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School climate and the Latino-White achievement gap

Rachael R. Leavitt

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UNIVERSITY OF NORTHERN COLORADO

Greeley, Colorado

The Graduate School

SCHOOL CLIMATE AND THE LATINO-WHITE ACHIEVEMENT GAP

A Dissertation Submitted in Partial Fulfillment
of the Requirements for the Degree of
Doctor of Philosophy

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ABSTRACT

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The goal of this study was to examine whether school-based factors could significantly predict the variance in amount of achievement gap among schools. Using state-wide data from the Colorado Department of Education, the study compared teacher perceptions of school climate to overall academic achievement, as well as the difference in the percentages of White students and Latino students passing the Colorado state standardized academic assessment. Significant relationships were found when comparing school climate to both overall achievement and the amount of achievement gap within schools. Results indicate school climate as a potential avenue for promoting ethnic equity in education.

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TABLE OF CONTENTS

CHAPTER I: INTRODUCTION	1
Statement of Problem	2
Purpose	6
Research Design	11
Research Questions	12
Delimitations	13
Terms and Definitions	14
Frequently-Used Acronyms	16
CHAPTER II: LITERATURE REVIEW	17
Inequities in American Education	17
School Climate	35
Summary	49
CHAPTER III: METHODOLOGY	51
Research Design	51
Participants	53
Measures	55
Data Analysis	64
Summary	65
CHAPTER IV: RESULTS	66
Assumptions	66

Data Analysis	69
CHAPTER V: DISCUSSION	76
Achievement Gap	76
School Climate and Achievement	77
School Climate and Achievement Gap	83
Achievement and Achievement Gap	91
Limitations	92
Avenues for Future Research	93
Conclusion	97
REFERENCES	99
APPENDIX A: TELL Colorado Survey Questions	123
APPENDIX B: Descriptive Statistics	129
APPENDIX C: Bivariate Correlations	131

List of Tables

Table 1: Skewness and Kurtosis of Latino and White Student Achievement	67
Table 2: Skewness and Kurtosis of Overall Achievement and Achievement Gap	69
Table 3: Partial Correlations between School Climate and Achievement	71
Table 4: Partial Correlations between School Climate and Achievement Gap	73

CHAPTER I

INTRODUCTION

Since nearly the beginning of America's history, education has been viewed as a strong force for democracy and equality, as well as the source of national strength and leadership for the future. Horace Mann, the father of American public education, believed that educational opportunity was essential for political freedom (Brick, 2005). More than sixty years after the monumental *Brown v. Board of Education* (1954) decision, many Americans would like to believe that our nation has achieved equality of educational opportunity. However, research has revealed problematic trends over the past few decades of increasing group differences in academic achievement, as well as disparities in other aspects of the educational system (e.g., Kozol, 1991; Lee, 2002; Magnuson & Waldfogel, 2008; Paige & Witty, 2010). Reducing these inequalities has come to national attention in recent years, though reform efforts have met with mixed results. The aim of the current study was to examine ethnicity-based differences in educational achievement from a school-level perspective, investigating whether school-level variables as perceived by teachers significantly relate to the size of educational disparities between Latino and White students in the schools. The intent is that school-level factors that predict equity in achievement can be promoted within individual schools, and in this way disparities in achievement can be reduced or even eliminated.

Statement of Problem

It has widely been acknowledged that inequities based on race and ethnicity are present within the American educational system. Trends of disproportionality (the situation in which diverse demographic groups have different likelihoods of experiencing different events, as described below) can be seen in the rates of special education referral and placement (e.g., Shifrer, Muller, & Callahan, 2010), school discipline (e.g., Tobin & Vincent, 2011), advanced academic programming (e.g., Ouyang & Conoley, 2007), and high school graduation (e.g., Verdugo, 2011).

The academic achievement gap is an example of educational disparity that is perhaps more hidden, yet also more wide-spread, than those described above. Paige and Witty (2010) defined the achievement gap in terms of differences on achievement test scores between members of different racial/ethnic groups. Significant differences in average scores for different racial/ethnic groups can be seen on various tests, such as the National Assessment of Educational Progress (National Center for Education Statistics, 2013), as well as the Scholastic Aptitude Test (Gándara & Contreras, 2009). Closing the achievement gap, then, would result in no significant differences among groups on these tests. Furthermore, achievement gaps can be based on factors such as socioeconomic status or native language, and the closure of the gaps would mean that these factors no longer significantly explain any variance in students' academic performance (Smith, 2011). Consequently, closing achievement gaps was one of the major goals of the 2001 *No Child Left Behind* legislation, which for the first time required schools to report achievement data disaggregated by race/ethnicity (Paige & Witty, 2010), as well as

substantially increasing the incentives and consequences associated with schools' standardized testing results (Bohrnstedt & O'Day, 2008).

Explanations for the Achievement Gap

Research into the achievement gap generally focuses on one of three overarching explanations: poverty or low socioeconomic status, sociocultural factors, and the educational environment. The effects of poverty can include issues related to low birth weight and exposure to pollution, both of which can have a negative impact on children's neurological development (Berliner, 2009). Sociocultural explanations can include parenting styles (Burchinal et al., 2011), as well as divergent responses to societal marginalization and oppression (Gibson & Ogbu, 1991).

Other potential explanations for the achievement gap focus more on the school system, rather than on the student, the student's home and family, or the student's group membership. Although the factors above may provide valid theoretical explanations, focusing on the school system may be preferable in order to discover variables that are easily changed, and in order to place the impetus for change on the school system rather than on the individual child. Bol and Berry (2005) point out that focusing on student factors, such as family background or lack of motivation, perpetuates deficit-based thinking (the assumption that students' low performance is due to some flaw or negative characteristic within the individual students) and minimizes educators' roles in both perpetuating and closing the gap. In contrast, explanations focusing on aspects of the educational climate show promise for both uncovering factors amenable to change and providing students with quality educations that build from their own cultural strengths rather than presuming that cultural divergence precludes achievement.

Latino Experiences in American Education

Much research has been conducted on the topic of racial/ethnic inequities in the American educational system. Of this, the largest amount has focused on African Americans, and fewer studies have examined the achievement gap as it pertains to Latinos (Lee, 2002). Although some parallels certainly exist between the educational inequities faced by African Americans and Latinos, other aspects are unique. For instance, whereas the bulk of the African American population came to the Southern and Eastern United States as slaves, the majority of the Latino population came to the United States through the annexation of their home lands or through immigration (MacDonald, 2004). Some Latino families have lived in the Southwestern United States for centuries, through several changes in geopolitical boundaries and ownership, as well as other immense societal changes (MacDonald, 2004).

Additionally, the past few decades have seen a substantial immigration wave of Latinos to the United States, primarily from Mexico (Gonzalez-Barrera & Lopez, 2013). Currently, about one-third of United States residents of Mexican origin are first-generation immigrants, about one-third are second-generation (born in the United States with at least one immigrant parent), and about one third have been in the United States longer than two generations (Gonzalez-Barrera & Lopez, 2013). Latinos have recently surpassed African Americans as the largest racial/ethnic minority group in the United States (MacDonald, 2004).

Latinos' group identity within the larger American culture has changed over time. As with African Americans, Latinos historically faced educational segregation; however, it did not occur as consistently, and segregation of Latinos was not always mandated by

law (MacDonald, 2004). During the Jim Crow era, children of Mexican and other Latino backgrounds were sometimes schooled along with White children, sometimes in segregated schools together with other students of color, and sometimes in their own separate schools (MacDonald, 2004). During several court cases in the early 20th century, it was argued that Mexican Americans are White (Aguirre, 2005; MacDonald, 2004). Conversely, by the 1970s, within the context of the civil rights and desegregation movements, Latinos in the United States established their identity as a distinct minority group (MacDonald, 2004; Valencia, Menchaca, & Donato, 2002). The terms *Hispanic* and *Latino* came to specifically denote an *ethnicity*, as opposed to a *race* in the 2000 United States census, which asked participants to indicate Hispanic background in a separate question from their race (MacDonald, 2004).

Recently, educational resegregation has become a concern, as Latino students in the Southwest (including Colorado) are increasingly likely to attend schools with mainly those of their own ethnicity (Valencia, Menchaca, & Donato, 2002). Furthermore, many Latinos in the United States are immigrants, and face the challenges of cultural adjustment and language acquisition. Teaching methods for English Language Learners (ELLs) has been a hotly debated topic for decades, leading to numerous litigation cases and educational reform efforts (Valencia, et al., 2002; Guerrero, 2002; Gándara & Contreras, 2009). Some research suggests that language acquisition may mediate relationships between ethnicity and educational outcomes, though the findings are mixed (Gándara & Contreras, 2009).

It should be noted that the term *Latino* is often used to describe persons from a number of different cultural, geographic, and racial groups. The diversity within and

among the various Latino groups can be masked when they are studied together under the one term. For example, according to Gándara and Contreras (2009), Cuban Americans have higher rates of college attendance than White Americans do, whereas Mexican Americans and Puerto Ricans (who comprise the majority of Latinos in the United States) attend college much less frequently. In Colorado specifically, as of 2013 78% were of Mexican origin, and 75% were native-born (“Demographic Profile of Hispanics in Colorado, 2011,” 2013). In contrast, other regions of the United States have other trends in national origin: the New York and Providence metro areas have higher populations of Puerto Rican and Dominican origin, and the Miami metro area has a large Cuban population (Brown & Lopez, 2013). Nevertheless, most research does not examine different Latino groups separately. For the purposes of the present study, because the Colorado Department of Education presents the standardized testing data for Latino students without disaggregating further, they were studied as a unitary group with the awareness that considerable diversity exists within the group. As explained below, the word *Latino* is considered preferable to the term *Hispanic*, due to the terms’ origins. However, when referencing previous authors’ works, the original term from the original work was generally used. These terms are used by different sources to refer to the same group; therefore, they were used interchangeably within this study.

Purpose

Based on the above research, the current study proposed to examine school-based factors and their relationship to the Latino-White achievement gap. Specifically, the study aimed to address teachers’ perceptions of variables influencing their own teaching efficacy, such as sufficient support and resources, autonomy and leadership opportunities,

and positive administrative leadership. Teachers' perceptions are important because teacher satisfaction may enhance retention and help schools attract higher-quality teachers (Greenlee & Brown, 2009). Teacher quality likely relates directly to the achievement gap as Corcoran and Evans (2008) reported that teacher quality significantly correlates to students' race—students of color are less likely to have teachers with higher qualifications. Notably, they also found that this relationship has strengthened over time, concurrent with the nationwide widening of the achievement gap (Corcoran & Evans, 2008). Consequently, it hypothesized that school reform efforts focused on the aspects of schooling that teachers rated as important—resources, leadership opportunities, perceptions of efficacy, and so on—may in turn relate to a reduction in the schools' achievement gap.

School Climate

School climate can be described as the school system's health or personality (Hoy & Hannum, 1997). It includes social, organizational, and tangible elements that contribute to whether or not the school is a setting conducive to learning (Cohen, McCabe, Michelli, & Pickeral, 2009; Thapa, Cohen, Guffey, & Higgins-D'Alessandro, 2013). Many different aspects of the environment can contribute to school climate. For example, physical aspects of schools—the building's age, classroom carpeting (reducing noise), as well as the availability of technology and other resources—significantly relate to students' achievement (O'Neill & Oates, 2001). Other factors that appear to influence achievement include the fairness and consistency of school discipline (Ripski & Gregory, 2009) as well as the schools' connections with parents and the community (Gordon & Louis, 2009). Leadership, of both administrators and teachers, also appears to relate to

achievement (e.g., Heck & Hallinger, 2009; Reardon, 2011). Another influence on achievement appears to be teacher support, including teachers' autonomy and clear expectations (Vansteenkiste et al, 2012), professional development (Hough & Schmitt, 2011; Johnson, Kahle, & Fargo, 2007), and instructional support (Murnane, Sharkey, & Boudett, 2005). Together, these findings suggest that many aspects of the school environment may play an important role in promoting student achievement.

In fact, Greenlee and Brown (2009) found that teachers in low-affluence schools were more likely to be motivated to stay in their schools if they were given autonomy, resources, and support—in other words, improvements in aspects of school climate. Conversely, teachers in high-affluence schools reported being more motivated by performance bonuses (Greenlee & Brown, 2009). Improved school climate for teachers may benefit the achievement of all students, and particularly of those in disadvantaged circumstances. Similarly, a qualitative study on the differences between schools with larger and smaller achievement gaps found schools with smaller gaps tended to have more emphasis on high academic achievement for all students, as well as higher levels of administrative support and feedback for teachers (Brown, Benkovitz, Muttillio, & Urban, 2011). Therefore, school climate variables appear to be promising as a potential area for research into the factors influencing the achievement gap.

The Current Study

The current study sought to extend previous research by comparing teacher perceptions of school climate variables (e.g., time, facilities and resources, community involvement, school conduct policies, teacher leadership, school leadership, professional development, and instructional support) to the Latino-White achievement gap on state

standardized testing scores. Notably, the current study utilized state-wide data on both achievement and school climate; encompassing a wide spectrum of school sizes, demographic variables, and levels of urbanicity, allowing the results to be more generalizeable to a variety of school systems.

Whereas most previous research on achievement gaps has simply compared different groups of students from different ethnic backgrounds (e.g., Burchinal, et al., 2011; Mandara, Varner, Greene, & Richman, 2009), this study examined the variance in the amount of achievement gap among schools. With the former approach, researchers have tended to look at differences between the groups of students for potential explanations of the achievement gap. An important exception is a study by Brown, et al., (2011), who found that schools with small achievement gaps had administrators with traits characteristic of higher academic optimism, whereas administrators of schools with larger gaps had lower academic optimism. The current study focused on how schools differ in amount of gap between White and Latino students, and the school-wide factors that are associated with the achievement gap. The benefits of focusing on school-level explanatory variables are that they are often easier to change and they do not blame or target specific students or groups. With information about the kinds of school environment variables associated with smaller achievement gaps, school personnel can then work with those variables in reform efforts to improve students' outcomes and experiences in school.

A further distinction of the current study is that it examined the gap between Latino and White students in Colorado. As described above, most research on the achievement gap focuses on African American students; however, due to their unique

historical and social experiences, it is also important to study how educational inequities affect Latinos (as well as other students of color). Colorado presents a unique setting for research on Latino populations. The southern region of Colorado was settled by Spanish colonists, and was within the territory of Mexico before becoming part of the United States. Because of this, Colorado has had a sizeable population of Latinos throughout its history, a good number of whom have been in the area for many generations. The state has also continually attracted high numbers of immigrants from Mexico, Central America, and other Latin American countries. As of 2011, Colorado ranked eighth in the nation for total Hispanic population and seventh for percentage (Brown & Lopez, 2013). The Denver-Boulder metropolitan area ranks 15th in the nation for total Hispanic population (Brown & Lopez, 2013). Therefore, while not the largest by number or proportion in comparison to other states, such as California or Texas, Latinos in Colorado do comprise a sizeable and growing minority group. Research conducted in Colorado could also be applicable to other regions of the nation with growing Latino populations.

The results of this study may yield an important piece to the puzzle of how to reduce the achievement gap. With a better understanding of how school climate, as measured by teachers' perceptions, relates to the level of achievement gap within a school, school leaders may be provided with an additional avenue for addressing this concerning problem. Significant results would suggest that taking steps toward improving aspects of school climate could potentially be accompanied by increased equality of achievement in the school. This prospect is encouraging, because school climate is a variable that can be changed—unlike others that are frequently implicated for the achievement gap, such as income disparities or historical discrimination.

School psychologists are also uniquely able to advocate a climate of equity, acceptance, and justice within their schools and practices. It is imperative that the field of school psychology produce and disseminate research on practices promoting social justice, and that those in the field access and implement those practices (Shriberg, Song, Miranda, & Radliff, 2013).

For school psychologists, taking steps to improve school climate would certainly be within our purview. For example, school psychologists frequently communicate with both teachers and administrators; in that task, school psychologists can promote collegial and collaborative relationships as well as advocate for everyone's voice to be heard in decision-making and policy-implementation. School psychologists can also work with their schools' leadership teams to address school climate issues and promote factors such as positive leadership, adequate time and resources, and a safe, collegial atmosphere within the school. Additionally, because school psychologists often serve as a liaison between the school and outside resources (e.g., medical and mental health centers, community support agencies, local businesses), they have the unique opportunity to forge connections between the school and the surrounding community.

Research Design

The current study used pre-existing, state-wide achievement data from the 2013 Transitional Colorado Assessment Program (TCAP) and school climate data from the 2013 Teaching, Empowering, Leading and Learning (TELL) Colorado Survey. Because the current study examined the sizes of the achievement gap within schools, the unit of analysis was individual schools rather than individual persons. Consequently, it was necessary to use achievement and climate data from a large number of schools, which

would be less feasible to accomplish if it were necessary to collect the data from each school. Fortunately, because the TELL and the TCAP had already been conducted, the data only needed to be accessed and analyzed in order to conduct the analyses. An additional benefit of the TELL data is that it only reported scores from schools with at least 50% participation of faculty. This number is higher than what is typically expected in survey research. The results reported can be assumed to reflect the perceptions of the schools' faculty members with a greater degree of accuracy than is common to survey research.

Academic achievement was evaluated using scores from the 2013 TCAP, obtained from the Colorado Department of Education. Because of the proportion of Latino students who do not speak English as their first language, the Math section of the TCAP was used as a proxy for academic achievement. Achievement gap scores were calculated using the percentages of Latino and White students scoring proficient or advanced on the TCAP. Although it is not a perfect proxy, standardized testing data is often used in research to represent academic achievement (e.g., Lee, 2002; National Center for Education Statistics, 2013; Pearson & Zurkowski, 2013). Data on schools' percentages of Latino students, English language learner (ELL) students and free/reduced lunch students were obtained from the Colorado Department of Education.

Research Questions

- Q1** Is there a significant achievement gap, as measured by the TCAP Math section, between White and Latino students in Colorado?
- Q2** Accounting for percentages of Latino students, ELL status, and low socioeconomic status, to what extent do the eight school climate factors, as measured by teacher reports on the TELL Colorado Survey, explain the variance in achievement on the TCAP Math section?

- Q3** Accounting for percentages of Latino students, ELL status, and low socioeconomic status, to what extent do the eight school climate factors, as measured by teacher reports on the TELL Colorado Survey, explain the variance in schools' amount of achievement gap between Latino and White students on the TCAP Math section?

Delimitations

This study used the score classification from the math section of the 2013 TCAP as a proxy for achievement. Although certainly imperfect, similar standardized testing data is commonly used in research to indicate achievement (e.g., Lee, 2002; National Center for Education Statistics, 2013; Pearson & Zurkowski, 2013). The study was conducted using data taken from public schools in Colorado during spring of 2013. Schools' data were included in the analysis if they had at least an average of 30 Latino students and 30 White students per grade level, and if they had at least 5 and at least 50% faculty members who completed the TELL survey. Thus, schools may not have been included if they are very small or very ethnically homogenous, which may potentially influence the study's results. Additionally, private schools and online programs were not included (charter schools and magnet schools under the auspices of a school district were included, provided they met the above criteria).

Schools of all levels (i.e., elementary, middle, high, and variants thereof) were be included; however, because TCAP testing begins in 3rd grade, achievement gap scores were be calculated for students below 3rd grade. Nevertheless, because TELL data did not disaggregate scores based on teachers' grade level, results from those who teach K-2 were included in schools' climate scores. However, because it is expected that all teachers within a school experience and contribute to the school's climate, it is not likely that this distinction (having students who have/have not taken the TCAP) would make a difference in teacher ratings on the TELL. Because only teachers' responses are included

on the TELL, students' perceptions of school climate were addressed in this study.

Students' perceptions of climate would be a key variable to examine in future research on this topic.

Another delimitation is the use of *Latino* as a unitary group, although students who are identified as Latino may come from any race and from a variety of cultural backgrounds. Although it may be interesting to compare, for instance, Latinos of different backgrounds, or other demographic characteristics, this was not part of the current study.

Terms and Definitions

Achievement gap is a term that is used widely and in many different ways, but generally describes the observed differences in academic assessment data among students from different ethnic and racial backgrounds (Paige & Witty, 2010). For the purposes of this study, achievement gap was defined more precisely as the difference between the proportion of White students scoring proficient or advanced on the 2013 TCAP Mathematics test, and the proportion of Latino students scoring in the same categories in any one school included in this study.

Disproportionality refers to the situation in which members of a certain group are more or less likely to be categorized in a certain way or undergo a certain experience (Artiles, Kozleski, Trent, Osher, & Ortiz, 2010). For purposes of this study, the term disproportionality was used to denote situations in which students who are racial/ethnic minorities are more likely to experience a given event within their schooling (e.g., special education placement or exclusionary discipline) than are White students within their same schools.

English Language Learner (ELL) students are those who are learning English as a second or subsequent language, and who have not yet achieved proficiency equivalent to their native-English-speaking peers. Although ELL is used to refer specifically to students who are enrolled in English acquisition programs, the broader term Culturally and Linguistically Diverse (CLD) is sometimes preferred to connote that diverse students have unique needs, experiences, and strengths that should be considered, beyond merely their language skills (Perez & Holmes, 2010). Recently, the Colorado Department of Education has begun to use the term English Language Development (ELD). However, at the time of the 2013 TCAP data collection, ELL was used to categorize students enrolled in an English acquisition program (“Fall 2013 Pupil Membership by Instructional Program,” 2013); therefore, it is the term that was generally used in this study. Other terms are sometimes used for ELL students and their educational programs and assessments, including Non-English Proficient (NEP), Limited English Proficient (LEP), English Language Proficiency (ELP), English Language Acquisition (ELA), and English as a Second Language (ESL). In 2009-2010, 86% of the students in Colorado identified as LEP spoke Spanish as their native language (“Consolidated State Performance Report,” 2011).

Free/reduced lunch is a term indicating students who qualify for free or reduced-price school lunches under the National School Lunch Program. Qualifying students come from families whose income is at or below 185% of the poverty level. For the 2013-2014 school year, the qualifying income level was \$43,568 for a family of four (“National School Lunch Program,” 2013). Free/reduced lunch is often used in research

as a proxy for students' socioeconomic status (e.g., Uline & Tschannen-Moran, 2006), and it was used as such for this study.

The word *Latino* will be used to refer to persons of any racial background who are identified with the sociocultural heritage of Mexico, Central America, South America, and the Caribbean islands. Based on the American Psychological Association's (2012) definition, Latino is used rather than Hispanic, because the latter was coined for the purposes of United States census and record-keeping, and has not historically been the term that members of that ethnic group would use to describe themselves. However, there were times within this study when the works of previous authors are quoted or cited, and the terminology from the original work was retained.

Although it is noted that persons of Latino ethnicity can also be of White racial background, the term White in this study referred to persons who are non-Latino to avoid the awkward use of White, non-Latino throughout the document.

Frequently-Used Acronyms

ELL: English language learner (or English language learners)

SES: Socioeconomic status

TCAP: Transitional Colorado Assessment Program

TELL: Teaching, empowering, leading, and learning

CHAPTER II

LITERATURE REVIEW

Given the importance of education to our society in the United States, it is vital that research continually examine potential shortcomings within the educational system, as well as promising areas of potential improvement and reform. One such shortcoming is the existence of a gap in academic achievement between White and Latino students; a promising area of potential improvement is school climate. The purpose of this chapter is to summarize the extant research and background on both of these issues, as well as to present a rationale for the utility of studying them together in order to promote greater equity and further excellence in the nation's educational system.

Inequities in American Education

Almost from its inception, the United States has emphasized the value of education. In the eyes of many Americans, events such as the *Brown v. Board of Education* (1954) decision have appeared to herald the end of racial/ethnic injustice in our nation. However, inequity can still be seen in many aspects of society—including education. Current injustices are perhaps more subtle—*de jure* segregation along racial or ethnic lines is no longer in place—however, as the research presented below will show, inequities are still present.

Latino Experiences in American Education

Although their experiences have not been studied or publicized as extensively as those of African Americans, Latinos within the American educational system have faced unique issues of discrimination and inequality. During the 19th century, students of Mexican and other Latino backgrounds were generally integrated into the local school systems; within various times and locations, the White American-controlled school systems were more or less tolerant of education in Spanish and the retention of Latino culture (MacDonald, 2004). In the early 20th century, Mexican American students were more likely to be sent to separate schools, with the rationale that they could not learn in English-speaking schools (MacDonald, 2004). The first desegregation victory in the United States was *Alvarez v. Lemon Grove* (1931), in which Mexican parents in California won the case that schools could not place students in segregated schools based on surname or physical appearance (MacDonald, 2004). In *Méndez v. Westminster School District of Orange County* (1947), a decision that paved the way for the monumental *Brown v. Board of Education* (1954) decision seven years later, sociological evidence was used for the first time to argue against segregated schools, resulting in the ruling that segregated schools negatively affected the education of Spanish-speaking children (Aguirre, 2005; MacDonald, 2004). Similarly, the 1948 case *Delgado vs. Bastrop Independent School District* mandated that Latino students in Texas be allowed to attend school with White students, though it still allowed for separate classrooms during first grade (MacDonald, 2004).

However, the primary difference between these cases and *Brown* was that there was no argument against all racial segregation in schools, but rather that Latino children

are White, and should therefore be allowed to use White-only facilities (MacDonald, 2004). It was not until *Keyes v. District One*, 1973 and 1975 (by which time the desegregation movement was in full force) that Latinos were officially recognized as a distinct minority group within educational policy (MacDonald, 2004).

More recently, however, educational resegregation has become a concern. Many states, including Colorado, saw trends of school desegregation during the 1960s and 1970s as busing programs sought to integrate students from different parts of urban areas (Valencia, Menchaca, & Donato, 2002). However, when those programs ended during the 1980s and 1990s, most of those areas and schools became more sharply divided along ethnic lines. Several years after Denver's busing program ended nearly two decades ago, almost one-third of the district's schools were over 75% Latino, and several were over 90% (Valencia, et al., 2002). Similar situations occurred in other areas, particularly in the Southwestern states. Additionally, academic resegregation was observed when students were disproportionately placed into higher or low academic tracks—perhaps not overtly due to their race/ethnicity, but with the result that students were segregated within (rather than between) schools and students of color were provided with a less rigorous education (Valencia, et al., 2002)—a trend also reminiscent of disproportionality in both special education and advanced programming that is seen today.

Disproportionality

In order to examine the issue of equity and justice in the educational system, researchers in the past several decades have studied whether certain educational experiences and outcomes occur at different rates for students of diverse races/ethnicities, socioeconomic status (SES), and other types of group membership (e.g., Artiles,

Kozleski, Trent, Osher, & Ortiz, 2010; Shifrer, Muller, & Callahan, 2010). By disaggregating data by race/ethnicity, qualification for free/reduced lunch (a commonly-used proxy for SES), and so on, it is possible to assess whether students of different backgrounds are more or less likely have certain educational experiences and outcomes (e.g., special education placement, high school graduation). The term *disproportionality* describes when the demographic proportions of individuals in a specific situation do not reflect the demographics of the wider population (Artiles, et al., 2010). For example, in a school, a particular program would be disproportionate if it included a significantly higher or lower percentage of a certain ethnic group than is present in the school as a whole (or, in some cases, the community as a whole). Disproportionality has been studied in areas including special education (Shifrer, et al., 2010; Skiba, et al., 2006), school discipline (Nicholson-Crotty, Birchmeier, & Valentine, 2009; Skiba, et al., 2011), advanced academic programming (Corra, Carter, & Carter, 2011; Sarouphim, & Maker, 2010), and high school graduation/dropout rates (Griffin, B. W., 2002; Suh, Suh, & Houston, 2007).

It should be noted that some authors have criticized disproportionality research that focuses on group membership as the source of differing outcomes, rather than considering broader or more complex factors. Artiles and Bal (2008) point out that much of the research and practice regarding disproportionality in special education is flawed in its focus on the individual student or the student's group as the source of difficulties in school, rather than examining potential injustice at the systemic level. Furthermore, such research stigmatizes difference from the majority culture, focusing on narrow labels rather than on multifaceted situations and experiences. These authors called for future

research that is more conscious of regional and temporal variation in outcomes, of the complex nature of cultural identity, and of social power of relationships (Artiles & Bal, 2008). Evidence of disproportionality, therefore, should be interpreted with consideration of these broader influential forces.

Special education placement. One area where significant disproportionality can be seen is in special education placements. This issue is particularly important because long term outcomes for students who are placed into certain types of programming can include underachievement, low expectations, and ultimately a certificate of accomplishment rather than a high school diploma. In 1968, Lloyd Dunn was one of the first to observe and comment on the educational disproportionality in special education referrals and qualifications (Artiles & Trent, 1994). Since then, there have been many comprehensive analyses of referral and placement data disaggregated by race, ethnicity, and disability category (e.g., Rueda, Artiles, Salazar, & Higaeda, 2002; Shifrer, et al., 2010). Whereas earlier studies seemed to indicate a higher proportion of African American students placed in certain types of disability categories (e.g., intellectual disability, significant emotional disorder), more recent, nationally-representative data from 2002 (Shifrer, et al., 2010) conveyed that ethnicity-based disproportionality in special education identification may be better accounted for by SES. Notably, the effect of gender and linguistic diversity remained even when accounting for SES.

The relationship between linguistic diversity and special education placement is particularly concerning because, by definition, a diagnosis of learning disability should not be given if the difficulty is due to limited English proficiency (*IDEA* Regulations, 2006). Qualification for special education is problematic both because it requires

establishing that difficulties are due to a genuine disability, rather than due to the language acquisition process, and because commonly-used assessment tools are often invalid or inappropriate for students who are learning English (e.g., Abedi, J., 2006; Ortiz, et al., 2011). When linguistically diverse students are qualified and placed in special education, they may have teachers who not be acquainted with the language acquisition process, and bilingual special education is not always available (Ruffin, 2009). There are also educational pitfalls associated with spending too much time away from the general education classroom. Students who are removed for both English learner programming and special education programming miss out on both academic content and exposure to advanced academic English, which may actually be detrimental for both their English acquisition and their general academic growth (York-Barr, Ghere, & Sommerness, 2007).

In order to better understand how teachers made sense of disproportionality, Skiba et al., (2006), interviewed 28 teachers, 7 special education directors, 22 principals or assistant principals, and 9 school psychologists, all from elementary schools. They found that one of the biggest concerns was classroom behavior, which may involve conflicting (and perhaps culturally-defined) definitions of what behaviors are acceptable or unacceptable. Another theme they observed was that teachers sometimes perceived their own general education resources as insufficient, and special education as their only option for handling student concerns. Interestingly, although the educators were quite willing to talk about the effects of poverty, and their own higher likelihood to refer poor children to special education (albeit with likely benevolent intentions), they were reluctant to talk about their students' race/ethnicity (Skiba et al., 2006). It is possible that

these teachers inadvertently contributed to disproportionality by using special education as a resource for handling situations they find frustrating. However, if students are placed in special education inaccurately—if they are referred because the teacher is frustrated, not because the students have genuine disabilities—they may not receive appropriate educational programming for their needs and capabilities. Indeed, whatever the reason for incorrect placement, the result of disproportionality in special education may be that students of certain backgrounds are less likely to receive educational services appropriate to their needs.

Discipline. Recent disproportionality research has also identified disparities in school discipline, both in rates and types of disciplinary actions. Tobin and Vincent (2011) analyzed disciplinary records from 46 schools (elementary, middle, high, and alternative schools) in four states. They found that African American students were much more likely to be suspended or expelled than White students. These findings are built on the early work of Nicholson-Crotty, et al., (2009), who analyzed data county-wide data on out-of-school suspensions and juvenile justice system cases from 53 counties in Missouri. They not only found that African American students were not only more likely to be suspended than White students were for the same offense, but also that school districts with high disproportionality in school discipline were more likely to be located in counties with high disproportionality rates in juvenile justice (Nicholson-Crotty, et al., 2009). School discipline trends for Latino students also reveal disproportionality, albeit in somewhat different patterns. By analyzing a national database used by 4,000 schools, Skiba et al., (2011) found that Latino students were

underrepresented in elementary school disciplinary actions, but overrepresented in secondary school discipline.

Unfortunately, students who are expelled or suspended from school are more likely to be disengaged from school, to drop out of school, and to become involved in the juvenile justice system. This association reflects what Fenning and Rose (2007) call the “school-to-prison pipeline:” students who were suspended in school are also more likely to end up in the criminal justice system (see also Darensbourg, Perez, & Blake, 2010). Although there are certainly a myriad of factors involved in leading individuals to criminal behaviors and/or the judicial system, it does appear that disproportionate school disciplinary actions may place certain students at risk for undesirable outcomes later in life.

Advanced academic programming. An additional area of concern is the underrepresentation of Latino and African American students in advanced programming—Advanced Placement courses and gifted/talented education programs. Advanced programming can help prepare students for postsecondary schooling through providing challenging academic content, as well as promoting skills in studying and self-monitoring. Disproportionality in these programs may help contribute to other areas of disparity—notably, college enrollment and degree completion. Research regarding gifted education reveals that Asian American students tend to be over-represented, whereas African American and Latino students tend to be underrepresented in these programs (Ouyang & Conoley, 2007). Qualification procedures, and even the very definition of “giftedness,” vary among states and districts. However, the process generally consists of two steps: 1) the classroom teacher recommends a student who may benefit from gifted

programming, and 2) the student is assessed or other evidence is gathered to determine whether the student qualifies. Disproportionality has been demonstrated in both of these steps (e.g., Brice & Brice, 2004; Harris, Plucker, Rapp, & Martinez, 2009; Ouyang & Conoley, 2007) suggesting that disproportionality might also be perpetuated in the methods used to decide if students qualify for services.

Even when self-choice in advanced coursework enrollment is emphasized, rather than a selection process, disproportionality can still be seen. In one study, data from 5,470 high school students in North Carolina revealed that both gender and race were significantly related to Advanced Placement course enrollment, and that the effect of race was stronger (Corra, et al., 2011). In fact, some have argued that disproportionality in course level enrollment constitutes a type of resegregation—though attending the same schools, students of different races/ethnicities are kept separate from each other through class placement (Valencia, et al., 2002), which in some cases amounts to tracking via race and social class (Mickelson & Everett, 2008). Under-servicing of advanced and gifted students is problematic because those students may feel bored or unchallenged at school, leading to negative outcomes such as behavioral issues, underachievement, or dropout (Winner, 1997). When schools ensure equitable practices in qualifying and providing advanced programming services, they may help prevent some of these negative outcomes and encourage greater likelihood of students attending post-secondary education and earning college degrees.

High school graduation. Disproportionality also affects the ultimate outcome of K-12 schooling, high school graduation. Ortiz, Valerio, and Lopez (2012) analyzed data on high school dropout from the years 1975-2010, obtained from National Assessment of

Educational Progress (NAEP), a long-term study of trends in academic achievement, and the U.S. Census Bureau. They found that Hispanic students nearly always had the lowest high school graduation rate, when compared to White and Black students. Similarly, Verdugo (2011) presented event disaggregated dropout data (showing how many students dropped out during that year) from 1967 to 2002, revealing that Hispanics usually had the highest dropout rate, and both Hispanic and Black students consistently had a higher dropout rate than Whites. Given the increasing importance of educational attainment for career advancement in our society, disparities in high school graduation may certainly help explain other examples of inequity in our society, such as income and poverty levels, and even disparities in health care and illness (Paige & Witty, 2010).

Disparities in high school graduation rates may also potentially skew research on other types of educational disparities. Verdugo (2011) pointed out that the phenomenon of high school dropout affects achievement gap research. Some data (for example, from the NAEP) suggests that achievement gaps narrow during high school, and are smaller for 17-year-old students than for 13-year-old students. However, Verdugo argued that interpretation of this data must account for high school dropout; indeed, the research samples of 17-year-olds are not equivalent to the samples of 13-year-olds, because a significant portion of those who might have scored very low on the NAEP may have dropped out before age 17. Furthermore, if high school dropout rates change over time, different students may be included in achievement gap studies—for example, one sample of 17-year-olds may be different from the 17-year-olds of a decade later, due to high school student retention efforts. As a result, research suggesting the gap has widened or

narrowed from one decade to the next may also be influenced by which students are still in school to be tested at the time (Verdugo, 2011).

The Academic Achievement Gap

These examples of disproportionality are certainly weighty concerns in their own right. However, they may also reflect a common thread: overall differences in educational outcomes for students based on their demographics. Academic achievement, particularly as evidenced by gaps in achievement testing scores, appears to be one of the underlying indicators of this inequity. Achievement gaps based on race/ethnicity are clearly seen in the data from the NAEP (National Center for Education Statistics, 2013). The NAEP collects data on students in 4th and 8th grade, using demographically representative samples from across the nation. It is not technically a longitudinal study, because there is no attempt to test the same students year after year. However, since each sample is selected to represent the entire nation there is a degree of confidence that the observed trends reflect national achievement tendencies.

Data collected by the National Assessment of Educational Progress (NAEP) from 1978 to 2012 revealed narrowing, but still present, achievement gaps both between Hispanic and White students and between African American and White students. In general, the Hispanic-White gap was narrower than the Black-White gap, although it was still substantial. The data also showed a general increase over time in scores across all groups, as well as a general tendency of higher scores in math than in reading. Additionally, reading scores generally revealed a larger disparity between White and Hispanic students than math did. There was also a substantial difference in scores

between English language learner students and non-ELL students on both reading and math, for all age levels (National Center for Education Statistics, 2013).

For Colorado, results from the Colorado Student Assessment Program (CSAP, used before 2012), and the Transitional Colorado Assessment Program (TCAP, beginning 2012) also revealed achievement gaps based on race/ethnicity. From 2008 to 2014, White, Black, and Hispanic students had higher rates of proficient or advanced scores in all tested subjects (reading, writing, math, and science). However, White students were substantially more likely to score in the proficient or advanced categories than Black and Hispanic students were. Between 2008 and 2013, the percentages of Hispanic students in those categories increased more than White percentages did, resulting in narrowed gaps in all subjects. Black students also increased in percentages of proficient and advanced in all subjects, but the increases were not as large, and therefore only resulted in narrowed gaps for writing and science. Even these gaps only narrowed a small amount (Pearson & Zurkowski, 2013).

The achievement gap can also be seen on other academic tests. The gap between Latino students and White students has increased over time on the Scholastic Aptitude Test (SAT), from 59 points in 1986 to 79 points in 2006 (Gándara & Contreras, 2009). Like the NAEP, the SAT showed a trend of narrowing achievement gaps for both Black and Hispanic students during the 1970s and early 1980s, whereas the gaps widened again during the late 1980s and 1990s (Lee, 2002). The SAT is perhaps not a proxy for nationwide-achievement because represents a select group of students who wish to pursue higher education. It is possible that the widening gap reflects a larger pool of test-takers—it may be that more low-scoring students take the test today than would have

several decades ago. It may also reflect the discrepancies in advanced educational programming—if White students take more advanced coursework, they may be better equipped to earn a higher score on the SAT. The presence of a score gap on the SAT is particularly problematic because the SAT is often used in college admissions; therefore, a score gap may result in—or at least reflect—disproportionality in higher education enrollment (Gándara & Contreras, 2009).

State-level accountability. The 2001 reauthorization of the Elementary and Secondary Education Act, also known as No Child Left Behind, decidedly changed the nature and function of standardized testing (Bohrnstedt & O’Day, 2008). Most notably, this legislation made a significant portion of federal funding to local education agencies contingent upon their meeting adequate yearly progress, mandating standardized testing of all students and adding considerable importance to the results of those tests (Bohrnstedt & O’Day, 2008).

High-stakes testing has been the source of considerable controversy. Advocates claim that it promotes accountability, provides framework for instruction, and raises expectations for learning. However, opponents assert that it focuses on simplistic forms of knowledge and may contain bias against certain groups of students (Staudt, 2011). Nevertheless, standardized testing remains prevalent throughout the United States and is therefore one of the best sources for obtaining data on students’ academic achievement in the nation.

With the implementation of No Child Left Behind, state tests were now required to be criterion-referenced; students’ scores were to be based on meeting specific skill proficiencies, rather than simply comparing performance across the population (Causey-

Bush, 2005). In addition, this was the first federal legislation to mandate that schools monitor and reduce the achievement gap (Paige & Witty, 2010). Perhaps most dramatically, it required that all students in the United States meet the standard for *proficient* by the 2013-2014 school year (Bohrnstedt & O'Day, 2008). In 2011, Colorado was one of the first states to be granted a waiver to No Child Left Behind. The waiver did not entirely excuse the Colorado from the law's requirements, but it allowed school accountability to be monitored using state standards rather than the national adequate yearly progress criteria and allowed for a less stringent goal than 100% proficiency by 2013-2014 ("Colorado NCLB Waiver", 2011).

Evaluating the Latino-White Achievement Gap

As described above, previous research has revealed the existence of an achievement gap between Latino and White students across schools in the United States. When interpreting the results of this research, several important caveats should be kept in mind. First, language acquisition can influence academic achievement, and particularly scores on achievement tests. Colorado's state accountability testing program reports disaggregated results for students qualifying as English language learners (ELL), though it does not disaggregate further by level of English proficiency. Colorado also allows Spanish-speaking students to take the reading and writing portions of the exam in Spanish during 3rd and 4th grade, though older students can may qualify for other linguistic accommodations (e.g., translated oral directions and responses in native language on certain items) ("Colorado Accommodations Guide for English Learners," 2013). Therefore, even though Colorado testing data does provide some information on

students' language background, it does not fully explain the potential effect of the English acquisition process on scores.

The effects of acculturation and immigration may also influence Latino students' academic achievement. In Colorado, 25% of Latinos are immigrants, mainly from Mexico ("Demographic Profile of Hispanics in Colorado, 2011," 2013). Here again, Colorado data provides some information, but not enough. Although the Department of Education disaggregates results based on immigrant/migrant status, other useful variables, such as time spent in the United States, are not reported ("CSAP/TCAP—Data and Results," 2013). Also notable is the fact that results regarding immigration, as well as language proficiency results, do not specifically indicate whether the immigrant/migrant or ELL students are Latino or if they are of a different national origin and/or language ("CSAP/TCAP—Data and Results," 2013). The recent growth of non-Latino immigrant and refugee populations, who are also included in these data sets, further complicates the obtained results. Inferences drawn from data disaggregated by immigrant, migrant, and ELL status do not necessarily convey the educational experiences of Latino students in Colorado.

Explanations for the Achievement Gap

Over the past several decades, much research, as well as programming and policy-making, has aimed to both explain and reduce the achievement gap (e.g., Balfanz & Byrnes, 2009; Beecher & Sweeny, 2008; Flores, 2007; Palumbo & Kramer-Vida, 2012). Numerous explanations have been proffered, and corresponding solutions attempted, some showing more promise than others, but none fully explaining or solving the problem. Currently, many of the proposed explanations for the achievement gap fall into

one of three categories: poverty or low SES, sociocultural factors, and the educational environment itself.

One of the most commonly-studied explanations for the gap is low SES, including the direct effects of low income, as well as more latent consequences of living in poverty. The most famous example—indeed, the first study of its kind—was the 1966 *Coleman Report*. Among other findings, the *Coleman Report* found that students' SES predicted their academic achievement much more strongly than within-school factors—for example, quality of teaching and facilities. More recent research on the effects of low-SES include factors such as low birth weight and environmental toxins (Berliner, 2009), greater losses of academic skills during the summer (Alexander, Entwisle, & Olson, 2001), and enrollment in high-quality preschool programs (Magnuson & Waldfogel, 2005). Neighborhood issues, particularly those associated with impoverished communities, have also been implicated for academic disparities. For example, social disorganization—higher rates of crime, mobility, family instability, low-quality housing, etc. has been associated with lower academic achievement—if students are too anxious about their personal safety or where they will get their next meals, they will be hard-pressed to pay attention and learn in school (Madyun, 2011; Whipple, Evans, Barry, & Maxwell, 2010).

Although economic-based explanations may certainly explain some of the variance in the achievement gap, they are generally less helpful because they are more difficult to change. Certainly, schools and communities could offer low-SES students services such as pre-Kindergarten education, as well as more educational activities in the summer. However, such initiatives would not solve the underlying problem, that

impoverished families generally do not have the time or resources to support their children's education in the same ways as wealthier families do. Furthermore, it would be much more difficult to eliminate pollutants and *in utero* teratogens, and nearly impossible to eliminate poverty or its effects entirely.

Other researchers have implicated various cultural factors for the achievement gap. At their simplest, explanations focusing on cultural differences examine how differing behaviors and behavioral expectations can account for differing outcomes (e.g., Burchinal et al., 2011; Mandara, Varner, Greene, & Richman, 2009). Cultural explanations can also include behaviors stemming from interactions between majority and minority cultures (which may involve oppression, marginalization, and/or alienation). For example, Gibson and Ogbu (1991) theorized that members of involuntary immigrant groups (those who entered the United States by force—through either slavery or territorial acquisition—as opposed to those who come voluntarily) react against the dominant culture by refusing to conform to its standards and values. For African American, as well as some Latino groups, this would equate to not striving for academic achievement and other behaviors that might be perceived as acquiescing to the oppressors (Gibson & Ogbu, 1991).

These explanations for the achievement gap yield valid information; however, they are also problematic in that they focus on factors that would be very difficult, if not impossible, to change, and they place the onus for change on the individual student or family. Bol and Berry (2005) described this way of thinking as a *deficit model*; in other words, these explanations presume that differences in achievement are due to some type of fault or inferiority within the children who perform more poorly, or within a group of

which they are members. Granted, research based on a deficit model yields statistically significant correlations and predictive models linking various factors with the observed unequal outcomes. Nevertheless, such findings are not sufficient to solve the puzzle of disparities. Furthermore, this type of research may (intentionally or not) imply a vindication of larger, societal factors. Those involved in policymaking at the system level may be tempted to forgo examining their own practices and searching for a solution. Because the deficit model puts all the impetus for change onto the student, potentially effective strategies that would involve changes at the school level may not be considered (Bol & Berry, 2005).

One example of this type of deficit thinking is the focus on inalterable factors, many that are inherent to the individual or family—for example, low SES, lower levels of parent education, or living in an unsafe neighborhood. Those who point to these explanations for lower achievement outcomes seem to suggest not only that these poorer outcomes are to be expected, but that nothing can be done. The deficit model can also appear within schools' expectations for student behavior. Bol and Berry (2005) suggest that schools are structured to support White middle-class behavioral values, so students who were brought up under different expectations of what behaviors are allowable would have a harder time conforming to the school's expectations. If teachers and administrators interpret cultural differences in behavior as flaws in character, they may be falling into what Paige and Witty (2010) call *new racism*: demanding that everyone else, irrespective of background and personal cultural values, conform to majority culture's norms, and faulting any individuals who do not measure up.

The insidious consequence of the deficit model is that changes which might have been beneficial, such as efforts to improve school racial equity climate, may be left untried, while students who might face disadvantage from institutionalized racism are presumed to merely be less capable or less industrious if they do not succeed in school. Students are left to navigate a playing field that is presumed even, but is in fact not. Ideally, it may be most beneficial to focus research and intervention efforts on potential factors that avoid blaming or stigmatizing the students themselves, and are amenable to change through school reform, policy, programming, and other such endeavors.

A third approach to understanding the achievement gap is to consider aspects of the school environment itself, including policies and practices, which might contribute to inequitable achievement outcomes for students of different ethnic backgrounds. Factors such as curriculum and instructional mismatch, subtractive models of language instruction, disciplinary policy, and cultural climates may all contribute in subtle ways to inequitable academic outcomes.

School Climate

School climate is one aspect of the education process that would certainly be possible to change, and that may hold promise for improving educational quality and reducing the achievement gap. School climate has been widely-studied, although no consensus on its precise definition has developed (Bosworth, Orpina, & Hein, 2009). Many researchers have proposed different models of its components and effects, emphasizing different aspects of the school community. Cohen, McCabe, Michelli, and Pickeral (2009) define school climate as “spheres of school life (e.g., safety, relationships, teaching and learning, the environment) and larger organizational patterns

(e.g., from fragmented to cohesive or ‘shared’ vision, healthy or unhealthy, conscious or unrecognized)” (p. 182). School climate can also be conceptualized as the school’s health: healthy schools are those with happy, successful people and relationships, whereas unhealthy schools contain mainly destructive interactions and relational patterns (Hoy & Hannum, 1997). School climate can also be defined in terms of personality (i.e., traits that differentiate the school from others, just as individual persons have different personalities from others), such as the levels of openness and warmth within the system (Hoy & Hannum, 1997). The National School Climate Council defined it as follows:

School climate is based on patterns of people’s experiences of school life and reflects norms, goals, values, interpersonal relationships, teaching and learning practices, and organizational structures. A sustainable, positive school climate fosters youth development and learning necessary for a productive, contributive, and satisfying life in a democratic society. This climate includes:

- Norms, values, and expectations that support people feeling socially, emotionally and physically safe.
- People are engaged and respected.
- Students, families and educators work together develop, live, and contribute to a shared school vision.
- Educators model and nurture an attitude that emphasizes the benefits of, and satisfaction from, learning.
- Each person contributes to the operations of the school as well as the care of the physical environment. (National School Climate Center, 2014)

Taken together, these various definitions convey that factors such as positive relationships, facilities and resources, educational policies and practices, connections to students’ families and communities, and teacher variables are the key elements of school climate.

Considerable research has been conducted to examine the relationship between school climate and student outcomes (e.g., Cohen, McCabe, Michelli, & Pickeral, 2009; Thapa, Cohen, Guffey, & Higgins-D’Alessandro, 2013). School climate has been shown

to relate to student achievement (Hoy & Hannum, 1997) as well as teacher commitment (Collie, Shapka, and Perry, 2012). Both relational (e.g., positive relationships with colleagues, support from administrators) and non-relational (e.g., planning time, clean and well-equipped facilities) aspects of climate have been found to relate to teacher satisfaction and commitment (and, to a lesser degree, to student achievement); however, the relational aspects were shown to have a stronger effect (Johnson, Kraft, & Papay, 2012). Preble and Gordon (2011) highlight that many members of school communities think of school climate only in student-centered terms. In other words, school climate is gauged by indicators such as whether students follow rules, whether there is bullying, and so on. School climate should also involve factors such as teachers' respect of students, positive discipline procedures (e.g., whether the disciplinary system uses reinforcements in addition to punishments), and collaborative—rather than top-down—decision-making (Preble & Gordon, 2011).

Positive Relationships

Positive relationships, both among staff members and between staff members and students, are a key factor of a healthy school climate. Among other variables (e.g., academic support, order and discipline, and academic satisfaction), both school connectedness and positive student-teacher relationships were found to be significantly related to students' overall satisfaction with their schools (Zullig, Huebner, and Patton, 2011). In a focus group study involving 11 secondary schools in Arizona, students and faculty members were asked about what factors they believed were involved in making schools safe. Along with physical characteristics and school policies, positive relationships—including communication and comfort level between students and faculty

members, faculty awareness and involvement in what was occurring on campus, as well as perceptions of being part of a team and part of a community--were identified as important sources of safety within schools (Bosworth, Ford, & Hernandez, 2011). Positive teacher-student relationships also appear to affect long-term school outcomes—for example, they have been linked to reduced dropout rates and increased student achievement (Barile et al., 2012). In another study, students attending schools in which teachers were supportive and considerate of students' perspectives were less likely to report drug use and symptoms of depression (LaRusso, Romer, & Selman, 2008). Therefore, it appears that positive relationships with faculty members, as well as a collegial atmosphere overall, are key components of school climate, as well as influential factors in students' overall success.

Relationships between teachers and students can be especially influential if the adults in the school come from similar cultural backgrounds as their students. Cultural mismatch—different unspoken behavioral expectations--between teachers and students can lead to frustrating misunderstandings and even unnecessary discipline. Fenning and Rose (2007) give the example of a teacher who expected a student to approach her and apologize after an offensive statement, whereas the student's upbringing had taught that it would be more respectful to keep a quiet distance. Conversely, Monroe (2005) suggests that the most effective teachers are often those who have similar communication styles, behavioral expectations, and disciplinary approaches as the students would experience within their own homes. A case study conducted within a Colorado high school conveyed that culturally responsive teachers not only have better relationships with students, but are also able to foster a climate supportive of multiculturalism within their

schools, as well as improving their students' resilience and success in school (Fránquiz & Salazar, 2004).

Relationships among schools' faculty members, and particularly between teachers and administrators, also appear to be important aspects of school climate. Kelley, Thornton, and Daugherty (2005) found that teachers who viewed their administrators as effective were more likely to have positive perceptions of other aspects of school climate, such as communication, innovation, and staff development. Teachers also express more willingness to communicate with their administrators in schools that are perceived as more open and less bureaucratic (Rafferty, 2003). Principals are also more satisfied and committed to their positions if they have positive relationships and balanced power dynamics with their teachers (Price, 2011). Hollingworth (2012) conducted a case study of how leaders within a small high school began implementing formative evaluations. The study found that the principal was the central figure in promoting teachers' knowledge and support in the new formative testing method, and that the initiative's success depended on the quality of the teacher-principal relationships (Hollingworth, 2012). These findings suggest that attempts at reform and school improvement might be more successful in the presence of strong administrative leadership, along with positive relationships between administrators and teachers.

Faculty relationships can also affect students. A 5-year intervention was implemented in three schools in order to improve teacher-administrator relationships. At the end of the intervention, teachers reported higher perceptions of principal support, and students reported better perceptions of school climate (Rhodes, Camic, Milburn, & Lowe, 2009). This finding suggests that students can be influenced by how well their schools'

teachers and administrators get along with each other. In other words, even if the adults in the school interact positively with students, the students' experiences may be adversely affected if the adults have negative relationships with each other. Conversely, if relational dynamics among the adults are positive, students will benefit as well. Therefore, these relationships comprise an important aspect of the schools' overall climate.

Positive relationships with students' families and communities also contribute to school climate and student outcomes. Parents are uniquely able to motivate their children to achieve in school, over and above other motivating factors (Cheung & Pomerantz, 2012). Hurd, Zimmerman, and Xue (2009) found that students who identified their parents as their biggest two role models had higher school performance. The quality of the school's climate may serve to encourage or discourage parental involvement. For example, a study of 545 schools in New York found parents had more difficulty connecting and communicating with large schools; however, this relationship was mediated by the parents' perceptions of safety and respect within the school—in other words, they were more involved in schools with positive climates (Goldkind & Farmer, 2013). The relationship between climate and parental involvement can also be improved from the opposite direction--schools' efforts to connect with parents and communities may result in improved school climate and other positive outcomes for students. Nelson, McMahan, and Torres (2012) found that a 2-year community partnership project led to higher student attendance and more positive perceptions of school by both students and staff members. Similarly, when 47 elementary and secondary schools implemented measures to increase involvement with students' families and communities, student

behavior problems and disciplinary actions decreased (Sheldon & Epstein, 2002). As described below, reducing negative behaviors is an important step in improving school climate. Therefore, positive relationships between parents and school staff members appears to comprise a crucial aspect of climate, as well as promoting students' overall well-being.

Facilities and Resources

One of the most concrete aspects of school climate is the school building itself, along with the resources that are available to students within the school setting. In his book *Savage Inequalities*, Kozol (1991) meticulously and dramatically describes several school systems' inequitable distribution of funding and resources among schools serving students of different ethnic and socioeconomic backgrounds. This relationship has been supported in subsequent research where a significant relationship was found between achievement and several aspects of school facilities—building age, availability of technology, specialized learning areas, and even carpeting within classrooms (O'Neill & Oates, 2001). School administrators were interviewed on their perceptions of school facilities and suggested that there was a wide-spread perception that aspects such as cleanliness, maintenance, and low acoustics (resulting in less noise) were perceived as most beneficial for student success (O'Neill & Oates, 2001).

Other research, however, has found mixed and nonsignificant results regarding the relationship between school facilities and achievement. For example, a study conducted in Wyoming compared school building quality with achievement, using SES as a covarying factor. The results indicated no significant relationship between building quality and achievement (Picus, Marion, Calvo, & Glenn, 2005). In 2006, middle school

teachers were surveyed regarding their school buildings (e.g., whether the building was comfortable, clean, and adequately spacious), resources and support (e.g., teachers had sufficient supplies and technology), and other aspects of school climate (academic press, community engagement, teacher professionalism, and collegial leadership). From these data, the authors created a facilities index and a school climate index (comprised of academic press, community engagement, teacher professionalism, and collegial leadership). These results were compared in aggregate, by school, to student achievement data and proportion of students receiving free/reduced-price lunch. Separately, both the facilities index and the school climate index were significantly related to student achievement. However, when facilities and school climate were analyzed together, the facilities index was no longer significantly related to student achievement, suggesting that the other school climate variables mediated the relationship between facilities and achievement (Uline & Tschannen-Moran, 2006).

Uline and Tschannen-Moran (2006) also suggest that support staff in the school might be considered part of the school's overall resources available to students. In their examination of achievement data and school personnel data across 150 districts, Goodman and Young (2006) found that the presence and number of school counselors and school psychologists was significantly related to achievement within that school. Well-qualified teachers could also be considered a school resource. Corcoran and Evans (2008) found a negative correlation between students' race and several potential (albeit imperfect) indicators of teacher quality—conventional vs. temporary or emergency certification, years of experience, and achievement of an advanced degree. Schools in which there were a higher number of students of color were more likely to have a teaching force with

alternative licensure, less years of experience, and less likely to have an advanced degree. They also found that many of these relationships were stronger in the 2003-2004 sample than they were in 1987-1988. Notably, this coincided with increases in the achievement gap during the same period. Although this evidence does not substantiate a causal relationship, it does suggest that teacher quality has at least maintained the achievement gap over time (Corcoran & Evans, 2008).

Safety and School Discipline

Another important aspect of school climate is whether those within the school feel safe, and whether there is an expectation that rules will be enforced fairly and consistently. In schools with high levels of gang activity, drug use and availability, crime, and student incivility (behaviors such as bullying, hate language, name calling, and social exclusion), students are more likely to experience anxiety and display avoidant behaviors. However, schools are less likely to have these problems, and their negative effects on students' behavior and affective condition, if school rules and policies are consistently implemented and clearly communicated to students (Mayer, 2010). Schools with high disorder and high rates of problematic incidents and criminal activity also have significantly lower school attendance and academic achievement (Chen, 2007).

School climate is significantly related to the amount of bullying within schools. Lower bullying rates have been seen in schools with high levels of both structure and support—behavioral expectations are clear and consistently enforced, and also adults who are caring and respectful of students (Gregory et al., 2010). (Totura, et al., 2009) found that in schools with higher levels of adult supervision, students who had externalizing behavioral problems were less likely to engage in bullying behaviors.

Students who perceive their schools' climate positively are less likely to report engaging in bullying behaviors than those who viewed their schools' climate negatively (Gendron, Williams, and Guerra, 2011). At the classroom level, higher levels of bullying appear to occur in rooms where teachers discipline harshly, where there is less organization and lower-quality instruction, and where negative behaviors have positive social results among students (Allen, 2010).

As with other types of school reform, efforts to reduce bullying are more likely to succeed if other aspects of school climate are positive. Students may be more likely to report bullying if they have supportive relationships with the adults in their schools (Eliot, Cornell, Gregory, & Fan, 2010). Climate can also be an important consideration for school-wide bullying-reduction efforts: in one school that was in the process of implementing an anti-bullying program, staff members identified characteristics such as warm and collaboration relationships, as well as a sense of family within the school, as important for the program's success (Coyle, 2008).

One of the most important policies is that of school discipline, which affects both school climate and student achievement. Recently, research within the field of education has cast doubt on the effectiveness of punitive school discipline, particularly exclusionary discipline and *zero-tolerance* policies (Thomas & Grimes, 2008). Several alternative policies have been suggested—for example, those that focus on the school and classroom environment (i.e., ecological approaches), those that focus on giving positive reinforcement for appropriate behaviors (i.e., school-wide positive behavioral support), and those that focus on teaching students self-control and social skills (i.e., positive youth development). It may be that the best approach would combine these models (Osher,

Bear, Sprague, & Doyle, 2010). Monroe (2005) also emphasizes that discipline should be culturally responsive and should not target behaviors that are acceptable within the students' cultures.

School climate certainly fits well with ecologically-based efforts to improve student behavior and reduce exclusionary discipline. A study by Gregory, Cornell, and Fan (2011) revealed that in schools where students feel supported and are given high expectations, there were lower rates of suspensions, compared to schools in which students are given lower expectations and support. Interestingly, although African American students were overall more likely to be suspended than White students, the schools with high support and expectations also had smaller disparities in discipline rates (Gregory et al., 2011). In particular, school-wide positive behavior support, which focuses on teaching and social reinforcement of appropriate behavior, rather than punitive action for inappropriate behavior, has been found to relate to both higher teacher ratings of school climate and decreases in behavioral issues such as tardiness, absences, and discipline referrals (Calderella, Shatzer, Gray, Young, & Young, 2011).

Teacher Variables

The research on school climate and teacher variables demonstrates a robust relationship between aspects of teacher satisfaction and elements of the school environment. Teachers can influence school climate both directly (e.g., through classroom behaviors) and indirectly (e.g., by staying in the school and in the profession) (Cohen, McCabe, Michelli, & Pickeral, 2009). The variables described below appear to have both direct and indirect effects on student achievement.

The extent to which teachers are able to exercise autonomy, be involved in decision-making within the school, and work collaboratively appears to contribute considerably to a school's climate. One potential source of teacher leadership is the ability to make decisions about what they teach and how they teach it (i.e., having influence over curriculum decisions as well as other aspects of school life.). Pearson and Moomaw (2005) found that higher levels of curricular autonomy and general autonomy were associated with higher levels of empowerment and professionalism, as well as lower stress. They also found that empowerment and professionalism were associated with job satisfaction, although the relationship between autonomy and satisfaction was small. Similarly, a more recent study found that schools with both teacher autonomy and clear expectations from school leaders had the best student outcomes on variables such as study motivation, self-regulated learning, and reduced behavioral problems (Vansteenkiste et al., 2012). According to Heck and Hallinger (2009), distributed leadership is another promising model, in which teachers and parents take a more active and powerful role, along with administrators, in school leadership. Using structural equation modeling, a significant relationship was found between distributed leadership and students' growth in math achievement (Heck & Hallinger, 2009).

Another aspect of school climate that could influence student achievement is the extent to which teachers receive support within the school—for example, if they are provided with helpful professional development sessions and instructional support. Research reveals that professional development programs for teachers can be associated with increased student achievement. One such study, conducted by Hough and Schmitt (2011), examined the effects of a two-year professional development program on

classroom management. They found that the professional development program resulted in improvements in a variety of outcomes, such as attendance, behavior, and academic achievement (Hough & Schmitt, 2011). Another professional development program, aimed specifically at science teachers, resulted both in overall improvements in science achievement, and a narrowed achievement gap in science performance between white and students of color, in comparison to a control school without the program (Johnson, Kahle, & Fargo, 2007). Another component of instructional support is using assessment data (e.g., standardized testing feedback) to inform changes in teaching. A workshop program in Boston, school staff members from 10 schools were instructed in data analysis and problem-solving, as well as communication and leadership (Murnane, Sharkey, & Boudett, 2005).

Manageable schedules—that is, the extent to which teachers are able to complete what is expected of them within their allotted time frame—also appear to influence teachers' satisfaction, and thereby affect students. Surveying elementary school teachers in Norway, Skaalvik and Skaalvik (2011) found that time pressure negatively predicted job satisfaction, both directly and through the moderating variable of emotional exhaustion. They also found a positive relationship between emotional exhaustion and motivation to leave the teaching profession, as well as a negative relationship between job satisfaction and motivation to leave.

Teachers' perceptions of school climate can also influence their satisfaction and commitment, and thereby indirectly affecting their students' learning. Using structural equation modeling, Johnson and Stevens (2006) found a significant relationship between teachers' perceptions of school climate and student achievement within their schools.

Perry and Weinstein's 1998 literature review identified teacher characteristics, classroom instructional climate, classroom social relationships, classroom aggregate characteristics, and school factors as the main categories of influential factors on student adjustment to school. Notably, they highlighted teacher expectations and differential treatment, citing several studies suggesting that teachers' expectations significantly affected their students' performance, and that even young children can notice when teachers treat some students differently (Perry & Weinstein, 1998). Teachers' motivation and satisfaction with teaching is also based on the type of school in which they are teaching. Greenlee and Brown (2009) surveyed teachers on which aspects of the school environment they believed would make teachers wish to stay at the school. They compared which characteristics were most valued by teachers in low-affluence schools with those desired by teachers in high-affluence settings. While teachers in both school settings reported that incentives such as salary bonuses, tuition reimbursement, and authority in the school would motivate them to stay, teachers in high-affluence schools were much more likely to indicate performance bonuses based on student achievement, whereas those in low-affluence schools were more likely to state autonomy and resources for curriculum innovations, as well as professional development (Greenlee & Brown, 2009). Notably, the factors identified in low-affluence schools seem related to the teachers' sense of efficacy—their personal power to effectively teach and effect change in their students' lives. Greenlee and Brown pointed out that reducing teacher turn-over may be a way to improve struggling schools; therefore, implementing improvements to promote teacher efficacy could perhaps help to reduce the achievement gap. As a component of the broader construct of academic optimism, teacher efficacy was also used in research by

Brown, Benkovitz, Muttillio, and Urban (2011) to model differences between schools with large achievement gaps and schools with small achievement gaps. In general, they found that schools with smaller gaps had faculty members with high academic optimism, principals who were teamwork-oriented, and high academic standards for all students. Consequently, it appears that opportunities for teachers to experience efficacy, positive relationships with administrators, and high expectations for students, could significantly impact the achievement gap.

Summary

The Latino-White achievement gap, as well as other racial/ethnic disparities within the U.S. educational system, presents a serious and complex problem, for which many explanations have been put forth. The current study will focus on explanations focusing on changeable, system-level factors.

Aspects of school climate, such as positive relationships, facilities and resources, educational policies and procedures, connection to families and communities, and teacher variables, appear to relate to student achievement. In general, variables regarding relationships and human resources, as well as support for teachers, seem to be the most influential. Teacher-level variables, such as perceptions of support, a manageable schedule, and efficacy, are important because they appear to relate to teacher satisfaction and commitment—whether teachers will stay and thrive or burn out and quit. Teachers' satisfaction may affect students both directly through promoting teacher engagement in the teaching process, and indirectly through prompting teachers to stay in their schools and in the profession in general. Schools with lower achievement also seem to have teachers who are less qualified and remain for less time. Promoting a positive school

climate where teachers feel satisfied and committed to their work, and where students feel safe and encouraged to achieve, may be a key factor in reducing the achievement gap.

CHAPTER III

METHODOLOGY

Given the potential relationship between factors related to school climate and different aspects of student achievement, the purpose of this study was to examine whether the achievement gap within specific schools could be explained using the TELL school climate model (time, facilities, community involvement, school conduct policies, teacher leadership, school leadership, professional development, and instructional support). Certain demographic variables—Latino population within the school, population students with limited English proficiency, and population of students of low socioeconomic status—were considered potentially confounding variables and these relationships were considered prior to conducting the analysis of school climate.

Research Design

This study compared teacher survey results to standardized testing outcomes based on the Spring 2013 TCAP mathematics scores, using two existing data bases from the Colorado Department of Education. The unit of analysis was each individual school, rather than individual teachers or students. Prior to conducting any analyses, the data were analyzed to determine whether the assumptions for each statistical test were met. The first step included establishing the presence of a significant achievement gap. To complete this analysis, the percentage of Latino students in a given school who scored

proficient and advanced was compared to the percentages of White students scoring proficient and advanced. This analysis was conducted using a paired-samples *t*-test.

For the second analysis, the independent variables were the average rating provided by teachers, administrators, and other school personnel within a school on each of the school climate subfactors. The dependent variable was the overall achievement of the school, as measured by the percentage of all students scoring proficient and advanced. These data were analyzed using a hierarchical multiple regression procedure. In the first step, the significance and effect size of the variance in gap scores explained by the school's percentage of Latino students, the percentage of students enrolled in English language learner (ELL) services, and the percentage of students qualifying for free/reduced lunch was analyzed. Then, the school climate variables were analyzed in the second step. Consequently, it was inferred that the variance in gap explained by school climate (the results from the second step) was above and beyond the variance in gap explained by socioeconomic status and language acquisition.

For the third analysis, the same procedure was followed, except that the dependent variable was the corresponding achievement gap score for each school. This was calculated by subtracting the percentage of Latino students scoring proficient or advanced from the percentage of White students scoring proficient or advanced. Effect size for the overall model, as well as partial correlations for the individual subconstructs, were also examined.

Participants

Power Analysis

The number of schools included was sufficient according to an analysis conducted using G*Power software (Faul, Erdfelder, Buchner, & Lang, 2009). Using the *a priori* assumptions of a medium effect size (.15), an alpha of .05 and power level (1 – beta error prob.) of .8, 8 tested predictors and 10 total predictors, the minimum required sample size was 109.

Schools

Each of the schools included in this study met the following criteria. Schools were included in the analysis if they had a mean of 30 Latino students and 30 White students per grade level, in order to satisfy the Central Limit Theorem—smaller samples do not tend to adequately approximate the distribution of scores within the wider population (Anderson, 2009). Additionally, schools were included in this study if they had TELL scores for at least 50% of their faculty, and a minimum of 5 faculty who completed the survey. Although the total TELL database includes more teacher reports from a great number of schools, because the unit of analysis was the school setting, it was important that the TELL data were somewhat representative of the school (i.e., participation of at least 50%).

The obtained sample was comprised of 323 schools. These were located within 58 school districts, located within 31 counties. A range of urban and rural areas were represented: 82.25% of schools were located within large counties (populations of more than 100,000), 16.09% were located within mid-size counties (populations of 10,000-100,000), and 1.24% were located within small counties (less than 10,000 residents) (one

school was in a district that is not within a specific county) (“School View Data Center,” 2015; “American Fact Finder,” 2013). In comparison, 84.51% of Colorado residents live in large counties, 13.23% live in mid-size counties, and 2.25% live in small counties. Therefore, even though it was suspected that the sample might exclude small, rural schools, the sample does appear to reflect the urbanicity of the state as a whole.

Students

Within the sample’s schools, scores for a total of 271,250 students were reported in the 2013 TCAP. In October of 2012, earlier in that school year, approximately 863,561 students were enrolled in public education in Colorado (Colorado Department of Education). Therefore, the schools in this sample represented approximately one fourth of public school students in Colorado. In the 2012/2013 school year, the student population in Colorado’s public education system included 56% of students who were White, 32% who were Latino, and the remaining 12% who were of different, mixed, or unreported ethnic backgrounds (Colorado Department of Education). In comparison, of the students within the sample, 58% were White and 30% were Latino, and 12% were otherwise classified. On average, schools in the sample had 12% of students in ELL, and 43% in free or reduced lunch. The state as a whole had 14% of students in ELL, and 42% in free or reduced lunch (Colorado Department of Education). Therefore, the sample appears to closely represent the demographics of Colorado’s public school population as a whole.

Teachers

The original TELL survey was completed in 2013 by 33,200 educators, representing approximately 55% of licensed, school-based educators in Colorado

(“Validity and Reliability Report,” 2013). Within the current sample of schools, 12,281 educators participated in the survey, representing 37% of that larger sample. In addition to their perceptions of school climate, the 2013 TELL survey asked teachers to indicate their position, their years in the teaching profession, and their years at their current school. No other demographic data for the teachers were available as it was not collected within the TELL survey.

Of all participants in the 2013 TELL Colorado, 88.7% were teachers, 3.8% were administrators, and 7.6% were other professionals such as school counselors, school psychologists, or social workers (“Validity and Reliability Report,” 2013). On average, respondents had been educators 4.38 years and had been at their current school 3.45 years. In the current study, 88.3% of educators surveyed were teachers, 3.7% were administrators, and 8.0% were other professionals. The average years in the education profession was 4.43, and the average years at the current school was 3.43. Based on these data, the teachers in the sample appear to be similar in these basic demographics to the participants in the TELL Colorado survey as a whole. It should be noted, as with any voluntary survey research, the potential exists that those who chose to participate may be different from those who did not.

Measures

Data from two different measures were used for this study. The first is the Teaching, Empowering, Leading and Learning (TELL) survey administered to teachers, administrators, and other school personnel during Spring 2013. The other source of data were the results from each school on their math achievement scores based on the Transitional Colorado Assessment Program (TCAP).

Teaching, Empowering, Leading, and Learning

Theoretical basis. The Teaching, Empowering, Leading and Learning (TELL) Survey was developed by the New Teacher Center (“Validity and Reliability Report,” 2013). The original purpose of the survey was to help schools and policy-makers evaluate aspects of school climate that could be ameliorated to improve teacher retention and student learning (“Validity and Reliability Report,” 2013). The survey was drawn from research (e.g., Ladd, 2009) suggesting that teachers’ decisions whether to stay or leave their current schools are influenced by school climate factors—perceptions of the administration, school facilities, and peer relationships (“Validity and Reliability Report,” 2013).

Development of the measure. The TELL survey resulted from research by the Measuring Effective Teachers Project, which was supported by the Bill and Melinda Gates foundation. In addition, work by the North Carolina Professional Teaching Standards Commission produced the eight-factor model used in the TELL survey (NCTWCS, 2011). The eight factors were identified by the Commission after an extensive literature review, with the goal of examining factors that explain teacher retention and satisfaction, as well as student learning. The eight factors in the model are: time, facilities and resources, community support and involvement, managing student conduct, teacher leadership, school leadership, professional development, and instructional practices and support.

In 2012-2013, nine states administered the TELL survey state-wide (Vermont, Tennessee, Ohio, Maryland, Kentucky, Delaware, Colorado, North Carolina, and Massachusetts). Using the results from each of these states, it was possible to identify

trends within and across states. Educators in Colorado rated all school climate subconstructs significantly below the mean except for Managing Student Conduct, whereas educators in Kentucky, North Carolina, and Tennessee gave ratings above the mean on all factors except Time. These data do not provide detail on why these trends exist, but they may be used by state education personnel to examine policies and practices that could contribute to lower or higher ratings.

The 2013 TELL Colorado data were collected between February 6 and March 11, 2013 (“TELL Colorado,” 2013). These dates closely correspond to the timing of TCAP testing, which takes place between early February and mid-April (“CSAP/TCAP—Data and Results,” 2013). Fifty-five percent (33,200 out of 60,891) of licensed school-based educators in Colorado responded to the survey (“Validity and Reliability Report,” 2013). Of these, 89% were teachers, 4% were administrators, and 8% were other licensed education professionals (“Validity and Reliability Report,” 2013).

The survey has a total of 192 items, of which 75 address school climate. The other items include questions about the participant’s position within the school, years as an educator, and experiences as a novice educator. Most of the items on the TELL are grouped under a statement that begins, “Please rate how strongly you agree or disagree with the following statements about...” followed by a description of one of the aspects of the school’s climate (e.g., “about the use of time in your school”). Several items are grouped under different headings (e.g., “The school leadership makes a sustained effort to address teacher concerns about” followed by several potential teacher concerns). Items are on a Likert-type scale; however, they are not all on the same scale. For that reason, they were transformed to Z-scores for the regression analysis.

New Teacher Center researchers conducted an exploratory factor analysis on the TELL Colorado data (E. Hirsh, personal communication, March 17, 2014). Using principal components analysis, they determined that the model should have about 8-9 factors. Another method they used was to keep the factors that individually explained at least 10% of the variance—again, using this method, eight factors were included (together, these eight factors explained 58% of the variance). They also used the Kaiser criterion, which posits that factors should be included if they have an eigenvalue greater than one. By this criterion, eight factors would be included. These methods indicate that the eight-factor model best fits the data; these eight factors include: time, facilities, community involvement, student conduct policies, teacher leadership, school leadership, professional development, instructional support (“Validity and Reliability Report,” 2013). These factors are defined as follows:

Time refers to the extent that teachers have sufficient time to perform their jobs effectively; for example, reasonable class sizes and instructional time, time for collaboration with colleagues, and minimal time spent in paperwork, classroom interruptions, and such interferences. This scale includes 7 items. One example item is “The non-instructional time provided for teachers in my school is sufficient.”

Facilities and resources includes the physical environment of the school, work space, technology (and training to use technology), educational materials, support personnel, access to the building, and cleanliness and maintenance of the school building. This scale includes 11 items. One example item is “Teachers have sufficient access to school library resources.”

Community support and involvement refers to the school's communication and ties with the local community and students' families, as well as the extent to which parents and community members support and remain involved with the school. This scale includes 9 items. One example item is "The school maintains clear, two-way communication with the community."

Managing student conduct refers to the extent to which students understand and follow behavioral rules, school staff follow and enforce school rules, and faculty perceive the school environment as safe. This scale includes 7 items. One example item is "Policies and procedures about student conduct are clearly understood by the faculty."

Teacher leadership refers to the extent to which teachers are regarded as leaders and experts, are able to pursue formal leadership positions, are able to collaborate effectively, are trusted and trust each other. This scale includes 10 items. One example item is "Teachers pursue opportunities to participate in school leadership roles."

School leadership refers to the actions of principals and other administrators to support learning by enforcing rules, communicating clearly, promoting trust and mutual respect, being accessible and addressing teachers' concerns regarding a variety of issues, evaluating teachers and recognizing their success, and sharing vision with the faculty. This scale includes 15 items. One example item is "The faculty and leadership have a shared vision."

Professional Development refers to continuing education or other opportunities for teachers to receive instruction in information or skills relevant to their careers. This scale includes 15 items. One example item is "Professional development is differentiated to meet the needs of individual teachers."

Instructional Support refers practices and resources within the school that support student learning, such as assessments (both teacher-generated and state- or district-wide, standardized or non-standardized), curricula, classroom assignment procedures, professional learning communities and/or instructional coaching, and teachers' degree of autonomy and innovation. This scale includes 13 items. One example item is "Teachers are encouraged to try new things to improve instruction."

On the TELL 2013 Colorado survey, the Cronbach's alpha values ranged from .79 to .95 (the highest value was on the sub-construct of Professional Development; the lowest was on Instructional Practices and Support). The eight factors seemed to represent distinct factors as the correlations ranged from .23 (between Community Support and Involvement and Instructional Practices and Support) to .69 (between Time and Facilities and Resources); thus, effect sizes for these bivariate relationships ranged from .05 to .47. Because the correlations were only moderate, collinearity was not a concern.

Transitional Colorado Assessment Program

The Transitional Colorado Assessment Program (TCAP) is a criterion-referenced academic achievement test with standardized administration. It replaced the Colorado State Assessment Program (CSAP) beginning with the school-year 2011-2012. The change was intended to better align the test with the Colorado Academic Standards. The 2013 TCAP was administered between February and April 2013. For this study, only the Math portion of the TCAPs were used to determine the presence of an achievement gap due to the possibility of English acquisition affecting Latino students' reading and writing scores on the TCAP.

The TCAP mathematics section contains both multiple choice and constructed response items. Multiple choice items are scanned and scored electronically, and constructed response items are scored by trained teams of teachers. Reliability of teacher scoring is checked by 1) having exemplars for each possible score for each item (anchor items) for reference, 2) frequent double- and triple-scoring (blind to scorers), and 3) items used in previous years are saved for score comparisons. The score for each subtest is then grouped into one of four classification categories: advanced, proficient, partially proficient, and unsatisfactory. Combined subject scores (e.g. reading, math) are reported using the same four-category system. Individual students' scores are not accessible to the public. However, the Colorado Department of Education reports the number and percentage of students scoring in each of the four categories on the combined subject scores, in each grade level, in each school. These results are also reported with students' scores disaggregated by certain demographic characteristics: race/ethnicity, socioeconomic status, and instructional program enrollment (e.g., ELL, special education, gifted/talented, etc.).

For the current study, TCAP achievement in each school was shown by the percentage of students scoring advanced and proficient in each school. These percentages were summed to create one achievement score. When different grade levels were present within the school, which was the case for most schools, achievement scores were averaged so the school would have one achievement score (or two, when the comparing Latino and White scores).

Procedures

Prior to beginning this study, permission was obtained from the UNC IRB under exempt status. The New Teacher Center was contacted for permission to obtain the entire Colorado TELL results in order to facilitate additional analyses of the data rather than relying on the percentages that are available on the Colorado Department of Education website. The Colorado Department of Education was also contacted for permission to obtain data on the percentage of students enrolled in ELL program in each of the individual schools included in this study. Other data, such as TCAP results, student enrollment, and demographic data (ethnicity and free/reduced lunch) were downloaded from their website and did not require permission for use.

Statistical assumptions were tested prior to conducting any analyses related to the research questions. Normal distribution of variables was examined by calculating skew and kurtosis for the variables. Collinearity was assessed by examining the bivariate correlations among the eight factors, as well as by examining the variance inflation factor values, which examine the extent to which the relationship between individual independent variables and the dependent variable is explained by the other independent variables (Pedhazur, 1997). Results of these analyses are given in Chapter IV. Outliers were checked using Cook's *D*, which detects data points that excessively influence the regression (Pedhazur, 1997); no outliers were detected.

Data from both the New Teacher Center and from the Colorado Department of Education were accessed in the form of Excel spreadsheets. The Excel spreadsheets were then converted into SPSS files for analysis (some simple computations, such as response means among teachers, were performed in Excel). Schools that were included in the

analysis (i.e., meet criteria for both TCAP and TELL inclusion) were then combined into the same file, with the variables matching by school identification number.

All TCAP analyses were performed using each school's achievement data taken from the 2012-2013 TCAP mathematics score report, downloaded from the Colorado Department of Education (from <http://www.cde.state.co.us/assessment/CoAssess-DataAndResults.asp#disaggregated>). The TCAP reports scores in four ordinal achievement categories: unsatisfactory, partially proficient, proficient, and advanced. The data indicate the number and percentage of students scoring in each category. Thus, data across grade levels within a particular school were collapsed into an aggregate percentage across different ethnic groups. Each school's achievement score was recorded as the percentage of total students scoring in the proficient and advanced categories combined.

Results of the TCAP can be obtained in disaggregated form: by grade level, ethnicity, and other demographic characteristics. For example, one could obtain the numbers and percentages of Latino 6th grade students in a specific school who scored in each achievement category. Gap scores were obtained using the difference in percent above cut score method (as described by Ho & Reardon, 2012; see also Armor, 2008 and Paige & Witty, 2010). For the purposes of this study, the percent above cut score represented the percentage of students scoring in the proficient and advanced categories. For each school, an arithmetic difference was computed between the percentage of White students and the percentage of Hispanic students scoring in these two categories. For example, if 60% of Latino students scored proficient or advanced, and 70% of White students did, the gap score would be 10.

Data Analysis

Data were analyzed using IBM SPSS Statistics Version 22. Data files were obtained as Excel files, and were converted into SPSS. Some simple calculations (e.g., calculating sums or means within variables) were performed within Excel; all other procedures were completed using SPSS.

Q1 Is there a significant achievement gap, as measured by the TCAP Math section, between White and Latino students in Colorado?

To analyze this question, a paired-samples t-test was conducted. The two groups being compared were Latino students and White students, and the variable being compared was the schools' percentage of students scoring proficient and advanced on the 2013 TCAP math test.

Q2 Accounting for percentages of Latino students, ELL status, and low socioeconomic status, to what extent do the eight school climate factors, as measured by teacher reports on the TELL Colorado Survey, explain the variance in achievement on the TCAP Math section?

To analyze this question, a two-step hierarchical multiple regression was used. In the first step, the schools' percentages of Latino students, of students in ELL, and of students in free/reduced lunch, respectively, were entered as explanatory variables. The outcome variable was each school's total percentage of students scoring proficient and advanced on the TCAP math test. In the second step, the schools' average ratings on the TELL scales were used as explanatory variables. The difference in R^2 was used as the amount of variance in achievement explained by school climate, accounting for Latino ethnicity, SES and ELL. The significance test of the difference in R^2 was used to determine whether the amount of variance explained by school climate, Latino ethnicity, SES, and ELL, was significantly more than what is explained by Latino ethnicity, SES, and ELL alone. Additionally, partial correlations for each TELL construct were

examined to determine each TELL scale's individual amount of achievement data explained. Each scale's squared partial correlation indicated its effect size.

Q3 Accounting for percentages of Latino students, ELL status, and low socioeconomic status, to what extent do the eight school climate factors, as measured by teacher reports on the TELL Colorado Survey, explain the variance in schools' amount of achievement gap between Latino and White students on the TCAP Math section?

To analyze this question, the same statistical analyses were used as in Q2.

However, the outcome variable was each school's difference in percent above cut score, as described above.

Summary

Hierarchical multiple regression analyses were used to examine the extent to which the variance in schools' achievement and achievement gap are explained by teachers' ratings of their schools' climate. Teacher ratings were derived from the 2013 TELL Colorado survey. Achievement scores and achievement gap scores were derived from scores on the Mathematics subtest of the 2012-2013 TCAP. The percentage of students scoring in the proficient and advanced ranges was used as achievement scores. Achievement gap scores were computed using the mathematical difference between the percentage of White students scoring proficient and advanced, and the percentage of Latino students scoring in those categories.

CHAPTER IV

RESULTS

The purpose of the current study was to examine the extent to which the variance in achievement gap among Colorado schools could be explained by school climate and aspects thereof. For the analyses, data were obtained from the Colorado Department of Education and the TELL 2013 Colorado data provided by the New Teacher Center. The unit of analysis was the school; the sample included all schools in Colorado that met certain criteria, as described in Chapter III. In the section below, descriptive statistics of the sample are given. In the following section, results of the data analyses are provided.

For the purpose of simplicity, the term *achievement* will be used to discuss the percentage of students scoring in the proficient or advanced ranges on the 2013 TCAP Math test. Additionally, the term *gap* will be used to denote the difference (in percentage points) between White students and Latino students scoring in the proficient or advanced ranges on the 2013 TCAP Math test.

Assumptions

The assumption of normal distribution was checked by examining frequency histograms for Latino and White achievement within each school. Additionally, the skew and kurtosis of both samples were examined, and were found to be within the acceptable range (+/-1), as shown in Table 1.

Table 1

Skewness and Kurtosis of Latino and White Student Achievement

	Skewness	Kurtosis
Latino achievement	.17	-.77
White achievement	-.37	-.52

The skew and kurtosis of the independent variables—percent of Latino students, percent of ELL students, and percent of students identified for free/reduced lunch; and the original eight TELL factors (i.e., time, facilities and resources, community support, student conduct, teacher leadership, school leadership, professional development, and instructional support)—are provided in Appendix B. All variables were normally distributed except for percent of students who are identified as ELL, which had positive (>1) skewness and kurtosis. Therefore it was transformed using a natural log procedure. Descriptive statistics for this new variable are listed below in Appendix B. under “Natural log ELL;” this variable was used in the regression analysis. Normality of residual distributions was examined using the normal probability plot. All variables appeared to fit this criterion; the plot for percent Latino appeared slightly curvilinear; however, it still approximated the expected line for the normal probability plot.

Collinearity was checked by examining bivariate correlations among the explanatory variables. The correlation table is shown in Appendix C. Teacher leadership appeared particularly problematic, with a bivariate correlation of .91 with school leadership, and a .85 correlation with instructional support. Collinearity was also examined using variance inflation factor (VIF) values, which indicates the extent to which the effect of one independent variable on the dependent variable is influenced by the effects of the other independent variables in the model. A common, albeit arbitrary,

cutoff for VIF is 10 (Freund, Wilson, & Sa, 2006; Pedhazur, 1997). A more conservative value, although similarly arbitrary, is 5 (Kutner, Nachtsheim, & Neter, 2004). In this model, two variables had particularly high VIF values: teacher leadership (8.55) and school leadership (8.59), indicating high multicollinearity associated with those variables. Instructional support also had a somewhat high VIF value (5.36).

In order to rectify situations of collinearity, Pedhazur (1997) recommends either deleting the problematic variables or combining them. In order to avoid losing important information related to school leadership, and to preserve the original TELL model to the extent possible, teacher leadership and school leadership were combined into one leadership variable. Instructional support might have also been included; however, it did not make as much sense conceptually, and it was not as problematic, so it was decided to leave it as its own variable. This new combined leadership variable had a smaller VIF value of 6.69. This also lowered the VIF value for instructional support to 4.92; all other VIF values in the model were also now below 5.

It should also be noted that collinearity only affects the results and interpretation of the individual variables within the model, not the model as a whole (Freund et al., 2006). Although the partial correlations in this analysis must be interpreted with caution, the whole model regressions may be presumed to accurately reflect the relationship between school climate and both achievement and achievement gap.

Normality of the outcome variables, achievement and achievement gap, was assessed by examining skewness and kurtosis, and were found to be within the acceptable range (+/-1) as shown in Table 2. Additionally, the histograms were examined and approximated a normal distribution. Outliers were checked using by examining Cook's

Distance values, which indicated that no outliers were influencing the results. Therefore, the multiple regression procedure was considered appropriate for the current data.

Table 2

Skewness and Kurtosis of Overall Achievement and Achievement Gap

	Skewness	Kurtosis
Overall achievement	-.2	-.695
Achievement gap	.76	.82

Data Analysis

Q1 Is there a significant achievement gap, as measured by the TCAP Math section, between White and Latino students in Colorado?

A significant difference was found when comparing achievement of White and Latino students, $\eta^2 = .79$, $t(322) = 34.95$, $p < .001$, 95% CI [18.39, 20.58]. The effect size of this difference was .79, indicating a large effect of group difference. The mean percentage of Latino students scoring proficient and advanced in each school was 39.73 (17.72), and for White students it was 59.21 (18.07). On average, schools had a gap of 19.48 (10.02). In other words, based on the TCAP Math scores, there was a significant achievement gap between White and Latino students. The f the gap was between -4.92 and 58.58. Two schools, notably, had a negative achievement gap, with more Latino students than White students scoring proficient or advanced on the TCAP.

Q2 Accounting for percentages of Latino students, ELL status, and low socioeconomic status, to what extent do the eight school climate factors, as measured by teacher reports on the TELL Colorado Survey, explain the variance in achievement on the TCAP Math section?

This question was analyzed using a two-step hierarchical multiple regression. In the first step, percentage of Latino students, of students in ELL, and of students in free/reduced lunch programming, were entered as explanatory variables, and total

percentage of students passing the TCAP (all racial/ethnic groups) was entered as the outcome variable. In the second step, the seven TELL Colorado variables (with combined teacher leadership and school leadership) were entered as explanatory variables, with achievement (TCAP Math) as the outcome variable. The difference in explained variance between the two steps was analyzed for significance. With the combined leadership variable, the regression equation for this step was as follows:

$$Y(\text{achievement}) = \mu + \beta(\% \text{Latino}) + \beta(\% \text{ELL}) + \beta(\% \text{free/reduced lunch}) + \beta(\text{time}) + \beta(\text{facilities}) + \beta(\text{community involvement}) + \beta(\text{managing student conduct}) + \beta(\text{leadership}) + \beta(\text{professional development}) + \beta(\text{instructional support}) + \epsilon.$$

Regression analysis. In the first step of the analysis, percent Latino, percent ELL, and percent free/reduced lunch together explained a significant proportion of the variance in achievement, $R^2 = .32$, $F(3, 319) = 50.88$, $p < .001$. Together, these three variables explained 32% of the variance in achievement. In the second step, the three independent variables above, as well as the seven school climate variables, together explained a significant proportion of the variance in achievement: $R^2 = .59$, $F(10, 312) = 44.75$, $p < .001$. The difference between the two steps was also significant, indicating that the school climate variables explained a significant proportion of the variance in achievement, over and above the variance explained by percent Latino, percent ELL, and percent free/reduced lunch, $\Delta R^2 = .27$, $\Delta F(7, 312) = 28.81$, $p < .001$. This indicates that the school climate variables explained 27% of the variance in achievement, when accounting for the three control variables (percent Latino, percent ELL, and percent free/reduced lunch).

Significance of the correlations was obtained for the seven climate variables, as shown in Table 3.

Table 3

Partial Correlations between School Climate and Achievement

Construct	<i>B</i>	<i>T</i>	<i>p</i>	Partial correlation
Time	-5.07	-1.61	.108	-.09
Facilities and resources	-5.10	-1.68	.094	-.10
Community support	25.24	7.20	>.001**	.38
Student conduct	13.73	4.68	>.001**	.26
Leadership	-9.85	-2.94	.004**	-.16
Professional development	16.72	4.54	>.001**	.25
Instructional support	-8.89	-2.09	.037*	-.12

*Statistically significant at the .05 level

**Statistically significant at the .01 level

Significant correlations were found for community support, student conduct, leadership, and professional development. Schools where educational personnel rated community support, student conduct and professional development higher, also had higher overall levels of student achievement. Surprisingly, the partial correlation for leadership and achievement was negative, indicating a negative relationship with achievement. That is, schools in which educational personnel rated the combined leadership variable higher, overall student achievement tended to be lower.

The negative correlation between leadership and achievement should be interpreted with some caution. Collinearity can influence the strength, and even the directionality, of partial correlations (Freund et al., 2006; Pedhazur, 1997). Partial correlations indicate the effect of each independent variable when accounting for all the others; when variables have a small overlap with the others in the model, the partial correlation provides a more accurate representation of the variable's unique contribution. However, interpreting partial correlations becomes problematic if there is a large amount

of overlap, because the effect remaining after the other variables' effects are parceled out may not accurately reflect the relationship between that independent variable and the dependent variable (Freund et al., 2006). This may have occurred with the leadership variable because, as shown above, it still had a VIF value of higher than .5.

Q3 Accounting for percentages of Latino students, ELL status, and low socioeconomic status, to what extent do the eight school climate factors, as measured by teacher reports on the **TELL** Colorado Survey, explain the variance in schools' amount of achievement gap between Latino and White students on the **TCAP** Math section?

Similar to the process used for research question 2, this question was analyzed with a two-step hierarchical multiple regression. All of the explanatory variables described above were used (in the same two steps). However, the outcome variable used was the amount of gap—the percentage points difference between White students scoring proficient or advanced and Latino students in those categories, within the schools.

Regression analysis. In the first step of the analysis, percent Latino, percent ELL, and percent free/reduced lunch together explained a significant proportion of the variance in gap, $R^2 = .09$, $F(3, 319) = 11.04$, $p < .001$. In the second step, the three independent variables above, as well as the seven school climate variables, together explained a significant proportion of the variance in gap, $R^2 = .21$, $F(10, 312) = 8.07$, $p < .001$. The difference between the two steps was also significant, $\Delta R^2 = .11$, $\Delta F(7, 312) = 6.25$, $p < .001$. This indicates that the school climate variables explained 11% of the variance in the achievement gap, over and above the variance explained by percent Latino, percent ELL, and percent free/reduced lunch. Significance of the correlations of the school climate variables was also obtained, and are shown in Table 4.

Table 4

Partial Correlations between School Climate and Achievement Gap

Construct	<i>B</i>	<i>t</i>	<i>p</i>	Partial Correlation
Time	4.73	1.99	.047*	.11
Facilities and resources	-1.58	-.69	.491	-.04
Community support	13.36	5.05	>.001**	.28
Student conduct	-4.06	-1.84	.067	-.10
Leadership	-1.59	-.63	.530	-.04
Professional development	-8.07	-2.90	.004**	-.16
Instructional support	3.48	1.09	.279	.06

*Statistically significant at the .05 level

**Statistically significant at the .01 level

In this analysis, significant relationships were found for time, community support, and professional development. Of these, the correlations for time and community support were positive (associated with larger gaps), whereas the correlation for professional development was negative (associated with smaller gaps). This means that schools with more positive ratings for teachers' time allotment, as well as higher levels of parent and community involvement in the school, tended to have larger achievement gaps. Conversely, schools in which educators perceived professional development as helpful and effective tended to have smaller gaps. However, it should again be noted that the VIF factor for leadership was greater than 5, and therefore interpretation of its partial correlation may require some caution.

Achievement and Achievement Gap

A post hoc analysis was conducted to examine the correlation between achievement and achievement gap within this study. As described in Chapter II, much research and educational reform efforts—for example, the No Child Left Behind legislation (Bohrnstedt & O'Day, 2008) and the National Assessment of Educational

Progress research (National Center for Education Statistics, 2013)—have sought to increase overall achievement while reducing the achievement gap. In light of the above results, it seemed advantageous to examine the extent to which achievement and achievement gap were related within the current sample—and, in particular, the strength and directionality of the relationship.

To analyze this question, a Pearson's correlation was conducted between achievement and achievement gap, using all the schools in the sample. A small but significant correlation was found: $R(321) = .13, p = .02$. The effect size (R^2) is .016. Therefore, although significant, this relationship is quite small. This finding suggests that schools with higher achievement tend to also have a larger achievement gap. Therefore, the assumption that raising achievement for all students will automatically narrow the achievement gap, does not appear to be true. As discussed in the next chapter, school leaders may want to examine each of these desired outcomes (i.e., higher achievement and smaller gap) separately to better understand how to increase achievement and reduce the gap for all students.

Summary

To summarize, all three research questions yielded statistically significant results. A significant difference was found between White and Latino students' achievement. The school climate model, as a whole, was significantly related to both achievement and achievement gap, even when controlling for percent of students in free/reduced lunch, percent of students in ELL, and percent of Latino students. In general, the school climate variables explained a higher amount of variance in achievement than they explained amount of variance in gap, although both were significant. Significant and positive

partial correlations were found when comparing community support, student conduct, and professional development with achievement, whereas a significant negative correlation was found regarding leadership. When examining achievement gap, positive correlations were found for time and community support, and a negative correlation was found for professional development. Additionally, a small but significant correlation was found between achievement and achievement gap, suggesting that schools with higher achievement are slightly more likely to also have a larger achievement gap.

CHAPTER V

DISCUSSION

The purpose of the current study was to examine the potential influence of school climate on the Latino-White achievement gap. Disparities and disproportionality in educational attainment among various groups in our society reflect (and even perpetuate) lingering inequities present in our society (e.g., Paige & Witty, 2010). Researchers examining achievement gaps among racial/ethnic groups often focus on factors intrinsic to the student, such as the effects of poverty and societal marginalization or differing behavioral expectations (e.g. Berliner, 2009; Burchinal, et al., 2011; Gibson & Ogbu, 1991); however, this study examined the influence of school-level factors (see Bol & Berry, 2005) on these gaps—specifically, school climate. Many aspects of school climate have been associated with achievement and other positive school outcomes (e.g., Cohen, McCabe, Michelli, & Pickeral, 2009; Thapa, Cohen, Guffey, & Higgins-D'Alessandro, 2013). Therefore, after finding the presence of a significant Latino-White achievement gap in Colorado, the current study examined school climate as an explanatory factor for both overall achievement and the achievement gap.

Achievement Gap

The current study confirmed the existence of a significant achievement gap between White and Latino students in Colorado, on the TCAP math test, within the schools sampled. These results corroborate a multitude of previous studies suggesting

the existence of an achievement gap based on ethnicity (e.g., National Center for Education Statistics, 2013), and particularly, a discrepancy in academic achievement between Latino and White students (e.g., Gándara & Contreras, 2009; Lee, 2002). In particular, this gap was found to be present in Colorado, which corresponded to historical evidence (Valencia, Menchaca, & Donato, 2002) as well as recent findings (Pearson & Zurkowski, 2013).

In the current study, the overall percentage of Latino students scoring in proficient and advanced on the 2013 math TCAP was 39.73%. In the state as a whole, from the years 2004 to 2014, this percentage had increased from 21.09% to 39.56%--notably, nearly half of this increase took place between 2004 and 2005. During the same years, the percentage of White students scoring proficient and advanced increased from 51.91% to 67.12% ("School View Data Center," 2015). Therefore, during that period, the achievement gap narrowed from 30.82 percentage points to 27.56. In the nation as a whole, Latino students scored 2 percentage points higher in 2013 than in 2011, and narrowed the gap by 1 point (National Center for Education Statistics, 2013). Thus, the evidence suggests that the Latino-White achievement gap is narrowing slowly, but is still a substantial concern.

School Climate and Achievement

This study confirmed the connection between school climate and student achievement. Overall, school climate explained over one fourth of the variance in achievement, when accounting for socioeconomic status, English acquisition, and Latino background. Previous research has examined school climate as a potential avenue for explaining and improving students' educational success (e.g., Thapa, Cohen, Guffey, &

Higgins-D'Alessandro, 2013). The thesis underlying school climate research is that the environment and shared experiences of those within the school—relational dynamics, leadership styles, perceptions of safety, and shared goals—can be a key influence on students' success (Cohen, McCabe, Michelli, & Pickeral, 2009). The current study provides evidence to support this perspective.

Using standardized tests results, it was possible to determine the degree to which aspects of school climate explained differences in these scores across schools. Cohen et al. (2009) highlighted that there is a lack in the literature regarding school climate research and policymaking. Since standardized testing is such a politically charged issue, the current study could potentially serve as a good platform to bring school climate to the attention of educational leaders and policymakers as an avenue for improving achievement overall. Additionally, more focus and effort might be directed toward the aspects of school climate that appeared to be the best predictors of achievement, such as community support, student conduct, and professional development.

Community Support

Community support was found to be positively related to achievement. This was not particularly surprising, in light of studies connecting community involvement with fewer school disciplinary actions (Sheldon & Epstein, 2002), reduced absenteeism (Sheldon & Epstein, 2004) and less student victimization at school (Jiménez, Musitu, Ramos, & Murgui, 2009). It should be noted that most (six of nine) of the TELL items in this category were related to parents' relationships with the school. Parent involvement appears particularly instrumental in positive student outcomes. Students with more involved parents tend to have better social skills and fewer problematic behaviors (El

Nokali, Bachman, & Votruba-Drzal, 2010). Furthermore, a meta-analysis of parental involvement and achievement of middle school students found an overall significant correlation of .19 (confidence interval .10-.21) between school-based parental involvement in education and achievement (Hill & Tyson, 2009). The partial correlation of .38 found in the current study is even stronger, although some caution is warranted because the constructs were not identical across studies. Nevertheless, this finding is compelling as a partial correlation because it reflects the relationship when the effects of the other variables in the model are taken out.

Although the emphases in many parent involvement studies have focused on the parents and their degree of involvement, it may be that some of the schools in this study were engaged in focused efforts to increase their communications with families, include parents in decision-making, and to create a generally welcome climate (e.g., Reece, Staudt, & Ogle, 2013). Not only are the findings from this study consistent with past research, they highlight the degree of importance of parental and community involvement on achievement and suggest that the relationship may be even stronger than previously thought.

Student Conduct

A positive relationship was found between student conduct management and achievement. That is, clear expectations, consistent enforcement of rules, and an overall perception of safety were related to high levels of student achievement. Given the multitude of studies connecting positive student behavior and achievement (e.g., Algozzine, Wang, & Violette, 2011), as well as the research and reform efforts aimed at improving both (e.g., Muscott, Mann, & LeBrun, 2008), this finding is not surprising. It

is unlikely given the number of schools that any one discipline program or approach accounted for this finding (e.g., school-wide positive behavior support, see Menendez, Payne, & Mayton, 2008; Solomon, Klein, Hintze, Cresey, & Peller, 2011). Instead, this finding highlights the general importance of attending to aspects of student discipline as part of reform efforts to improve student achievement.

Professional Development

Professional development was also positively correlated with achievement. Schools—and most importantly the leaders within them—that endeavor to provide helpful information and guidance to their staff members are, in fact, associated with higher student performance. The current study examined educators' perceptions of the professional development in their schools—for example, the extent to which the professional development is applicable and relevant, data-driven, and involves an appropriate use of time and resources rather than the value of any one program or type of professional development. Much of the current research on professional development has focused on specific topics or programs (e.g., Hough & Schmitt, 2011; Johnson, Kahle, & Fargo, 2007; Kennedy, 2010; Santau, Maerten-Rivera, & Huggins, 2011), with an emphasis on changes in instructional practices. For example, Johnson et al. (2007) highlighted the dearth of research specifically addressing professional development and student achievement. Therefore, the findings of this study indicating a significant relationship between professional development and achievement helps to address a gap in the extant literature.

Instructional Support

Instructional support was also positively correlated with achievement. On the TELL, instructional support addresses the extent to which teachers are given support and autonomy, and it addresses the extent to which student and teacher assessments relate directly to improving practice. The finding that instructional support correlates with achievement was not surprising. In a similar effort, Pennsylvania implemented instructional support teams in select elementary schools to support problem-solving within multi-tiered support systems. Within those schools, student achievement on state standardized testing improved, and special education referrals decreased (Kovaleski & Glew, 2006). Although the TELL did not address a specific program as Kovaleski and Glew's study did, it does corroborate the finding that systematic, data-driven support is related to improvements in student achievement.

Leadership

As previously described, the TELL factors of school leadership and teacher leadership were combined to form one leadership scale (due to concerns regarding collinearity). When examining the items within both scales, they appeared to combine well into one construct—among other topics, both scales included items mentioning administrators granting teachers influence in decision-making and addressing teachers' concerns. An unexpected result was the significant, negative relationship between leadership and achievement. This was somewhat surprising, given the research on the benefits of positive effects from good leadership, positive relationships among teachers and administrators, and systems for teacher voice and influence in decision-making (e.g.,

Kelley, Thornton, & Daugherty, 2005; Price, 2011; Rafferty, 2003; Rhodes, Camic, Milburn, & Lowe, 2009).

However, Nettles and Herrington (2007) point out that the preponderance of research on the relationship between leadership and achievement examines indirect effects rather than direct effects. This is supported by Louis, Dretzke, & Wahlstrom (2010), whose study used structural equation modeling to find that leadership had only an indirect effect on achievement, mediated by teachers' professional communities and focused instruction. Similarly, Williams (2009) examined the relationship between achievement and several aspects of school leadership (instructional leadership, interpersonal skills, making decisions, planning and organization, teacher evaluation, school climate). Of these only planning and organization, as well as school climate (defined in Williams' study as one component of positive leadership), were significantly correlated with achievement—and only very weakly.

Given that leadership had a positive and moderate (.41) bivariate correlation with achievement, it may be that the obtained negative partial correlation is an artifact of accounting for the effects of all the other school climate variables within the regression analysis. The above studies suggest that observed effects of school leadership on achievement can also be explained by other variables. In other words, positive, collaborative, democratic school leadership appears to positively influence achievement only inasmuch as it promotes improvements in other aspects of the school environment. The results of the current study seem to take this further; it would seem that this type of positive leadership would even be detrimental if the other factors are not also in place. It may be that in schools where achievement is already low and systemic factors are

ineffectual, a collaborative leadership style that grants teachers too much influence may not be able to make the necessary systemic changes to result in lasting improvements.

Indeed, Finnigan and Stewart's (2009) study of low-performing Chicago schools reported that the schools that made the most significant improvements in performance were led by principals who collaborated with teachers while still maintaining centralized decision-making control. These principals listened to teachers' voices but did not acquiesce their own authority. Additionally, the more successful principals were willing to terminate teachers who were found to be ineffective. Each of these traits suggests a more authoritarian approach than reflected in the TELL items; however, it may be that this type of leadership style is necessary in schools where other positive contributors to success may be missing. It would be an interesting avenue for future research to further examine whether the positive effects of leadership are due to other factors. This would suggest, furthermore, that school leadership should not be examined in isolation, but rather it should be examined as it operates in relation to other aspects of school climate.

School Climate and Achievement Gap

A significant relationship was also found between school climate and the amount of achievement gap—that is, the extent to which White students outperformed Latino students within a given school. For this study, a significant, positive relationship would indicate that the presence of that aspect of school climate would be related to a larger gap. Therefore, it would not be expected that the same factors would contribute to both overall achievement of schools and the amount of their gap.

There has been limited research on the relationship between achievement gap and school climate. However, of the existing research, there is some evidence to suggest that

climate is important to consider. Mattison and Aber (2007) specifically examined school racial climate—that is, students’ experiences of racism within the school and their perceptions of racial fairness and/or need for change. They found both significant differences in perceptions of climate based on students’ race and gender, as well as significant relationships between perceptions of positive climate and positive student outcomes (e.g., grades, less involvement in school discipline), even when accounting for race and gender. Therefore, although it did not address gap at the school level, Mattison and Aber’s study (2007) does suggest that perceptions of climate may help account for racial disparities in achievement.

Another study connecting climate and achievement gap was conducted by Brown, Benkovitz, Muttilllo, and Urban (2011). Their study examined achievement gap at the school level—24 schools of similar overall achievement were sorted by their amount of disparity between achievement of White students and achievement of students from other racial/ethnic backgrounds. Then, the researchers qualitatively studied the differences between schools with large gaps and schools with small gaps. Although they found that the two groups of schools were similar regarding some factors—for example, facilities, school discipline, and teacher qualifications—they did find notable differences regarding the extent to which school leadership recognized and celebrated student achievement, expected excellence from all students, monitored teachers, and gave support and feedback regarding instruction. They also found that schools with smaller gaps had better communication and involvement with students’ families.

The finding that large-gap and small-gap schools had similar facilities corresponded to the results of the present study in which facilities did not have a

significant relationship with the degree of achievement gap. However, Brown et al. (2011) suggested that instructional support was different between small- and large-gap schools, but no such relationship was found in this study. Most surprisingly, Brown et al. found that schools with smaller gaps were more likely to have positive relationships with students' families, whereas the current study found that schools with higher endorsed levels of parent involvement and community connections had larger achievement gaps between White and Latino students. It is possible that these differences in results may reflect the different methodologies that were used.

Nevertheless, Brown et al.'s (2011) study supports the finding that school climate appears to help explain differences in schools' achievement gaps. Like the current study, their study examined gap as a characteristic of the school, looking at factors that influence its size among different schools. However, it used a much smaller sample size of schools than the current study, and chose schools from one school district that had similarly high achievement (all schools had been previously designated as "honor" schools). Their results might therefore be less applicable to schools with lower overall achievement. In contrast, the current study used a larger sample of schools from across the state of Colorado, and included a wide range of overall achievement, size, urbanicity, etc. Therefore, it may be more generalizeable and applicable to a greater variety of schools across the nation. Moreover, the current study did not dichotomize gap, dividing the schools into two groups of large and small, but rather used gap as a continuous variable, allowing for more detailed statistical analysis. As with overall achievement, professional development emerged as an important variable associated with smaller achievement gaps.

Professional Development

Professional development was significantly and negatively correlated with achievement gap, indicating that more professional development was associated with a smaller gap. As described above, previous research has found associations between professional development programming and improved student academic performance (e.g., Hough & Schmitt, 2011; Johnson, Kahle, & Fargo, 2007). Relevant to the current study, research has also found that professional development can improve the achievement of students in commonly under-performing groups. For example, Santau, Maerten-Rivera, and Huggins (2011) examined the effect of a 5-year professional development intervention on math and science achievement of English language learner (ELL) students. They found that the ELL students had scored significantly lower than an English-proficient control group (with no intervention) at the pretest; however, the students scored higher at the post-test. Furthermore, both ELL and English-proficient students benefited when their teachers received the professional development. Therefore, this intervention appeared effective at narrowing the gap between ELL and non-ELL students in math and science achievement. Similarly, Kennedy (2010) found significant improvements in the reading skills of students in a high-poverty school after a teacher professional development endeavor. Students progressed significantly more than what would be expected based on their pretest performance; indeed, on average, these students had increased by more than half of a standard deviation on a standardized reading test.

These two studies yielded results that effectually narrowed the achievement gap by means of professional development programming. Although it is not possible to endorse any specific professional development program based on the current study, the

results clearly support that positive perceptions of professional development opportunities were associated with higher achievement and with smaller gaps.

This is a rich area for future research because the items on the TELL did not address professional development specifically focused on teaching diverse students or culturally competent practice. It is not known what type of professional development was offered and whether the same types of programs are effective for both increasing achievement and reducing gap. This is worth mentioning because it may be that the specific content of the professional development is less instrumental than simply whether it is applicable and beneficial to teaching and learning within the school. Furthermore, it suggests that teachers' content knowledge and pedagogy training—and, for that matter, the extent to which knowledge and practice are unified across teachers within a school (which would be the effect of school-based professional development, even when teachers received their degrees from different institutions)—may be one of the most useful avenues for both increasing achievement and reducing achievement gaps.

Time

Teacher time was positively correlated with achievement gap, suggesting that higher satisfaction regarding time was associated with larger gaps. This finding was unexpected. However, it may in fact be a situation of reverse causality (of course, speculations regarding causality should be offered with much caution in any correlational research). In previous research regarding schools and districts that have managed to dramatically narrow (or even eliminate) achievement gaps, wide-spread, substantial systemic changes are usually involved (e.g., Pertrilli, 2005; Smith, 2011). In the midst of these reforms, teachers likely have to take more time to adjust and implement the

changes, requiring either less time devoted to direct instruction or more time spent outside school hours (or both). This would be an interesting avenue for future research, particularly regarding what aspects of reform implementation would be most effective for promoting both movement toward equity as well as overall student benefit.

Community Support

Community support was positively correlated with both achievement and the achievement gap. The positive correlation with achievement was expected, as described above. However, the association between community support and larger achievement gaps was unexpected. The preponderance of research suggests that more parental and community involvement results in better outcomes for students, including Latino students. For example, DeGarmo and Martinez (2006) surveyed Latino high school students about support factors contributing to their grades, homework completion, academic self-efficacy and intent to graduate. They found that family support was more strongly associated with these outcome variables than were students' relationships with either teachers or peers. Furthermore, the reserachers found that the effect of overall social support (parents, teachers, and peers) was able to compensate for negative effects of experiencing discrimination.

In Zalaquett's (2005) study, 12 Latino college students were interviewed regarding what life factors supported their educational attainment. All of them reported that parental support had been crucial for their success—even, interestingly, when the parents had not themselves achieved higher education (all but two of those interviewed were first generation college students). Furthermore, a study of Latino university students in science, technology, engineering and mathematics fields (Peralta, Caspary, &

Boothe, 2013) found that although parental encouragement appears to be the strongest source of support, friends and communities are also significantly instrumental in the students' success. In light of these studies, as well as the previously-described research, it would have been expected that family and community support would have been associated with more educational equity between Latino and White students. Therefore, the finding of a positive relationship between community support and larger achievement gap was surprising.

The results of the current study were based on teacher reports, whereas the research above reflected student perceptions. Teachers and students—and parents, for that matter—may have different personal definitions and expectations of what parent and community support mean. When examining the TELL questions related to this construct, many of the items address parental participation with the schools' operations, such as “parents/guardians support teachers, contributing to their success” and “parents/guardians are influential decision makers in the school.” The items on the TELL mirror teachers' definitions of parental involvement as examined by Lawson (2003) in an ethnographic study of an elementary school in a low-income, predominantly African American community. When interviewing teachers about parental involvement, teachers defined the concept in school-centric terms, mainly speaking of ways that parents could support teachers' efforts—particularly by coming to school to volunteer and by reinforcing lessons at home. Teachers expressed their highest approval toward parents who were willing to come to the school when called and perform tasks the teachers asked. Parents, however, spoke in child- and community-centered terms. Parents viewed their role as doing what was necessary to keep their children provided for and safe, helping their

children achieve positive life outcomes and working toward improving the environment of the community as a whole. These differing definitions suggest a cultural mismatch regarding the meaning of *parental involvement*. It would be interesting to examine whether a broader definition of parental and community involvement would still be associated with wider achievement gaps or if it would indeed suggest a way to narrow the gaps.

When revisiting the previously-mentioned studies, parental volunteering in class does not appear to truly encompass the type of support that would lead to positive student outcomes, particularly for Latino students. DeGarmo and Martinez (2006) measured family support, among other types of social support, by asking students how comfortable they would feel going to their parents (or other relationships) to talk about various life struggles. They did not ask students about whether their parents volunteered at school or were involved in a parent-teacher organization. Similarly, Zalaquett (2005) found that students defined their parents' support in terms of instilling the value of education and encouraging their children to remain in schooling in order to obtain better life circumstances than they themselves had attained. Zalaquett's study is interesting in that it reported extensive interviews and life stories of students; however, none of the included accounts gave any mention of parents volunteering at school, involvement in parent-teacher associations or organizations, or seeking to influence policy-making (indeed, most of the parents mentioned in the study did not have a high level of education, and some did not speak English).

Although the result of a positive correlation between community involvement and achievement gap was initially surprising, it does make more sense when viewed from the

lens of cultural mismatch between parents and schools. It would be interesting in future research to examine whether other types of involvement, as well as parents' and students' perceptions of involvement, would have a different relationship with the achievement gap.

Achievement and Achievement Gap

Initially, this study was based on the assumption that overall achievement and the achievement gap were highly related. However, with the differing outcomes as related to school climate, a follow up analysis was conducted regarding the correlation between schools' overall achievement and the size of their achievement gap. This analysis revealed a significant but small relationship. In other words, schools with higher overall achievement tend to have larger gaps, although the relationship is relatively weak. This initial assumption was contradicted by the findings. Granted, the correlation was rather small, but it suggests that the efforts and strategies promoted in the field for raising overall achievement may not be sufficient to solve the achievement gap. It may be more beneficial to research and address the two issues separately rather than assuming that what works for the one will also improve the other. Perhaps some students perform very highly, bringing up their schools' overall achievement, while also increasing the size of the gap between them and the students who perform poorly. On the other hand, the schools with smaller gaps may have even their best students performing at a lower level, which would reduce both overall achievement and the size of the gap. At the very least, this finding implies that other factors may be at work which would warrant further research.

Furthermore, this finding highlights the importance of examining disaggregated data and disproportionality. If an achievement gap is present, a school may appear to have adequate overall achievement if some students are performing well, even if others (e.g., students of color) are performing poorly. Administrators and policy-makers may then be satisfied, and conclude that no changes are necessary. However, this is unacceptable from a social justice perspective—schools must offer all students the opportunity to succeed, not merely some. Even if students from the majority are performing well, if students of color are less likely to succeed, systemic changes will be necessary in order to promote equity in society.

Limitations

The largest limitation found in this study was the collinearity among the independent variables, which necessitates caution in interpreting the partial correlations—particularly regarding leadership. Nevertheless, collinearity does not influence the significance and effect of overall models (Freund, Wilson, & Sa, 2006); therefore, the results obtained regarding overall school climate can be accepted with confidence. Statistically, combining teacher leadership and school leadership appeared to resolve some of the collinearity issue. However, this combining made interpretation problematic. Although it appeared to be the case statistically, from a theoretical perspective it is difficult to argue that strong teacher leadership and strong administrative leadership are the same, or that they would necessarily have the same effects on outcomes. Additionally, it must be highlighted that the two constructs were found to be separate, using statistical means, when the measure was first developed (“Validity and Reliability Report,” 2013). It is not clear why they were found to be so highly correlated

in the current study; nevertheless, it should certainly be examined further in future research using the TELL.

Another limitation in this study is the lack of teachers' demographic data. The TELL survey collected information only on participants' role in the school, total years teaching, and years at the current school. However, other characteristics could potentially influence the relationship between teachers' perceptions of climate and the achievement gap. It would be interesting to examine the effect of teachers' ethnicity on both their perceptions of climate and on their schools' amounts of gap. Another informative direction could be to examine cultural mismatch between teachers and students—in other words, the effect of having a faculty and a student body largely comprised of different cultural backgrounds (Moule & Higgins, 2007)—and whether schools with more or less mismatch would have differing amounts of achievement gap.

Avenues for Future Research

Although the current study included teachers' perceptions of their schools' climates, it did not assess student perceptions. Students and teacher may view their schools quite differently; in and of itself, it would be interesting to examine whether teachers and students would have different perceptions of climate within the same school. Some other states collect climate data for both faculty and students, and perhaps families as well. Additionally, cultural mismatch could potentially play a role, particularly if the school has a wide achievement gap and the students and faculty members are mainly from different ethnic groups. Furthermore, it would be interesting to examine whether schools' gap in achievement would be correlated with an ethnicity-based discrepancy in

students' perceptions of climate, or even if such a discrepancy were present (as was found by Mattison & Aber, 2007).

Since professional development was the most promising aspect of climate in this study, it would be beneficial to further study how it affects equity and achievement in schools. Future research could compare different types of professional development (e.g. instructional methods and models), as well as topics. If a certain type or subject of professional development were found to be particularly efficacious, it could be an exciting prospect for programming in schools to promote equity and achievement.

Because of the high collinearity found between teacher leadership and school leadership in this study, it would be useful to investigate the similarities and differences between these two constructs. Future research could develop surveys of the two constructs that more precisely differentiates between them, and then their respective influences on achievement and achievement gap could be analyzed.

The current study also offers a new way to examine achievement gap among schools, using the school as the unit of analysis. Further studies could re-examine previous achievement gap research, which had focused on various predictors of the difference between groups of students and compare those factors to the variance in gap among schools. The school climate variables on the TELL explained 11% of the variance in gap; although this amount is statistically significant, there is still a great deal of unexplained variance. A potential avenue for important future study would be to discover what factors account for the remainder of the variance in achievement gap at the school level. For example, a meta-analysis by Okoye-Johnson (2011) found that the implementation of multicultural education led to reduced racial prejudice among

students. The next step would be to examine whether schools implementing multicultural education programs would also have reduced achievement gaps. Bol and Berry's (2005) study of teacher attributions of the achievement gap could also provide informative avenues for further research. They found that secondary teachers identified four causes for the achievement gap: family factors, society-wide factors, school factors (e.g., curriculum and instruction), and student factors; some differences were found, however, based on the schools' urbanicity. It would be enlightening to study whether teachers' attributions for the gap would differ depending on the size of their schools' gap, as well as analyzing whether the identified factors are indeed significantly related to the size of the gap.

Another avenue for study could be disproportionality in both special education (e.g., Rueda, et al., 2002; Shifrer, et al., 2010) and advanced programming (e.g., Brice & Brice, 2004; Harris, Plucker, Rapp, & Martinez, 2009; Ouyang & Conoley, 2007). It would be revealing to examine whether there is a significant relationship between disproportionality and overall achievement, and whether different methods of qualifying students for both special education and advanced programming would result in not only differing amounts of disproportionality, but differing amounts of achievement gap. Also, schools' TELL results could be compared to rates of disproportionality to determine whether those disparities are related to school climate.

It is particularly compelling to more closely examine the relationship between school discipline and the achievement gap. Although school discipline factors predicted school achievement, they did not appear to be related to achievement gaps. It would be interesting to examine whether schools with certain behavior programs—for example,

school-wide positive behavior support—would have a narrower gap, and also to examine the relationship between discipline disproportionality and achievement gap. Gregory, Skiba, and Noguera (2010) provide a theoretical basis for this relationship, as well as a possible procedure for measuring discipline disproportionality in schools using risk and odds ratios. Their disproportionality research could be combined with the current study’s method of examining achievement gap to see if the two are correlated among schools.

The post hoc finding of a small but significant relationship between overall achievement and size of gap also brings up possibilities for future research. One issue to be further examined is whether schools that narrow their gaps do so by augmenting the skills and performance of students who would tend to perform more poorly, or whether the gaps are narrowed because the skills of students who would generally do better are diminished. Future research should examine this topic, as well as how achievement and achievement gap may potentially interact when studied in relation to other predictive and explanatory factors.

Importantly, further research on the achievement gap should incorporate growth data and how the gap has changed over time. As described previously, Colorado has demonstrated a slight narrowing of achievement gap over the past decade, while both Latino and White scores have improved (“School View,” 2015). Achievement gap research at the school level can help reveal the results of changing programs and policies in the educational system—which systemic changes and reforms have corresponded with trends of greater equity, and which have not.

Conclusion

In light of the ongoing goal of equity and justice within the education system, policies and strategies to reduce educational disparities must be researched, evaluated, and implemented. Not unexpectedly, current study found a significant achievement gap between Latino and White students in Colorado. In order to help correct achievement disparities, researchers have focused on curriculum, educator training and experience, and accountability reform efforts (e.g., Balfanz & Byrnes, 2009; Beecher & Sweeny, 2008; Palumbo & Kramer-Vida, 2012; Whipple, Evans, Barry, & Maxwell, 2010). School climate also appears to be a promising avenue for improving educational equity (e.g., Brown, Benkovitz, Muttillio, & Urban, 2011; Mattison & Aber, 2007). The current study found that school climate significantly related to both overall achievement within schools, as well as to the size of the achievement gap between White and Latino students. Post hoc analyses also revealed significant, albeit small, correlations between school climate as a unitary factor and both schools' achievement and achievement gap.

These findings indicated that school climate is a potential avenue for practical efforts to improve schools' achievement and reduce their achievement gap. However, they also revealed complexities that will need to be addressed in future research—particularly regarding what unique contribution each component would make to both achievement and to the achievement gap. Perhaps most importantly, this study highlighted the importance of studying achievement disparities at the systemic level, rather than merely looking at differences between groups of students. Some schools have greater disparities than others, and research addressing the differences among these

schools may hold the most promise for promoting equity and justice in our educational system.

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APPENDIX A
TELL COLORADO SURVEY QUESTIONS

Time

- Q2.1 Please rate how strongly you agree or disagree with the following statements about the use of time in your school.
- a. Teachers have reasonable class sizes.
 - b. Teachers have sufficient instructional time to meet the needs of all students.
 - c. Teachers have time available to collaborate with colleagues.
 - d. The non-instructional time provided for teachers in my school is sufficient.
 - e. Efforts are made to minimize the amount of routine paperwork teachers are required to do.
 - f. Teachers are protected from duties that interfere with their essential role of educating students.
 - g. Teachers are allowed to focus on educating students with minimal interruptions.

Facilities and Resources

- Q3.1 Please rate how strongly you agree or disagree with the following statements about your school facilities and resources.
- a. Teachers have sufficient access to appropriate instructional materials and resources.
 - b. Teachers have sufficient access to instructional technology, including computers, printers, software, and internet access.
 - c. Teachers have sufficient training and support to fully utilize available instructional technology.
 - d. Teachers have sufficient access to reliable communication technology, including phones, faxes, and email.
 - e. Teachers have sufficient access to office equipment and supplies such as copy machines, paper, pens, etc.
 - f. Teachers have sufficient access to a broad range of professional personnel.
 - g. The physical environment of classrooms (e.g., lighting, temperature, air circulation) supports teaching and learning.
 - h. Teachers have sufficient access to the school building before and after regular school hours.
 - i. Teachers have sufficient access to school library resources.
 - j. Teachers have adequate space to work productively.
 - k. The school environment is clean and well maintained.

Community Support and Involvement

- Q4.1 Please rate how strongly you agree or disagree with the following statements about community support and involvement in your school.
- The community we serve is supportive of this school.
 - Parents/guardians are influential decision makers in this school.
 - The school works directly with parents/guardians to improve the educational climate in students' homes.
 - This school maintains clear, two-way communication with the community.
 - This school does a good job of encouraging parent/guardian involvement.
 - Teachers provide parents/guardians with useful information about student learning.
 - Parents/guardians support teachers, contributing to their success with students.
 - Community members support teachers, contributing to their success with students.
 - Parents/guardians know what is going on in this school.

Managing Student Conduct

- Q5.1 Please rate how strongly you agree or disagree with the following statements about managing student conduct in your school.
- Students at this school understand expectations for their conduct.
 - Students at this school follow rules of conduct.
 - Policies and procedures about student conduct are clearly understood by the faculty.
 - Administration consistently enforces rules for student conduct.
 - Administration supports teachers' efforts to maintain discipline in the classroom.
 - Teachers consistently enforce rules for student conduct.
 - The faculty work in a school environment that is safe.

Teacher Leadership

- Q6.1 Please rate how strongly you agree or disagree with the following statements about teacher leadership in your school.
- Teachers are recognized as educational experts.
 - Teachers are relied upon to make decisions about educational issues.
 - Teachers are trusted to make sound professional decisions about instruction.
 - In this school we take steps to solve problems.
 - The faculty has an effective process for making group decisions to solve problems.

- f. Teachers in this school trust each other.
- g. Teachers pursue opportunities to participate in school leadership roles.
- h. Teachers are provided opportunities to take on formal leadership roles in the school (i.e., mentor, instructional coach, etc.).
- i. Teachers are effective leaders in this school.

Q6.5 Teachers have an appropriate level of influence on decision making in this school.

School Leadership

Q7.1 Please rate how strongly you agree or disagree with the following statements about school leadership in your school.

- a. The school leadership consistently enforces rules for student conduct.
- b. The school leadership consistently enforces rules for student conduct.
- c. There is an atmosphere of trust and mutual respect in this school.
- d. The school leadership communicates clear expectations to students and parents.
- e. The school leadership communicates with the faculty adequately.
- f. The faculty and leadership have a shared vision.
- g. Teachers feel comfortable raising issues and concerns that are important to them.
- h. The teacher evaluation process improves teachers' instructional strategies.
- i. Teacher evaluations are fair in my school.
- j. The components of the teacher evaluation process accurately identify effectiveness.
- k. The school leadership works to minimize disruptions for teachers, allowing teachers to focus on educating students.
- l. The school leadership consistently supports teachers.
- m. Teachers are held to high professional standards for delivering instruction.
- n. The school leadership facilitates using data to improve student learning.
- o. The faculty are recognized for accomplishments.

Q7.3 The school leadership makes a sustained effort to address teacher concerns about:

- a. Leadership issues
- b. Facilities and resources
- c. The use of time in my school
- d. Professional development
- e. Empowering teachers
- f. Community engagement
- g. Student learning

- h. New teacher support
- i. Managing student conduct

Q7.4 Overall, the school leadership in my school is effective.

Professional Development

- Q8.1 Please rate how strongly you agree or disagree with statements about professional development in your school.
- a. Sufficient resources are available for professional development in my school.
 - b. Professional development provides teachers with the knowledge and skills most needed to teach effectively.
 - c. Professional development provides ongoing opportunities for teachers to work with colleagues to refine teaching practices.
 - d. An appropriate amount of time is provided for professional development.
 - e. Professional development offerings are data driven.
 - f. Professional development is differentiated to meet the needs of individual teachers.
 - g. Professional development enhances teachers' ability to implement instructional strategies that meet diverse student learning needs.
 - h. Professional learning opportunities are aligned with the school's improvement plan.
 - i. Professional development enhances teachers' abilities to improve student learning.
 - j. Teachers are encouraged to reflect on their own practice.
 - k. Professional development deepens teachers' content knowledge.
 - l. Follow-up is provided from professional development in this school.
 - m. Professional development is evaluated and results are communicated to teachers.
- Q8.5 Teachers pursue professional development opportunities provided in this school.
- Q8.6 School leadership participates in professional development opportunities with teachers.

Instructional Practices and Support

- Q9.1 Please rate how strongly you agree or disagree with the following statements about instructional practices and support in your school.
- a. State assessment data are available in time to impact instructional practices.
 - b. State and local assessment data are used to improve student learning.
 - c. State and local assessment data are useful to me in my efforts to improve student learning.

- d. Teachers in this school use formative assessments in their classroom to make appropriate adjustments to instruction.
- f. The faculty are committed to helping every student learn.
- g. Teachers share their students' accomplishments with the school community.
- h. The curriculum taught meets the needs of the students
- i. Teachers work in professional learning communities to develop and align instructional practices.
- j. Provided supports (i.e., instructional coaching, professional learning communities, etc.) translate to improvements in instructional practices by teachers.
- k. Teachers are encouraged to try new things to improve instruction.
- l. Teachers are assigned classes that maximize their likelihood of success with students.
- m. Teachers have autonomy to make decisions about instructional delivery (i.e., pacing, materials, and pedagogy).

Overall

Q10.6 Overall, my school is a good place to work and learn.

APPENDIX B
DESCRIPTIVE STATISTICS

	Mean*	Standard Deviation*	Range*	Skewness	Kurtosis	VIF
Overall	52.29	18.46	8.49-89.75	-.29	-.70	
Achievement						
Latino	39.73	17.72	5.81-89.13	.17	-.77	
Achievement						
White	59.21	18.07	11.56-97.14	-.37	-.52	
Achievement						
Achievement	19.48	10.02	-4.92-58.58	.76	.82	
Gap						
Percent	33.36	18.77	6.84-86.25	.75	-.45	3.35
Latino						
Percent ELL	12.05	11.69	0.00-53.16	1.45	1.54	
Natural Log	2.19	.90	0.00-3.99	-.01	-.74	1.89
ELL						
Percent	43.49	21.69	2.69-89.37	.20	-.88	3.20
Free/Reduced						
Time	>.01	.30	-.80-1.17	.21	.27	2.01
Facilities	-.01	.32	-1.18-.95	-.25	.86	2.07
Community	-.02	.42	-1.23-.96	-.21	-.28	4.76
Support						
Student	.01	.42	-1.43-1.19	-.28	.15	3.32
Conduct						
Teacher	>.01	.37	.106-1.11	.07	.14	8.55 (before combining)
Leadership						
School	>.01	.36	-1.06-1.09	.10	.24	8.59 (before combining)
Leadership						
Combined	.01	.49	-1.39-1.48	.11	.29	6.11
Leadership						
Professional	>.01	.32	-.93-1.27	.23	.73	3.03
Development						
Instructional	-.02	.34	-1.09-1.23	.14	.88	4.72
Support						

**Please note: School climate variables are reported in standard deviation units*

APPENDIX C
BIVARIATE CORRELATIONS

	Gap	ELL	Latino	FRL	Time	Fac	Com	Cond	T lead	S Lead	Lead	Pro Dev	Ins Sup
Overall achievement	.13	-.13	-.49	-.44	.18	.35	.66	.58	.39	.41	.42	.41	.37
Achievement gap	1	.09	-.08	-.16	.18	.13	.30	.12	.15	.11	.13	.03	.17
Percent ELL	.09	1	.66	.64	-.12	-.18	-.34	-.17	-.13	-.08	-.10	-.05	-.25
Percent Latino	-.08	.66	1	.82	-.16	-.38	-.57	-.33	-.27	-.19	-.23	-.20	-.33
Percent free/reduced lunch	-.16	.64	.82	1	-.18	-.34	-.64	-.35	-.28	-.20	-.24	-.15	-.42
Time	.18	-.12	-.16	-.18	1	.56	.48	.40	.62	.60	.61	.56	.65
Facilities and resources	.13	-.18	-.38	-.34	.56	1	.60	.47	.58	.55	.56	.59	.61
Community support	.30	-.34	-.57	-.64	.48	.60	1	.74	.71	.68	.71	.56	.71
Student conduct	.12	-.17	-.33	-.35	.40	.47	.74	1	.72	.79	.78	.56	.62
Teacher leadership	.15	-.13	-.27	-.28	.62	.58	.71	.72	1	.91	.98	.75	.85
School leadership	.11	-.08	-.19	-.20	.60	.55	.68	.79	.91	1	.98	.76	.77
Leadership combined	.13	-.10	-.23	-.24	.61	.56	.71	.78	.98	.98	1	.76	.81
Professional Development	.03	-.05	-.20	-.15	.56	.59	.56	.56	.75	.76	.76	1	.73