson and Stevens (2006) attempted to discover whether teachers' perceptions of school climate and student achievement are mediated by community and school context. R. Goddard, Salloum, and Berebitsky (2009) tested the degree to which SES, racial composition and size were predictive of the level of trust in schools. Bowen, Rose, Powers, and Glennie (2008) looked at how students' perceptions of their social environment influence their school success outcomes. Elias and Haynes (2008) examined how the social and emotional competencies of minority, low-income, urban school children in third grade are related to their end of year school outcomes.

Skaggs and Bodenhorn (2006) explored the results of implementing Character Education (CE) programs in general, and the impact of implementation level specifically. This study was guided by the questions: is there a relationship between the presence of a character education program and perceptions of students and staff behavior, behavioral indicators, and school achievement? And is there a relationship between the degree of implementation of character education and measures of perceptions of student and staff

behavior, behavioral indicators, and school achievement? This is a quantitative study that is a true experimental pretest/posttest control group design.

Five school districts implemented CE programs, these included 18 rural/urban, middle class schools, 12 urban inner city, large minority, low SES schools, 13 suburban, middle class schools, 12 suburban, large minority, low to middle class schools, and 49 suburban/exurban, middle class schools.

This study was based on a grant project called the Partnership in Character Education, which was comprised of the state department of education and five school districts. Each of the five school districts used CE curricula from one of four formal programs. This is a longitudinal panel study, and began with a baseline year, 1996-97, before program implementation, and continued through three years of program implementation. By the end of the second year the comparison schools had adopted some form of CE so the comparison group component of the design was dropped.

By the end of the study in 2000, only seven districts in the state had not formally begun programs in CE. Achievement data and dropout rates from those schools were obtained from the state department of education database and used as a comparison group. These districts were not ideal for comparison since they were dissimilar in many respects. The researchers controlled for a number of demographic variables and examined differences in trends between the two groups of districts.

To find out behavioral perceptions "The School as a Caring Community Profile" (SCCP) was developed consisting of 30 Likert items that a ask students, staff and parents about their perceptions of student behavior. This profile was administered to all teachers, administrators and students each year with a response rate of more than 90%. It was also

sent home for parents, and across the five districts less than 10% of the parent surveys were returned.

Behavioral indicator data including suspensions, expulsions, attendance rates and dropout rates was collected. Suspension and expulsion data was gathered from each school, dropout rates were supplied from the state education department's database. Attendance rates were very high across the schools, and varied little so were not used in this study. Student achievement information came from the state assessment administered to grades three, five and eight in a variety of subjects. There was too little variability in the high school scores to use that assessment for analysis (the average pass rates ranged from 95-99%).

Each year administrators perceived the highest level of character based behavior, followed by teachers. Students had the lowest perceptions of positive behavior. In addition, the most positive statements were made regarding the school, teacher and staff behavior, and the least positive statements were about student behavior. Although student behavior was rated poorly, a significant portion of the perceived improvement in CE came from improved student behavior. In all years elementary school behavior was perceived as much more positive that secondary school behavior.

There was no clear relationship between suspension rates and the presence of CE. Also, the relationship between CE and the dropout rate was virtually nonexistent. When the relationship between CE implementation and achievement was analyzed the effect size was very small. There was little difference between the CE schools and the non-CE schools. The presence of a CE program accounted for no more than 5% of the variance in 2000 achievement.

When high-implementation schools were compared with low-implementation schools, there was a difference in 2000 SCCP scores. The schools with higher implementation, whose student and staff behavior was initially positive about the CE program, had higher scores on the SCCP than the low implementation schools, even when their baseline was also high.

One strength of this study is that researchers gathered their own data, they were able to design questionnaires that addressed questions specifically related to the research questions as opposed to relying on data bases. One weakness of the study is that the control group, consisting of the schools without CE programs ended up adopting them partway through the study. In addition, there were several different character education programs to choose from, some may have been more effective than others.

Given the fact that the questionnaires designed for this study were able to speak specifically to the study's questions, it seems reasonable to conclude that CE programs do not directly impact student achievement. They do seem to have some effect on school atmosphere, some may do so more effectively than others, but they do not influence achievement.

Johnson and Stevens (2006) attempted to answer the question: Are teachers' perceptions of school climate and student achievement mediated by community and school context? It is a quantitative study that looked at elementary schools in a southwestern US city and 59 of the 78 elementary schools in the school district participated. There were 1106 completed teacher surveys out of 1115 teachers who volunteered to participate in the 59 schools.

The study defines school climate as the psychosocial environment in which teachers work with other teachers, students and administrators. This was measured by asking teachers in each of the 78 elementary schools in the school district to complete an existing school climate instrument, the School-Level Environment Questionnaire (SLEQ). The original SLEQ had 56 items with seven items each in eight scales, however exploratory and confirmatory factor analyses as well as internal consistency analysis led to the use of a shortened version with 35 items arranged in five scales. These scales are affiliation, innovation, participatory decision making, resource adequacy and student support. Student achievement was measured through a combination of scores on subtests of the Terra Nova Survey Plus standardized achievement test administered to grade four students in the subjects of reading, math, language, social studies and science. Community and school context measures were taken from existing district data and included measures of average adult education level, percentage of students not receiving free and reduced price lunch, percentage of community not single parent households and the percentage of students who are not classified as LEP. Structural equation modeling (SEM) was used to examine the relationships between the major constructs of interest-school climate, student achievement, and community and school context.

The first model tested only school climate as a predictor of student achievement and the fit was only marginal according to goodness of fit indices in SEM. In model two, community and school context were added as an influence on student achievement both directly and as a mediator of school climate. The fit indices show substantial improvement and indicate a well fitting model. In this model with school and community

context as mediating constructs, school climate accounts for 77% of the total effect of student achievement.

A strength of the study is that the use of reliability coefficients showed internal consistency and reliability of data. Weaknesses are that the samples were volunteers, and only 59 of the 78 schools had large enough samples to be included in analysis. In all of these schools there were large Hispanic populations so results might not be transferable.

R. Goddard, Salloum, and Berebitsky (2009) examined the degree to which organizational features such as school socioeconomic status (SES), racial composition, and size were predictive of the level of trust in schools. Next, the authors asked whether the level of trust in schools was related to school achievement on state mandated tests used to meet accountability requirements under NCLB.

This is a quantitative study that used path analysis to examine whether school disadvantage was linked indirectly to academic achievement through a direct relationship with trust in schools. The subjects were a stratified random sample of elementary schools with fourth and fifth grade classrooms in 2003-2004 from the state of Michigan. Schools were eligible if they had at least 15 students in fourth grade, and no students above sixth grade. Public charter schools were excluded. A total of 80 schools completed surveys, however two schools were dropped due to insufficient survey response rates.

Teachers at each school responded to a 14-item scale used to measure trust. About half of the teachers at each school were randomly selected to respond to these surveys. The proportion of students who passed the state-mandated fourth grade math and reading assessments represented the achievement level of each school. Path analysis was used as the primary analytic method since the model involved several structural

relationships. This enabled researchers to estimate the indirect effects of school disadvantage on academic achievement through trust. The statistical controls for school context and prior achievement reduced the possibility that any relationship detected between trust and current achievement would be due to prior status.

Four linear regression models were developed. Two models predicted trust, one controlled for reading achievement and the other for math. Two models predicted school achievement in reading and math. The measures of school context included percentage of students receiving subsidized lunch and racial composition, the proportion of students passing the math and reading assessments one year earlier, and school size.

The association between trust and school membership was statistically significant and very large compared with academic measures used to determine school effectiveness under NCLB. Trust was significantly associated with school size, the proportion of students receiving subsidized lunch, the proportion of minority students enrolled and prior mathematics achievement.

After controlling for school context measures, faculty trust significantly and positively predicted math achievement in fourth grade, but was not a significant predictor of reading achievement at p<.10. School level prior achievement was also a significant predictor of current achievement in reading and math.

Trust is strongly and negatively associated with racial composition, socioeconomic disadvantage and school size. The negative associations between disadvantaged students and achievement seem to be mediated by the level of trust in schools. When the effects of trust were estimated, SES and the proportion of minority students were no longer statistically significant predictors of achievement.

One strength of this study is the analysis controlling for school measures. This allowed the relationship between trust and school measures to become visible. There were limitations in the data available. There was no investigation into the influence of structural and institutional factors that might affect student achievement. Given the weaknesses of this study this topic needs to be explored further, looking at the relationship between trust and achievement in context of other variables found to have some effect on achievement.

This study is similar to several others that noted relationships between achievement and a cohesive school/district vision, teachers and administrators working together toward a common vision and goal within the school, students feeling valued and respected, and teachers belief in the capabilities of students. All of these variables are linked in some way to issues of trust. Given the negative association between trust and school variables, it seems reasonable to infer that there is a relationship between academic achievement and trust. What that relationship is needs to be explored further. It is interesting that the relationship is statistically significant in mathematics achievement but not in reading. It appears that cultivating environments of trust may be one way high-poverty urban schools can combat achievement gaps.

Bowen, Rose, Powers, and Glennie (2008) looked at how students' perceptions of their social environment influenced their school success outcomes in the either the long term or the short term. It is a quantitative study of quasi-experimental design, incorporating one group pretest-posttest design, using longitudinal data. The subjects included students from 11 middle schools with 60-80% of students at or above grade level in 2003: five rural and six urban. Students were in middle school for both 2004 and

2005. In fall 2004 the mean student age was 12 years, three months old, with 47% in sixth grade and 53% in seventh grade. 26% of students had been retained at least once by fall 2005. 48% of students were female, 46% African American, 10% Hispanic, 36% White, 8% Other, 65% FRPL eligible, and half of the students were from an urban district and while the other half was from a rural district.

Bowen et al. (2008) reviewed findings from earlier studies on the influence of neighborhood, school, peer and family systems on school engagement, trouble avoidance and grades over a 12-month period. Focused on 14 dimensions of the School Success Profile (SSP), which was administered repeatedly in 11 middle schools. This survey assessed students' perceptions of micro level processes of these influences: three neighborhood dimensions (support, youth behavior, safety), three school dimensions (satisfaction, teacher support, safety), three peer dimensions (friend support, group acceptance, friend behavior) and five family dimensions (togetherness, parent support, home academic environment, parent education support and school behavior expectations). This analysis incorporated two demographic variables: student age, grade level, grade retention, gender, race/ethnicity, and eligibility for free and reduced price lunch (FRPL) which served as a proxy for SES status.

These variables were used as a "noise reduction" strategy when examining the relationship between features of the social environment and the three school success outcomes. The schools implemented a universal social intervention to promote the functioning of middle schools as learning organizations, directed at school personnel as a whole, not at individual students. Hard copy SSP surveys were administered to the population of students enrolled in each of the 11 middle schools in fall 2004 and fall

2005. Students were allowed 60 minutes on average to complete the SSP, which includes 220 multiple choice questions with 22 summary measures (dimensions) that have consistently shown high reliability and validity in previous research. Both English and Spanish surveys were available. Students could skip questions and parents could refuse to have their children participate by filling out a waiver form.

There were 6,976 surveys collected year 1 and 6,586 collected year to (response rate went up but enrollment decreased). Survey data was lined up with a key that matched them to students, 240 were thrown out because students couldn't be matched to records. Only students present during both survey years were included (in analytical data set), which ended up being 4,071 surveys. 17 of 22 SSP dimensions were scored for analysis. 2,224 students were missing at least 1 variable in the analysis, used multiple imputation to create values for missing data points.

Implementation of the intervention was very low overall, with no sites completing the five planning steps. Preliminary analysis showed that the program didn't affect student outcomes and the intervention context was ignored here. Only neighborhood safety was associated with school success outcomes, those in safer neighborhoods reported greater trouble avoidance. None of the school social environment dimensions was associated with school success outcomes. Peer group acceptance and friend behavior were associated with school success outcomes. Friend behavior was associated with higher trouble avoidance, while level of school engagement decreased with increased peer group acceptance. Family togetherness was associated with positive gain in school engagement and students who had higher school behavior expectations from parents had improvements in trouble avoidance and grades over two surveys.

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Each demographic variable had a statistically significant association with at least one of the three school success outcomes. Being older was associated with positive shift in school engagement. Seventh grade was associated with more trouble avoidance. Retention was associated with a decrease in trouble avoidance and grades. Compared to females, males were less successful in avoiding trouble and had lower grades. Being African American was associated with greater school engagement and less success avoiding trouble. Latinos had more school engagement but had a drop in grades. FRPL eligible students dropped in trouble avoidance and grades. Each initial assessment had a large and statistically significant effect on the corresponding follow up assessment of the dependent outcome.

Strengths include the use of analysis to determine significance of missing data points and the program used to impute those points once the analysis was complete. In addition, surveys found to be significant in previous research were used, and administered to the entire population of study. Weaknesses were that all data was reported by students and is subjective. There are also missing variables in the data, in addition to losing 240 surveys due to not being able to match them with student information. There was also a limited sample from two districts.

Elias and Haynes (2008) examined how the social and emotional competencies of minority, low-income, urban school children in the third grade are related to their end-of-year school outcomes. It is a quantitative study, and used data from a larger longitudinal action-research project based on an integration of the evidence-based Social Decision Making/Social Problem Solving curriculum (a video-based series focused on teamwork skills, tailored toward preventing violence and promoting social-emotional competence in

urban elementary school children). It is a one group pretest/post test design, and used a

preassessment at the start of the school year in addition to the administration of a Survey

of Children's Social Support to measure levels of perceived support. In addition,

teachers filled out the Social Skills Rating Scale for each student in addition to an

attached demographic information sheet. Nine months later (May), the research

assistants returned to the schools and administered the same instruments as had been

given previously. In June students' academic and nonacademic information was obtained

from report cards.

The subjects were 282 third grade students (46% boys, 54% girls) from six

elementary school in a Northeastern urban community made up of 172 black/African

American students, 27 Hispanic/Latino, one Native American, two Caucasian and three

Other. Seventy-seven students were ethnically unidentified. The study sample was

representative of the full school population, although the community population was

about 20% white. About 60% received free or reduced lunch although many who were

eligible did not apply.

The shortened version of the Survey of Children's Social Support (developed

using the three items with the highest factor loadings for Teacher and Peer Support

factors, with high correlations with the full items subscale scores) was administered to

teachers and students to measure perceived social support. The Social Skills Rating Scale

was used to measure three components of competence: cooperation, assertion and self-

control. 28 items were used to get the competence score, if participants had more than

three items missing they were excluded from the analyses. School outcomes were

measured using report card grades for reading and math at the end of the beginning and end of the school year, students with academic scores missing were excluded.

Girls generally scored higher on academic outcomes, social-emotional competence, and peer support. Boys reported higher perceived teacher support, but there was no statistical significance found. The hypothesized relationship between previous social-emotional competence and school outcomes was mostly supported. The relationship of academic pretest scores to academic posttests showed that prior educational history is highly predictive but not deterministically so. Social-emotional skills and support combine to serve as protective processes, but not in ways that are uniform across cultural and ethnic groups or sources of support. Perceived teacher support did not generally influence end of year academic performance, but did influence the number of absences from school. Prior social-emotional competence and change in competence were found to significantly affect later academic performance supporting the position that transitional support is influential in determining later school performance for at-risk students. Less competent students perceived more support from their teachers as opposed to more competent students. Students' initial perception of teacher support didn't affect their academic performance, but change in perception did.

The strengths of the study are that the surveys used to gather data are widely used and have strong empirical support in the literature. The data was gathered from several different sources including pre- and posttests, grades, and teacher and students surveys. In addition, Elias and Haynes (2008) looked at the social connection required for learning to take place. Weaknesses include the maturation and selection-maturation interaction: students were given the pretest at the start of the school year and nine and 10 months

later, after being exposed to curriculum, posttests and results were collected. Surveys also relied on subjective information, including levels of perceived support. Also, the SOCCS Survey was reduced from 31 items to three, in addition, the scale used on the SSRS was a three point scale, which might not allow teachers room to show smaller changes in student behavior/achievement. The timing of the pre- and posttests could also be a weakness of the study, it might have been useful to have another test a few months after the start of the school year to catch some of the developments that occurred after the first of the year. There was also no data collected from the students' families, which plays a large role in the development of students' social-emotional support.

Skaggs and Bodenhorn (2006) discovered that the character education programs did not affect student achievement. Johnson and Stevens (2006) found that school climate accounted for 77% of the total effect of student achievement. R. Goddard, Salloum, and Berebitsky (2009) discovered that trust was negatively associated with racial composition, socioeconomic disadvantage and school size, but that the level of trust in the schools mediates the negative associations. Bowen, Rose, Powers, and Glennie (2008) found that several factors related to friendship, safety and trust played a role in student achievement. Elias and Haynes (2008) found that prior social-emotional competence and change in competence were found to significantly affect later academic performance. The following section examines the role SES and physical capital play in student achievement.

<p align="center">SES and Physical Capital</p>

The previous section looked at the role trust plays in student achievement. The following studies examined role monetary funding, physical size and physical capital of

schools play in student achievement. Sirin (2005) starts the analysis because it is a meta-analytic review of the research on poverty. In this analysis, the Sirin (2005) study is followed by Coladarci's (2006) study that examined the relationship between SES, school size and student achievement. Coladarci's (2006) study is followed by Crampton (2009) who attempted to determine whether investment in human, social and physical capital have an impact on student achievement.

In a meta-analytic review of research Sirin (2005) assessed the magnitude of the relationship between SES and academic achievement in 58 published journal articles. He also examined how the type of SES measure, the source of the SES data and unit of analysis, and student characteristics such as grade level, minority status and school location affected the relationship, and to determine whether there has been any change in the correlation since White's 1982 study. In order to be included in the review a study had to apply a measure of SES and academic achievement, report quantitative data with enough detail for calculations of correlations between SES and academic achievement, include students K-12 in its sample, be published in a professional journal between 1990 and 2000, and include students in the United States in its sample. After double entries were eliminated, 2,477 studies remained. Based on the inclusion criteria, the 58 articles were selected.

A coding form was developed that included information about the publication, school location from which the data was gathered, participant demographics, research methodology, SES and academic achievement measures, and the statistics necessary to calculate effect size. The author coded all studies. A doctoral student who helped design the coding process coded an additional random sample of 10 studies and the interrater

agreement levels for the six coding categories ranged from 89% for the methodology section to 100% for the names of the coding form.

Six SES components were used to assess SES. Parental education, then parental occupation, parental income and eligibility for free or reduced price lunch programs were the most commonly used. The type of SES component significantly moderated the relationship between SES and academic achievement. The home resources available to students had the highest effect size followed by free and reduced price lunch eligibility. An increase in home resources saw a corresponding increase in student achievement, while an increase in the number of minorities in a sample was negatively associated with SES-achievement correlations. An increased proportion of minority students in a sample minimized the correlation between SES and achievement, which may be due to the fact that more of these students, and fewer white students, live in neighborhoods with higher educational risk factors (2005).

The magnitude of the relationship between SES and school achievement is not as strong in this review as it was in White's review. The overall effect size of this study shows a medium level of association between SES and academic achievement at the student level and a large degree of association at the school level. With the exception of high school students, there was a trend of increasing effect size from kindergarten to middle school, which indicated that SES was not as significant at predicting achievement in high school. Family SES at the student level has one of the strongest correlations with academic performance, and at the school level is even stronger. Sirin (2005) suggested therefore that "parents' location in the socioeconomic structure has a strong impact on

students' academic achievement" (p. 438). Family SES determines access to resources at home, and to other forms of social capital that may contribute to student achievement.

Several factors affected the magnitude of the relationship between SES and achievement. Specifically, the type of SES measure, and student characteristics altered the relationship. Future research should consider these four factors when examining SES: unit of analysis, type of measure, range of variable, and source of data. When data was used to examine SES-achievement relationship at the student level the findings were likely to be contaminated because of the ecological fallacy. Artificially restricting student's SES significantly reduces the magnitude of the interaction between SES and school achievement. When SES data was collected from parents the magnitude of the relationship between SES and achievement was much higher than when data was collected from students. Single subject achievement measures (math, science etc.) had significantly larger correlations than general achievement measures (GPA, achievement test).

Some studies suggest that neighborhood and school SES, not family SES, may exert a more powerful effect on academic achievement in minority communities, particularly in African American communities. The impact of family SES varies for individuals depending on where they live and the cohort with whom they go to school. When only a single component is chosen the results are more likely to overestimate the effect of SES. Only a small number of studies considered neighborhood characteristics as part of their assessment of students' social and economic background. SES seems to have different meanings for students from different ethnic backgrounds.

Strengths of this study are that the same person did all coding, with a random sample coded by one of the doctoral students who helped design the system to check for agreement. Publication bias was tested for among the sample of literature chosen for this study. The articles were divided into those with the SES-achievement relationship as one of the main questions of the study and those that only used it as a control variable. The former was treated as the central group and the latter as the control group. One major weakness of the study, as with all studies on this topic, is that SES is assessed by a variety of different combinations of variables so it is difficult to interpret research findings. In addition, studies were only used between 1990 and 2000. The samples in all of the studies included in this analysis were limited to students in the United States. It is not possible to know if all relevant studies were included. The results of this meta-analysis are also limited by the quality of the research on which it is based.

While Sirin (2005) analyzed the SES-achievement correlation between students, families and neighborhoods, Coladarci (2006) addressed the question of whether the lower SES-achievement correlation among smaller schools is an artifact of the lower reliability of school achievement for such schools. It was a quantitative study that used data from the Maine Educational Assessment for the 2002-2003 and 2003-2004 schools years for all 8th grade public school classes where there were at least two 8th grade students in a school. It used least-squares regression to demonstrate interactions between variables. The subjects were 8th grade reading and mathematics students in Maine public schools with at least two 8th grade students in each of the two school years during 2002-2003 and 2003-2004 (216 out of 233 public schools having an 8th grade).

Coladarci (2006) created a weighted two year mean for both reading and math achievement, for the SES measure, the percentage of students receiving free and reduced price lunch for each school, and also determined the mean enrollment per grade for each school across the two years. Coladarci (2006) determined the difference in mean achievement between the two years for reading and math separately, and used those to determine a volatility rating for each school, then set up analysis so the degree of association between poverty and achievement depends on school size, or that the degree of association between school size and achievement depends on the SES of the school.

The findings show there is greater volatility (lower reliability) of school level achievement among smaller schools than among larger schools. Reading achievement is increasingly related to poverty as school size increases, and decreasingly related to poverty as school size decreases. Coladarci (2005) noted "there is some tendency for smaller higher-poverty schools to have reading achievement superior to that of larger higher-poverty schools" (p. 12), which appears possible considering the results of the regression analysis performed in this study. Math achievement is increasingly related to poverty as school size increases and decreasingly related to poverty as school size decreases, though this relationship is not as strong as the one between reading and poverty.

Throughout this study school size is a proxy rather than a causal force and stronger evidence regarding the mechanisms is necessary. The strengths of the study are that the source of data is from the Maine Educational Assessment for the 2002-2003 and 2003-2004 school years. The small number of variables allowed author to fully explore potential relationships between them. Initial analysis included all schools falling under

the acceptable criteria. The weaknesses include that the study uses number of students receiving free and reduced lunch as a measure of school poverty when many students may not apply for this program, and these numbers may not accurately reflect poverty in schools. This study does not distinguish between random variation in achievement and variation due to educational practice in the classroom, so some schools have most likely been excluded from the analysis that should have been included. In addition, regression analysis was conducted on successively less-volatile schools, and because achievement volatility is more pronounced in smaller schools, this data may be compromised, which defeats the purpose of the study.

The previous study examined whether the lower SES-achievement correlation among smaller schools is an artifact of the lower reliability of school achievement for such schools, Crampton (2009) used statistical analysis to answer the question: what is the impact of investment in human, social, and physical capital on student achievement? The author used canonical analysis, a multivariate statistical approach that allowed for multiple independent and dependent variables. Given the limited body of research on the question the state was the unit of analysis. The subjects of this study include all 4th and 8th grade public school students in the US in the years 2003, 2005 and 2007.

Based on the theory that investment in school infrastructure represents physical capital that works in tandem with investments in human and social capital to build capacity for increased student achievement, this study used data from national databases maintained by the Institute for Education Sciences and the US Census Bureau. Researchers gathered data on student poverty based on the percentage of students eligible for free and reduced price lunch from the Common Core of Data (CCD). The National

Assessment of Educational Progress (NAEP) is the only nationally representative and continuing assessment of American students and gave data on student achievement in math, reading, science, writing, the arts, civics, economics, geography and US history. Data on human, social and physical capital came from the US Census Bureau in the form of the level of school district expenditure on instructional compensation, expenditures labeled "instructional staff support" including staff training, curriculum development etc., and the expenditure on school infrastructure and its maintenance respectively. Descriptive statistics and multivariate analysis were used to answer the research question.

Results of the canonical analysis were robust and consistent over time. Investment in human, social and physical capital accounted for between 55.8 and 77.2 percent of the variation in student achievement on the 4th and 8th grade math and reading assessments. In 2003 investment in human, social and physical capital accounted for 57.4 percent of the variation while in 2005 it accounted for 55.8 percent, and in 2007 it accounted for 77.4 percent. These were statistically significant to the .001 level for the three years. The student poverty factor used as a control variable had a negative impact on student achievement ranging from -.464 to -.947. Investment in human capital had the strongest impact on student achievement over time however the effects declined over time from .890 in 2003 to .648 in 2007. At the same time the impact of social capital increased from .158 to .299. The impact of school infrastructure was somewhat inconsistent dipping from .236 in 2003 to .049 in 2005 and then back to .234 in 2007. The results of this study indicate that the impacts of investments in human, social and physical capital are maximized when made in tandem.

One strength of this study is the type of analysis chosen. In addition, controlling for the poverty variable enables a view of the impact of physical capital excluding this commonly accepted indicator of achievement. One weakness of this study is the limited number of years available for analysis. State-by-state data for student achievement for fourth and eight graders were available for only 2003 and 2005 (data from a previous study), and 2007 (the data included in this study). In addition, the study was limited by the data available in the databases.

Given the strengths of this analysis it seems reasonable to conclude that investment in physical capital may have an effect on student achievement, especially when in combination with social and human capital. This seems like a reasonable inference. Monetary investments in schools are positively correlated with achievement. Future investigations should look for a lengthier period of time over which data is available. Also, although the authors did control for free and reduced lunch status, they did not control for minority status. It would be interesting to see whether do so would alter the effect of the relationship between physical capital and student achievement, and if so, how.

The analysis of the research in SES and physical capital suggests these factors do play a role in student achievement. Sirin (2005) showed that family and school SES had the strongest correlations to student achievement. Coladarci (2006) demonstrated that there might be a relationship between school size and the SES-achievement relationship. In reading the results shows a decrease in correlation between SES and achievement in smaller schools, while the effect increased in larger schools. The opposite was true in math. Crampton (2009) discovered that investment in human, social and physical capital

accounted for between 55.8 and 77.2 percent of the variation in student achievement, while the student poverty factor used as a control variable had a negative impact on student achievement.

Summary

Chapter three was a review of the research about student achievement. The findings of the studies were summarized and analyzed, based on the conclusions provided. The research was reviewed to examine strategies that are available to teachers to help increase student learning and eliminate achievement gaps. The research in Social and Cultural Capital and Family sections suggested that family background plays a large role in student achievement, and that when students' cultural background varies from the social norm, their cultural capital decreases which corresponds with a similar decrease in achievement. In addition, a students' social capital is related to resources at home, and fewer resources are related to lower achievement. The research of the An Overview of Practices, Enrichment, Differentiation and Reform, and An Examination of Teaching Strategies sections indicated that there are many strategies available to teachers that improve student learning and achievement. The research of the Trust section is not consistent, and indicates that future research is necessary. However it does indicate that students who feel comfortable and trust the people around them do better in school. The research on SES and Physical Capital indicates that there may be school factors that teachers cannot directly influence in order to improve student achievement. However, as demonstrated in previous sections, there are strategies that counteract the negatives beyond a teacher's control. Chapter four outlines the summary of the findings from this chapter with respect to Social and Cultural Capital, Family, An Overview of Practices,

Enrichment, Differentiation and Reform, An Examination of Teaching Strategies, Trust,

and SES and Physical Capital. Then chapter four will consider classroom implications

and suggestions for future research.

CHAPTER FOUR: CONCLUSION

Introduction

Chapter one discussed the purpose of NCLB, granting students fair and equal access to

high-quality education, and asked how teachers could help students learn while reducing

gaps in achievement. In spite of legislation and reform beliefs that all children can

succeed, these gaps continue. It examined conflicts related to identification and

measurement of achievement using standardized tests, in addition to the impact of funds

and resources on achievement. Chapter two explained the history of the accountability

movement in the United States. It outlined the legislation leading from Johnson's *War on

Poverty* to No Child Left Behind, described the development of state standards and

standardized testing, and discussed the unintended consequences of the NCLB

requirement that classroom programs be scientifically based, which is that academically

underprivileged students frequently do not experience curriculums that value the

resources they bring to the classroom. Chapter three reviewed the research about student

achievement. The research reviewed in chapter three was organized into seven sections:

social and cultural capital, family, an overview of practices, enrichment, differentiation

and reform, an examination of teaching strategies, trust, and SES and physical capital.

Each of these studies were summarized and analyzed, based on the conclusions provided.

The research is reviewed to examine how teachers in the classroom can improve student

achievement. Chapter four is the concluding chapter of this paper. This chapter revisits

the guiding question, what can teachers do to increase student learning and reduce

achievement gaps, based on the seven areas: social and cultural capital, family, an

overview of practices, enrichment, differentiation and reform, an examination of teaching

strategies, trust, and SES and physical capital from the initial review from chapter three

to answer the study, implications for classroom practice, and suggestions for further

research.

<div align="center">Summary of the Findings</div>

What can teachers do to increase student learning and reduce achievement gaps?

This was an important question when you consider the role teachers play in education.

The introduction brought forth the idea that a desire to continue learning is important in

education, but is often contradicted by teaching practices. The rationale introduced the

purpose of the NCLB Act, granting students fair and equal access to high-quality

education, and achieving proficiency on challenging state standards. In spite of

legislation and reform beliefs that all children can succeed, gaps in achievement continue.

The controversies section explored conflicts related to indentifying and measuring

achievement using standardized tests, in addition to issues related to funding and

resources. The definitions section introduced important terms used throughout this paper,

and the limitations discussed the limits of the studies regarding the question of what

teachers can do to reduce achievement gaps.

The history of accountability section explained the rise of accountability through

Johnson's *War on Poverty* and ESEA. The development of the *Elementary and

Secondary Education Act* (ESEA) led to Title I, which provided funds for students in

need. Underfunding and misuses of funds plagued Title I from the start. The report *A

Nation at Risk* prompted academic focus to shift from equity and access to excellence,

and prompted the development of high academic content standards and standardized tests

in an effort to reduce achievement gaps. The focus on content standards continued with

Improving America's Schools Act (IASA) which stated that students must be taught state content standards and given the means to meet those standards for schools to receive Title I funding.

The No Child Left Behind section examined how NCLB was implemented, similar to previous efforts, in order to provide access to high academic standards and achievement. It placed power back in the hands of the federal government, granting approval over school standards. It required classroom curriculums be scientifically research based, which had the unintended consequence of excluding research most relevant to disadvantaged students. NCLB also narrowed academic focus to reading, literacy and computational skills, inadvertently eliminating many subject areas from classrooms, and with an unintentional shift toward basic skills over thinking and sense making. Chapter three reviews the research about what teachers in the classroom can do to increase student learning and reduce achievement gaps.

In spite of legislation promoting academic excellence for all students, aimed specifically at academically disadvantaged students, achievement gaps exist. Chapters one and two suggested that this might be related to a lack of social and cultural capital. The analysis of research in social and cultural capital suggests that both types of capital play a large role in student achievement. Moon et al. (2009) found that factors such as poverty, parents' employment status, and TANF status are statistically significant predictors of both initial achievement and developmental trajectories for all three areas of knowledge (reading, mathematics and general knowledge). In addition, children from families that received TANF started school with disadvantages in learning compared with students of the same ethnicity who are not TANF recipients. The study by Nonoyama-

Tarumi (2008) discovered that a multidimensional measure of SES had a larger effect size on the relationship between SES and achievement than the standard SES measure in every country but two. This measure added a family effect, and took cultural resources at home into consideration. The final two studies examined the effect of cultural capital in schools. Wildhagen (2009) found that parent education has a positive effect on students' levels of cultural capital, which in turn had a positive effect on students' educational expectations. In addition, students who behave in compliance with dominant norms are more readily accepted by their teachers, and seen in a more positive light than students who exhibit behavior outside those norms. This theme reappeared in the study by Boykin et al. (2005), which analyzed cultural values present in the classroom.

The studies on family showed there are many similarities between measurements of family and those of social and cultural capital. The difference in the sections here is in the variables researchers chose to investigate. The study by Milne and Plourde (2006) discovered that common themes of low-SES, high achieving students included access to resources at home, the presence in students' lives of a belief in the importance of education, positive relationships with caretakers, and support and guidance at home. Pong, Hao and Gardner (2005) study found that Asian students had higher achievement than both Hispanic and third generation white students, while white students had higher achievement than Hispanic students. Another result of this analysis was a decline across all models between the second and third generations. The Lee and Kushner (2008) study found that female students living with their fathers had higher achievement than any other students living in a single parent home. The following section explored school and teacher practices that increased student learning and achievement.

Students who live outside mainstream society have reduced social and cultural capital, and frequently have fewer resources, which result in lower academic achievement. There are exceptions, highlighted in the section on families, where traditionally disadvantaged students attain high levels of achievement. The multisite study by Brown, Anfara, and Roney (2005) exposed a number of differences between high performing and low performing schools, including teacher engagement in curriculum development, use of standards, and beliefs in students' ability to succeed. These are all strategies every teacher can implement in their classroom to positively influence student learning and achievement. Mosenthal, Lipson, Torncello, Russ, and Mekkelsen (2004) found a similar set of school practices led to literacy achievement. Those practices included the belief in students' abilities, strong administrative leadership, and teachers' level of expertise. Daeschner, Munoz, and Barnes (2004) also found that teachers' belief in students was included in the Kentucky schools' success, in addition to consistent leadership, before and after school assistance programs, community support, and the belief that all students can achieve high standards. Y. Goddard, R. Goddard, and Tschannen (2007) found that teacher collaboration was a small but significant predictor of improved math and reading achievement. Gimbert, Bol, and Wallace (2007) found the surprising result that use of content standards in the classroom had a significant and negative influence on student achievement. That contradicts the findings in the other studies included in this section. Carbonaro (2005) found that increased effort is correlated with increased achievement, but that regardless of effort, students placed in low tracks will not achieve at the levels of students in higher tracks. The following

section explored strategies that helped students learn and increase achievement through enrichment, differentiation and reform.

Beecher and Sweeny (2008) found that integration of gifted and talented strategies, broad instructional goals, specific learning objectives and detailed plans of action were all strategies that led to the elimination of achievement gaps at one school. Burris, Wiley, Welner, and Murphy (2008) also found that implementation of high track curriculum improved student achievement. In this study, the high track curriculum was combined with heterogeneous grouping of students as tracks were eliminated. M. Mac Iver and D. Mac Iver (2009) demonstrated that the Whole School Reform (WSR) schools that implemented a math based curriculum school wide made gains in student achievement that were not experienced by schools without a reform model or by schools that implemented a Comprehensive School Reform (CSR) model. The schools that implemented the CSR model did not see gains beyond those schools without a model. Burross (2008) also found that CSR models were not correlated with an increase in achievement. The study by Balfanz and Byrnes (2007) explored the benefits of WSR and found that similar to M. Mac Iver and D. Mac Iver (2009), the implementation of WSR resulted in significant increases in student achievement. The following section examined a number of specific teaching strategies in order to identify those most likely to help teachers increase student learning and reduce achievement gaps.

An examination of teaching strategies showed that more than one strategy is effective at improving student achievement. Santamaria (2008) focused on culturally responsive teaching and differentiated instruction. The students involved in this study benefitted. Over the course of five years there were steady increases in assessment data.

Cooper and Schleser (2006) examined African American cognitive development level compared to their same aged white peers and found that achievement on computational problems were similar, however African American students scored significantly lower on the applied problems, which signified that these students were still in the pre-operational stage of development. Kamii, Rummelsburg, and Kari (2005) found that when first grade students learned in a constructivist classroom where they played physical knowledge games over the course of the year, student achievement was much higher than in students from traditional first grade classrooms. In the final article Minotti (2005) found that when learning styles and attitudes toward homework were taken into consideration while designing the homework approach there was a significant increase in achievement over students that used traditional study methods.

Skaggs and Bodenhorn (2006) discovered that the character education programs did not affect student achievement. Johnson and Stevens (2006) found that school climate accounted for 77% of the total effect of student achievement. R. Goddard, Salloum, and Berebitsky (2009) discovered that trust was negatively associated with racial composition, socioeconomic disadvantage and school size, but that the level of trust in the schools mediates the negative associations. Bowen, Rose, Powers, and Glennie (2008) found that several factors related to friendship, safety and trust played a role in student achievement. Elias and Haynes (2008) found that prior social-emotional competence and change in competence were found to significantly affect later academic performance. The following section examines implications for teaching.

Implications for Teaching

One thing the literature makes clear is that there is no single strategy for eliminating achievement gaps. There are any number of strategies and combinations of strategies that can be implemented with success. What is important is that "Educational administrators need to create a setting that promotes the will to learn how to close the achievement gap" (Daeschner, S., Munoz, M., & Barnes, J., 2004, p. 15). When administrators recognize the issue and create an atmosphere of awareness in the school, it opens the door for change. It is through careful observation of the needs in each school, the needs of the students, faculty, staff and administration that will yield insight into finding solutions.

While "small school and class size, early childhood education, federal programs such as Title I and Head Start, after-school programs and summer school sessions, and qualified school personnel, all have been found to be important factors in reducing the achievement gap between children of the 'haves' and the 'have-nots'" (Sirin, S., 2005, p. 446), in many instances it is difficult if not impossible for schools to gain access to these programs due to issues of funding, especially since schools in need are frequently the same schools with low test scores. Instead of being offered access to these programs as a way to improve student achievement, the result of NCLB policy is that schools are penalized by having their funding removed and school personnel replaced.

While it is possible to create change in spite of inequalities in funding and resources, there is no reason for these inequalities to remain. "At present, one in five children in the United States lives in poverty, which puts many of these students at risk for poor school performance or failure (Dalaker & Proctor, 2000). The negative effects

of poverty are far reaching, from its affect on social and cultural capital to the environment of trust at school. In order "to significantly reduce the gap in achievement between low-and high-SES students, policy decisions at the local, state, and federal levels must aim at leveling the playing field for students deemed to be at risk academically as a result of their family SES" (Sirin, S., 2005, p. 446). In order for all students to experience the benefits of education, they must have equivalent opportunities.

<div align="center">Suggestions for Further Research</div>

One of the most prominent questions I still have is which variables are most significant regarding the effects of poverty on student achievement, and which variables are most important in measuring that effect. The most frequent measurement I encountered in these studies was qualification and/or enrollment in free and reduced price meal programs, however in the meta-analysis on SES the author suggested this is not necessarily an accurate measurement tool, only convenient. In addition, because poverty has such a large impact on so many variables impacting student achievement, it is difficult to get a clear picture of the true effect of poverty.

In terms of successful school reform, many elements were found to have a positive impact on student achievement. Some of those elements were a unified vision within the school and district, belief in the abilities of every student, support from the district, school and for the students, high academic standards with support programs in place to help students who need it, and the importance of consistent leadership in the schools. What needs to be further explored is whether these strategies are effective only when implemented together, or whether they are capable of positively impacting student

achievement independently. Also, is one or more combination more effective at improving student achievement?

Some schools implemented Comprehensive School Reform (CSR) models and Whole School Reform (WSR) models during their school reform. In two studies implementing CSR programs, neither was found to have significant impact on student achievement, however when math-based WSR models were implemented these programs were found to have a significant impact on student achievement. How were the CSR and WSR programs different? Further exploration needs to examine what elements in the math-based WSR model improved student scores when the CSR programs didn't.

Another area for further exploration is the effect of students' home lives on achievement. How much do students' social connections and family environments influence their attitude toward school? What relationships exist between these variables and others known to have an effect on achievement? I am particularly curious about this in light of the pattern of decline in immigrant achievement. Was that particular study an anomaly or does this type of pattern exist? If so, why?

Other questions I still have are regarding effective teaching strategies for student achievement and the effect of cognitive development level (CDL) on student learning. The results of two studies showed African American students of an age with their white peers operated at a lower cognitive development level (based on Piaget's stages of development) but did not offer any reasons or mechanisms for why this might be. If looked at on a broader spectrum would similar findings exist? Why? One study showed some success in transitioning students through CDLs using constructivist learning. Are there other teaching strategies that work equally well or better?

There are many other questions worth exploring including how to define cultural capital in order to analyze it's effects on student learning and how to create a global definition of wealth.

Conclusion

Chapter one discussed the purpose of NCLB, granting students fair and equal access to high-quality education, and asked how teachers could help students learn while reducing gaps in achievement. In spite of legislation and reform beliefs that all children can succeed, these gaps continue. It examined conflicts related to identification and measurement of achievement using standardized tests, in addition to the impact of funds and resources on achievement. Chapter two explained the history of the accountability movement in the United States. It outlined the legislation leading from Johnson's *War on Poverty* to No Child Left Behind, described the development of state standards and standardized testing, and discussed the unintended consequences of the NCLB requirement that classroom programs be scientifically based, which is that academically underprivileged students frequently do not experience curriculums that value the resources they bring to the classroom. Chapter three reviewed the research about student achievement. The research reviewed in chapter three was organized into seven sections: social and cultural capital, family, an overview of practices, enrichment, differentiation and reform, an examination of teaching strategies, trust, and SES and physical capital. Each of these studies were summarized and analyzed, based on the conclusions provided. The research is reviewed to examine how teachers in the classroom can improve student achievement. Chapter four is the concluding chapter of this paper. This chapter revisited the guiding question, what can teachers do to increase student learning and reduce

achievement gaps, based on the seven areas: social and cultural capital, family, an overview of practices, enrichment, differentiation and reform, an examination of teaching strategies, trust, and SES and physical capital from the initial review from chapter three to answer the study, implications for classroom practice, and suggestions for further research.

The analysis of research in social and cultural capital suggested that both types of capital play a large role in student achievement. In addition, the studies on family showed there are many similarities between measurements of family and those of social and cultural capital. Students who live outside mainstream society have reduced social and cultural capital, and frequently have fewer resources, which result in lower academic achievement. Beecher and Sweeny (2008) found that integration of gifted and talented strategies, broad instructional goals, specific learning objectives and detailed plans of action were all strategies that led to the elimination of achievement gaps. Burris, Wiley, Welner, and Murphy (2008) also found that implementation of high track curriculum improved student achievement. An examination of teaching strategies showed that more than one strategy is effective at improving student achievement. One thing the literature makes clear is that there is no single strategy for eliminating achievement gaps. There are any number of strategies and combinations of strategies that can be implemented with success. It is through careful observation of the needs in each school, the needs of the students, faculty, staff and administration that will yield insight into finding solutions.

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