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Tiffany M. Jones

Understanding Race Differences in Academic Outcomes, School Climate and Social Emotional
Learning to Promote Racial Equity and Policy Reform

Tiffany M. Jones

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Reading Committee:

Todd Herrenkohl, Chair

Amelia Gavin

Charles Fleming

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University of Washington

Abstract

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Tiffany M. Jones

Chair of the Supervisory Committee:

Todd Herrenkohl

School of Social Work

This dissertation investigated relationships between school climate, social emotional learning (SEL) and racial equity in academic outcomes to understand the role that school climate and SEL can play in the promotion of racially equitable academic outcomes. The setting of the study was the Seattle Public Schools (SPS), a racially diverse school district serving over 50,000 students. All students in grades 3-12 are invited to complete a survey each Spring that covers school climate and SEL. The present study found the student survey to be a reliable measure of student perceptions of school climate and student self-reported SEL, which, after some adjustment, was invariant to race, gender, and home language. This study found that Multiracial students reported significantly less positive perceived school climate, while Asian and Latinx students reported slightly more positive perceived school climate compared to White students. All racial groups of color reported lower levels of self-reported SEL compared to their White peers. School climate did not account for race differences in self-reported grades. SEL accounted for a statistically significant, but small portion of race differences in grades. The strength of the association between SEL and grades was not as strong for Black, Native, Asian, and Multiracial students compared to Whites. Perceptions of school climate were positively associated with grades for all racial groups, although the association was less

strong for Asian students. Finally, schools with more positive school climates experienced smaller race differences in student self-reported grades. The moderating effect of school climate on race differences in grades remained after accounting for the poverty level of the school and students' own perceptions of climate at their school. This moderating effect may be confounded by the effects of school grade-level category (i.e., elementary, middle, or high) since perception of positive school climate was lower in middle and high schools than in elementary schools. Despite the difficulty of disentangling school climate from grade-level category, the findings suggest school improvement strategies focused on school climate may promote racial equity in academic outcomes. Additional research on racial equity in SEL and its role in race differences in grades is also warranted.

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INTRODUCTION

The goal of this dissertation was to investigate relationships between school climate, social emotional learning (SEL) and racial equity in academic outcomes in the Seattle Public Schools (SPS). The SPS is a diverse urban district that serves more than 50,000 students. Most student groups of color, with the exception of some students of Asian descent, have consistently had less academic success compared to White students (Kao & Thomson, 2003; Lee, 2002). These racial differences are present in SPS, where Black students are performing 3.5 grade levels below White students on achievement tests (Morton, 2018; Reardon, Robinson-Cimpian, & Weathers, 2015). In addition 83% of Asian students, 79% of Multiracial students, 79% of Pacific Islander students, 74% of African students, 70% of African American students, 64% of Latinx students, and 48% of Native American students graduate on time compared to 83% of White students (SPS, 2017). Given these racial differences in student outcomes, it is important that all school improvement efforts are evaluated as to whether they contribute to or diminish racial equity in academic outcomes.

It is critical to investigate the roles that school climate and SEL can play in the promotion of racially equitable academic outcomes. This dissertation will report on self-reported grades as the primary academic outcome since the data were anonymous and unable to be linked to student achievement data. School climate represents students' social experience of school and is the subject of many school improvement strategies. School climate has been linked to academic outcomes in many reviews (Berkowitz, Moore, Astor, & Benbenishty, 2016; Thapa, Cohen, Guffey, & Higgins-D'Alessandro, 2013; Wang & Degol, 2016). There are numerous ways to define and measure school climate; this dissertation is based on the way that SPS has chosen to define school climate. A positive school climate has been shown to boost academic performance of students of low socioeconomic backgrounds, whereby the performance gap between low- and high-income students is less in schools with a positive climate than in those with a poor climate (Berkowitz et al., 2016).

SEL is the broad set of “soft skills” that are important for academic success alongside academic skills. Building social relationships, managing one’s own emotions, and recognizing and responding appropriately to emotions in others are all social emotional skills. There is some evidence that SEL is tied to academic success, though the evidence is mostly from intervention studies rather than etiological or longitudinal studies (Domitrovich, Durlak, Staley, & Weissberg, 2017; Durlak, Weissberg, Dymnicki, Taylor, & Schellinger, 2011).

Despite these promising connections of school climate and SEL to academic outcomes, little is known about whether these factors can be used to promote racial equity. It is critical to investigate these relationships empirically in order to avoid investing in programs that may widen rather than lessen the differences in student academic success that has historically been patterned by race. To learn about the relationships between school climate, SEL, and race differences in student academic outcomes, I analyze the annual student survey of SPS students. My analyses are intended to unpack the average positive effect that many studies have shown for school climate and SEL and examine specifically whether school climate and SEL are related to racial equity in student academic success. To accomplish this goal, I have written three papers for my dissertation. The first paper establishes the measurement model and psychometric properties for the student survey, which was developed by SPS to align with school improvement strategies in place at the district level. A strong survey that is reliable and valid is necessary to investigate substantive questions about SEL, school climate, and academic outcomes. The second paper analyzes race differences in perceptions of school climate and SEL, the extent to which school climate and SEL account for the relationship between race and academic success, and whether school climate and SEL relate to academic success for students of different racial groups to the same extent. The third paper examines whether school climate explains school variation in race differences in grades, to help understand whether school climate is a factor that is associated with racial equity in student grades.

References

- Berkowitz, R., Moore, H., Astor, R. A., & Benbenishty, R. (2016). A Research Synthesis of the Associations Between Socioeconomic Background, Inequality, School Climate, and Academic Achievement. *Review of Educational Research, 87*(2), 425-469. doi:10.3102/0034654316669821
- Coburn, C. E., Penuel, W. R., & Geil, K. E. (2013). *Research-practice partnerships: A strategy for leveraging research for educational improvement in school districts*. New York, NY: William T. Grant Foundation.
- Domitrovich, C., Durlak, J., Staley, K., & Weissberg, R. (2017). Social-emotional competence: An essential factor for promoting positive adjustment and reducing risk in school children. *Child Development, 88*(2), 408–416. doi:10.1111/cdev.12739
- Durlak, J. A., Weissberg, R. P., Dymnicki, A. B., Taylor, R. D., & Schellinger, K. B. (2011). The impact of enhancing students' social and emotional learning: a meta-analysis of school-based universal interventions. *Child Development, 82*(1), 405–432. <https://doi.org/10.1111/j.1467-8624.2010.01564.x>
- Kao, G., & Thompson, J. (2003). Racial and Ethnic Stratification in Educational Achievement and Attainment. *Sociology, 29*(1), 417–442. doi:10.1146/annurev.soc.29.010202.100019
- Reardon, S. F., Robinson-Cimpian, J. P., & Weathers, E. F. (2015). Patterns and trends in racial/ethnic and socioeconomic academic achievement gaps. In H. A. Ladd & M. E. Goertz (Eds.), *Handbook of research in education finance and policy* (2nd ed.) (pp. 491–509). New York, NY: Routledge.
- Thapa, A., Cohen, J., Guffey, S., & Higgins-D'Alessandro, A. (2013). A review of school climate research. *Review of Educational Research, 83*, 357-385.
- Voight, A., & Nation, M. (2016). Practices for improving secondary school climate: A systematic review of the research literature. *American Journal of Community Psychology, 58*(1-2), 174–191. doi:10.1002/ajcp.12074
- Wang, M.-T., & Degol, J. (2016). School climate: A review of the construct, measurement, and impact on student outcomes. *Educational Psychology Review, 28*(2), 315–352. doi:10.1007/s10648-015-9319-1

PAPER 1: PSYCHOMETRIC ANALYSIS OF SEATTLE PUBLIC SCHOOL'S ANNUAL STUDENT SURVEY OF STUDENT PERCEPTIONS OF SCHOOL CLIMATE AND SOCIAL EMOTIONAL LEARNING

Researchers, practitioners, and the public have become interested in promoting the social and emotional development of students and improving students' social experience of school, also known as school climate (Duckworth & Yeager, 2015; Farrington et al., 2012; West et al., 2016). A focus on school climate and social emotional learning (SEL) stems from a growing consensus that students' social and emotional experiences of school are important to consider alongside their academic needs (Voight & Hanson, 2017). Thus, school districts are increasingly measuring climate and social emotional skills to assess growth and change of school climate at schools, and social emotional skills in students (Darling-Hammond, et al., 2016; Durlak, Weissberg, Dymnicki, Taylor, & Schellinger 2011). The current study investigated the psychometric properties of the SPS student survey and explains the motivations for developing a locally tailored survey. In the present study, school climate and SEL are considered together, as school climate provides a positive social environment to learn social and emotional skills, and the social and emotional skills of students and teachers, in turn, create more positive school climates. In this way, school climate and SEL are reciprocal and in a mutually reinforcing relationship (Berg, Osher, Maroney, & Yoder, 2017). Drawing from national sources and local initiatives, Seattle Public Schools (SPS) developed a student survey to measure student perceptions of school climate and their own SEL skills. The survey is designed to provide information to school and district leaders about students' experiences in school creating a feedback loop for school improvement goals.

School Climate

School climate “represents virtually every aspect of the school experience, including the quality of teaching and learning, school community relationships, school organization, and the

institutional and structural features of the school environment” (Wang & Degol, 2016, p. 1). There is no consensus about how to define school climate or on what aspects of the school social experience are most important to consider, though there is significant overlap between definitions (Cohen, McCabe, Michelli, & Pickeral, 2009; Garibaldi, Ruddy, Kendziora, & Osher, 2015; Thapa, Cohen, Guffey, & Higgins-D’Alessandro, 2013; Wang & Degol, 2016). Generally, school climate captures aspects of the school experience related to physical and emotional safety, quality of instruction, and relationships between students and among students and teachers (Cohen et al., 2009; Thapa et al., 2013). Students’ perceptions of safety are affected by incidents of bullying, harassment and physical violence, and students who attend schools they perceive as unsafe have more attendance problems and lower achievement (Thapa et al., 2013). Having a sense of belonging to school is an important part of school climate. Relationships among students and teachers and between peers are fundamental to the social experience of schools and positive relationships are a necessary element to foster a sense of connection or belonging to school. Quality of instruction includes teacher pedagogical practices and teachers’ skill at engaging and motivating students (Thapa et al., 2013; Wang & Degol, 2016). School climate is a malleable component of schools and can thus be the target of school intervention to improve student outcomes.

Research also has demonstrated that school climate matters; many studies have found that school climate has a positive association with student achievement (Bear, Gaskins, Blank, & Chen, 2011; Kwong & Davis, 2015; Shukla, Konold, & Cornell, 2016; Thapa, et al., 2013; Voight & Hanson, 2017). Schools with more positive climates have higher English and math standardized test scores. Improvements in school climate are also associated with improvements in overall school academic performance (Voight & Hanson, 2017). In schools where students feel safe and supported by their teachers and peers, correlational evidence suggests that these students are more likely to have better physical health, miss school less often, engage in fewer risky behaviors, and be more

psychologically well-adjusted (Kuperminc, Leadbeater, & Blatt, 2001; Thapa et al., 2013). Positive school climate provides the necessary conditions for learning, including SEL. Thus, positive school climate depends on the capacity of students to develop positive relationships with each other and the adults at their school. The social emotional skills of students and school staff contribute to a better social experience at school; students and staff who are able to build strong relationships, have empathy for one another, and respond to each other's emotions positively, contribute to a more positive school climate (Berg et al., 2017). Positive school climate provides the necessary supportive social environment to foster the development of students' SEL skills necessary for academic success (Garibaldi et al., 2015).

There are many existing measures of school climate, corresponding to the many definitions of school climate. A number of reviews of climate measures exist (Colorado Education Initiative, 2012; Phillips & Rowley, 2016; Voight & Hanson, 2012). These reviews have highlighted the variation in the depth of psychometric testing that these measures have undergone (Phillips & Rowley, 2016; Voight & Hanson, 2012) and the large differences in the way that school climate has been operationalized across measures (National Center for Education Statistics, 2016). A few of the large-scale school climate surveys come with guides to understand the meaning of the data (U.S. Department of Education, 2016). However, these surveys are, by their nature, disseminated nationally and not necessarily aligned to or responsive to the priorities of local contexts. Since survey validity can only be determined in context and aligned to the ways the survey results will be used locally (Duckworth & Yeager, 201), the national surveys are often unable to provide the kinds of information that will help school districts and teachers to improve their practices in the school and in classrooms. Schools and districts need information related to how they can improve their practices that are within their locus of control and useful at the local level; therefore, the national surveys designed for large-scale surveillance might not be attuned to local needs.

Social Emotional Learning

SEL refers to the process of building social and emotional skills: developing attitudes and beliefs needed for positive social relationships, learning to understand and respond appropriately to emotions, and learning to behave in a responsible manner (Elliott, Davies, Frey, Gresham, & Cooper, 2017; Osher, Kidron, & Brackett, 2016; Zins & Elias, 2007). Built on transactional and ecological theories of development, SEL aims to build skills in youth, to increase resilience, and to prevent problem behaviors (Osher et al., 2016). SEL or a focus on the whole child are a couple of the terms used to refer to different individual skills or competencies required for school success that go beyond traditional academic skills. SEL skills are not specifically cognitive, academic, or related to a single subject (Duckworth & Yeager, 2015; Elias, 2006). Rather, these skills include a set of competencies, attitudes, and beliefs to help students to do well in school, develop relationships with others, and successfully regulate their emotions. I refer to SEL generally, but will use the term *whole child success factors*, when discussing the specific measure of SEL-related skills developed by Seattle Public Schools. Within the broad domain of SEL, I am interested in the two sub-constructs of social emotional competence and learning mindset, referred to collectively here as *whole child success factors*. These social emotional skill areas are associated with student achievement and academic success (Durlak et al., 2011; Zins & Elias, 2007) and are predictors of positive outcomes across multiple domains, including school readiness and performance, and economic, social, psychological, and physical well-being (Duckworth & Yeager, 2015, Dweck, Walton, & Cohen, 2011; Gokiart et al., 2014).

Social emotional competence (SEC) refers to the skills students obtain as a result of SEL. The Collaborative on Social Emotional Learning (CASEL), a national organization devoted to policy and practice of SEL, has defined five social emotional competencies that include relationship skills, social awareness, self-awareness, self-management, and responsible decision-making (Weissberg,

Goren, Domitrovich, & Dusenbury, 2013). Learning mindset refers to degree to which students believe that their abilities can be cultivated through effort and that one's intellectual ability is malleable and can be developed (Dweck, 2006; 2015). Learning mindset, or growth mindset as it is also called, is the opposite of fixed mindset, or the belief that ones' academic capability is predetermined and unchangeable (Dweck, 2006, p. 6). Students who approach learning with a growth mindset do more than just put in more effort, but use multiple strategies to learn, especially when they are stuck (Dweck, 2015). Students with growth mindset also have higher levels of achievement and educational attainment (Dweck, 2006; Duckworth & Yeager, 2015). Learning mindset has been associated with long-term academic success in multiple studies (Duckworth, Peterson, Matthews, & Kelly, 2007; Duckworth & Yeager, 2015; Dweck, 2006; Dweck et al., 2011).

Measuring SEL is fraught with challenges, and of existing measures, none has been denoted as a "gold standard" (Barblett & Maloney, 2010; Gokiart et al., 2014; Jones, Zaslow, Darling-Churchill, & Halle, 2016; Yates, et al., 2008). Though the CASEL framework is widely used for defining the competencies related to SEL, like school climate, the ways that SEL is measured are quite varied. Further, few SEL assessment tools are aligned to CASEL's competencies (Elliott et al., 2017). Measures of SEL come in many forms ranging from self-report, teacher observation of students, universal screeners (Jenkins et al., 2014), student performance tasks, observation of classrooms, and even behavioral rating scales traditionally used in clinical populations (Elliott et al., 2017). This study will focus on student self-report measures. There are benefits and drawbacks to having students report their own SEC and learning mindset. The benefits include the ease of administration of self-report measures to large groups of students cheaply and quickly. There are also significant drawbacks to having students' self-report their own SEC. For example, rating SEC requires self-reflection, students who lack the skill to reflect on their own behavior and emotions are probably also poor raters of their own skill level (Duckworth & Yeager, 2015).

Three comprehensive reviews of social emotional skill measures were published recently that included measures designed for youth in grade school (Crowe, Beauchamp, Catroppa & Anderson 2011; Humphrey et al., 2011; Jenkins et al., 2014). Humphrey and colleagues (2011) found 12 measures that assessed SEC; seven included a self-report component and three were solely student self-reports. Only one of the 12 measures was aligned to the CASEL framework, the Devereux Student Strengths Assessment (DESSA)(Naglieri, LeBuffe, & Shapiro, 2011), and it is an assessment based on teacher observation. Crowe and colleagues (2011) reviewed measures specific to youth social development. These authors found 87 measures, 45 of which were self-reported by students in a survey format. Of these 45, only eight included measures of student self-reported social competence; most measures captured other aspects of social experience such as social support, social maturity, social problems, or social attributions. Of the student self-reported SEC measures covered by these reviews, most were developed for clinical diagnosis, universal screening, or research purposes (such as for theory testing or intervention efficacy trials). None was developed to be used as part of a comprehensive student survey, nor meant to provide feedback to school staff to inform practice improvement.

Another issue in measuring SEL is reference bias. Reference bias refers to the necessary process of comparing oneself to an external frame of reference when rating one's own skill level. Frames of reference differ based on the relative competence of the larger environment of students and students' own culture and the culture at large, but also on the students' own competence. Students who are more competent in a domain tend to judge themselves more acutely in that domain (Duckworth & Yeager, 2015). As such, these measures cannot be used for school comparison, as paradoxical effects have been reported when individual measures of SEL are aggregated to the school level, a dynamic attributed to reference bias (West et al., 2016). Use of self-report measures of SEL or school climate are not appropriate for assessing between program

differences, program evaluation, or as a measure of accountability due to the problem of reference bias (Duckworth & Yeager, 2015). These types of student self-report measures are best used to inform practice improvement (Duckworth & Yeager, 2015), which is the ultimate goal for how the student survey will be used by SPS.

To summarize, the school climate and SEL literature has made clear that there are many areas where additional research on measures of these two constructs is needed. There is significant variation in how school climate and SEL are defined and operationalized in measures. First, the multitude of ways that school climate and SEL are conceptualized implies that there is no one true definition for either. It may be that the aspects of school climate that are most important are context specific. Second, one of the largest gaps in this literature is the connection of school climate definitions (and their related measures) to practice improvement strategies (Cohen et al., 2009). Third, few existing surveys measure both school climate and SEL in the same survey, using the same data collection and reporting procedures.

Seattle Public Schools Student Survey

There were a number of motivators for SPS to choose to design their own student survey to measure student perceptions of school climate and SEL. First, there is no consensus in the research literature on how to define or measure school climate and SEL; no one measure or definition has emerged as the best. Second, it was clear from an early review that large-scale surveys contained many constructs that were either unrelated to local school district priorities or were unrelated to the practices of school staff (e.g., the quality of bathrooms or questions about the school neighborhood). Third, many surveys were proprietary and would require additional funding to purchase rights for use, posing an immutable barrier. Fourth, few surveys considered the perspectives of school practitioners, the teachers, school administrators, and staff, and how they

would use survey results to improve their practices. Fifth, the district had a survey in place already, originally designed to measure student motivation and engagement but tailored to include constructs related to school climate. Changing this survey would require a survey that was superior to what already existed to justify the significant overhaul of systems already in place. Sixth, the context of Seattle is unique in that the school district has some of the largest race differences in academic outcomes in the country (Morton, 2018; Reardon et al., 2017; SPS, 2017), and the district has a sizable refugee population and a surprising diversity in the languages spoken by students and families. This unique context warrants a survey that is amenable to all the different student backgrounds unique to Seattle. I hypothesized that by using a locally developed survey, survey results would be more readily useable by school staff, as they would be aligned to the strategic goals of the school district and tailored to the language used to describe relevant issues. By utilizing district language and priorities in survey development, the goal was to make a survey more easily actionable and usable for practice improvement.

The school climate portion of the SPS student survey was designed to capture students' perceptions of the following constructs: *healthy community*, *belonging*, *classroom environment*, *safety*, *motivation and engagement*, and *pedagogical effectiveness*. *Healthy community* refers to the sense that school is a positive environment where students are treated fairly and with respect. *Belonging* is the students' perceptions of how they fit in the school, including relationships with adults at school. *Classroom environment* is focused on positive relationships between students in the classroom, and students support of each other's learning. *Safety* includes items about students' perceptions of physical safety at school and perceptions of adults' responses to bullying and sexual harassment (at the secondary level). *Motivation and inclusion* refers to students' perceptions of their teachers' ability to encourage students to learn and stay motivated. *Pedagogical effectiveness* measures students' perceptions of specific teacher strategies such as checking for understanding and providing feedback. Conceptually, these

scales substantially overlap with three major school climate frameworks used nationally (Garibaldi et al., 2015). Within the SEL domain, SPS is interested in measuring *Social emotional competence* and *learning mindset*.

Measurement Issues

It is critical to have a clear vision of the purpose of assessment and how the data created by the survey will be used, since “validity is not an inherent feature of a measure itself, but rather a characteristic of a measure with respect to a particular end use” (Duckworth & Yeager, 2015, p. 243). For SPS, the survey data is anonymous (meaning that it cannot be linked back to students or teachers) and is primarily used for practice improvement at the school level, as opposed to accountability or screening (Gokiert et al., 2014). The survey will not be used to assess students’ functioning, nor will it be able to provide student level progress data. Survey data is also used by schools to set yearly goals, by the district as a whole to compare schools’ growth over time, and is included as one of many data points to determine school functioning. Thus, internal consistency and construct validity are of key importance (DeVellis, 1991; Duckworth & Yeager, 2015), as schools use a website, which reports scores by construct in the process of goal setting. Using the survey for these purposes is in line with recommendations of the current state of the art on how climate and whole child success factor data is most useful and how such data is limited (Duckworth & Yeager, 2015).

The student survey relies on student self-report of perceptions of their school, their teachers, and their own SEC and learning mindset. Self-report measures of personal qualities are common, cheap, quick, and reliable, and are best for quantitatively measuring internal psychological states such as self-awareness or sense of belonging (Duckworth & Yeager, 2015). Researchers generally agree that students reporting their perceptions of aspects of climate on a survey is necessary (though staff perception of climate is also relevant), and reliable and valid methods of measuring student

perceptions of school climate exist (U.S. Department of Education, 2016). As long as students feel comfortable in answering survey questions, questionnaires are largely accurate in capturing true opinions (Duckworth & Yeager, 2015).

Measurement invariance is another critical issue in measuring school climate and SEL; it refers to whether there are similar relationships among items to the underlying constructs of interest across groups. Measures assessing school climate and SEC in students from various identities must be shown to be invariant across identities, yet few measures report on invariance testing (Phillips & Rowley, 2015; Konold, Cornell, Shukla, & Huang, 2017). Measures that are non-invariant can lead to bias in statistical analyses (Cheung & Rensvold, 2002; Chen, 2007), yet only two studies in a recent review of school climate literature report on invariance (Thapa et al., 2013) and four of 14 student school climate perception measures recommended by the U. S. Department of Education conducted invariance testing (National Center on Safe Supportive Learning Environments, 2014; Phillips & Rowley, 2015). Similarly, few measures of SEC examine invariance (Ji, DuBois, & Flay, 2013; Zhou & Ee, 2012), and those that do are limited in the student characteristics tested (e.g., Ross and Tolan, [2017] tested invariance by developmental level but not student identities).

Race, gender, language, and grade level are student characteristics that have the potential to influence how students respond to the school climate and SEL surveys. Best practice suggests that measures be invariant across identities and characteristics where there is the potential for difference in the interpretation of items (Chen, 2007). Race and culture are highly intertwined and are likely to influence the frames of reference through which students interpret survey items (Castro-Olivo, 2014; Hoffman, 2009). Research has also shown that students of different genders often develop social and emotional skills at different rates and may experience differences in the values placed on some climate factors or social and emotional skills, also potentially influencing their interpretation of the survey (i.e., female students are generally encouraged to express emotions more than males;

Brackett, Rivers, Shiffman, Lerner, & Salovey, 2006; Denham, et al., 2012). Students who are not native English speakers might interpret items and constructs differently, either due to language difficulty or because of differences in cultural backgrounds or levels of acculturation (Castro-Olivo, 2014). It is also important to understand student skill and SEC in the context of development (Campbell et al., 2016), knowing that students at different developmental levels not only have different vocabulary levels, but also will have differing degrees of nuance in their experiences of the world.

Current Study

Establishing the psychometric properties of the SPS survey is important to construct a solid foundation upon which to build practice improvement goals and show school and district growth over time. There are two goals for this paper. The first is to assess the measurement model of the survey for the whole sample. This will involve examining item functioning and distributions, as well as the degree to which latent constructs hypothesized by SPS fit the data, and the degree of internal consistency among the various subscales. Second, a series of invariance tests will assess whether the measurement model works for students from different identities and grade levels. This will involve testing whether the constructs, the relationships among items, and the means of items relative to the means of other items are consistent for students from different grade levels and identities. Following these steps will allow conclusions to be drawn about the reliability and validity of the survey given the specific uses in the Seattle context and the ability of the survey to represent student perceptions for students across identities and grade levels.

Methods

Survey Development

Before deciding to redesign the student survey, existing free surveys were evaluated for the extent to which they would meet the needs of the school district. The National Center on Safe and Supportive Learning Environments was the main candidate, which provides a free survey along with guides for data use (found here: <https://safesupportivelearning.ed.gov/safe-and-healthy-students/school-climate>). Ultimately, the survey was determined not to be sufficiently tailored to the local context. With a team from SPS, we engaged a process whereby existing surveys of school climate and the various components of SEL were reviewed. Since the constructs on school climate from the main survey already in use contained areas of importance to measure in school climate, this section was included largely in its original form. Small wording adjustments were made based largely on practitioner input. The review of existing surveys focused on aspects of the whole child, including surveys that were meant to be used universally in school-based settings. Stakeholders in the district were interested in adding SEL as there were a number of schools using programs that aimed to improve SEL, some of which were district sponsored. As reported in the literature review, I was not able to find surveys that were meant to be used in the capacity I was interested in. Existing surveys were utilized for ideas on how to ask questions about the student level competencies of interest, but for this section new items were written to correspond to SEL, items that covered the skills and attitudes related to social emotional competence and learning mindset (Denham, 2015; Dweck, 2006; Duckworth et al., 2007).

Sample

SPS, a large urban district that serves more than 50,000 students, administers their student survey every year in the spring. All students in grades 3-12 take the survey. Schools are given the options of providing the survey on paper or on the computer. Schools that elect to administer the

survey on paper generally do so during a class period. Teachers are provided a protocol to read to their class before giving the paper survey, which is one sheet of paper, double-sided. Schools that administer the survey on the computer generally do so by allowing students to take the survey a few at a time on the computers in classrooms. In this case, students read the directions on the computer, rather than hearing them aloud from their teachers. The survey consists of 51 items and takes about 10 minutes for most students to complete. Survey data is collected by the contracted survey administrator, Panorama education. Panorama provides a platform for sharing survey data publicly through a web portal, which can be found here:

http://seattleschools.org/district/district_scorecards/school_surveys. Data from the 2016 survey was used; 71% of the 41,430 students enrolled in 3rd through 12th grade took the survey that year. Students are from a number of racial backgrounds, including 43% White, 16% Asian, 12% Black, 17% Multiracial, 7% Latino, 2% Pacific Islander, and 1.5% Native American students. Students in SPS speak 146 different languages and originate from 149 countries. Fifty-seven percent of families always speak English at home. Approximately 34% meet the low-income requirements to receive free or reduced-price lunch. All schools were invited to administer the survey, including 60 elementary schools, 10 middle schools, 10 K-8 schools, 15 high schools, and 2 alternative schools.

Survey Measures

School climate-related constructs measured included *belonging*, *classroom environment*, *healthy community*, *school safety*, *pedagogical effectiveness*, and *motivation and inclusion*. In addition, SPS included measures of whole child success factors, which included a scale on *learning mindset* and one on *SEC*. Response options are on a 5-point Likert scale. For the school climate scales, response options are 1="Strongly disagree," 2="Disagree," 3="Neither agree nor disagree," 4="Agree," and 5="Strongly agree." For the whole child success scales, response options are, 1="Not like me at all," 2="Not much like me," 3="Somewhat like me," 4="Mostly like me," and 5="Very much like me." The

survey asks students to self-report the following: their race with response options of “Asian,” “Black,” “Latino,” “Multiracial,” “Native American,” “Pacific Islander,” or “White”; gender “Male,” “Female,” or “Decline to state”; how often English is spoken at home with response options of “Always,” “Most of the time,” “Sometimes,” or “Rarely or never” (dichotomized to “Always” or “Not Always” for analyses). Students also self-report their grades, with response options of “Mostly A’s,” “Mostly B’s,” “Mostly C’s,” and “Mostly D’s or E’s.” Grouping variables for invariance testing include all demographics (race, gender, and language spoken at home), and their grade level based on school of attendance: elementary, middle, or high school. For K-8 schools, grade was used to determine level, with 3-5 being elementary and 6-8 being middle school.

Analysis Plan

Two robustness checks were conducted to assess the quality of students’ answers. First, grade levels were compared to students’ school of attendance. A total of 761 students (2.6%) reported being in a grade not served by their school of attendance (for instance, some elementary school students reported being in 12th grade). These responses were not included in analyses. Second, responses were checked to see if any students reported the same answer for all survey items (i.e., all answers were “strongly disagree”). Only 84 students (0.3%) answered with the same response for all items. These responses were kept since the percentage was low, and it is possible that students did intend to answer this way. Item quality was assessed by evaluating the distribution of responses based on the mean, variance, kurtosis, and skewness of each item, and the item correlations and the corrected-item total correlations (DeVellis, 1991). Examinations of descriptive statistics were conducted using SPSS v19.

Confirmatory factor analysis (CFA) assessed whether associations among items conform to the hypothesized measurement model. Fit of the CFA to the data was assessed using the CFI, TLI, and RMSEA. Fit indices of RMSEA below .06, CFI greater than .90, and TLI greater than .90 are

considered sufficient fit (Kline, 2015). The Chi-square was also reported, but not used to assess model fit, as this study has a large sample size. Maximum likelihood estimation was used, and indicators were treated as continuous. Although the response options were ordered categories, ordinal data with five or more categories can be treated as continuous with confidence, given the intended uses of this study's analyses and symmetry in the distribution of its data (Rhemtulla, Brosseau-Liard, & Savalei, 2012). In addition, fit indices used for invariance testing have been validated for use in continuous data only (Chen, 2007; Phillips & Rowley, 2015). CFA constructs were used to establish the items that constituted subscales. Reliability analyses on subscales were conducted using Cronbach's Alpha, which refers to the internal consistency of constructs or the degree to which items are related to each other within proposed constructs (DeVellis, 1991). Examinations of reliability were conducted using SPSS v19. All other analyses were conducted using Mplus v7.4. Missing data was accounted for using Full Information Maximum Likelihood in Mplus (Muthén & Muthén, 2017).

Measurement invariance was examined using multiple group CFA modeling; invariance across gender, race, language, and grade level was tested. Configural, metric, and scalar invariance were tested using a multiple group model for each characteristic and specifying configural, metric, and scalar in the model command of Mplus (Muthén & Muthén, 2017). Using this procedure, the fit of models where parameters of interest are held equal are compared to the free model, where parameters are allowed to vary based on the grouping variable specified in the multiple group model. Surveys where items group together to form constructs in the same way across groups or similarly strong within-construct correlations across groups have configural invariance (Phillips & Rowley, 2015). If students use different frames of reference to interpret items, they may attach different meaning to constructs and item groupings may differ (Cheung & Rensvold, 2002). Configural invariance is found when the same number of factors and same items are related to those factors

across student identities (Cheung & Rensvold, 2002). When testing configural invariance, the number of factors and the items associated with each factor are constrained to be equal across groups. Configural invariance must be established before perceptions of climate can be aggregated to the school level or biased estimates will result (Phillips & Rowley, 2015). Metric invariance is found when the strength of items associated with each construct is similar across groups (i.e., the factor loadings are similar) and is necessary for cross-group comparisons (Cheung & Rensvold, 2002). Bias in estimates of constructs for subgroups of students can result if metric invariance is not established (Phillips & Rowley, 2015). When testing metric invariance, factor loadings are constrained to be equal across groups. Scalar invariance is found when scales have the same operational definition across groups, resulting from similar mean scores on items compared to other items on the same construct. Scalar invariance is necessary to compare the means of scales across groups, and bias in conclusions about the perceptions of constructs in subgroup of students can result if scalar invariance is not established (Cheung & Rensvold, 2002; Phillips & Rowley, 2015). In this case, scalar invariance is important to establish before making comparisons of race differences in school climate, for example. When testing scalar invariance, item means are constrained to be equal across groups. The Chi-square was also reported, but not used to assess model since it will almost always be significant due to the large sample size. Deviations from fit were assessed using the CFI, and a critical value of a change of 0.01 in the CFI is considered to demonstrate non-invariance (Cheung & Rensvold, 2002). All CFA models were run in Mplus v7.4 (Muthén & Muthén, 2017).

Results

Descriptive Statistics

Descriptive statistics, reported on Table 1.1, indicate that the mean of all items is between 3.09 and 4.22 with an average standard deviation of 1.02. No variable had a skewness of less than -

1.37 or kurtosis of more than 1.44. Item correlations were all significant ($p < 0.0001$) and ranged from 0.07 to 0.57. Three items had a corrected-item total correlation of less than 0.3, suggesting that these items are not sufficiently related to the other items in the scale as hypothesized by the original measurement model (DeVellis, 1991; Traub, 1994). The first item dropped was, “I belong to a group of friends at school,” which had very low variance. Very few students reported that they did not belong to a group of friends at school, which was likely driving the problem of correlation with other items. The only two items with negatively worded scales were also dropped, “Bullying is a problem at my school” and “Sexual harassment is a problem at my school.” It is likely that only having two negatively worded items highlighted these items as being different from the rest, so they were excluded from the subsequent analyses.

CFA Results

The measurement model proposed by SPS, with some minor modifications, was largely confirmed by the CFA. The fit of the initial measurement model did not meet the threshold for adequate fit (RMSEA= 0.048; CFI= 0.900; TLI=0.890). Modification indices suggested specifications contributing to poor fit, and the largest four indices were utilized to make changes. The largest of the modification indices suggested the two items related to bullying, “Adults notice if someone is bullied” and “Adults are able to stop someone from being a bully,” were associated independent of their relationships to the latent safety factor ($\Delta \chi^2 = 3628$). The residuals for these items were allowed to correlate in the model. Second, the item “Students in my school treat each other with respect” was removed from the model, since modification indices suggested the item was strongly related to multiple constructs. Lastly, the item “I am treated with as much respect as other students” was moved from the *belonging* construct to the *healthy community* construct ($\chi \Delta^2 = 3104$). With these modifications, fit of the final measurement model was sufficient (RMSEA= 0.042; CFI= 0.926; TLI=0.919). Standardized factor loadings range from .55 to .79 and are reported in Figure 1.1.

Based on these final scales, Cronbach's alphas were calculated for scales and are reported in Table 1.2. All reliabilities were acceptable, ranging from .72 to .87.

Many of the correlations among model constructs were high (see Table 1.3). There were three instances where correlations were above .90, suggesting constructs were nearly indistinguishable in the eyes of students. The correlation between the *healthy community* and *safety* constructs was near 1 ($r=.99$). *Belonging* and *healthy community* showed very high correlations ($r=.91$), as did *teacher pedagogy* and *motivation and inclusion* ($r=.93$). The *teacher pedagogy* and *motivation and inclusion* scales were both asking students to refer to the practices of their teachers, and this high correlation suggests that students do not rate these constructs as different from one another. The *belonging* and *healthy community* scales both refer to different things adults do to encourage community or belonging.

Measurement Invariance Testing

Measurement invariance was examined for the grouping variables race (Asian, Black, Latino, Multiracial, Native American, Pacific Islander, White), gender (male, female, decline to state gender), home language (English always spoken at home, English sometimes, rarely or never spoken at home), and grade level (elementary, middle, high school). Mean scores on each scale for the different student characteristics tested are reported in Table 1.4. Fit for the configural, metric, and scalar invariance models are reported in Table 1.5, including change in fit from the configural model to the more stringent metric and scalar models. Evidence for configural, metric and scalar invariance across the grouping variables of gender and home language was found, since the change in fit as measured by the CFI when models were constrained to be equal did not decrease more than 0.010. Evidence also indicated configural and metric invariance for the grouping the variables race and grade level. There was, however, evidence of scalar non-invariance for both race ($\Delta\text{CFI}=-.011$) and grade level ($\Delta\text{CFI}=-0.024$). To probe non-invariance based on racial group, I assessed degradations in fit across

all items when each was constrained to be the same across racial groups. Three problematic items were found: “I have clear goals for my future,” “My teacher shows us how our work will help us in real life,” and “I feel safe at my school.” The pattern of means of these items relative to the means of other items within the constructs they reflect differed by race. The means of each item by race were examined (or “difficulty” in terms of typical language for describing non-invariance), and racial differences were found in the average by race for each item (means of “safe” item: Asian=4.02, Black=3.32, Latinx= 3.76, Multiracial=3.65, Native= 3.24, Pacific Islander=3.59, White=4.23; means of “real life” item: Asian=3.18, Black=3.06, Latinx= 3.06, Multiracial=2.85, Native= 2.97, Pacific Islander=3.03, White=2.60; mean of “goals” item: Asian= 3.41, Black= 3.92, Latinx=3.60, Multiracial=3.31, Native= 3.19, Pacific Islander= 3.4, White=3.23). The difference in means for each racial group on these items were large enough to indicate that differences in the difficulty of the item or that the means of some items were significantly different relative to the means of other items between racial groups. If any two of the three items were removed, the change in fit from metric to scalar models was no longer above the threshold. I decided to remove the “goals” item and the “real life” item rather than removing the “safe” item, as the safe item is more closely aligned with the label for the *Safety* scale. Since including these items would create scales that were not comparable among racial groups, they were removed from the final model, and the measurement properties of the CFA were re-evaluated. The final model fit was still sufficient (RMSEA= 0.041, CFI= 0.935, TLI= 0.927), and factor loadings ranged from 0.58-0.76. Final model latent factors and factor loadings are shown in Figure 1.1.

The data revealed evidence of scalar non-invariance across grade level, suggesting that the pattern of item difficulty varies by grade level. While it is an important finding that the survey is interpreted differently by students in different grade levels, I concluded that no changes needed to be made to the survey. This conclusion is based on the typical usage of the survey. It was important

to the school district that the survey be the same across grade levels, so changing items based on non-invariance was not an option. The survey is generally used to make comparisons across schools within the same grade level, so elementary schools are generally compared against different elementary schools, etc., within the district when school comparisons are made. The limitations of the survey are known to school district staff and will be communicated to the survey users.

Discussion

Study findings suggest that Seattle Public Schools' student survey is a reliable and valid survey of school climate and SEL with adequate psychometric properties. The strength of the survey depends on its ability to measure student perceptions of school climate in a way that relates to SPS' vision for improving schools, especially by focusing on student safety, belonging, and community. The survey also reliably captures self-reported SEL. These findings confirm the current usage of the SPS student survey as a tool to inform practice improvement strategies. These findings also offer important contributions to the literature, as well as highlight areas needing improvement in the student survey.

The process of psychometric validation of the SPS student survey shed some light on the intersection between research and practice, and points to the importance of linking survey analyses to the planned uses of the survey in order to determine the survey's validity (Duckworth & Yeager, 2015). A number of analysis decisions were guided by the needs of the district or tailored to the specific uses of the survey. First, it was critical to recognize and work within the existing infrastructure (website design, in progress school goals, district scorecard, etc.) surrounding the student survey in its current form. The starting point for survey development was not a blank slate as it often is for research purposes. Rather, I worked in partnership with the school district to understand the context that the survey would be used in and how end-users interacted with the data.

Teachers and school leaders access their schools' results through a publicly available website at: (www.seattleschools.org/district/district_scorecards/school_surveys). This meant that schools already had goals in place based on the survey as it currently existed, and the language used as part of the constructs and items was already in place. The typical first step in survey design would be exploratory factor analysis. Yet, changing the entire makeup of the survey based on exploratory factor analysis findings would be disruptive to the way the survey is used year after year for making survey-based goals. Instead, I began the analysis with confirmatory factor analysis using the constructs as proposed by the school district, considering these constructs as being based on the ways in which practitioners develop goals. Additional changes to the factor structure could have been made to improve fit but would have increased the differences in the final model compared to the reporting mechanisms in place.

The current study's analysis of measurement invariance begins to fill a large gap in research on climate and SEL. The findings herein also provide further evidence for the importance of invariance testing along aspects of student identity and development. I found evidence for scalar non-invariance across race and grade level. Students of color in schools are known to have significantly different school experiences compared to their white peers (Carter, Skiba Arredondo, & Pollock, 2016), making students racial background an important factor to test for invariance. Students' different experiences might lead them to interpret items differently since their frames of reference might vary, influencing the likelihood that they respond positively or negatively to items within constructs.

The finding of partial non-invariance by grade level was not surprising, though it did confirm my assumption that students interpret items differently when they are in elementary school compared to high school. It was a priority of the school district to have a survey that was applicable across all grades where possible, rendering the possibility of making changes to the survey to adjust for

non-invariance across level unfeasible. Here again was another decision where I had to weigh the analytic consequences of non-invariance to the issues that changes would cause in the context of the survey's use. Practitioners were most likely to compare to other schools within the same level, and additional changes to the survey to account for non-invariance would be counterproductive.

I found similarities and differences in the invariance testing results compared to Phillips and Rowley's (2016) findings on the Tripod school climate measure. Both tests find partial scalar non-invariance by race, but Phillips and Rowley found their measure to be invariant by grade level. This is likely due to the fact that elementary students are not included in their sample. I found invariance by gender, but the Tripod survey showed evidence of scalar non-invariance by gender. Their survey freed parameters across factors that were found to be non-invariant to achieve comparable means. This strategy is not feasible in the case of SPS, since means are compared using the public facing website and because it would not be feasible for practitioners and school staff to set goals based on means where partial non-invariance would need to be taken into account.

Since the survey is used primarily for goal setting and practice improvement, it implies that the users of survey data are primarily teachers and school staff, rather than researchers. The perspectives of the survey data users were considered when making decisions about strategies for how to address the high correlations among factors and non-invariance of the survey by race and level. Even though the survey results produced scales with different names and adequate reliability, there is significant redundancy among constructs of the survey. The survey could be much shorter and obtain the same general results. The high correlations among survey constructs are also evidence that the survey constructs lack discriminant validity. The decision to keep the survey construct as is represents another way that the considerations of practitioner use was taken into account. The separation between *healthy community* and *safety* constructs was maintained despite the near perfect correlation of these constructs, because the practice strategies to improve each construct are likely

very different. Schools are likely to take different actions when they implement changes focused on improving safety, compared to the changes to improve community. For example, teachers may provide additional adult supervision at recess where students are complaining of bullying to improve students' perceptions of safety, while they may implement positive reinforcement systems for acts of kindness to improve sense of community. Having more items than needed for each construct also helps practitioners to get a sense of what kinds of student experiences make up the different latent constructs. It is also theoretically meaningful that these constructs are highly related, a healthy community might be necessary for students to feel safe, and vice-versa.

Limitations

While the survey does capture important aspects of climate and SEL, there are also some important lessons to take away from this analysis. Although my efforts to preserve as much of the survey as possible in its original form served the purpose of making it more user friendly for practitioners, these choices also resulted in some important limitations to the survey. Despite the closeness of the hypothesized factor model to the final model, changes that were required to reach sufficient fit did have important substantive implications. The latent construct *belonging* significantly changed as a result of items dropped and moved and serves as an example of how the naming fallacy can lead to incorrect assumptions and problems with practice (Klein, 2015). The naming fallacy can happen when researchers assume the name correctly describes the latent construct's contents, even if a construct is incorrectly labeled (Klein, 2015). The two items related to students' connection to adults were removed from the construct, leaving only three adult focused items. What used to be *belonging* seems more aptly named "relationships with adults." Despite this change in meaning, and because of the way that the student survey is used, changes to naming conventions and reporting practices are not easily made. The high correlations among constructs and disconnects between existing names of constructs and items means that this survey is probably not useful for use in other

contexts. These issues suggest that the survey itself might not be generalizable to other contexts, though the process of developing a practitioner-oriented survey might be useful to replicate in other school districts or other settings where setting up practitioner-oriented data feedback loops is a goal.

Future Directions

These lessons have informed an ongoing planning process to improve the SPS survey and more fully integrate the survey use cases into the survey itself and the process of redesign. I and the team I work with are currently redesigning the survey to more closely align to the way that teachers and school administrators are currently using the survey to improve practice, while also incorporating findings from this analysis into future designs. Constructs are being more carefully defined, taking into account the analysis results (including non-differentiation of some factors and removing poorly performing items), and language from district leaders is being incorporated into construct definitions through a process of stakeholder engagement. The design process is intended not only to make the survey most useful in practice, but also to involve decision makers in the process to increase their awareness of how the survey can be used as a tool to inform practice improvement.

Table 1.1.
Descriptive Statistics

Items	Mean	SD	Skewness	Kurtosis
I enjoy going to school most days	3.56	1.03	-0.69	0.07
I feel proud of my school	3.69	1.00	-0.62	0.10
Adults at school treat students fairly	3.54	1.03	-0.56	-0.15
Students in my school treat each other with respect	3.16	0.97	-0.32	-0.22
We learn how to solve conflicts with each other at my school	3.41	1.01	-0.39	-0.26
I belong to a group of friends at school	4.09	1.03	-1.20	1.04
I am treated with as much respect as other students	3.66	1.01	-0.72	0.19
Adults at my school care about me	3.86	0.93	-0.77	0.61
My teachers take the time to get to know me	3.64	1.02	-0.55	-0.14
If I have a problem there is at least one adult at school I can talk to	3.79	1.09	-0.85	0.16
Students in my class are friendly to each other	3.45	0.96	-0.54	0.15
Students in my class help each other learn	3.45	0.95	-0.47	0.03
Students in my class are respectful to adults	3.29	0.96	-0.35	-0.08
Students in my class are focused on learning	3.22	0.90	-0.28	0.13
I feel safe at my school	3.86	1.01	-0.90	0.58
I usually feel calm and relaxed when I'm at school	3.34	1.11	-0.42	-0.52
I feel safe in the neighborhood by my school	3.74	1.03	-0.74	0.19
Bullying is a problem at my school	3.24	1.18	-0.27	-0.73
Adults notice if someone is bullied at school	3.09	1.11	-0.11	-0.59
Adults are able to stop someone from being a bully	3.22	1.10	-0.22	-0.54
Sexual harassment is a problem in my school	3.69	1.07	-0.54	-0.29
Adults at school take action to stop sexual harassment	3.43	1.03	-0.37	-0.07
I am motivated to learn as much as I can in class	3.86	1.01	-0.82	0.31
My teacher makes what we learn in class interesting	3.54	1.11	-0.51	-0.37
My teacher makes me feel included in class	3.82	0.94	-0.74	0.50
My teacher encourages me to keep trying when I feel like giving up	3.72	1.04	-0.63	-0.06
My teacher shows us how our work will help us in real life	3.37	1.21	-0.38	-0.78
My teacher checks to make sure I understand what we are learning	3.72	1.04	-0.69	0.01
My teacher gives me new challenges if the work is too easy	3.43	1.12	-0.37	-0.55
My teacher gives me extra help and support if I need it	3.80	0.99	-0.81	0.47
My teacher challenges me to think in new ways	3.67	1.02	-0.63	0.06
My teacher asks me to explain my answers and my thinking	4.06	0.83	-1.02	1.61
My teacher gives me feedback/comments about my work that helps me improve	3.88	0.95	-0.87	0.68
I can do most things if I try	4.12	0.85	-0.93	0.97
I usually finish whatever I begin	3.71	1.00	-0.53	-0.18

Items	Mean	SD	Skewness	Kurtosis
I work hard to learn at school	4.04	0.96	-0.91	0.47
I challenge myself to do difficult things	3.74	1.05	-0.61	-0.19
I have clear goals for my future	3.88	1.16	-0.80	-0.25
I keep working toward my goals even if I experience problems	3.96	0.95	-0.83	0.50
I am aware of my moods and feelings	4.05	0.97	-1.04	0.88
I can calm myself down when I get frustrated or upset	3.77	1.09	-0.74	-0.05
I think before I act	3.72	1.05	-0.66	-0.01
I respect other points of view even if I disagree	3.98	0.95	-0.88	0.58
I make an effort to improve my relationships with other people	4.03	0.96	-0.95	0.62
I feel bad when someone gets their feelings hurt	4.22	1.01	-1.37	1.44

Note: SD=standard deviation.

Table 1.2.
Final Scale Reliability

Scales	Standardized Cronbach's Alpha
Health community	0.72
Belonging	0.72
Classroom environment	0.79
Safety	0.73
Motivation and Inclusion	0.87
Teacher pedagogy	0.81
Learning mindset	0.82
Social emotional competence	0.79

Table 1.3.
Correlations among latent factors in final CFA model headings for climate and whole child

	1	2	3	4	5	6	7	8
1 Health community	1							
2 Belonging	0.905	1						
3 Classroom environment	0.791	0.608	1					
4 Safety	0.996	0.853	0.797	1				
5 Motivation and Inclusion	0.806	0.872	0.601	0.831	1			
6 Teacher pedagogy	0.730	0.803	0.549	0.759	0.925	1		
7 Learning mindset	0.487	0.466	0.400	0.485	0.571	0.505	1	
8 Social emotional competence	0.548	0.495	0.455	0.541	0.768	0.477	0.768	1

Table 1.4.
Means Per Scale For Characteristics Tested for Invariance

	Race							School Level			Home Language		Gender		Decline to State Gender
	Asian	Black	Latinx	Multi- racial	Native Amer- ican	Pacific Islander	White	Elemen- tary	Middle	High	English	Not English	Fe- male	Male	
Belonging	3.73	3.73	3.76	3.78	3.85	3.73	3.78	4.03	3.57	3.62	3.75	3.78	3.75	3.81	3.57
Healthy Community	3.62	3.49	3.62	3.54	3.58	3.53	3.60	3.77	3.40	3.51	3.58	3.58	3.56	3.63	3.36
Classroom Environment	3.39	3.30	3.34	3.30	3.34	3.31	3.38	3.45	3.18	3.40	3.34	3.36	3.36	3.36	3.18
Safety	3.43	3.40	3.43	3.34	3.44	3.36	3.37	3.60	3.19	3.28	3.40	3.37	3.42	3.38	3.14
Motivation and Inclusion	3.76	3.77	3.76	3.77	3.88	3.72	3.70	4.07	3.54	3.47	3.77	3.72	3.71	3.79	3.56
Teacher Pedagogy	3.80	3.85	3.82	3.79	3.84	3.78	3.70	4.02	3.62	3.54	3.80	3.73	3.75	3.80	3.59
Learning Mindset	3.92	3.91	3.82	3.91	3.74	3.84	3.95	3.97	3.89	3.86	3.89	3.93	3.89	3.97	3.68
Social Emotional Competence	3.94	3.86	3.89	3.94	3.79	3.86	4.03	4.01	3.91	3.95	3.91	3.99	3.90	4.05	3.72
Climate	3.62	3.59	3.62	3.59	3.65	3.57	3.59	3.82	3.42	3.47	3.60	3.59	3.59	3.63	3.40
Whole Child Success Factors	3.93	3.88	3.86	3.92	3.76	3.85	3.99	3.99	3.90	3.90	3.90	3.96	3.89	4.01	3.70

Table 1.5.
Fit of Configural, Metric and Scalar Invariance Models and Differences Between Models

		Configural	Metric		Scalar	
		fit	fit	difference	fit	difference
Race	χ^2	36571.61	37036.17	-464.56	41711.37	-5139.76
	df	4452	4632	-180	4812	-360
	CFI	0.923	0.923	0	0.912	0.011
Gender	χ^2	35242.12	35619.32	-377.20	38000.78	-2758.66
	df	1908	1968	-60	2028	-120
	CFI	0.924	0.923	0.001	0.918	0.006
English at home	χ^2	34432.18	34577.7	-145.52	36294.14	-1861.96
	df	1272	1302	-30	1332	-60
	CFI	0.926	0.925	0.001	0.922	0.004
Grade	χ^2	36132.12	37312.46	-1180.35	46574.06	-10441.9
	df	1908	1968	-60	2028	-120
	CFI	0.92	0.917	0.003	0.896	0.024
Race final model	χ^2	36571.61	37036.17	-464.56	34943.55	1628.06
	df	4452	4632	-180	4291	-360
	CFI	0.923	0.923	0	0.922	0.001

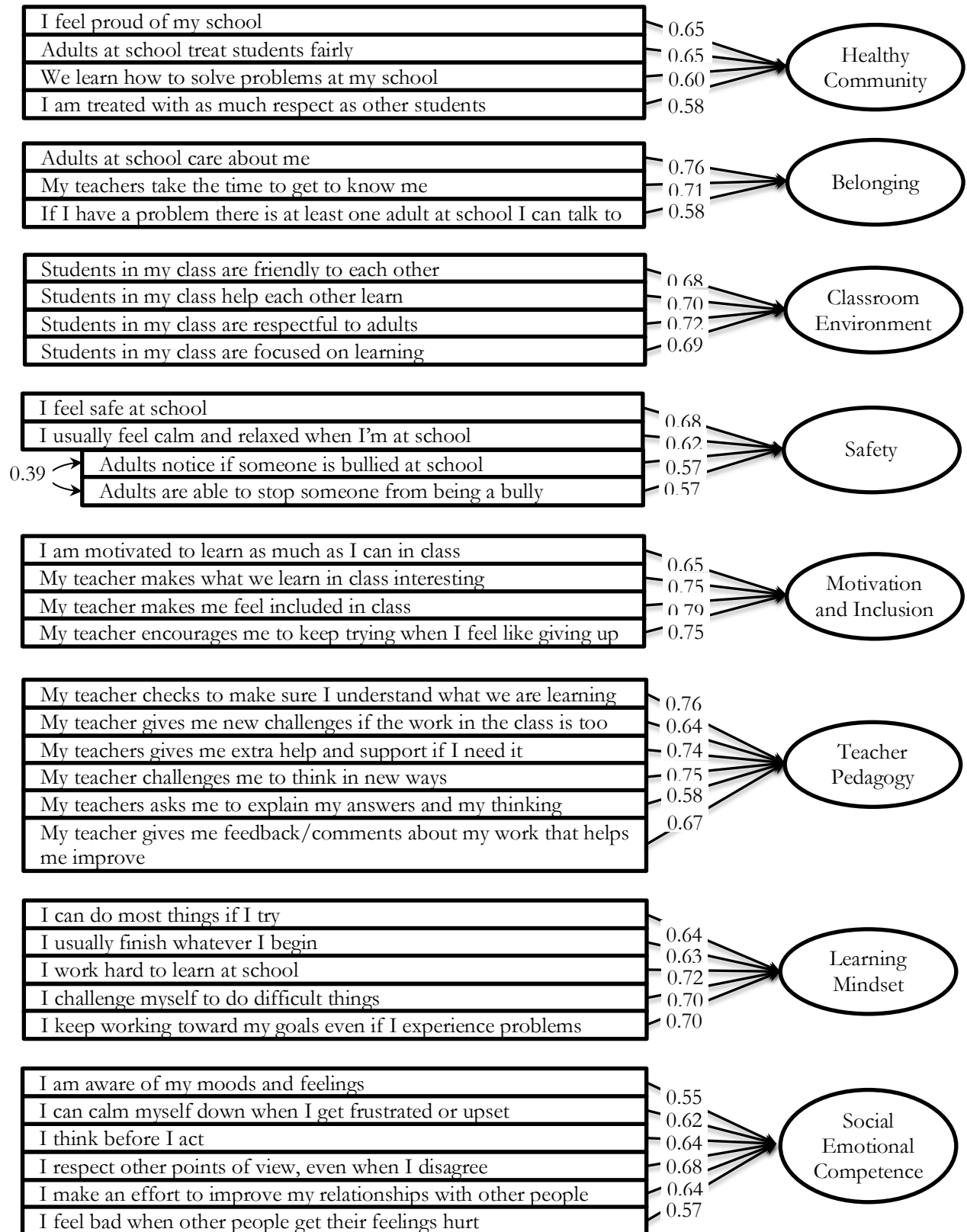


Figure 1.1: Final confirmatory factor analysis model

Note: Correlations among latent factors not shown. Correlations are reported in Table 1.3.

References

- Barblett, L., & Maloney, C. (2010). Complexities of assessing social and emotional competence and wellbeing in young children. *Australasian Journal of Early Childhood, 35*(2), 13-18.
- Bear, G., Gaskins, C., Blank, J., & Chen, F. (2011). Delaware School Climate Survey—Student: Its factor structure, concurrent validity, and reliability. *Journal of School Psychology, 49*(2), 157–174. <https://doi.org/10.1016/j.jsp.2011.01.001>
- Berg, J., Osher, D., Moroney, D., & Yoder, N. (2017). *The intersection of school climate and social emotional development*. Washington DC: American Institutes for Research.
- Berkowitz, R., Moore, H., Astor, R. A., & Benbenishty, R. (2016). A research synthesis of the associations between socioeconomic background, inequality, school climate, and academic achievement. *Review of Educational Research, 87*(2), 425-469. doi:10.3102/003465431666982
- Brackett, M., Rivers, S., Shiffman, S., Lerner, N., & Salovey, P. (2006). Relating emotional abilities to social functioning: A comparison of self-report and performance measures of emotional intelligence. *Journal of Personality and Social Psychology, 91*(4), 780. doi:10.1037/0022-3514.91.4.780
- Campbell, S., Denham, S., Howarth, G., Jones, S., Whittaker, J., Williford, A., ... Darling-Churchill, K. (2016). Commentary on the review of measures of early childhood social and emotional development: Conceptualization, critique, and recommendations. *Journal of Applied Developmental Psychology, 45*, 19-41. <https://doi.org/10.1016/j.appdev.2016.01.008>
- Carter, P., Skiba, R., Arredondo, M., & Pollock, M. (2017). You can't fix what you don't look at: Acknowledging race in addressing racial discipline disparities. *Urban Education, 52*(2), 207-235.
- Castro-Olivo, S. (2014). Promoting social-emotional learning in adolescent Latino ELLs: A study of the culturally adapted "Strong Teens" program. *School Psychology Quarterly, 29*(4), 567-577. <https://doi.org/10.1037/spq0000055>
- Chen, F. (2007). Sensitivity of goodness of fit indexes to lack of measurement invariance. *Structural Equation Modeling: A Multidisciplinary Journal, 14*(3), 464–504. <https://doi.org/10.1080/10705510701301834>
- Cheung, G., & Rensvold, R. (2002). Evaluating goodness-of-fit indexes for testing measurement invariance. *Structural Equation Modeling: A Multidisciplinary Journal, 9*(2), 233–255. https://doi.org/10.1207/S15328007SEM0902_5
- Cohen, J., McCabe, L., Michelli, N., & Pickeral, T. (2009). School climate: Research, policy, practice, and teacher education. *Teachers College Record, 111*, 180-213.
- Colorado Education Initiative. (2012). Measuring school climate: A toolkit for districts and schools. Denver, CO: Colorado Education Initiative and Colorado Department of Education.

- Crowe, L. M., Beauchamp, M. H., Catroppa, & Anderson, V. (2011). Social function assessment tools for children and adolescents: A systematic review from 1988 to 2010. *Clinical Psychology Review, 31*(5), 767–785. doi:10.1016/j.cpr.2011.03.008
- Darling-Hammond, L., Bae, S., Cook-Harvey, C. M., Lam, L., Mercer, C., Podolsky, A., & Stosich, E. L. (2016). Pathways to new accountability through the Every Student Succeeds Act. Palo Alto, CA: Learning Policy Institute.
- Denham, S. A. (2015). Assessment of SEL in educational contexts. In J. A. Durlak, C. P. Domitrovich, R. E. Weissberg, & T. P. Gullotta (Eds.). *Handbook of social and emotional learning: research and practice* (pp. 285–300). New York, NY: Guilford.
- Denham, S., Bassett, H., Mincic, M., Kalb, S., Way, E., Wyatt, T., & Segal, Y. (2012). Social-emotional learning profiles of preschoolers' early school success: A person-centered approach. *Learning and Individual Differences, 22*(2), 178–189. <https://doi.org/10.1016/j.lindif.2011.05.001>
- DeVellis, R. F. (1991). *Scale development: Theory and applications* (Vol. 26). Thousand Oaks, CA: Sage.
- Duckworth, A. L., Peterson, C., Matthews, M. D., & Kelly, D. R. (2007). Grit: Perseverance and passion for long-term goals. *Journal of Personality and Social Psychology, 92*(6), 1087–101. <https://doi.org/10.1037/0022-3514.92.6.1087>
- Duckworth, A., & Yeager, D. (2015). Measurement matters. *Educational Researcher, 44*(4), 237–251. <https://doi.org/10.3102/0013189X15584327>
- Durlak, J. A., Weissberg, R. P., Dymnicki, A. B., Taylor, R. D., & Schellinger, K. B. (2011). The impact of enhancing students' social and emotional learning: a meta-analysis of school-based universal interventions. *Child Development, 82*(1), 405–432. <https://doi.org/10.1111/j.1467-8624.2010.01564.x>
- Dweck, C. (2015). Carol Dweck revisits the 'growth mindset'. *Education Week, 35*(5), 20-24.
- Dweck, C. S. (2006). *Mindset: The new psychology of success*. New York, NY: Random House Incorporated.
- Dweck, C. S., Walton, G. M., & Cohen, G. L. (2011). *Academic tenacity: Mindsets and skills that promote long-term learning*. Gates Foundation. Seattle, WA: Bill & Melinda Gates Foundation. Retrieved from <https://ed.stanford.edu/sites/default/files/manual/dweck-walton-cohen-2014.pdf>
- Elliott, S., Davies, M., Frey, J., Gresham, F., & Cooper, G. (2017). Development and initial validation of a social emotional learning assessment for universal screening. *Journal of Applied Developmental Psychology, 55*, 39-51. doi:10.1016/j.appdev.2017.06.002
- Farrington, C. A., Roderick, M., Allensworth, E., Nagaoka, J., Keyes, T.S., Johnson, D.W., & Beechum, N.O. (2012). Teaching adolescents to become learners. The role of noncognitive factors in shaping school performance: A critical literature review. Chicago, IL: University of Chicago Consortium on Chicago School Research. <https://ccrcenter.org/products-resources/resource-database/teaching-adolescents-become-leaders-role-noncognitive-factors>

- Garibaldi, M., Ruddy, S., Kendziora, K., & Osher, D.. (2015). Assessment of climate and conditions for learning. In J. A. Durlak, C. P. Domitrovich, R. E. Weissberg, & T. P. Gullotta (Eds.). *Handbook of social and emotional learning: research and practice* (pp. 348-360). New York, NY: Guilford Press.
- Gokiert, R., Georgis, R., Tremblay, M., Krishnan, V., Vandenberghe, C., & Lee, C. (2014). Evaluating the adequacy of social-emotional measures in early childhood. *Journal of Psychoeducational Assessment*, 32(5), 441–454. <https://doi.org/10.1177/0734282913516718>
- Konold, T., Cornell, D., Shukla, K., & Huang, F. (2016). Racial/ethnic differences in perceptions of school climate and its association with student engagement and peer aggression. *Journal of Youth and Adolescence*, 46(6), 1289–1303. doi:10.1007/s10964-016-0576-1
- Hoffman. (2009). Reflecting on social emotional learning: A critical perspective on trends in the United States. *Review of Educational Research*, 79(2), 533–556. <https://doi.org/10.3102/0034654308325184>
- Humphrey, N., Kalambouka, A., Wigelsworth, M., Lendrum, A., Deighton, J., & Wolpert, M. (2011). Measures of social and emotional skills for children and young people. *Educational and Psychological Measurement*, 71(4), 617–637. doi:10.1177/0013164410382896
- Ji, P., Flay, B., & DuBois, D. (2013). Social-Emotional and Character Development Scale: Development and initial validation with urban elementary school students. *Journal of Research in Character Education*, 9.
- Jenkins, L., Demaray, M., Wren, N., Secord, S., Lyell, K., Magers, A., ... Tennant, J. (2014). A critical review of five commonly used social-emotional and behavioral screeners for elementary or secondary schools. *Contemporary School Psychology*, 18(4), 241–254. doi:10.1007/s40688-014-0026-6
- Jones, S., Zaslow, M., Darling-Churchill, K., & Halle, T. (2016). Assessing early childhood social and emotional development: Key conceptual and measurement issues. *Journal of Applied Developmental Psychology*, 45, 42–48. <https://doi.org/10.1016/j.appdev.2016.02.008>
- Kline, R. B. (2015). *Principles and practice of structural equation modeling*. New York, NY: Guilford Press.
- Kuperminc, G., Leadbeater, B., & Blatt, S. (2001). School social climate and individual differences in vulnerability to psychopathology among middle school students. *Journal of School Psychology*, 39, 141-159. [https://doi.org/10.1016/S0022-4405\(01\)00059-0](https://doi.org/10.1016/S0022-4405(01)00059-0)
- Kwong, D., & Davis, J. (2015). School climate for academic success: A multilevel analysis of school climate and student outcomes. *Journal of Research in Education*, 25, 68-81..
- Morton, N. (2018, January 12). Racial equity in Seattle schools has a long frustrating history- and it's getting worse. Retrieved from: <https://www.seattletimes.com/education-lab/racial-equity-in-seattle-schools-has-a-long-frustrating-history-and-its-getting-worse/>
- Muthén, L. K., & Muthén, B. O. (2017). Mplus. Statistical analysis with latent variables. Version 8. Los Angeles, CA: Authors.

- Naglieri, J. A., LeBuffe, P., & Shapiro, V. B. (2011). Universal screening for social-emotional competencies: A study of the reliability and validity of the DESSA-mini. *Psychology in the Schools, 48*(7), 660-671.
- National Center for Education Statistics. (2016). ED school climate surveys national benchmark study 2016: Appendix D. Washington, DC: U.S. Department of Education.
- National Center on Safe Supportive Learning Environments. (2014, August). *Summary table of Office of Safe and Healthy Students approved school climate surveys*. Washington, DC: American Institutes for Research.
- Osher, D., Kidron, Y., & Brackett, M. (2016). Advancing the science and practice of social and emotional learning: Looking back and moving forward. *Review of Research in Education, 40*, 644-681. <https://doi.org/10.3102/0091732X16673595>
- Phillips, S., & Rowley, J. (2016). The Tripod School Climate Index: An Invariant measure of school safety and relationships. *Social Work Research, 40*(1), 31-39. <https://doi.org/10.1093/swr/svv036>
- Reardon, S. F. Ho., A. D., Shear, B. R., Fahle, E. M., Kalogrides, D., & DiSalvo, R. (2017). Stanford Education Data Archive (Version 2.0). Retrieved from: <http://purl.stanford.edu/db586ns4974>.
- Rhemtulla, M., Brosseau-Liard, P. É., & Savalei, V. (2012). When can categorical variables be treated as continuous? A comparison of robust continuous and categorical SEM estimation methods under suboptimal conditions. *Psychological Methods, 17*(3), 354-373. <https://doi.org/10.1037/a0029315>
- Ross, K. M., & Tolan, P. (2017). Social and emotional learning in adolescence: Testing the CASEL model in a normative sample. *The Journal of Early Adolescence, 0272431617725198*.
- Seattle Public Schools. (2017). 2016-2017 District scorecard: Research & Evaluation Department. Retrieved from https://www.seattleschools.org/UserFiles/Servers/Server_543/File/District/Departments/School%20Board/17-18%20agendas/20171108/SPS%20District%20Scorecard%202016-17%20Board%20Presentation_ADA.pdf
- Shukla, K., Konold, T., & Cornell, D. (2016). Profiles of student perceptions of school climate: Relations with risk behaviors and academic outcomes. *American Journal of Community Psychology, 57*(3-4), 291-307. doi:10.1002/ajcp.12044
- Thapa, A., Cohen, J., Guffey, S., & Higgins-D'Alessandro, A. (2013). A review of school climate research. *Review of Educational Research, 83*, 357-385. <https://doi.org/10.3102/0034654313483907>
- Traub, R. E. (1994). Reliability for the social sciences: Theory and applications (Vol. 3). Thousand Oaks, CA: SAGE.

- U.S. Department of Education, Office of Safe and Healthy Students. (2016). Quick guide on making school climate improvements. Washington, DC: Author.
- Voight, A., & Hanson, T. (2012). Summary of existing school climate instruments for middle school. San Francisco, CA: Regional Education Laboratory West at WestEd.
- Voight, A., & Hanson, T. (2017). How are middle school climate and academic performance related across schools and over time? REL 2017-212. Regional Educational Laboratory West. Retrieved from <https://eric.ed.gov/?id=ED572366>
- Wang, M.-T., & Degol, J. (2016). School climate: A review of the construct, measurement, and impact on student outcomes. *Educational Psychology Review*, 28(2), 315–352. doi:10.1007/s10648-015-9319-1
- Weissberg, R. P., Goren, P., Domitrovich, C., & Dusenbury, L. (2013). *Effective social and emotional learning programs: Preschool and elementary school edition*. Chicago, IL: Collaborative for Academic, Social, and Emotional Learning.
- West, M. R., Kraft, M. A., Finn, A. S., Martin, R. E., Duckworth, A. L., Gabrieli, C., & Gabrieli, J. (2015). Promise and paradox: Measuring students' non-cognitive skills and the impact of schooling. *Educational Evaluation and Policy Analysis*, 38(1), 148–170. doi:10.3102/0162373715597298
- Yates, T., Ostrosky, M., Cheatham, G., Fettig, A., Shaffer, & Santos, R. (2008). *Research synthesis on screening and assessing social-emotional competence*. Nashville, TN: Vanderbilt University. The Center on the Social and Emotional Foundations for Early Learning. Retrieved from http://csefel.vanderbilt.edu/documents/rs_screening_assessment.pdf
- Zhou, M., & Ee, J. (2012). Development and validation of the social emotional competence questionnaire (SECQ). *The International Journal of Emotional Education*. Retrieved from <http://www.enseceurope.org/journal/Papers/ENSECV4I2P2.pdf>
- Zins, J. E., & Elias, M. J. (2007). Social and emotional learning: Promoting the development of all students. *Journal of Educational and Psychological Consultation*, 17(2-3), 233-255. <https://doi.org/10.1080/10474410701413152>

PAPER 2. THE ROLE OF SCHOOL CLIMATE AND SOCIAL EMOTIONAL LEARNING IN RACIALLY EQUITABLE ACADEMIC SUCCESS

The difference in academic success between White students and students of color has been well documented (Lee, 2002). In American schools, students of color, excluding those of East Asian descent, are less likely to graduate from high school on time, have lower grades on average, score lower on achievement tests, and attain lower levels of education overall (Kao & Thomson, 2003; Lee, 2002; Nitardy, Duke, Pettingell, & Borowsky, 2014). Lower educational attainment has long lasting effects over the life course, ranging from worse health outcomes (Ross & Wu, 1995) to lower income and less upward social mobility (Baum, Ma, & Payea, 2013). Seattle Public Schools (SPS), the setting of this study, also has large racial differences in academic outcomes despite considerable efforts to ameliorate these gaps (Morton, 2018; Reardon et al., 2017; SPS, 2017). Researchers have suggested that strategies to improve school climate (Voight, Hanson, O'Malley, & Adekanye, 2015) and individual social emotional learning (SEL) (Elias, White, & Stepney, 2014) could also improve the academic performance of students of color, thus contributing to more racially equitable academic outcomes. There are many research-based strategies to enhance school climate (for a review see Voight & Nation, 2016) and SEL (for a review see: CASEL, 2013, 2015). School climate is associated with academic success (Berkowitz, Moore, Astor, & Benbenishty, 2016; Wang & Degol, 2016), and though inconsistent, there is some evidence that suggests SEL is linked to academic success as well (Domitrovich, Durlak, Staley, & Weissberg, 2017; Durlak, Weissberg, Dymnicki, Taylor, & Schellinger, 2011; Elias, 2006). Yet, little is known about whether improvements in school climate and SEL will contribute to racial equity in academic outcomes. A first step is to understand the role that school climate and SEL might play in contributing to racial equity in academic outcomes (Voight et al., 2015). This paper examines racial differences in student perceptions of school climate and SEL as they relate to the racial equity in academic success. Specifically, this study

examines 1) race differences in perceptions of school climate and SEL, 2) whether perceptions of school climate and SEL account for the relationship between race and academic success, and 3) whether school climate and SEL relate similarly to academic success for students of different racial groups.

School climate creates the social conditions for learning and applying social and emotional skills (Berg, Osher, Moroney, & Yoder, 2017). Students cannot learn how to have strong relationships or appropriately respond to and understand their emotions without being in relationships with others, especially the adults at their school (Gregory & Fergus, 2017). School climate, in turn, is influenced by the social and emotional competence of students (and teachers). Students and teachers who are more socially and emotionally competent are able to build stronger relationships with other students and school staff, respond to conflict in more productive ways, and to stay focused in class. In fact, SEL interventions have been recognized as an evidence-based method for improving school climate (Voight & Nation, 2016).

Racial Differences in Student Achievement and Racial Equity

Racial differences in student grades are the outcome of a long history of the “education debt” whereby students of color have been systematically denied access to equal education through a variety of mechanisms: students of color attend schools with fewer resources, are more likely to be exposed to exclusionary discipline, are less likely to be tracked into advanced classes, etcetera (Carter, Skiba, Arredondo, & Pollock, 2016; Ladson-Billings, 2006). The education debt has manifested in racial differences in students’ level of academic success, a long-standing problem in American schools. Historically, with the exception of students of East Asian descent, students of color have consistently achieved lower than their White counterparts (Kao & Thomson, 2003; Lee, 2002; Nitardy et al., 2014). Evidence of racial differences in academic performance can be found

across all markers of achievement, from test scores and grades to course-taking in high school, high school graduation, and educational attainment (Kao & Thomson, 2003). Federal programs and policies such as No Child Left Behind and Head Start have expressly aimed to reduce the differences in academic success among students from different racial groups, but the gaps remain largely intractable (Paschall, Gershoff, & Kuhfeld, 2018).

Given the extent of the differences in racial disparities in American schools and the long-standing education debt for students of color, it is important that schools and school districts understand the effect of school-based interventions on racial equity in student success. School climate and SEL represent intervention targets towards which schools and school districts are increasingly devoting instructional time and resources. These system or school-wide decisions may have important ramifications for racial equity in student academic success. Equity is related to “fairness or justice in the provision of education” (Espinoza, 2007, p. 345). Equity stands in contrast to equality, which implies that students receive the same opportunities without regard to the outcomes (Espinoza, 2007). I consider racial equity in the context of racial differences in academic outcomes, and I use the term “racial equity” to denote a state of affairs where there are no longer racial gaps in patterns of achievement. Contrasting to equality, the term racial equity is used to challenge the assumptions that equal opportunity will lead to equality in academic success. In the case of this paper, a focus on racial equity requires going beyond traditional risk and protective factor models that investigate whether SEL or school climate are associated with academic achievement on average, and to also investigate the extent to which these variables are related to racial differences in achievement. Traditionally, when examining the relationships of a variable of interest to student outcomes, researchers have compared whether the mean of a given variable is related to the mean of the outcome. To examine whether these variables contribute to racial equity, researchers must provide empirical evidence that the variables are related to a decrease in the racial

differences in student academic success. To contrast this concept with that of equality, normally a significant association between school climate or SEL and academic outcomes is assumed sufficient. Implied in the usual approach to intervention targets is that what works on average will help all students, ignoring the important differences in students' experiences of school. By centering racial equity, this study takes into account the context of racial disparities in American schools and prioritizes finding intervention targets that reduce gaps in achievement (equity) rather than improve achievement for all (equality). The potential intervention targets that are evaluated by this paper are SEL and school climate. A focus on equity leads to an analysis of whether school climate and SEL account for racial differences in academics, and if they do, then the evidence indicates that boosting school climate and SEL might reduce the gap in academic success among students from different racial groups.

Social Emotional Learning

Schools are being increasingly tasked with teaching skills beyond academics, taking a “whole child” approach in order to help students learn so called “non-cognitive” or “soft skills” alongside traditional academic skills (Zins, Bloodworth, Weissberg, & Walberg, 2004). SEL is the broad term used to describe the collection of skills beyond academic skills that are necessary for students to succeed in school. SEL has been broadly categorized into three interrelated sets of skills: cognitive processes, emotional processes, and interpersonal skills (Jones & Bouffard, 2012). Cognitive processes include the ability of students to shift mindsets and positive attitudes towards learning and their ability to learn, as well as executive functioning and attention skills. Emotional processes include emotion and behavioral regulation, emotion knowledge, and having empathy for others. Interpersonal skills include the ability to develop strong peer and teacher relationships, based on students' skills at observing and responding to social cues, understanding emotions in others, and

having positive social interactions (Jones & Bouffard, 2012). SPS uses the term whole child success factors, whereas I will be using the term SEL to connect to the broader literature in this area (Duckworth & Yeager, 2015). The SEL skills discussed in this paper and for Seattle Public Schools include two related sets of skills: social emotional competence (SEC) and learning mindset. These areas of focus include components of each of the three areas of SEL. Not only are these skills necessary for academic success, but these skill areas are also important to parents of young people and community leaders (Elias, 2006).

SEC is defined as the “knowledge, skills and attitudes ... to understand and manage emotions, set and achieve positive goals, feel and show caring and concern for others, establish and maintain positive relationships, and make responsible decisions” (Weissberg et al., 2015, p. 6). The Collaborative on Social Emotional Learning (CASEL), a national organization devoted to policy and practice of SEL, has defined and operationalized five social emotional competencies, which include relationship skills, social awareness, self-awareness, self-management, and responsible decision-making (Weissberg, Goren, Domitrovich, & Dusenbury, 2013). Learning mindsets are defined as the “psychosocial attitudes or beliefs that one has about oneself in relation to academic work” (Farrington et al., 2012, p. 9). Students with a positive learning mindset (also known as academic mindset) believe that their skills and intelligence can be developed with effort over time and, because of this, persist when faced with challenges and see effort as the path towards learning (Dweck, 2006). Learning mindset is a characteristic of students important to consider alongside SEC, as it characterizes the attitudes important to learning that motivate students’ self-management and decision-making with regard to their academic focus.

There are a multitude of theoretical and conceptual studies describing the ways that SEL is essential for academic success (Elias, 2006; Jones & Bouffard, 2012; Osher, Kidron, & Brackett, 2016; Zins et al., 2004). SEL described as being interdependent with academic skills; students need

to be able to regulate their emotions to sit and focus in class, to develop social connections with peers to work effectively in groups, and to develop positive relationships with teachers to obtain more positive feedback and ask for help when needed (Jones & Bouffard, 2012). Despite this theoretical connection, the empirical evidence linking SEL with academic success is modest at best (Leighton, Guo, Chu, & Tang, 2018). Existing research explores this association through three types of studies: the first is tests of associations of SEL with academics through etiological, longitudinal or correlational analyses; the second is tests of associations of subcomponents of SEL with academics; and the third is through tests of SEL focused interventions that improve academic performance (Domitrovich et al., 2017).

There are relatively few empirical investigations of the association of student SEL and academic achievement, despite the large body of SEL-focused literature (Jones & Bouffard, 2012; Leighton et al., 2018). An ongoing problem with this literature on the SEL-academics connection is the inconsistent definitions of SEL and studies that discuss student skill sets related to SEL, but that are not aligned to existing SEL frameworks. Only one study was found that measured SEL aligned to the CASEL definition (using teacher reports on the DESSA), examined associations of SEL with academic success, and examined the role of race in these relationships. Chain and colleagues (2017) tested the connection between teacher-rated SEL and academic achievement in a sample of 350 3rd-8th graders in Alaska and found that SEL was associated with standardized test scores. These authors also tested whether the SEL-academics link was moderated by race, and found that SEL was more strongly associated with academic achievement for Native American students compared to White students or other students of color.

When the way that SEL is operationalized and defined is broadened, or the component parts of SEL are examined separately (e.g., social awareness, relationship skills, self-awareness, self-management, responsible decision making), more evidence linking SEL to academic achievement is

found. For example, Jones and colleagues (2015) conducted a longitudinal study and found that kindergarten prosocial communication skills predicted high school on-time graduation and college degree completion. These authors tested for race moderation of the link between prosocial skills and outcomes. They found no evidence of race moderation. In another study, Leighton and colleagues (2017) tested theorized pathways that involved SEL and student achievement in a sample of elementary school students. These authors examined pathways from trust in the teacher and empathy for peers to student engagement, which in turn predicted language arts and math achievement cross-sectionally and longitudinally at a 7-month follow up. This study included a sample of 262 students from a single school. No information on the race or ethnicities of students was reported; therefore, the degree to which the theorized pathways of SEL mechanisms are applicable across race is unknown. Duckworth and Seligman (2005) found that self-discipline, a trait related to the self-management competency of the CASEL definition of SEL competencies, was related to grades over and above IQ and ability as measured by achievement scores. In a comprehensive literature review, Denham and Brown (2010) outlined empirical evidence linking each SEL competency to academic success, largely focusing on early childhood. They provided a selective review of studies confirming the association between SEL and academic achievement for all five of the CASEL competencies and highlighted the dynamic and bidirectional influence of SEL and academics. To highlight a few relevant studies, Howse and colleagues (2003) found that emotion regulation in preschoolers predicted kindergarten academic achievement, and Liew and colleagues (2008) found that inhibitory control, a skill related to behavior regulation, predicted improved third grade reading scores.

One issue common across these studies is that SEL is operationalized in a variety of different ways, making conclusions as to the whole of SEL and its impact on academics difficult. Compiling literature across various fields that was not designed to test SEL specifically also has

drawbacks and creates confusion as to the definition of SEL. In the Denham and Brown (2010) review, self-awareness was equated with self-perceived academic competence or self-esteem, and studies related to social problem skills were reported when discussing literature relevant to the responsible decision-making competency. There is much still to be learned about the association between various components of SEL and academic success, including the strength of the association, whether race moderates the relationship, and whether contextual or social environmental variables such as school climate are at play.

The current knowledge about the relationships between SEL and academic outcomes comes largely from studies that test interventions focused on improving SEL skills in students. Two meta-analyses have shown that interventions focused on improving SEL have significantly increased student academic achievement (Durlak et al., 2011; Taylor et al., 2018). Durlak and colleagues (2011) found that SEL interventions increased academic achievement by 11 percentile points on average. Taylor and colleagues (2017) found that SEL interventions improved academic achievement with an effect size of .33 in studies that had long-term follow up with students. The studies included in both of these meta-analyses span a large range of program types, including anti-bullying programs and substance use prevention programs, despite being labeled SEL programs. CASEL has developed a list of SEL programs found to be evidence based, and 11 of 23 elementary and preschool programs (CASEL, 2013) and 7 of 9 middle school or high school programs showed evidence of program effects on academic performance during at least one developmental stage (CASEL, 2015). Intervention studies to adjust students' mindset about learning have also demonstrated that improving learning mindset is associated with increases in grades (Farrington et al., 2012). In one such study, an intervention to improve growth mindset and sense of purpose was delivered through online modules to 1,594 students in 13 high schools. Students improved academic performance by an average of 6.4%, and students who were performing the worst prior to the intervention made the

largest gains (Paunesku et al., 2015). While many of these interventions theorized that the mechanism of influence is improving student SEL, few specifically tested whether improved SEL leads to improvements in academic outcomes (Leighton, et al., 2018). Intervention studies have provided theoretical evidence for the SEL academics link, but they have not provided evidence for the direct association of SEC with academics.

Race and Social Emotional Learning

While research has demonstrated that SEL is important for student academic performance, few studies have examined whether there are race differences in these factors or whether these factors may be related to race differences in academic success. In a review, Garner and colleagues (2014) reviewed literature on current knowledge of the race differences in different aspects of SEL. These authors investigated whether students from different racial groups have different levels of SEC. They found that studies presented mixed findings as to whether there are race differences in SEC. Again, the definition of SEL and SEC varies across studies, yet disparate constructs are all described as SEL. For example, in one study, Black students were found to have less SEC compared to White students (Elias & Haynes, 2008), while in another no differences in prosocial behavior were found between Black and White students (Kistner, Metzler, Gatlin, & Risi, 1993), and in a third, students of color were found to have higher levels of prosocial competence (Garner, 2006).

Studies of the extent to which race moderates SEL intervention effects could provide another source of evidence as to whether there are race differences in SEL and whether race may moderate the association between SEL variables and student outcomes such as academic success. In a review, Rowe and Trickett (2017) examined the extent to which race moderates the intervention effects of SEL programs and found that there is not enough evidence to draw conclusions either way. Garner and colleagues (2014) found similar results with respect to SEL interventions and race –

that there is not enough information available to know whether and to what extent SEL-focused interventions have similar effects across racial groups.

In sum, there is modest empirical evidence linking SEL and academic outcomes, and even less evidence investigating race and its associations with SEL and academics. Given the disparate findings on whether there are race differences in SEC, it is not surprising that little is known about whether differences in SEC is associated with racial differences in academic outcomes. While some researchers have written about how improving social and emotional competencies could contribute to more racially equitable academic outcomes (Elias et al., 2014), there is very little empirical evidence exploring this connection. Only one study has tested this assumption empirically. Chain and colleagues (2017) found that teacher-rated SEC was related to academic achievement for all students but was more strongly associated with academic achievement for Native students compared to White students and other students of color. This finding suggests that improving SEC might be more important for Native students compared to White students or other students of color. Additional research is needed in this area since there are so few studies that empirically investigate the relationship of SEL to racial differences in academic outcomes.

School Climate

School climate refers to the “social, emotional and physical characteristics of a school community” (Voight & Hanson, 2017), and offers a window to understand students’ experience of school. From the students’ perspective, school climate is generally thought of as the collective experiences of students at a school that characterize the social environment of the school (Cohen McCabe, Michelli, & Pickeral, 2009). School climate captures a range of different aspects of students’ school experiences, generally including relationships among adults and students and between students, students’ sense of physical and emotional safety, students’ sense of belonging to

school, and students' perspective on the quality of instruction (Wang & Degol, 2016; Cohen et al., 2009; Thapa, Cohen, Guffey, & Higgins-D'Alessandro, 2013). Many different frameworks exist for defining and operationalizing school climate, and there is not agreement in the literature as to the most important parts of school climate (Rudasill, Snyder, Levinson, & Adelson, 2017). However, researchers do agree that a positive school climate provides the necessary conditions for learning (Cohen et al., 2009; Garibaldi, Ruddy, Kendziora, & Osher, 2015; Wang & Degol, 2016).

Multiple empirical studies and comprehensive reviews have found that school climate is associated with academic outcomes (Bear, Gaskins, Blank, & Chen, 2011; Berkowitz et al., 2016; Kwong & Davis, 2015; Shukla, Konold, & Cornell, 2016; Thapa et al., 2013; Voight & Hanson, 2017; Wang & Degol, 2016). Voight and Hanson (2017) studied the climate of 1,000 California middle schools and found that students attending schools with better climate also reported higher English and Math academic performance, and that changes in student-reported climate were associated with changes in academic performance. However, race differences in these relationships were not explored. In a person-centered analysis, students who perceived the highest levels of climate were found to also have the highest grades (Shukla et al., 2016). Findings from a comprehensive review indicated that school climate moderates the association of socioeconomic status and academic achievement such that the gap in achievement between low and high-income students was smaller in schools with more positive climates (Berkowitz et al., 2016). Positive school climates have also been associated with a number of other important student outcomes known to influence student achievement, ranging from reduced student psychopathology and reduced problem behaviors, to reduced school disorder (Gottfredson, Gottfredson, Payne, & Gottfredson, 2005; Wang & Degol, 2016; Way, Reddy, & Rhoades, 2007). In all these studies, the fact that students' experiences of school may differ based on their race was not taken into account.

Although school climate is thought of as a characteristic of schools, evidence suggests that students within schools may have different experiences of the same school based on their race (Voight et al., 2015; Shirley & Cornell, 2011; De Pedro, Gilreath, & Berkowitz, 2015). School climate measures may capture racial differences in students' school experience, but only when disaggregated by race (Voight et al., 2015; Shirley & Cornell, 2011). Studies have found racial differences in various domains of school climate, where students of color feel less supported by their relationships with adults, have a lower sense of belonging, and feel that schools do not treat them fairly compared to their White peers (Anyon, Zhang, & Hazel, 2016; Bottiani, Bradshaw, & Mendelson, 2017). Numerous studies have documented differences in perceptions of school climate based on students' race, with students of color generally reporting worse school climate compared to White students (Anyon et al., 2016; Bottiani et al., 2017; De Pedro et al., 2015; Konold, Cornell, Shukla, & Huang, 2016; Koth, Bradshaw, & Leaf, 2008; Shirley & Cornell, 2011; Shukla et al., 2016; Voight et al., 2015). De Pedro and colleagues (2016) aimed to characterize the different school experiences of racial groups of students, and found that Black students were three times more likely to belong to a latent class who perceived a negative school climate compared to White students. They did not test different associations of latent classes with academic outcomes (De Pedro et al., 2016). Another study found that Black and Multiracial students were significantly less likely than White students to be a member of a positive school climate latent class (Shukla et al., 2016). These authors also found that students in positive climate latent classes were also more likely to have better grades and engaged in fewer risky behaviors. Konold and colleagues (2017) found significant differences in perceptions of school climate in Black compared to White students, but not in Hispanic compared to White students, on average. They also found that there were no differences in the association of perceptions of climate and school engagement or peer aggression, though they did not test whether climate was related to race differences in academic success.

Studies have also suggested a reciprocal relationship between school climate and perceptions of equity. Two studies examined aspects of school climate related to racial climate and perceptions of equity. Debnam and colleagues found that students who attend schools they perceive to be more equitable (based on race, gender, socioeconomic status, and culturally representative classroom materials) were also more likely to be engaged in school and feel connected to school (Debnam, Lindstrom Johnson, Waasdorp, & Bradshaw, 2013). Similarly, Mattison and Aber (2007) found that the school racial climate was associated with student grades and disciplinary outcomes, and that for Black students, negative perceptions of racial climate were associated with lower grades and increased detentions and suspensions.

Despite the many studies that have explored race differences in school climate, there are important gaps in this literature. First, few studies have considered whether student perceptions of school climate are related to racial differences in academic outcomes, or if climate is linked to student outcomes to the same degree for students from different racial groups. Only one study was found that investigated the association between racial disparities in student perceptions of school climate and race differences in achievement. Voight and colleagues (2015) reported that racial differences in students' perception of school climate was associated with race differences in grades, and that the gap was more pronounced in higher income schools. Second, no studies were found that explored whether school climate is associated with academic outcomes to the same extent for students from different racial groups. It may be that race moderates this association, with climate having a stronger or weaker relationship on academic outcomes for some racial groups (Konold et al., 2016). Third, although most studies in this area have found differences in perceptions of school climate comparing Black and Latino students to White students, no studies were found to have examined the experiences of Multiracial, Asian, Pacific Islander, or Native American students.

The Present Study

The setting of the present study is the SPS District, a large urban district that serves more than 50,000 students. Evidence of the education debt is present in SPS. In fact, in 2016 Seattle was the fifth most unequal school district in the nation; Black students were performing at 3.5 grades lower than White students in the district (Reardon et al., 2017). In Seattle, 86% of White students graduate in 4 years or less, compared to 83% of Asian students, 79% of Multiracial students, 79% of Pacific Islander students, 74% of African students, 70% of African American students, 64% of Latinx students, and 48% of Native American students (SPS, 2017). Across the district, historically underserved racial groups of students (Black, Latinx, Native American, and Pacific Islanders) are suspended or expelled two to seven times more often than White students (Morton, 2018; Reardon et al., 2017; SPS, 2017). SPS is keenly focused on improving racial equity and is eager to study potential intervention targets within its locus of control. Since there are many school-based interventions with evidence of improving academic achievement focused on school climate and student SEL, SPS is especially interested in learning about racial differences in school climate and SEL, and the possibility that these factors could contribute to racial equity.

Race is a social construct that has large ramifications for students of color and has a significant impact on students' school experience (Carter et al., 2016). I refer to students of color throughout this paper collectively, to recognize the difference in experience comparing students from marginalized racial groups to those in the dominant racial group. This study is limited to the seven racial groups required for reporting to the federal government – Asian, Black, Latinx, Multiracial, Native, Pacific Islander, and White. These groups have modest improvements to many racial groupings because of the separate categories for multiracial individuals and separate Pacific Islander students from Asian students. Despite the problems of categorization, I believe it is imperative that researchers examine the differences in school experience for different groups of

students of color using these categories as the best option available. The potential consequences of not doing so – implementing programs that worsen racial disparities – necessitate using these categories to empirically investigate whether and to what degree students' perceptions of school climate or students' SEL is related to racial disparities in academic outcomes. I set out to investigate racial differences in student self-reports of school climate and SEL, whether and to what extent these factors are associated with race differences in grades.

I was first interested in examining whether there are racial differences in students' experiences of school as measured by school climate and whether there are racial differences in student self-reports of SEL (research question 1). Racial differences in school climate and SEL might, in turn, be related to race differences in grades (research question 2). To test this, I examined the extent to which these factors explain the association between race and grades. Evidence for partial mediation would point to the degree that racial differences in school climate and SEL account for racial differences in grades (i.e., racial equity). The magnitude of the effect of racial differences on SEL and school climate is represented by the indirect effects in a mediation model. My third research question investigates the extent to which the association between school climate and SEL varies based on students' race. Applying the equity lens to these proposed analyses, racial differences in the associations among school climate and SEL on grades could show that these factors are more or less related to grades for certain racial groups. If evidence that the association is stronger for students of color is found, then interventions focused on these factors would reduce racial disparities in grades thus contributing to equity. If there is no evidence that the effects are different, these factors might still be helpful in reducing the racial differences if evidence for mediation is found. If evidence for a difference in association is found whereby the factors are less associated with grades for students of color, then other variables might be at play or whether school climate and SEL are the right areas of focus becomes an issue.

Method

Sample

SPS' annual student survey from 2016 was the data source. SPS serves more than 50,000 students in 97 schools, and all students in grades 3 through 12 are invited to take the survey. The student survey consists of 51 items and takes about 10 minutes for most students to complete. The survey is administered every year in the Spring to students during class time by teachers or school staff. Schools are provided a protocol to read aloud to students about the survey, and each school determines the survey administration procedures. Most students take the survey during class time, but some take it individually. Schools select whether they want to take the survey on paper or on the computer. Since the survey is administered during school time, there is a relatively high response rate. Seventy-one percent of the 41,430 students enrolled in 3rd through 12th grade took the survey in 2016. Students who responded to the survey are from a number of racial backgrounds, including 43% White, 16% Asian, 12% Black, 17% Multiracial, 7% Latino, 2% Pacific Islander, and 1.5% Native American. Approximately 34% of SPS students receive free or reduced-price lunch. Students in SPS originate from 149 countries and speak 146 different languages.

Measures

School climate consisted of 6 subscales: (1) healthy community, (2) belonging, (3) classroom environment, (4) school safety, (5) pedagogical effectiveness, and (6) motivation and inclusion. Response options for school climate items are “strongly disagree,” “disagree,” “neither agree nor disagree,” “agree,” and “strongly agree.” In the first paper of this dissertation, the psychometric properties of the school climate and SEL success factor scales were investigated. Scale measurement structure was confirmed with an adequate fitting confirmatory factor analysis, and scales were found to be internally consistent, with Cronbach's alpha ranging from .72 to .87. Scales were also adjusted to be non-invariant across race, gender, and home language.

SEL was measured with two subscales: SEC and learning mindset. Examples of items in the learning mindset scale include “I can do most things if I try” and “I work hard to learn at school.” Examples of items in the SEC scale include “I am aware of my moods and feelings” and “I think before I act.” The response options for this set of scales are “Not like me at all,” “Not much like me,” “Somewhat like me,” “Mostly like me,” and “Very much like me.”

Self-reported grades were the primary outcome. Modeled as ordered categorical, students selected whether they had “Mostly A’s,” “Mostly B’s,” “Mostly C’s,” or “Mostly D’s or E’s.”

Race was self-selected by students from the list of seven racial categories determined by the federal government as necessary for reporting purposes (U.S. Department of Education, 2008): Asian, Black, Latino, Multiracial, Native American, Pacific Islander, or White. Dummy variables for race were included in all models with White as the referent category.

Schools were the primary grouping variable and students from 97 schools across the district responded to the survey. Students filled out the survey in the school at which they were enrolled in April 2016. All schools were included in the analysis: 60 elementary schools, 10 middle schools, 10 K-8 schools, 15 high schools, and 2 alternative schools.

Control variables. Students also self-reported their grade level (3-12) and gender (male, female, or decline to state gender). These variables were included as controls. In the case of gender, dummy variables of male=1 and decline to state gender=1 were entered into models; female served as the referent category.

Analysis Plan

Model strategies are described below according to research questions. All models adjusted for students being nested in schools using the type=complex function in Mplus v7.4 (Muthén & Muthén, 2015) that adjusts standard errors for non-independence of students attending the same school (Muthén & Santorra, 1995). The outcome variable of self-reported grades was modeled as

ordered categorical, necessitating a Weighted Least Squares Mean and Variances (WLSMV) estimator. All models also included race as a series of dummy variables with White being the referent category. In addition, all endogenous variables in all models were regressed on control variables of student grade level and gender. The first research question was examined with models of race regressed on school climate and race regressed on SEL in separate models. The analysis for the second research question had three steps. First, self-reported grades were regressed on race to assess the magnitude of race differences in self-reported grades (model 1). Then, in a series of structural equation models, pathways were added from race to school climate to self-reported grades (model 2), and separately, pathways were added from race to SEL to self-reported grades (model 3). Finally, both pathways were entered into the model at the same time, in order to ascertain how SEL and school climate influence may independently mediate associations between race and grades. Indirect effects were assessed in models 2 and 3. The third research question was investigated by including an interaction term between race dummy variables and school climate and between race dummy variables and SEL success variables to assess whether race moderated the association between school climate and SEL on self-reported grades. These interactions were further probed through multiple group modeling in Mplus. First, the multiple group modeled separate groups based on the seven racial categories. Second, each model path for each racial group was constrained to be equal to White students. The decrements to fit, based on change in model chi-square and CFI, were then recorded and can be interpreted as showing where differences lie between White students and each racial group of students of color. Because the sample size for this study is large, change in chi-square can be substantial and statistically significant even in cases where differences between groups are small. The CFI provides a measure of the change in fit accounting for sample size. Here, I draw upon recommendations developed by Chen (2007) and Cheung and Rensvold (2002) in conjunction with maximum likelihood estimation and consider a change in CFI of .01 to be evidence of a

substantial difference between racial groups. Since the WLSMV estimator has not been assessed for use in conjunction with fit statistics to determine differences between groups (Chen, 2007; Cheung & Rensvold, 2002), the change in CFI, change in chi-square, and the significance of interaction terms were all used to determine whether and where there were significant and substantial racial group differences in the effect of school climate and SEL on grades. As with previous analyses, SEL and climate were first considered separately and then together, and all models controlled for grade level and gender and accounted for school clustering.

Results

Descriptive Statistics

A summary of correlations among model variables, means, and missingness can be found in Table 2.1. Students' average grades were in the "Mostly A's" range with a mean of 3.35, with a standard deviation of .76. There were 678 students who reported having "Mostly D's and E's," 2,471 reporting "Mostly C's," 9,906 reporting "Mostly B's," and 12,923 reporting "Mostly A's." Most variables had little missing data, though 9% of students did not select a racial category. The racial composition of the sample was reflective of the racial distribution of students in the district. Less than 4% was missing on all other variables. An analysis of the magnitude of race differences in self-reported grades is reported in Model 1 of Table 2.2. Model 1 regressed dummy variables for race on grades. Controlling for grade level and gender, I found significant race differences and all racial groups, except for Asian students, reported lower grades compared to White students. The coefficients reported are standardized on the outcome, so that they represent the standard deviation unit differences.

Research Question 1: Race differences in SEL and School Climate

I found racial differences in students' perceptions of school climate and SEL. Results are reported in Figure 2.1, which shows effect sizes in terms of standard deviation unit differences in outcomes associated each race dummy variable effect. Asian and Latinx students reported significantly more positive perceptions of climate compared to White students, while differences between White and Black, Native, or Pacific Islander students were not statistically significant. Multiracial students reported that school climate was significantly worse than White students did, though the effect size was quite small at .05. All racial groups reported significantly lower SEL compared to that of White students. In some cases, the effect sizes of these differences were in the medium effect size range. Compared to White students, Black students reported scores that were .18 standard deviation units lower, Latinx and Pacific Islander students reported scores .22 standard deviation units lower, and Native students reported scores .35 standard deviation units lower.

Research Question 2: Role of SEL and Climate on Race Disparities in Grades

In the first analysis, I examined the association of race on grades and found evidence for the race differences in student grades. As noted above, all racial groups except for Asian students reported significantly lower grades than did White students, as shown in in the estimates for Model 1 in Table 2.2. Model 2 includes pathways from race to climate to self-reported grades. Climate was significantly associated with self-reported grades (standardized ES = .13, $p > .001$), but the indirect effect of race differences on climate was not significant. In Model 3, a significant direct effect of SEL on grades (ES .32, $p < .001$) and significant indirect effects of the race on grades through SEL are shown. The effect sizes of the indirect effects indicate the degree to which SEL accounts for race differences in grades. For Black, Latinx, Multiracial, and Pacific Islander students, the effect size is negligible, ranging from -.03 to -.07. The effect size for Native students was -.11, suggesting a small but meaningful effect of SEL on the disparity in grades (Cohen, 1992). Since higher grades are

reported by Asian students than by White students, the effect for Asian students of SEL is in the opposite direction.

I also estimated a model with both climate and SEL. This model indicated that SEL is the more salient variable, as evidenced by the fact that the role of climate turns negative, representing a suppressor effect. Climate and SEL are positively correlated ($r=.52, p<.001$). These results were not reported in Table 2.2 since they did not add any new information, other than the salience of SEL to grades compared to climate.

Research Question 3: Race Moderation

Table 2.3 reports on the series of models used to probe the interaction of race and climate and race and SEL on grades. Models 4 and 5 show the significance of interaction terms that were added to the models as shown in Table 2.2. Here, in model 4 the only significant moderation was for Asian students, for whom there was a significantly weaker association between climate and grades. For SEL in model 5, significant interaction terms are found for all racial groups, suggesting that the association for SEL with grades is significantly weaker for all racial groups compared to White students. To clarify the interpretation of interaction terms, multiple group modeling was employed.

In the first step of multiple group modeling, I found evidence of significant racial differences in the omnibus test that assessed the decrease in model fit when all pathways were held the same ($CFI=.91, df=30, \chi^2=214.97$). Models 6 and 7 of Table 2.3 show the results of changes in fit in a series of multiple group models holding the pathway between climate and grades equal to White students (Model 6), and SEL and grades equal to White students (Model 7). These tests largely confirmed the results of significant interaction terms with some notable exceptions. Where there was a small magnitude in the effect size of the interaction term, the CFI and chi-square difference tests did not provide evidence of race moderation; this was the case for Latino and Pacific Islander students, for whom the effect size of the interactions was .07. For Native students there were

differences between the three different test results. Significant and large interaction terms were found that decreased the association of SEL on grades, yet, these results were confirmed by the chi-square difference tests but not by the change in CFI. This may be due to the small sample size of Native students (N=347). The largest interaction term was for Black students, and the moderating effect was confirmed across tests.

Figure 2.2 shows the magnitude of the independent effect sizes of SEL and climate on grades, for each racial group, in the order of the smallest to largest effect of SEL. This graph shows that the association between SEL and grades for White students is stronger compared to all other racial groups. The effect of these skills on grades for White students was nearly double what it was for Native and Black students (a difference of .20 and .18, respectively).

Discussion

The present study set out to learn about the potential role of school climate and SEL in promoting racially equitable academic outcomes. By doing so, I aimed to distinguish between variables that contribute to equity versus those that are related to either equality or racial inequity. I found that students of color reported significantly lower levels of SEL compared to their White peers. SEL accounted for a small portion of the racial difference in student reported grades. I also found that the association between SEL and grades was moderated by race. Very small differences in perceived school climate appeared across racial groups. Contrasting with previous literature, only multiracial students perceived the climate of their schools to be worse than White students did, while Asian and Latinx students reported better perceived climate. School climate did not account for the race differences in grades, though it was consistently related to grades across race.

Social Emotional Learning

All groups of students of color reported significantly lower SEL skills compared to White students. It is important to examine this finding more deeply in order to avoid labeling students of color as having an SEL deficit. One possible explanation of this finding is that differences in students' SEL might represent another manifestation of the education debt (Ladson-Billings, 2006), since access to high quality SEL programming and supportive school environments is not equally distributed (Berg et al., 2017). Students' differential reports of SEL might be a result of an accumulation of risk exposures that serve to undermine students' ability to develop SEL skills or limited their opportunities for skill development. Some examples of potential risk exposures to which students of color are more likely to be subjected include higher rates of exclusionary discipline, which leads to loss of instructional time (Gregory, Skiba, & Noguera, 2010), the stress of microaggressions and stereotyping that is associated with being a member of an oppressed group (Berg et al., 2017; Howard, 2010), or experiencing discriminatory tracking into special education or out of advanced-learning opportunities (Carter et al., 2016). On the other hand, it may be that current conceptualizations of SEL are not capturing skills or ways of knowing relevant to students of color from diverse cultural groups. This may be an issue of measurement – whether constructs capture the aspects of social connection and emotional expression that are culturally relevant. However, it might also be indicative of a deeper problem as to whether SEL as currently defined is culturally congruent with students' understanding of social interaction and emotional expression, or that encompasses the differences in power and privilege experienced by students of color (Gregory & Fergus, 2017; Hoffman, 2009).

The findings herein suggest that SEL is less strongly associated with student grades for Black, Native, Asian, and Multiracial students compared to White students. In addition, the results show significant indirect effects of SEL, suggesting that SEL might account for a small portion of

the variance of racial differences in grades. This current study differs from findings by Chain and colleagues (2017), who found that SEL was more important for Native students compared to White students or other students of color. While I did find that for Native students, the effect of SEL on the achievement gap was the largest compared to other racial groups, SEL was also connected to grades for Native students to a lesser degree compared to other student racial groups. This difference might be due to the reporter. Teachers rated SEL in the Chain et al. (2017) study, whereas students rated themselves in ours. Rater bias might have a significant impact on the results of each study, as the degree of SEL skills of a given student is interpreted through the lens of the rater, whose race and culture likely influences their interpretation. A study of the DESSA, the SEL assessment tool used by Chain and colleagues (2017) found that 16% of the variance in student scores was due to rater bias, though this study did not examine the race of the student or teacher as a source of bias (Shapiro, Kim, Accomazzo, & Roscoe, 2016). Chain and colleagues (2017) theorized that SEL is a proxy for bicultural competence, which refers to the ability to stay grounded in one's own culture and sense of self while having the ability to switch cultural frames based on context (Chain et al., 2017). The notion of equating bicultural competence to SEL is problematic because students' cultural identity was not measured. What cannot be determined from this previous study is whether and how SEL as conceptualized is aligned to the cultural values of the Native students within the study or the degree to which the students maintain their own cultural identity. In a sense, this study implies that students' have the ability to act in a way that is perceived by teachers to align to SEL as defined by the dominant culture. In contrast, in the present study, I found that for some racial groups of color, especially Native American students, SEL is less strongly associated with academic success, which points to the importance of deepening the understanding of cultural interpretations of SEL concepts (Hoffman, 2009), as well as the role of power and privilege (Gregory & Fergus, 2017). It may be possible to measure SEL in a manner than is inclusive of

culturally diverse ways of considering SEC in students, and cultural identity may be an important aspect of SEC particularly relevant for students from marginalized backgrounds.

Taken together, the findings of this study suggest that the racial differences in SEL play a small part in the racial disparity in grades. However, since SEL was significantly less strongly associated with grades for many racial groups, these findings suggest that concentrating efforts on SEL may not contribute to racial equity in student academic success. There are a number of reasons why this might be case. For one, focusing on the commonalities among students ignores important differences in the experiences of students, such that the areas of focus in SEL may not relevant to students from different racial and cultural backgrounds (Gillborn, 2005). This is not to say that social relationships or emotional expression and understanding are not generalizable concepts cross-culturally, but that the way the cultural value placed on certain ways of socializing or expressing (or not expressing) emotions is known to vary (Hoffman, 2009). The approach that focuses on commonalities alone has been called colorblind, as it can ignore important differences in students' privilege and cultural values (Bonilla-Silva, 2014; Gregory & Fergus, 2017). Many scholars have written about racial and cultural differences in the perceptions of SEL. For instance, Blanco-Vega and colleagues (2007) argue that the social emotional needs of Latinx students, especially immigrant students, vary greatly compared to those of White students and other non-immigrant students of color. Students who have experienced immigration go through a process of acculturation, where they encounter new cultural beliefs, social behaviors, and customs, and need to successfully navigate the new culture along with its expectations for school success, while maintaining a connection to their culture of origin. SEL is rooted in cultural expectations of what positive socialization looks like, and how students should (or should not) express their emotions, making SEL another set of cultural expectations to which a student needs to acculturate. The extent to which a student is acculturated to American culture is likely to influence the degree to which SEL, as conceived of here, is related to

academic success. The level of acculturation of the family and of the student and that of the family and students' immigration experiences influence the development of students' social emotional skills (Blanco-Vega, Castro-Olivo, & Merrell, 2007)

School Climate

This current study's results on race differences in perceptions of school climate represent a departure from those of previous studies, most of which reported that compared with White students, students of color perceive the climate to be worse at their school (Konold et al., 2017; Voight et al., 2015). In fact, I found that Asian and Latinx students report slightly better school climate than did White students (ES .07 and .06 respectively). Previous studies reported significantly worse school climate for Black students compared to White students (Konold et al., 2017) or for Black and Latino students than for White students (Voight et al., 2015). In this study, school climate was not related to racial differences in student-reported grades, nor were there racial differences in the association of climate with student grades. School climate was related to grades in all analyses where it was entered in the model independently, but when SEL was included, it was no longer significant, possibly due to the large correlation with SEL and SEL being the more proximal effect. The results indicate that school climate is equally meaningful for all students and has a small association with grades. However, perceptions of school climate at the individual level was not related to racial differences in student grades, suggesting that addressing students' individual perceptions of school climate may not be a strategy to promote racial equity in academic success.

Implications and Future Directions

This paper demonstrates a new approach to studying racial differences in achievement, also known as the achievement gap. I reframe student deficits as the result of a long-standing educational debt, whereby students of color have received systematically unequal education. Rather than explaining the achievement gap, I pivot to the role that school climate and SEL can play as

protective factors promoting racial equity in academic success. The effect of SEL and school climate on grades is positive. Most studies stop here. I was instead interested in these variables as potential explanatory mechanisms for racial differences in grades that are tied to intervention strategies. The finding that the strength of the relationship of SEL with grades differs based on race highlights the need for additional research. Researchers must investigate assumptions of sameness and question whether SEL has been measured in a way that captures important racial and cultural differences in the meaning of SEL, and whether SEL is the right set of skills to be focusing on if one is interested in racial equity. Additional etiological research is needed to examine whether SEL is equally related to academic outcomes in other settings and populations, and with other assessments of SEL. Since few studies have focused on the relationship of SEL and climate to racial differences in grades, it is unclear whether the findings herein are an outlier or an indicator of a larger trend.

There are also important implications for intervention research. Additional research is needed on the impact of school-based intervention targets such as school climate and SEL on academic racial equity. Given these current findings and the result of reviews of SEL interventions (Rowe & Trickett, 2018; Garner et al., 2014) showing the lack of evidence as to the effect of SEL interventions for students from different racial groups, researchers need to investigate the potential for interventions to contribute to racial equity or inequity. If programs targeting SEL are differentially meaningful for students, there is potential for interventions to worsen inequalities (Frohlich & Potvin, 2008; Lorenc, Petticrew, Welch, & Tugwell, 2012). Without this information, school districts are unable to make informed decisions about which programs have the potential to improve racially equitable academic outcomes. To truly live up to the goals set for racial equity, all programs need to demonstrate evidence that they improve racial equity, and the educational system should divest from programs without such evidence.

There are a number of directions this work can take to improve the knowledge of the relationship between school climate, SEL, and racial equity in academic success. On a grand scale, all intervention programs being implemented in diverse schools characterized by racial differences in academic success need to be evaluated as to whether they improve or exacerbate the racial achievement gap. This means framing research questions in terms of racial equity rather than looking only at mean effects (equality). Examining the role of SEL interventions on racial equity will be especially important, given the findings in this study. It is clear from comparing this study to others in the field that the associations of race with intervention targets such as school climate and SEL vary by context, reporter, and racial group. Future research also needs to examine these factors longitudinally in order to disentangle the direction of effect and take steps towards establishing causality.

Improvements can also be made to the way that school climate and SEL are conceptualized in order to better account for the experiences unique to students of color from various racial backgrounds. Better school racial climate has been associated with higher achievement and fewer discipline problems (Mattison & Aber, 2007). Perceptions of equity measured across a number of dimensions (race, family poverty, and gender) have been shown to be related to racial disproportionality in discipline (Bottiani et al., 2017). The role of cultural identity and bicultural competence needs to be further evaluated, and measures suited to testing these hypotheses developed. Obtaining student perspectives in the development of student surveys on climate and SEL also has the potential to improve the extent to which measured constructs capture differences in students' experiences based on their race, that are likely critical to their development and academic success, and in turn, are related to race differences in academic outcomes.

Limitations

There are a number of limitations to this analysis that limit the generalizability and usefulness of findings. First, the use of self-reported grades is a problematic outcome as it is subject to student knowledge of their own grades and their truthfulness in reporting grades accurately. Grades are also not as meaningful for elementary school students. The school climate data is anonymous, and as such, cannot be tied back to other data, such as student achievement scores. This limits confidence in the findings, the ability for findings to be generalized to other settings, or the degree to which effect sizes are meaningful. I conducted analyses of school level disparities in grades in an attempt to provide some connection between student self-reported grades with more objective measures of achievement. I found that the model of self-reported grades showed smaller mean differences between racial groups than are present in achievement scores at the school level. The fact that there are smaller gaps suggests that these findings would be amplified if standardized test scores were able to be used as the outcome.

A second important limitation to mention is the reliance on racial groupings that were created by the dominant culture to describe marginalized groups. Racial categories are inherently problematic for many reasons; to name a few - there are larger differences within racial groups than between them (Betancourt & Lopez, 1993), and these categories lack the ability to capture student culture, ethnicity, religion, or other marginalized identities. Many find racial categories to be further marginalizing, and racial categories do not account for the experiences of multiracial individuals (Powell, 2012). In addition, the experiences of multiracial students are extremely diverse since it depends greatly on which racial groups constitute their background and how they visually present to others. This survey does not allow students to report more than one racial group.

Third, all of the present analyses rely on student self-report of their perceptions of climate and their own skill set. There are known issues with using a single reporter when it comes to

characterizing school climate. Students also have limited ability to report on their own social emotional skills, since part of the skill set that students are asked to rate themselves on requires a certain ability to be self-observant. There are also issues of reference bias with students' self-reports of SEL, where social comparison is necessary to determine their own skill level. This has implications for generalizing SEL findings across schools (Duckworth & Yeager, 2015; West et al., 2015).

Finally, the data in this study is structured in such a way that the study was limited to a cross-sectional design, limiting the conclusions to be correlational in nature. Given the interrelated nature of school climate and academics, it is important that future research examine these factors longitudinally. It is likely that the relationship between academic success and school climate is reciprocal, making longitudinal research on change in climate and academic success of students over time all the more important.

Table 2.1.
Correlations Among Model Variables, Means, and Missingness

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1 Self-reported grades														
2 Climate	0.15													
3 SEL	0.36	0.52												
4 Asian	0.10	0.02	-0.01											
5 Black	-0.13	-0.01	-0.03	-0.17										
6 Latino	-0.14	0.01	-0.04	-0.12	-0.10									
7 Multiracial	-0.04	-0.01	-0.01	-0.20	-0.17	-0.12								
8 Native American	-0.07	0.01	-0.04	-0.06	-0.05	-0.04	-0.06							
9 Pacific Islander	-0.03	-0.01	-0.02	-0.06	-0.05	-0.04	-0.06	-0.02						
10 White	0.15	-0.01	0.07	-0.40	-0.34	-0.25	-0.40	-0.11	-0.12					
11 Grade level	-0.04	-0.25	-0.06	0.05	0.01	0.03	-0.09	-0.06	0.03	0.02				
12 Female	0.14	0.05	0.11	0.01	0.02	0.00	0.01	-0.03	-0.01	-0.02	0.02			
13 Male	-0.12	-0.01	-0.07	0.00	-0.01	0.01	-0.03	0.02	0.01	0.02	0.02	-0.88		
14 Decline to state gender	-0.05	-0.08	-0.10	-0.02	-0.03	-0.03	0.06	0.02	0.00	0.00	-0.09	-0.25	-0.24	
Mean/percentage	0	0	0	16.3	12.2	7.2	16.3	1.5	1.8	40.8	6.7	47.4	46.3	6.4
Percentage missing	0.00	0.02	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.03	0.04	0.04	0.04

Note: Climate and SEL success factor scale scores are in standard deviation units

Table 2.2.
Models Examining the Extent to Which SEL and School Climate Account for the Association Between Race and Grades

	Model 1		Model 3		Model 3	
	β	S.E.	β	S.E.	β	S.E.
Asian → Grades	0.05	0.05	0.04	0.05	0.08	0.05
Black → Grades	-0.51*	0.05	-0.51*	0.05	-0.45*	0.05
Latinx → Grades	-0.67*	0.05	-0.68*	0.05	-0.60*	0.04
Multiracial → Grades	-0.26*	0.03	-0.25*	0.03	-0.23*	0.03
Native → Grades	-0.69*	0.06	-0.69*	0.06	-0.58*	0.06
Pacific Islander → Grades	-0.38*	0.08	-0.38*	0.08	-0.31*	0.08
Asian → Climate			0.07*	0.04		
Black → Climate			-0.01	0.05		
Latinx → Climate			0.06	0.04		
Multiracial → Climate			-0.05	0.03		
Native → Climate			-0.02	0.06		
Pacific Islander → Climate			0.02	0.05		
Asian → SEL					-0.10*	0.02
Black → SEL					-0.18*	0.03
Latinx → SEL					-0.22*	0.03
Multiracial → SEL					-0.11*	0.02
Native → SEL					-0.35*	0.04
Pacific Islander → SEL					-0.22*	0.05
Climate → Grades			0.13*	0.01		
SEL → Grades					0.32*	0.01
Model Indirect Effects						
Asian → Climate → Grades			0.01	0.01		
Black → Climate → Grades			0.00	0.01		
Latinx → Climate → Grades			0.01	0.01		
Multiracial → Climate → Grades			-0.01	0.00		
Native → Climate → Grades			0.00	0.01		
Pacific Islander → Climate → Grades			0.00	0.01		
Asian → SEL → Grades					-0.03*	0.01
Black → SEL → Grades					-0.06*	0.01
Latinx → SEL → Grades					-0.07*	0.01
Multiracial → SEL → Grades					-0.03*	0.01
Native → SEL → Grades					-0.11*	0.01
Pacific Islander → SEL → Grades					-0.07*	0.02

Note: Estimates are in standard deviation units. Control variables not shown. SEL= social emotional learning.

Table 2.3.

Results of Interaction Tests and Multiple Group Models Testing Race Moderation of School Climate and SEL Effect on Student Self-Reported Grades

	Interaction terms		Multiple group models			
	Model 4	Model 5	Model 6 Climate		Model 7 SEL	
	Climate → Grades	SEL → Grades	Δ Chi- square	Δ CFI	Δ Chi- square	Δ CFI
Asian	-0.14*	-0.14*	-2.35	0	-16.38*	0.01
Black	-0.03	-0.17*	-2.16	0	-103.03*	0.05
Latino	-0.01	-0.07*	-0.82	0	-2.39	0
Multiracial	-0.01	-0.10*	-0.85	0	-29.93*	0.01
Native American	-0.10	-0.19*	-1.57	0	-8.20*	0
Pacific Islander	0.02	-0.07*	-0.08	0	-0.79	0

*Significance level $p < .05$. Note: Models 4-5 are in standard deviation units. Chi-square tests used 1 degree of freedom. SEL= social emotional learning.

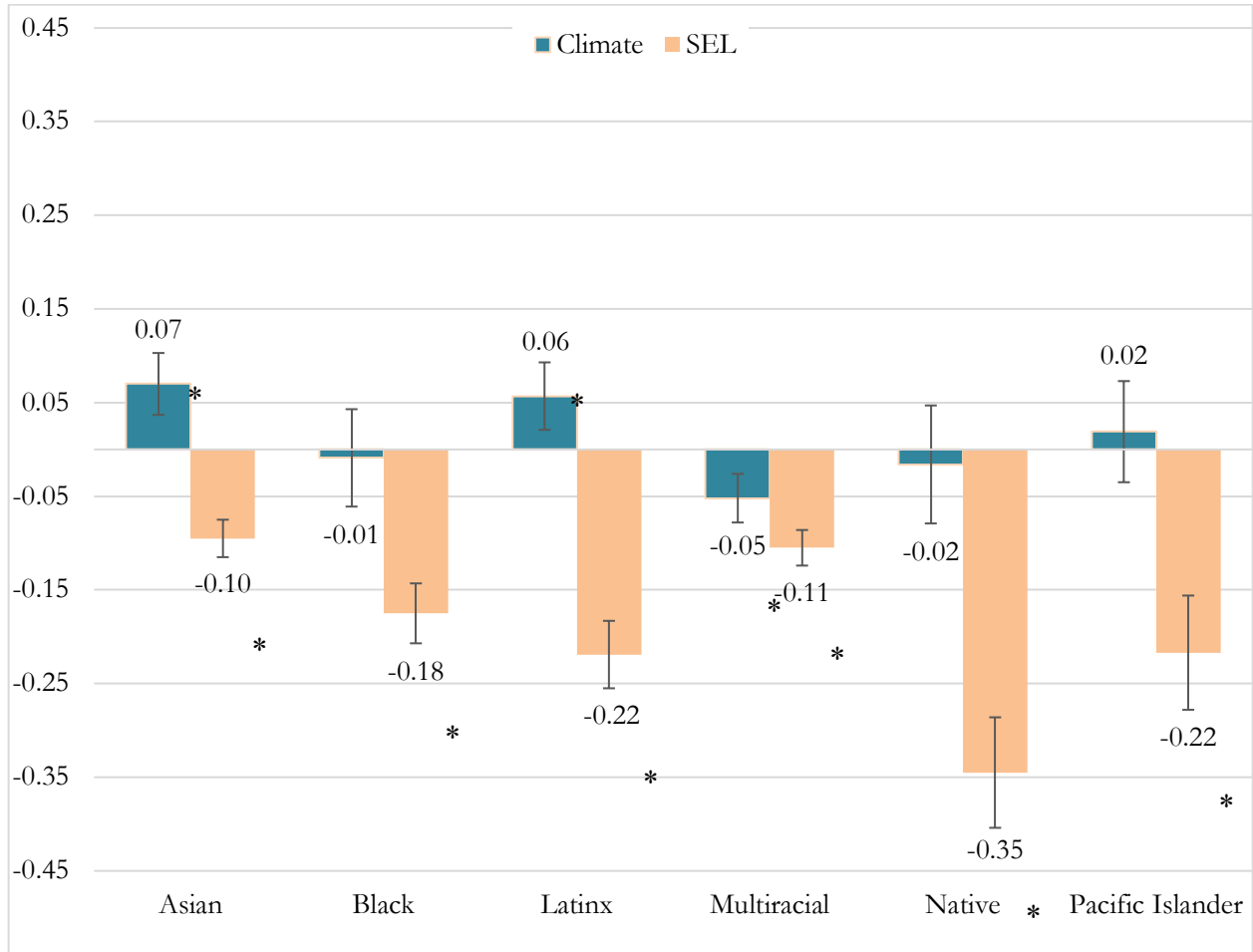


Figure 2.1. Research Question 1—Standardized effects of race differences in climate and SEL compared to White students

*Significantly different than White students. Note: Coefficients represent standard deviation unit differences compared to White students, represented at 0, controlling for gender and grade, accounting for school nesting. SEL=social emotional learning.

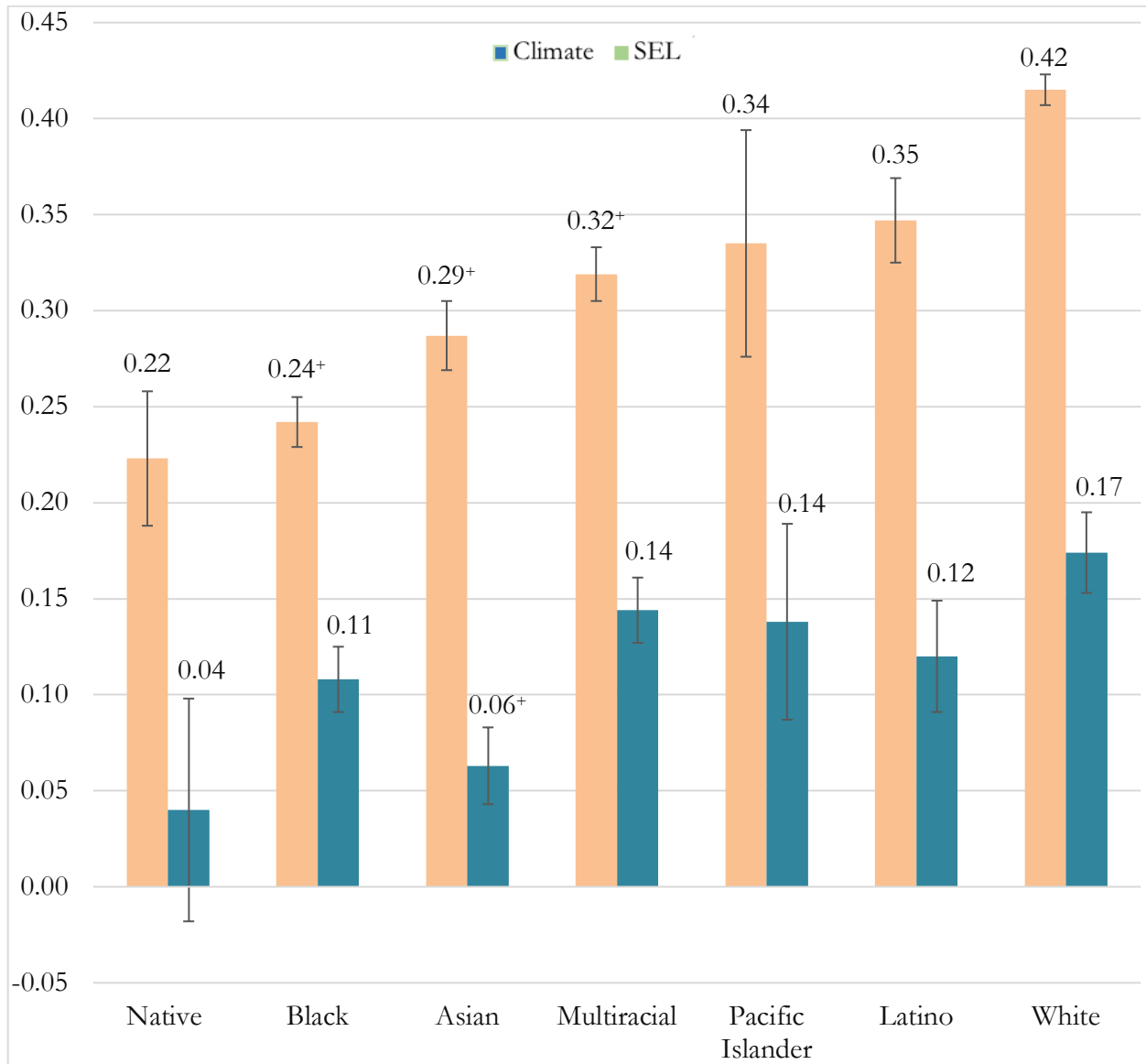


Figure 2.2. Research Question 3—Standardized effects of SEL and climate on self-reported grades for each racial group.

Note: Model shown controlled for grade level and gender. ⁺All tests agreed that the effect on grades was significantly different compared to White students.

References

- Anyon, Y., Zhang, D., & Hazel, C. (2016). Race, exclusionary discipline, and connectedness to adults in secondary schools. *American Journal of Community Psychology*, 57(3-4), 342–352. doi:10.1002/ajcp.12061
- Baum, S., Ma, J., & Payea, K. (2010). Education pays, 2010: The benefits of higher education for individuals and society. Trends in Higher Education Series. *College Board Advocacy & Policy Center*.
- Bear, G., Gaskins, C., Blank, J., & Chen, F. (2011). Delaware School Climate Survey—Student: Its factor structure, concurrent validity, and reliability. *Journal of School Psychology*, 49(2), 157–174. <https://doi.org/10.1016/j.jsp.2011.01.001>
- Berg, J., Osher, D., Moroney, D., & Yoder, N. (2017). *The intersection of school climate and social emotional development*. Washington DC: American Institutes for Research.
- Berkowitz, R., Moore, H., Astor, R. A., & Benbenishty, R. (2016). A research synthesis of the associations between socioeconomic background, inequality, school climate, and academic achievement. *Review of Educational Research*, 87(2), 425-469. doi:10.3102/003465431666982
- Betancourt, H., & López, S. (1993). The study of culture, ethnicity, and race in American psychology. *American Psychologist*, 48(6), 629. doi:10.1037/0003-066x.48.6.629
- Blanco-Vega, C., Castro-Olivo, S., & Merrell, K. (2008). Social–emotional needs of Latino immigrant adolescents: A sociocultural model for development and implementation of culturally specific interventions. *Journal of Latinos and Education*, 7(1), 43–61. doi:10.1080/15348430701693390
- Bonilla-Silva, E. (2014). *Racism without racists: Color-blind racism and the persistence of racial inequality in the United States*. Plymouth, UK: Rowman and Littlefield.
- Bottiani, J., Bradshaw, C., & Mendelson, T. (2017). A multilevel examination of racial disparities in high school discipline: black and white adolescents’ perceived equity, school belonging, and adjustment problems. *Journal of Educational Psychology*, 109(4), 532-545.
- Carter, P., Skiba, R., Arredondo, M., & Pollock, M. (2016). You can’t fix what you don’t look at: Acknowledging race in addressing racial discipline disparities. *Urban Education*, 52(2), 207-235.
- CASEL. (2013). *2013 CASEL Guide: Effective social and emotional learning programs - preschool and elementary school edition*. Chicago, IL: Collaborative for Academic, Social and Emotional Learning.
- CASEL. (2015). *2015 CASEL Guide: Effective Social and emotional learning programs - middle and high school edition*. Chicago, IL: Collaborative for Academic, Social, and Emotional Learning.

- Chain, J., Shapiro, V., LeBuffe, P., Bryson, A., & Committee, A. (2017). Academic achievement of American Indian and Alaska Native students: Does social emotional competence reduce the impact of poverty? *American Indian and Alaska Native Mental Health Research (Online)*, 24(1), 1–29. doi:10.5820/aian.2401.2017.1
- Chen, F. (2007). Sensitivity of goodness of fit indexes to lack of measurement invariance. *Structural Equation Modeling: A Multidisciplinary Journal*, 14(3), 464–504. doi:10.1080/10705510701301834
- Cheung, G., & Rensvold, R. (2002). Evaluating goodness-of-fit indexes for testing measurement invariance. *Structural Equation Modeling: A Multidisciplinary Journal*, 9(2), 233–255. doi:10.1207/s15328007sem0902_5
- Cohen, J. (1992). A power primer. *Psychological bulletin*, 112(1), 155-159.
- Cohen, J., McCabe, L., Michelli, N., & Pickeral, T. (2009). School climate: Research, policy, practice, and teacher education. *Teachers College Record*, 111, 180-213.
- De Pedro, K., Gilreath, T., & Berkowitz, R. (2016). A latent class analysis of school climate among middle and high school students in California public schools. *Children and Youth Services Review*, 63, 10–15. doi:10.1016/j.chilyouth.2016.01.023
- Debnam, K., Johnson, S., Waasdorp, T., & Bradshaw, C. (2014). Equity, connection, and engagement in the school context to promote positive youth development. *Journal of Research on Adolescence*, 24(3), 447–459. doi:10.1111/jora.12083
- Denham, S., & Brown, C. (2010). “Plays Nice With Others”: Social–Emotional Learning and Academic Success. *Early Education & Development*, 21(5), 652–680. doi:10.1080/10409289.2010.497450
- Domitrovich, C., Durlak, J., Staley, K., & Weissberg, R. (2017). Social-emotional competence: An essential factor for promoting positive adjustment and reducing risk in school children. *Child Development*, 88(2), 408–416. doi:10.1111/cdev.12739
- Duckworth, A., & Seligman, M. (2005). Self-discipline outdoes IQ in predicting academic performance of adolescents. *Psychological Science*, 16(12), 939–944. doi:10.1111/j.1467-9280.2005.01641.x
- Duckworth, A., & Yeager, D. (2015). Measurement matters. *Educational Researcher*, 44(4), 237–251. doi:10.3102/0013189x15584327
- Durlak, J. A., Weissberg, R. P., Dymnicki, A. B., Taylor, R. D., & Schellinger, K. B. (2011). The impact of enhancing students' social and emotional learning: a meta-analysis of school-based universal interventions. *Child Development*, 82(1), 405–432. <https://doi.org/10.1111/j.1467-8624.2010.01564.x>
- Dweck, C. S. (2006). *Mindset: The new psychology of success*. New York, NY: Random House Incorporated.

- Elias, M. J. (2006). The connection between academic and social-emotional learning. In M. J. Elias & H. Arnold (Eds.). *The Educator's guide to emotional intelligence and academic achievement* (pp. 4-14). Thousand Oaks, CA: Corwin Press.
- Elias, M. J., & Haynes, N. M. (2008). Social competence, social support, and academic achievement in minority, low-income, urban elementary school children. *School Psychology Quarterly*, 23(4), 474-495.
- Elias, M., White, G., & Stepney, C. (2014). Surmounting the challenges of improving academic performance: Closing the achievement gap through social-emotional and character development. *Journal of Urban Learning, Teaching, and Research*, 10, 14-24.
- Espinoza, O. (2007). Solving the equity–equality conceptual dilemma: a new model for analysis of the educational process. *Educational Research*, 49(4), 343-363.
- Farrington, C. A., Roderick, M., Allensworth, E., Nagaoka, J., Keyes, T., Johnson, D. W., & Beechum, N. O. (2012). Teaching adolescents to become learners: The role of noncognitive factors in shaping school performance--A critical literature review. Chicago, IL: University of Chicago Consortium on Chicago School Research. <https://ccrcenter.org/products-resources/resource-database/teaching-adolescents-become-leaders-role-noncognitive-factors>
- Frohlich, K., & Potvin, L. (2008). Transcending the known in public health practice: the inequality paradox: the population approach and vulnerable populations. *American Journal of Public Health*, 98(2), 216–221. doi:10.2105/AJPH.2007.114777
- Fryberg, S. A., & Leavitt, P. A. (2014). A sociocultural analysis of high-risk Native American children in schools. In J. A. Burack & L. A. Schmidt (Eds.), *Cultural and contextual perspectives on developmental risk and well-being* (pp. 57-80). Cambridge, UK: Cambridge University Press.
- Garibaldi, M., Ruddy, S., Kendziora, K., & Osher, D... (2015). Assessment of climate and conditions for learning. In J. A. Durlak, C. P. Domitrovich, R. E. Weissberg, & T. P. Gullotta (Eds.). *Handbook of social and emotional learning: research and practice* (pp. 348-360). New York, NY: Guilford Press.
- Garner, P. W. (2006). Prediction of prosocial and emotional competence from maternal behavior in African American preschoolers. *Cultural Diversity and Ethnic Minority Psychology*, 12(2), 179-198. doi: 10.1037/1099-9809.12.2.179
- Garner, P., Mahatmya, D., Brown, E., & Vesely, C. (2014). Promoting desirable outcomes among culturally and ethnically diverse children in social emotional learning programs: A multilevel heuristic model. *Educational Psychology Review*, 26(1), 165–189. doi:10.1007/s10648-014-9253-7
- Gillborn, D. (2005). Education policy as an act of white supremacy: whiteness, critical race theory and education reform. *Journal of Education Policy*, 20(4), 485–505. doi:10.1080/0268093050013234
- Gottfredson, G., Gottfredson, D., Payne, A., & Gottfredson, N. (2005). School climate predictors of school disorder: Results from a national study of delinquency prevention in schools. *Journal of Research in Crime and Delinquency*, 42(4), 412–444. doi:10.1177/0022427804271931

- Gregory, A., Skiba, R. J., & Noguera, P. A. (2010). The achievement gap and the discipline gap: Two sides of the same coin?. *Educational Researcher*, 39(1), 59-68.
- Gregory, A., & Fergus, E. (2017). Social and emotional learning and equity in school discipline. *The Future of Children*, 27, 117-136.
- Hoffman. (2009). Reflecting on social emotional learning: A critical perspective on trends in the United States. *Review of Educational Research*, 79(2), 533–556.
<https://doi.org/10.3102/0034654308325184>
- Howse, R. B., Calkins, S. D., Anastopoulos, A. D., Keane, S. P., & Shelton, T. L. (2003). Regulatory contributors to children's kindergarten achievement. *Early Education and Development*, 14(1), 101-120.
- Howard, T. C. (2010). *Why race and culture matter in schools: Closing the achievement gap in America's classrooms* (Vol. 39). New York, NY: Teachers College Press.
- Jones, D. E., Greenberg, M., & Crowley, M. (2015). Early social-emotional functioning and public health: The relationship between kindergarten social competence and future wellness. *American Journal of Public Health*, 105(11), 2283-2290
- Jones, S. M., & Bouffard, S. M. (2012). Social and emotional learning in schools: From programs to strategies. Social Policy Report. Volume 26, Number 4. *Society for Research in Child Development*. Retrieved from <https://eric.ed.gov/?id=ED540203>
- Kao, G., & Thompson, J. (2003). Racial and ethnic stratification in educational achievement and attainment. *Sociology*, 29(1), 417–442. doi:10.1146/annurev.soc.29.010202.100019
- Kistner, J., Metzler, A., Gatlin, D., & Risi, S. (1993). Classroom racial proportions and children's peer relations: Race and gender effects. *Journal of Educational Psychology*, 85(3), 446-452.
- Konold, T., Cornell, D., Shukla, K., & Huang, F. (2016). Racial/ethnic differences in perceptions of school climate and its association with student engagement and peer aggression. *Journal of Youth and Adolescence*, 46(6), 1289–1303. doi:10.1007/s10964-016-0576-1
- Koth, C., Bradshaw, C., & Leaf, P. (2008). A multilevel study of predictors of student perceptions of school climate: The effect of classroom-level factors. *Journal of Educational Psychology*, 100(1), 96-104. doi:10.1037/0022-0663.100.1.96
- Kwong, D., & Davis, J. (2015). School climate for academic success: A multilevel analysis of school climate and student outcomes. *Journal of Research in Education*, 25, 68-81.
- Ladson-Billings, G. (2006). From the achievement gap to the education debt: Understanding achievement in US schools. *Educational Researcher*, 35(7), 3-12.
- Lee, J. (2002). Racial and ethnic achievement gap trends: Reversing the progress toward equity? *Educational Researcher*, 31(1), 3–12. doi:10.3102/0013189X031001003

- Leighton, J., Guo, Q., Chu, M.-W., & Tang, W. (2018). A pedagogical alliance for academic achievement: Socio-Emotional effects on assessment outcomes. *Educational Assessment, 23*(1), 1-23. doi:10.1080/10627197.2017.1411188
- Liew, J., McTigue, E. M., Barrois, L., & Hughes, J. N. (2008). Adaptive and effortful control and academic self-efficacy beliefs on achievement: A longitudinal study of 1st through 3rd graders. *Early Childhood Research Quarterly, 23*(4), 515-526.
- Lorenc, T., Petticrew, M., Welch, V., & Tugwell, P. (2013). What types of interventions generate inequalities? Evidence from systematic reviews. *Journal of Epidemiology and Community Health, 67*(2), 190–193. doi:10.1136/jech-2012-201257
- Mattison, E., & Aber, M. (2007). Closing the achievement gap: The association of racial climate with achievement and behavioral outcomes. *American Journal of Community Psychology, 40*(1-2), 1–12. doi:10.1007/s10464-007-9128-x
- Morton, N. (2018, January 12). Racial equity in Seattle schools has a long frustrating history- and it's getting worse. Retrieved from: <https://www.seattletimes.com/education-lab/racial-equity-in-seattle-schools-has-a-long-frustrating-history-and-its-getting-worse/>
- Muthén, L. K. & Muthén, B. O. (2010). *Mplus User's Guide* (6th ed.). Los Angeles, CA: Authors.
- Muthén, B. O., & Satorra, A. (1995). Complex sample data in structural equation modeling. *Sociological Methodology, 25*, 267-316.
- Nitardy, C. M., Duke, N. N., Pettingell, S. L., & Borowsky, I. W. (2015). Racial and ethnic disparities in educational achievement and aspirations: Findings from a statewide survey from 1998 to 2010. *Maternal and Child Health Journal, 19*(1), 58-66.
- Osher, D, Kidron, Y, & Brackett, M. (2016). Advancing the science and practice of social and emotional learning: Looking back and moving forward. *Review of Research in Education, 40*(1), 644-668. doi:10.3102/0091732X16673595
- Paunesku, D., Walton, G. M., Romero, C., Smith, E. N., Yeager, D. S., & Dweck, C. S. (2015). Mind-set interventions are a scalable treatment for academic underachievement. *Psychological Science, 26*(6), 784-793.
- Paschall, K. W., Gershoff, E. T., & Kuhfeld, M. (2018). A Two decade examination of historical race/ethnicity disparities in academic achievement by poverty status. *Journal of Youth and Adolescence, 47*, 1164–1177.
- Powell, J. A. (2012). *Racing to justice: Transforming our conceptions of self and other to build an inclusive society*. Bloomington, IN: Indiana University Press.
- Reardon, S. F. Ho., A. D., Shear, B. R., Fahle, E. M., Kalogrides, D., & DiSalvo, R. (2017). Stanford Education Data Archive (Version 2.0). Retrieved from: <http://purl.stanford.edu/db586ns4974>

- Ross, C. E., & Wu, C. L. (1995). The links between education and health. *American Sociological Review*, *60*, 719-745.
- Rowe, H., & Trickett, E. (2017). Student diversity representation and reporting in universal school-based social and emotional learning programs: Implications for generalizability. *Educational Psychology Review*, *30*, 1–25. doi:10.1007/s10648-017-9425-3
- Rudasill, K., Snyder, K., Levinson, H., & Adelson, J. (2017). Systems view of school climate: A theoretical framework for research. *Educational Psychology Review*, *30*(1), 35-69. doi:10.1007/s10648-017-9401-y
- Seattle Public Schools. (2017). 2016-2017 District scorecard: Research & Evaluation Department. Retrieved from https://www.seattleschools.org/UserFiles/Servers/Server_543/File/District/Departments/School%20Board/17-18%20agendas/20171108/SPS%20District%20Scorecard%202016-17%20Board%20Presentation_ADA.pdf
- Shapiro, V., Kim, E., Accomazzo, S., & Roscoe, J. (2016). Predictors of rater bias in the assessment of social-emotional competence. *International Journal of Emotional Education*, *8*(2), 25-44.
- Shirley, E., & Cornell, D. (2012). The contribution of student perceptions of school climate to understanding the disproportionate punishment of African American students in a middle school. *School Psychology International*, *33*(2), 115–134. doi:10.1177/0143034311406815
- Shukla, K., Konold, T., & Cornell, D. (2016). Profiles of student perceptions of school climate: Relations with risk behaviors and academic outcomes. *American Journal of Community Psychology*, *57*(3-4), 291–307. doi:10.1002/ajcp.12044
- Taylor, R., Oberle, E., Durlak, J., & Weissberg, R. (2017). Promoting positive youth development through school-based social and emotional learning interventions: A meta-analysis of follow-up effects. *Child Development*, *88*(4), 1156–1171. doi:10.1111/cdev.12864
- Thapa, A., Cohen, J., Guffey, S., & Higgins-D'Alessandro, A. (2013). A review of school climate research. *Review of Educational Research*, *83*, 357-385.
- U.S. Department of Education. (2008). New race and ethnicity guidance for the collection of federal education data. Retrieved from: <https://www2.ed.gov/policy/rschstat/guid/raceethnicity/index.html>
- Voight, A., Hanson, T., O'Malley, M., & Adekanye, L. (2015). The racial school climate gap: Within-school disparities in students' experiences of safety, support, and connectedness. *American Journal of Community Psychology*, *56*(3-4), 252–267. doi:10.1007/s10464-015-9751-x
- Voight, A., & Hanson, T. (2017). How are middle school climate and academic performance related across schools and over time? REL 2017-212. San Francisco, CA: Regional Educational Laboratory West. Retrieved from <https://eric.ed.gov/?id=ED572366>

- Voight, A., & Nation, M. (2016). Practices for improving secondary school climate: A systematic review of the research literature. *American Journal of Community Psychology, 58*(1-2), 174–191. doi:10.1002/ajcp.12074
- Wang, M.-T., & Degol, J. (2016). School climate: A review of the construct, measurement, and impact on student outcomes. *Educational Psychology Review, 28*(2), 315–352. doi:10.1007/s10648-015-9319-1
- Way, N., Reddy, R., & Rhodes, J. (2007). Students' perceptions of school climate during the middle school years: associations with trajectories of psychological and behavioral adjustment. *American Journal of Community Psychology, 40*(3-4), 194–213. doi:10.1007/s10464-007-9143-y
- Weissberg, R. P., Durlak, J.A., Domitrovich, C. E., & Gullotta, T. P. (2015) Social and emotional learning: Past, present and future. In J. A. Durlak, C. P. Domitrovich, R. E. Weissberg, & T. P. Gullotta (Eds.). *Handbook of social and emotional learning: research and practice* (pp. 348-360). New York, NY: Guilford Press.
- Weissberg, R. P., Goren, P., Domitrovich, C., & Dusenbury, L. (2013). *Effective social and emotional learning programs: Preschool and elementary school edition*. Chicago, IL: Collaborative for Academic, Social, and Emotional Learning.
- West, M. R., Kraft, M. A., Finn, A. S., Martin, R. E., Duckworth, A. L., Gabrieli, C., & Gabrieli, J. (2015). Promise and paradox: Measuring students' non-cognitive skills and the impact of schooling. *Educational Evaluation and Policy Analysis, 38*(1), 148–170. doi:10.3102/0162373715597298
- Zins, J., Bloodworth, M., Weissberg, R., & Walberg, H. (2007). The Scientific base linking social and emotional learning to school success. *Journal of Educational and Psychological Consultation, 17*(2-3), 191–210. doi:10.1080/10474410701413145

PAPER 3. THE ASSOCIATION BETWEEN SCHOOL CLIMATE AND RACIAL EQUITY IN ACADEMIC OUTCOMES

Background and Introduction

The existence of significant racial differences in academic outcomes is well documented in the research literature (Lee, 2002; Carter, Skiba, Arredondo, & Pollock, 2016; Ladson-Billings, 2006). Most student groups of color, with the exception of some students of Asian descent, have consistently had less academic success compared to White students since schools were integrated following *Brown v. Board of Education* in 1954 (Lee, 2002; Love, 2004). These differences, particularly for Black compared to White students, appear to grow larger as students grow older (Reardon, Robinson-Cimpian, & Weathers, 2015). Given these race differences in academic success, it is critical that researchers identify malleable aspects of schools that can be altered to contribute to racial equity in academic outcomes. School climate (the social environment of schools) is a measurable intervention target known to influence students' academic achievement (Berkowitz et al., 2016; Kwong & Davis, 2015; Voight, & Hanson, 2017; Wang & Degol, 2016). In schools where students feel safe and supported by their teachers and peers, they are more apt to stay on task and be motivated to learn. However, little is known about the extent to which school climate promotes racial equity in academic outcomes. Since schools vary in the magnitude of race differences in academic outcomes, school climate is a potential characteristic of schools that can explain between-school variation in the size of race differences in academic success. This exploratory study aimed to further understand the variation by race in the relationship between school climate and self-reported grades, a measure of academic outcomes and how these relationships manifest across school levels (i.e., elementary, middle, high school) in the Seattle Public Schools (SPS). Further, I also investigated how these relationships are influenced by the sociodemographic composition of schools, which is also related to school climate and academic outcomes (Berkowitz, Astor, Roziner, & Wrabel, 2016).

Through these analyses, I hope to learn whether school climate is a potential mechanism to promote racial equity in academic success.

Race and Academic Success in Schools

In the United States, racial differences in student academic success is a well-documented issue. Academic success is generally racially patterned, with students from most racial groups of color doing worse than White students and students from East Asian descent (Kao & Thompson, 2003). This is true across measures of achievement: from standardized test scores to high school graduation rates and grade point averages (GPA) (Kao & Thompson, 2003). Based on data from the National Education Longitudinal Study (NELS) Asian students had an average GPA of 3.24, White students 2.96, Hispanic students 2.74, and Black students 2.73 (Kao & Thompson, 2003). Evidence for race differences in achievement emerges as young as 3 years old, and some of these differences have been found to grow larger at higher grade levels (Burchinal et al., 2011 Reardon et al., 2015). Data from the ECLS-K show race differences in standardized achievement scores present when student start kindergarten and larger differences by the time students reach 5th grade. By 8th grade the differences between racial groups of students stabilize, with Black students generally performing at about one standard deviation below White students (Reardon et al., 2015). Less is known about racial differences in academic success for Latinx students as they progress through school. Evidence available from the ECLS-K data at the elementary school level suggests that the gap between Latinx and White students is narrow through elementary school, but evidence is inconclusive about the size of the racial differences in secondary school. Within the Latinx population of students, academic performance is known to vary based on factors such as ethnicity, language, context of immigration, and acculturation, and because of this heterogeneity, studies are inconsistent as to the size and trajectory of differences in academic success (Reardon et al., 2015). Similar to Latinx students, Asian students are another highly heterogeneous group whose achievement is also intertwined with the

similar issues of ethnicity and language. When grouped together, Asian and Pacific Islander students tend to do better than White students on most markers of achievement and do increasingly better as students progress through school (Kao & Thompson, 2003; Reardon et al., 2015). Asian and Pacific Islander students' achievement is often reported together, though studies where 13 different Asian ethnicities were disaggregated found significant differences in achievement among different ethnic groups (Pang, Han, & Pang, 2011). The research on Native American students is sparse, but data available from the sample of 300 students who identify as Native in ECLS-K shows that Native students perform lower than all other racial groups on average, but that the difference in achievement lessens as students progress through school (Demmert, Grissmer, & Towner, 2006).

School Climate

School climate refers to the social environment at school and how students experience school (Wang & Degol, 2016). School climate is defined as the collective experiences of students at school related to students' relationships with teachers and their peers, their sense of physical and emotional safety, their sense of belonging or connectedness to the school, and their perceived quality of teacher instruction (Wang & Degol, 2016; Cohen, McGabe, Michelli, & Pickeral, 2009; Thapa, Cohen, Guffey, & Higgins-D'Alessandro, 2013). Positive school climate provides the necessary conditions for learning, since students who are in fear or under stress do not learn as well, and students with positive relationships who look forward to attending school are more successful (Cohen et al., 2009; Garibaldi, Ruddy, Kendziora, & Osher, 2015; Wang & Degol, 2016).

Many studies have demonstrated that students' individual perceptions of school climate are related to academic outcomes, and that measures of school climate aggregated to the school level are also related to individual students' academic success. Wang and Degol (2016) reviewed evidence for how different domains of school climate are related to academic success of students. These authors organized school climate literature into academic climate, community, safety, and institutional

environment factors. They found that schools with positive academic environments characterized by high standards, effective leaders, and a commitment to student mastery also have more academically successful students. Similar to the community domain, positive relationships between students and teachers, parental community, and a high regard for diversity are also known to increase student academic success (Thapa et al., 2013; Wang & Degol, 2016).

Many empirical studies have been conducted to examine the relationship between academic success and school climate, and most studies examined school climate at the school level. For example, Voight and Hanson (2017) found that middle schools where students perceived more positive climate also had higher English and Math performance in 7th grade. Kwong and Davis (2015) found that positive school climate was associated with academic success, as students performed better on reading tests in schools with a more positive school climate. These authors also examined student-level perception of school climate and found that it was associated with improved academic performance on standardized test scores (Kwong and Davis, 2015).

In their study of 53,946 fifth and eighth grade Israeli students, Berkowitz and colleagues (2015) found that school climate was associated with performance on standardized test scores. Further, school climate moderated the relationship between student socioeconomic status and academic achievement such that the gap between students with low and high socioeconomic status was smaller in positive climate schools. As such, school climate is thought to compensate for the effect that low socioeconomic status typically has on achievement. Since students from low socioeconomic backgrounds tend to do worse in school, school climate can serve to level the playing field, so to speak, and make up for a students' low socioeconomic background. In a review of 78 studies, Berkowitz and colleagues (2016) found that school climate can diminish the negative effect that students' low socioeconomic status has on academic outcomes, with academic outcomes being operationalized differently across studies. All but one study found school climate to be

positively associated with academic outcomes, and 84% of studies included in the review found that a positive school climate actually reduced the gap between low and high-income students on academic outcomes (Berkowitz, Moore, Astor, & Benbenishty, 2016). These findings indicating the importance of climate are promising for the present investigation of whether climate might have a compensatory effect on race differences in academic outcomes as well, especially since race and low socioeconomic status are known to be highly correlated.

Only one study examined associations between school climate and racial equity in academic outcomes; however, it was focused on individual level race differences in achievement and individual perceptions of climate (within-school student perceptions as opposed to school level or between school climate). Voight and colleagues (2015) examined within-school racial disparities in perceptions of school climate and how these gaps were associated with race differences in achievement. They found that schools with higher proportions of students in poverty had smaller Black-White gaps in students' perception of safety and connectedness. They also found that racial gaps in students' perceptions of climate within schools were linked with racial differences in student academic performance for Black and Hispanic students compared to White students (Voight, Hanson, O'Malley & Adekanye, 2015). Though its focus was on student perceptions of climate within schools, this study informs the present study, as school climate was found to be important for racial equity at the student level. It was focused on within-school differences and did not assess school climate at the school level for its associations between schools with differences in academic performance by race. No studies were found that examined whether school climate is associated with variation across schools in race differences in academic outcomes.

Dynamics of School Climate as Students Progress Through School

As noted above, patterns of academic success are known to change as students' progress through school (Seidman, Allen, Aber, Mitchell, & Feinman, 1994). Students' experience of school

climate follows a similar pattern, though there is little research about how students' perceptions of school climate change as students progress through school, or how these changes are associated with changes in academic outcomes (Wang & Degol, 2016). Most research is cross-sectional and focused on a single developmental time point. Cross-sectional studies in elementary school demonstrate the relationship between academic success and school climate in younger students. For example, Brookover and colleagues (1978) studied 4th and 5th graders from 68 elementary schools and found that school climate was associated with mean school achievement after controlling for school socioeconomic status and racial composition. Similarly, in a sample of 1,535 5th grade students from 50 schools, Wang and colleagues (2014) found that a one unit increase in average school climate score was associated with almost a whole grade point increase in GPA.

The transition from elementary to middle school corresponds with significant changes in students' physical and social development and increasing rigor in academic expectations (Wang & Eccles, 2011). During this transition, students learn to be more autonomous, and social acceptance is increasingly important (Voight & Hanson, 2017). The transition from elementary to middle school corresponds to a decrease in grades (Schwerdt & West, 2012; Seidman et al., 1994), as well as to a decrease in students' perceptions of climate in middle school (Kim, Schwartz, Cappella, & Seidman, 2014). Researchers have suggested that discrepancies between school environments and students' developmental needs are related to the decline in school engagement and, relatedly, perceptions of school climate (Wang & Eccles, 2011; Wang & Degol, 2016).

Many studies have focused on middle school specifically, or trajectories of school climate throughout secondary school, as students' perceptions of school climate are known to decrease over this developmental time period (Seidman et al., 1994; Wang & Dishion, 2012; Wang, Selman, Dishion & Stormshak, 2010, Wang & Degol, 2016). Wang and colleagues (2010) found that over the course of middle school, the proportion of students who perceived their school to have a positive

climate decreased. In addition, students who perceived better school climate also had a lower probability of having behavior problems. In another model of school climate trajectories, Way and colleagues (2007) found that student perceptions of school climate decreased over the 3 years of middle school, and these declines were associated with increases in behavioral and psychological problems. Further, these authors tested the direction of effect and found that school climate largely influenced behavioral adjustment rather than the other way around.

School engagement, school connectedness, and school bonding are closely related concepts, and are subcomponents of most measures of school climate, including the SPS school climate measure. Definitions of each of the related concepts varies by study, though they share common elements related to the sense of feeling supported and included by school staff and peers in the school social environment (Chapman, Buckley, Sheehan, & Shochet, 2013). Wang and Eccles (2011) studied trajectories of grades in middle and high school alongside trajectories of school engagement. They found that students' grade point average (GPA) decreased over grades 7 to 11, as did each of the components of school engagement. The authors define school engagement as school participation, self-regulated learning (a measure of cognitive engagement), and school belonging. Trajectories of school participation and self-regulated learning were related to trajectories of GPA and educational aspirations, but school belonging was related to educational aspirations but not GPA. Bond and colleagues (2007) conducted a longitudinal study of school connectedness in secondary Canadian Catholic school students from 8th to 10th grade. These authors found that school connectedness was associated with high school completion and higher education test scores, and that poor social connectedness and experiencing bullying reduced the odds of completing high school (Bond et al., 2007). By high school, many students have become disconnected from school, putting them at risk for school dropout and behavioral health problems. A sense of belonging in high school is related to higher grades and is protective against a number of issues including school

dropout and behavioral health problems (Bond et al., 2007; Monahan, Oesterle, & Hawkins, 2010). Another characteristic of schools known to impact students' academic achievement is the socioeconomic composition of schools.

School Socioeconomic Composition

Sociodemographic composition of schools refers to the socioeconomic status of the families of students within a school and the racial composition of school student populations. There is significant variation in the racial and socioeconomic makeup of the student bodies of schools both nationally and in the SPS. A number of studies have examined the role of school sociodemographic composition on academic outcomes (Crosnoe, 2009; Palardy, 2013; Perry & McConney, 2010; Reid & Ready, 2013). Research has generally confirmed that schools that have larger proportions of students of lower income families perform worse in terms of average levels of academic achievement, and these findings have been replicated across the spectrum of development. For example, in a sample of 12,000 students in Australia, Perry and McConney (2010) found that students' academic achievement increased when the average socioeconomic status of the school increased, and this relationship was found for all students independent of their individual socioeconomic status. Palardy (2013) used the Education Longitudinal Study, which surveyed students in 10th grade in 2002 and 12th grade in 2004, and found that a one standard deviation increase in socioeconomic composition of a school increases the odds of a student graduating high school by 40%, enrolling in a 2-year college by 16%, and enrolling in a 4-year college by 55%. The effects of socioeconomic composition on student academic outcomes can be seen as early as preschool. Reid and Ready (2013) also found that socioeconomic composition of preschool classrooms was associated with language and mathematics skill development, regardless of student's own socioeconomic status.

Racial and socioeconomic composition are highly correlated, since the parents of students of color are more likely to have lower levels of education and lower income because they were faced with similar structural challenges as their children (Brown-Jeffy, 2006). Students of color are more likely to attend schools with substantially lower levels of funding per student. Comparing three urban areas, Ladson-Billings (2007) documented an average of a \$10,000 difference in funding per student per year. Many studies have found that race plays a role above and beyond that of socioeconomics, but it is often challenging or impossible to disentangle these effects (Brown-Jeffy, 2006; Hopson, Lee, & Tang, 2014)

The Present Study

This study is based in the SPS, a large urban district that serves more than 50,000 students. Data are from surveys of students in grades 3 through 12. The survey included questions on students' perceptions of school climate as well as students' grades. I explore whether school climate is associated with racial equity in student grades. By examining school-level variation, analysis can be moved to the level of the school and take the focus off of individual students and their perceptions. I analyze student self-reported grades, grades are an important academic outcome as they are correlated with achievement test scores, but also incorporate student efforts (Kao & Thompson, 2003). Grades are also more related to success in higher education than other markers of achievement (Farrington et al., 2012; Kao & Thompson, 2003). Prior research has also shown self-report of grades to be correlated with school records of grades (r range .61 and .90) (Kuncel, Credé, & Thomas, 2005). For the present study, analyses are conducted within a single school district, allowing for schools that have smaller differences in academics across race to be identified. Specifically, I examine the extent to which school climate explains race differences in grades, testing the hypothesis that better school climate is associated with smaller racial differences in grades. In addressing this research question, I also consider socio-demographic composition of schools and

grade level, since these variables have been found to be related to academic outcomes and racial differences in academic outcomes.

Method

Sample

Data are from the SPS school climate survey administered in 2016. The student survey is administered every year in the spring to all students in grades 3 through 12. Schools choose between a paper or computer-based survey, and teachers and school staff administer the survey during the school day. The survey takes most students about ten minutes to complete. Seventy-one percent of the 41,430 enrolled students completed the survey in 2016. The resulting sample self-reported their race, with the following breakdown: 43% White, 16% Asian, 12% Black, 17% Multiracial, 7% Latino, 2% Pacific Islander, and 1.5% Native American. Students also self-identified their gender, with 41% male, 47% female, and 7% decline to state (an option on the survey as opposed to missing). Students in SPS originate from 149 different countries and speak 146 different languages. The survey is anonymous, so student data cannot be linked to achievement scores. Thirty-four percent of students in the district meet criteria for free and reduced-price lunch. All 97 schools were included in the sample: 60 elementary schools, 10 middle schools, 10 K-8 schools, 15 high schools, and 2 alternative schools. Schools ranged in the percentage of students who met criteria for free and reduced-price lunch from 4% to 96%.

Measures

Self-reported grades was the academic outcome of focus. Students selected whether they had achieved “Mostly D’s or E’s,” “Mostly C’s,” “Mostly B’s,” or “Mostly A’s,” or, with response options ranging from 1 to 4. Standardized effect sizes for race disparities in self-reported grades found in the current study were slightly smaller than the size of race disparities in the percentage of

students meeting grade level on English and Math standardized tests in 7th grade according to records (Seattle Public Schools, 2017).

Race was self-reported by students. The racial groups available were determined by the list provided by the federal government necessary for reporting purposes (U.S. Department of Education, 2008): Asian, Black or African American, Latinx or Hispanic, Multiracial, Native American, or Pacific Islander. For models predicting self-reported grades, dummy variables for each racial group were created, with White coded as the referent category.

Student perceptions of school climate was measured by 33 items constituting six different sub scales: 1) healthy community, 2) belonging, 3) classroom environment, 4) school safety, 5) pedagogical effectiveness, and 6) motivation and inclusion. Response options were on a Likert scale including “strongly disagree,” “disagree,” “neither agree nor disagree,” “agree,” and “strongly agree.” Scales were determined through an adequate fitting confirmatory factor analysis and invariance testing, and were found to be internally consistent, with Cronbach’s alpha ranging from .72 to .87. Details of the psychometric properties of these scales are reported in the first dissertation paper. Mean scores for each student on each subscale were calculated and standardized. A final individual school climate score was calculated for each student by taking the average of students’ reports on each of the six subscales. In models predicting grades, student perceptions of school climate were treated as both an individual- and a school-level variable. Individual-level scores were standardized across all students and group mean centered, with a student’s perception of climate scored relative to the mean score in that student’s school. **School-level school climate** was calculated by taking the average across all students’ individual perceptions of school climate at each school. School climate scale scores were standardized across schools.

Sociodemographic composition of schools was determined by the percentage of students who meet criteria for free and reduced priced lunch at each school. Students from families who

make less than 130% of poverty receive free lunch, and students between 130% and 185% of poverty receive a reduced-price lunch (NSLP, 2017). There are also categorically eligible students who qualify if they are homeless, migrant, runaway, or in foster care (NSLP, 2017). Family income information is collected by the Nutrition Services department and is only available at the school level. I also investigated the relationship between the percentage of students who were White and the percentage of students qualifying for free and reduced-price lunch to see how this measure of school poverty was related to other sociodemographic characteristics of schools. The percentage of White students of each school was correlated with the percentage of students on free and reduced lunch at $r = -.97$. I use the term school poverty as a shortened term for the variable that also indicates the direction of effect (higher numbers indicate more students in poverty). The school poverty variable was standardized across schools.

Gender and grade level were included as **control variables** in all models. Gender was dummy coded with male students and those who declined to state gender contrasted with female students. Grade level was self-reported by students and included grades 3 through 12.

Analysis Plan

A series of multilevel models predicting grades were run in Mplus version 7.4 (Muthén, & Muthén, 2010). Schools were entered as the clustering variable, and two-level models were estimated with self-reported grades specified as ordered categorical. First, I tested for between-school variation in race effects on grades by comparing fit of models in which effects of race were treated as fixed versus a model in which they were treated as random at the school level. The BIC was used to assess change in fit, as well as the significance of the variances in each of the random effects. To assess whether school-level variables accounted for between-school differences in race effects, school climate and school poverty were added to the model, both as main effects on grades and as moderators of race effects. First, school climate and poverty were entered separately (Models 2 & 3)

and then entered into the same model (Model 4). In models including school climate, individual perceptions of climate were included as an individual-level variable with a main effect on grades in order to illustrate how school climate may relate to grades at both the individual and school level. All models used maximum likelihood estimation with robust standard errors. Models were specified as two-level random and estimated with Monte Carlo integration.

Results

Students reported that, on average, their grades were in the “Mostly A’s” range, with a mean of 3.35 on the variable coded in terms of the 1-4 response range and standard deviation of .76. Schools had an average of 38% of students meeting criteria for free and reduced-price lunch, with schools ranging from 4% to 96%. The racial composition of the sample reflects that of the school district. Schools contained an average of 47% White students, ranging from 2% White to 80% White. Descriptive statistics and correlations are reported in Table 3.1.

A model in which effects of race on grades were treated as random (model 1 in Table 3.2) was a better fit than a model in which these effects were treated as fixed as evidenced by a lower BIC. The main effects of race on grades indicate the significant difference in grades compared to White students for all other racial groups. As expected, all groups except Asian students had on average significantly lower grades compared to White students. Also reflecting the better fit of the random race effects model, I found significant between-school variance in the effect of each race dummy, with the exception of the effect of Native, for which the variance approached significance ($p > .073$). I elected to retain the random slope for the Native effect in the model for consistency. Plots of school variation in the magnitude of the race differences in grades derived from Model 1 are found in Figure 3.1, with the size of the effects standardized (e.g., the mean difference in grades between Black and White students was $-.69$ standard deviation units). The standard deviation

reported in the Figure 3.1 captures the variation across schools, also represented visually in the distribution of the histograms.

Model 2 in Table 3.2 shows the effect of school climate on grades at the individual and school level, as well as tests of whether school climate moderated race effects. At the individual level, a one standard deviation unit increase in perception of school climate was associated with grades that were .29 standard deviations higher. The main effect of school-level school climate on grades was negative and not statistically significant, suggesting that schools with higher mean levels of perceived school climate did not have higher grades on average. School-level school climate did, however, significantly moderate all of the race effects. With the exception of the school climate x Asian effect, all of these interactions suggest race differences in grades were smaller at schools with higher mean climate scores. Figure 3.2 illustrates the cross-level interactions of school climate and race differences in student reported grades. The y-axis represents standardized race differences in grades, and schools are ordered along the x-axis in terms of their ranking with respect to school climate scores. The slope of the lines for each racial group, excluding Asian students, shows that in higher climate schools, the magnitude of the race gap in grades was smaller compared to low climate schools. The results are in the opposite direction for Asian students. As shown in Table 3.2, school-level variation in race effect is no longer significant in the model with school climate as an explanatory variable. This finding suggests that, in this model, school climate largely explains across-school variation in the magnitude of race differences in grades.

The direct and moderation effects of school poverty are shown in Model 3 in Table 3.2. The main effect of school poverty was not significant overall. With respect to whether school poverty was associated with the magnitude of race effects on grades, the difference in grades for Multiracial students compared to White students was significantly smaller in high poverty schools, while the difference in grades for Latinx, Native, and Pacific Islander students compared to White students is

larger in high poverty schools. There were no significant effects of school poverty on school variation in the size of the difference in grades for Black or Asian students compared to White students. Significant variance in race effects across schools remains unexplained in Model 3. Estimates for Native effects in this model are not trustworthy due to the non-positive definite first order derivative product matrix. This is likely due to the small sample of Native American students being unevenly distributed over schools. The association between school poverty and between-school variation in race differences in grades is illustrated in Figure 3.3. The y-axis represents race differences in grades and schools are ordered along the x-axis from high to low poverty. The slope of the lines shows that in lower poverty schools, there is a smaller difference in grades for Latinx, Native, and Pacific Islander students compared to White students. The slope is the opposite for Multiracial students and not significant for Asian students.

To examine whether including school poverty in the model diminishes the effect of climate on the magnitude of race differences in grades, school climate and school poverty were entered into the same model (Model 4 of Table 3.2). Cross-level interactions of race by school climate remain the same after adjusting for school poverty. Models with both school climate and school poverty accounted for the largest portion of variance across schools. Variation in race effects was no longer significant except for the Pacific Islander effect. These findings suggest that school climate is associated with race differences in grades, over and above the effect of school poverty.

Because of the possible association between student age or grade level and both race differences in grades and perception of school climate, I conducted two sensitivity analyses to examine whether school climate was confounded with grade level or school level (elementary, middle, or high). The types of schools are color-coded by grade level type in Figure 3.2, showing that elementary schools generally have the highest school climate scores, which corresponds to having smaller differences between racial groups on self-reported grades. The correlation of school-

level school climate with student's grade level was also very high ($r = .62$). To examine whether race differences in grades increased as students aged through school, confounding the results, I tested whether race x grade level interactions were significant as individual-level fixed effects. The results indicate that all race x grade interaction terms were significant for all racial groups, such that smaller race differences in grades were found for students in lower grade levels. I then included these interaction terms in the models with school climate x race cross level interactions. The pattern of results for the cross-level interactions remained largely the same, except that the effect sizes were half as large for all racial effects and the effect of climate on race differences for Native students was no longer significant (results not shown). These analyses suggest that the effect of school climate on race differences in grades is still significant after accounting for the fact that race differences in grades increase at higher grade levels, when grade level is considered as a continuous individual-level variable with a linear relationship with the magnitude of race differences in achievement.

The second sensitivity test conducted was to include dummy variables for the school category (elementary, middle, and high school). In order to do this, K-8 schools and alternative schools that had more than one school level were excluded, reducing the school sample size to 85. Distributions of school climate scores by school grade-level type are reported in Figure 3.4, and show how school climate drops on average in middle school, but then slightly increases in high school, and the distribution widens. In models predicting grades, dummy variables for middle and high school were entered at the school level with both direct effects on grades and as moderators of race effects on grades. Results of this sensitivity test are reported in Table 3.2, Model 5. Main effects for both the Middle and High dummy variables were significant and negative, reflecting students' reporting lower grades in high grade level schools than in elementary schools. Including the effect of school category results in a diminished and less clear picture of the moderation of grade differences by school climate, with most of school climate x race effects no longer significant. Higher school

climate was still significantly associated with smaller race differences in grades for Multiracial and Pacific Islander students after accounting for school category; for the Asian vs White difference, the moderation effect was still significant but reversed in direction. The estimates of school climate by Black, Latinx, and Native interactions were all smaller and nonsignificant. With respect to school category by race interactions in Model 5, middle and high school dummies showed positive moderation of the Asian vs White difference, reflecting the fact that Asian students performed increasingly better than White students as they progressed across school types. Moderation of the Black and Native effect reflected the opposite, with grade disparities growing larger for each of these groups compared to White students in middle and high school.

Discussion

Findings from this study suggest that school climate plays a role in racial equity in grades, but that school climate is difficult to disentangle from school category. Schools with more positive school climates also had smaller differences in grades between White students and Black, Latinx, Native, and Pacific Islander students. Moreover, school climate explains more between-school variation in race difference in grades than does school poverty, and school climate is important above and beyond individual students' own experiences of climate. This study provides evidence that focusing on improving the social experience of school as measured by school climate may help improve racial equity in academic outcomes. The strength of confidence in this interpretation of these findings is, however, tempered by the fact that the association between school climate and disparities in grades may be partly attributable to larger race differences in grades found in secondary school compared to primary school.

The fact that effects of school climate are difficult to separate from that of school grade-level type calls attention to the decline in school climate in middle school, which might also be

related to race differences in grades. Climate decrements in middle school point to some of the ways in which schools are not meeting the needs of students as they change during development (Wang & Eccles, 2011). Although the analysis herein does not allow distinguishing the effect of climate separately from that of school level, it does show that race differences in grades increase in middle and high school, which corresponds to a decrease in school climate. The fact that middle school and high school are qualitatively different is no surprise, but it does not diminish the role of school climate. In fact, this finding is aligned with literature about the difficulty students face in the transition to secondary school. School climate could be a factor that might support students in adjusting to middle school and may highlight areas where the school climate is not aligned to the needs of students (Wang & Eccles, 2011). Looking at the subconstructs of school climate might provide secondary schools with information about the areas where students' needs with regard to the social experience of school are not being met. Improving climate in secondary school may have the added benefit of contributing to racial equity, though future research with more secondary schools is necessary to extricate the effect of school climate from the known decrements in school climate that happen in secondary school (Wang & Degol, 2016; Wang & Eccles, 2011).

This analysis, which focuses on school-level influences on race differences in grades, is particularly helpful within a school district to highlight bright spots where the school climate is conducive to promoting racial equity. In comparison to Voight and colleagues' (2015) study, which found that individual-level school climate was associated with within-school (i.e., individual) differences in achievement, the present results show that school climate at the whole school level was associated with race differences. This highlights the need for additional research on the relationship between school climate and racial differences in academic outcomes, especially as to the level of analysis for school climate and the generalizability of these findings across geographic locations with different racial dynamics. It raises questions about why school-level climate, the

collective experience of the climate of schools, is important. It may be that having a positive social environment at school characterized by positive relationships with teachers and peers, a sense of belonging and community, feelings of safety, and teachers skilled at motivating and engaging students provides a foundation for learning that compensates for some of the negative effects of the education debt experienced by many students of color. Similar to the case of the relationship between low socioeconomic status and school climate (Berkowitz et al., 2016), positive school climates may compensate for the negative experiences students of color face in schools. Further, school climate matters above and beyond the contribution of school poverty to student grades. In this way, it may be that a focus on school climate is aligned to the interests of all students.

It is important to interpret findings in terms of educational equity and the education debt. The analysis herein suggests that climate may contribute to racial equity and that racial differences in grades increase as students progress through school. Yet, conducting this analysis required an examination of differences among racial groups. I recognize the problems involved with an explicit focus on achievement gaps (Gutierrez, 2008; Ladson-Billings, 2006; Milner, 2008). Having weighed the pros and cons of conducting this analysis given the risks, I concluded that it was still worth doing. By theorizing the reasons for gaps as the result of structural inequities and systemic racism, I refocused the analyses on characteristics of schools and away from student deficits. I also shifted the language focus away from the achievement gap. Rather than assuming school climate is important for all, I demonstrated with empirical evidence that school climate may be a school characteristic with potential to improve racial equity in academic outcomes. This type of analysis is especially critical for school district decision-makers and policy-makers who are deciding which programs to fund (Lubienski & Gutierrez, 2008). In this case, the findings show that improving school climate is may benefit all students, and that it may also contribute to racial equity. Although I want to be careful not to promote factors where the interests of White students are prioritized, this is one case

where interests among students of color and White students do converge (Milner, 2012). In schools and districts that are focused on racial equity, all programs should be put to the test as to whether they contribute to equity. This analysis provides some support for investments in school climate to promote racial equity in academic outcomes.

Implications and Future Directions

This study's analyses also highlight the issues with the problems inherent in the multiracial category. There are problems of categorization of any racial group, since the experiences of all racial groups are highly heterogeneous and there tends to be more differences within racial groups than between them (Betancourt & Lopez, 1993; Powell, 2012). However, for Multiracial students the categorization issue is exacerbated. For example, a biracial student of Asian and White parents has a different school experience than that of a biracial student of Black and White parents. This problem is evident in the current findings as well, in which multiracial students perform better in schools characterized by high poverty. I am unable to interpret this finding because it is impossible to draw conclusions about the experiences of such a diverse group of students.

The data are also limited in that the number of students of Pacific Islander and Native American descent at some schools are small. Students of these backgrounds are not evenly distributed across schools, and there are about 10 schools where there are no students of either group. These data issues caused problems with the model in some places. Rather than removing these groups from the model, I chose instead to highlight where the model problems exist so that some conclusions can be made for these groups for whom so little research has been published.

The outcome of student self-reported grades is subject to reporting bias by students and the limitations of students' knowledge of their grades. This outcome limits the ability to interpret the findings in terms of expected grades, especially since grades may not be very meaningful to elementary school students. By comparing the measure of the magnitude of race differences in

grades to school level objectively measured achievement, I found that the race differences were smaller in the measure of grades compared to standardized achievement. This provides some level of confidence that the measure of grades is picking up on important race differences. It is also imperative that future analyses address the role of students' own socioeconomic status. This level of data was unavailable for this analysis but is likely to influence the current findings. Future research would also benefit from investigating the perceptions of school climate from other informants, especially teachers, school administrators, and families.

The generalizability of this study's findings is limited because the analyses were conducted within a single school district. This limited the sample size of schools, which is critical for conducting multilevel analyses across all developmental levels. Having only 10 middle schools and 15 high schools in the sample limited the ability to disentangle the effect of being in middle or high school from that of school climate. Future research with larger samples of schools should look both cross-sectionally and longitudinally at how school climate changes as students progress through school and how it effects race differences in grades.

The direction of effects is not evident from these analyses, so I cannot draw conclusions about whether school climate influences student grades or vice versa. It may be that climate at schools with smaller differences between different racial groups of students is better because students perceive schools to be more equitable. Previous analyses have shown evidence that academic success drives improvement in school climate (Benbenishty, Astor, Roziner, & Wrabel, 2016), and the other way around (Berkowitz et al., 2016). It is likely that this relationship is bidirectional, since research has confirmed the importance of relationships, belonging, and teacher practices with academic outcomes (Thapa et al, 2013). Future longitudinal research is important to establish the direction of causality and role of school climate in the etiological chain of events in order to identify prevention interventions targets. Ultimately, the goal is to prevent the development

of educational inequities, making it critical to identify school characteristics that are malleable and within the purview of schools to change.

Table 3.1.
Correlations among Model Variables and Descriptive Statistics

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1 Self-reported grades	-														
2 Asian	0.08	-													
3 Black	-0.12	-0.17	-												
4 Latino	-0.14	-0.12	-0.10	-											
5 Multiracial	-0.03	-0.20	-0.17	-0.12	-										
6 Native American	-0.07	-0.06	-0.05	-0.03	-0.06	-									
7 Pacific Islander	-0.03	-0.06	-0.05	-0.04	-0.06	-0.02	-								
8 White	0.13	-0.40	-0.34	-0.25	-0.40	-0.11	-0.12	-							
9 Student climate	0.14	0.02	-0.01	0.01	-0.01	0.01	-0.01	-0.01	-						
10 School climate	0.00	-0.03	-0.02	-0.02	0.08	0.05	-0.02	-0.02	0.35	-					
11 School poverty	-0.13	0.22	0.27	0.17	0.00	0.03	0.08	-0.46	-0.02	-0.07	-				
12 School percentage white	0.10	-0.25	-0.27	-0.15	0.00	-0.02	-0.09	0.47	0.02	0.06	-0.97	-			
13 Grade level (3-12)	-0.05	0.05	0.01	0.03	-0.09	-0.07	0.03	0.02	-0.25	-0.62	0.07	-0.06	-		
14 Male=1	-0.10	0.00	-0.01	0.01	-0.03	0.02	0.01	0.01	-0.01	-0.02	0.02	-0.02	0.02	-	
15 No gender=1	-0.05	-0.02	-0.03	-0.03	0.06	0.02	0.00	0.01	-0.08	0.08	-0.06	0.05	-0.09	-0.24	
Mean/Percentage	3.35	16.3%	12.2%	7.2%	16.3%	1.5%	1.8%	44.7%	3.59	3.77	42%	44%	6.67	46.3%	6.4%
Standard Deviation	0.76	-	-	-	-	-	-	-	0.64	0.21	0.28	0.26	0.95	-	-

Note: Mean of scale variables are provided here as raw means and standard deviations (#9-13), though variables entered in the model are standardized and centered.

Table 3.2.

Results of Multilevel Models Estimating School Random Effects of Race on Grades and Cross Level Interactions in Standard Deviation Units

<i>Fixed effects</i>	Model 1		Model 2		Model 3		Model 4		Model 5	
	β	S.E.	β	S.E.	β	S.E.	β	S.E.	β	S.E.
Individual-level variables										
Grade level	-0.05	0.02	-0.04	0.02	-0.04	0.02	-0.05	0.04		
Gender										
Male=1	-0.56	0.04	-0.55	0.04	-0.56	0.04	-0.55	0.04	-0.55	0.05
No gender=1	-0.59	0.09	-0.46	0.08	-0.59	0.09	-0.45	0.08	-0.47	0.09
Main effects of race										
Intercept Asian	0.02	0.06	0.01	0.05	0.04	0.06	0.11	0.13	-0.28	0.16
Intercept Black	-0.69	0.08	-0.53	0.06	-0.72	0.08	-0.51	0.13	-0.32	0.10
Intercept Latinx	-1	0.07	-0.87	0.08	-1.04	0.04	-0.7	0.05	-0.70	0.18
Intercept Multiracial	-0.35	0.05	-0.25	0.04	-0.38	0.05	-0.19	0.13	-0.24	0.12
Intercept Native	-0.92	0.13	-0.81	0.15	-0.84	0	-0.99	0.03	-0.59	0.40
Intercept Pacific Islander	-0.56	0.14	-0.22	0.09	-0.51	0.03	-0.18	0.14	-0.12	0.40
Student perceptions of climate			0.29	0.02			0.28	0.02	0.30	0.02
School-level variables										
School climate			-0.18	0.13			-0.27	0.06	-0.31	0.15
School poverty					-0.08	0.07	-0.28	0.06		
Middle School Intercept									-0.33	0.26
High School Intercept									-0.66	0.13
School-level variables X race interactions										
School Climate X Asian			-0.12	0.04			-0.09	0.08	0.25	0.06
School Climate X Black			0.42	0.05			0.43	0.11	0.12	0.11
School Climate X Latinx			0.35	0.08			0.41	0.04	0.19	0.14
School Climate X Multiracial			0.25	0.04			0.28	0.2	0.27	0.10
School Climate X Native			0.34	0.17			0.48	0.08	0.07	0.09
School Climate X Pacific			0.59	0.17			0.59	0.09	0.44	0.17
School Poverty X Asian					-0.04	0.07	0.1	0.1		
School Poverty X Black					0.1	0.07	0.21	0.05		
School Poverty X Latinx					0.14	0.04	0.2	0.04		
School Poverty X Multiracial					-0.13	0.05	0.01	0.08		
School Poverty X Native					0.09*	0*	0.24	0.06		
School Poverty X Pacific					0.19	0.02	0.3	0.09		
Middle School X Asian									0.77	0.18
Middle School X Black									-0.64	0.41
Middle School X Latinx									-0.37	0.35

	Model 1		Model 2		Model 3		Model 4		Model 5	
<i>Fixed effects</i>	β	S.E.	β	S.E.	β	S.E.	β	S.E.	β	S.E.
Middle School X Multiracial									0.07	0.25
Middle School X Native									-0.80	0.23
Middle School X Pacific Islander									-0.45	0.24
High School X Asian									1.14	0.14
High School X Black									-0.81	0.24
High School X Latinx									-0.55	0.29
High School X Multiracial									0.01	0.18
High School X Native									-0.81	0.46
High School X Pacific Islander									-0.27	0.40
<i>Random effects</i>	<i>Var.</i>		<i>Var.</i>		<i>Var.</i>		<i>Var.</i>		<i>Var.</i>	
Intercept	0.29		0.28		0.26		0.23		0.26	
Asian	0.13		0.05		0.15		0.08		0.02	
Black	0.16		0.04		0.13		0.04		0.09	
Latinx	0.11		0.06		0.01		0.00		0.10	
Multi	0.06		0.03		0.04		0.02		0.04	
Native	0.13		0.11		0.00*		0.00		0.04	
Pacific	0.16		0.05		0.01*		0.14		0.16	

Note: Bold estimates are significant at $p < .05$. *Estimates of standard errors for the effect of school poverty on the slope for Native students may not be trustworthy. Estimates of residual variance for Pacific Islander students may not be trustworthy. In both cases, it is likely that the distribution of students of these racial backgrounds is uneven and sparse across schools.

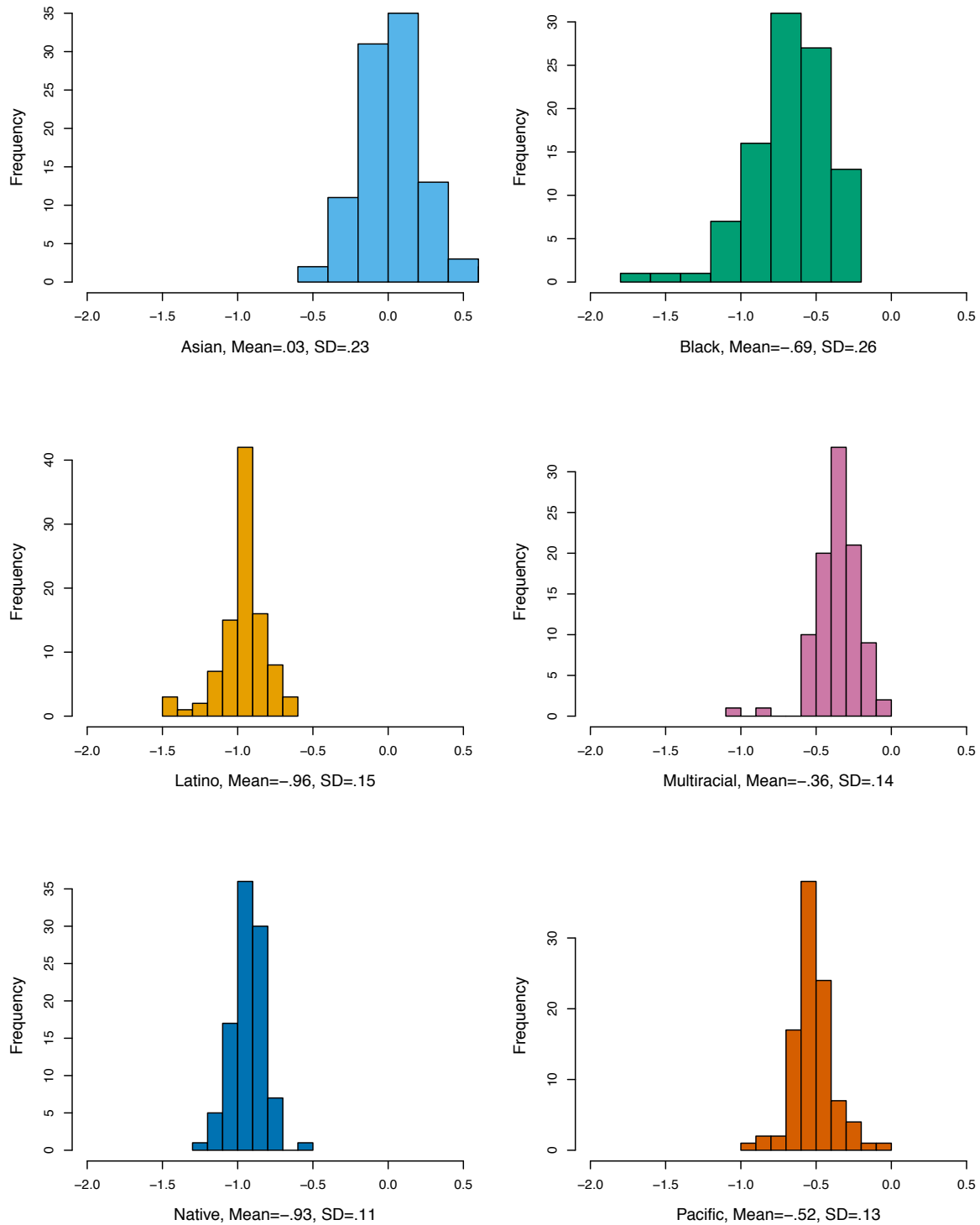


Figure 3.1. Histograms representing variation in the association of race with grades across schools in standard deviation units

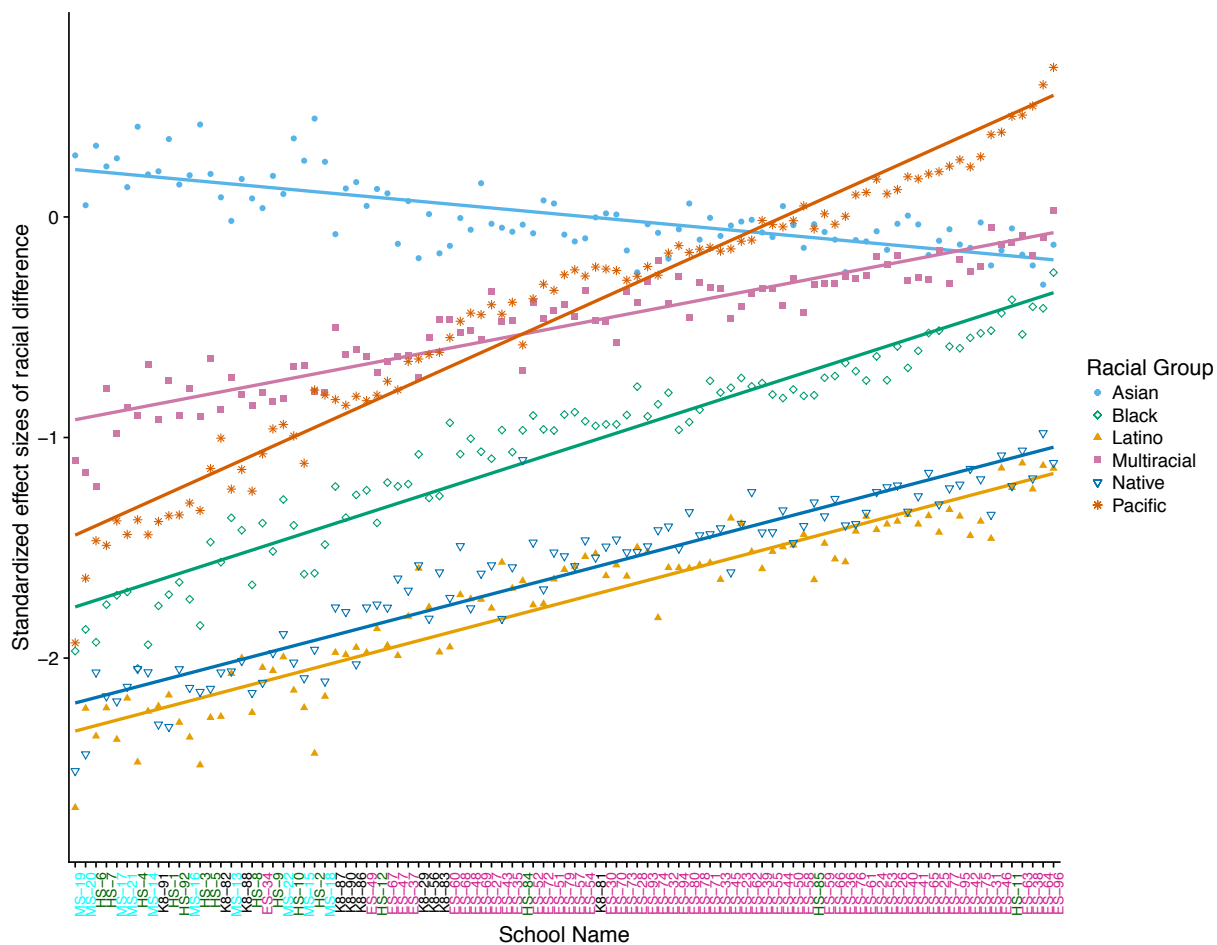


Figure 3.2. Model estimates of the magnitude of race differences in grades by school climate

Note: Lowest school climate on the left and highest school climate on the right, in standard deviation units. The slope is significant for all racial groups, the intercept is significant for all groups except Asian students. ES=Elementary School (pink), MS=Middle School (Blue), HS=High School (Green), K8=K8 School (Black).

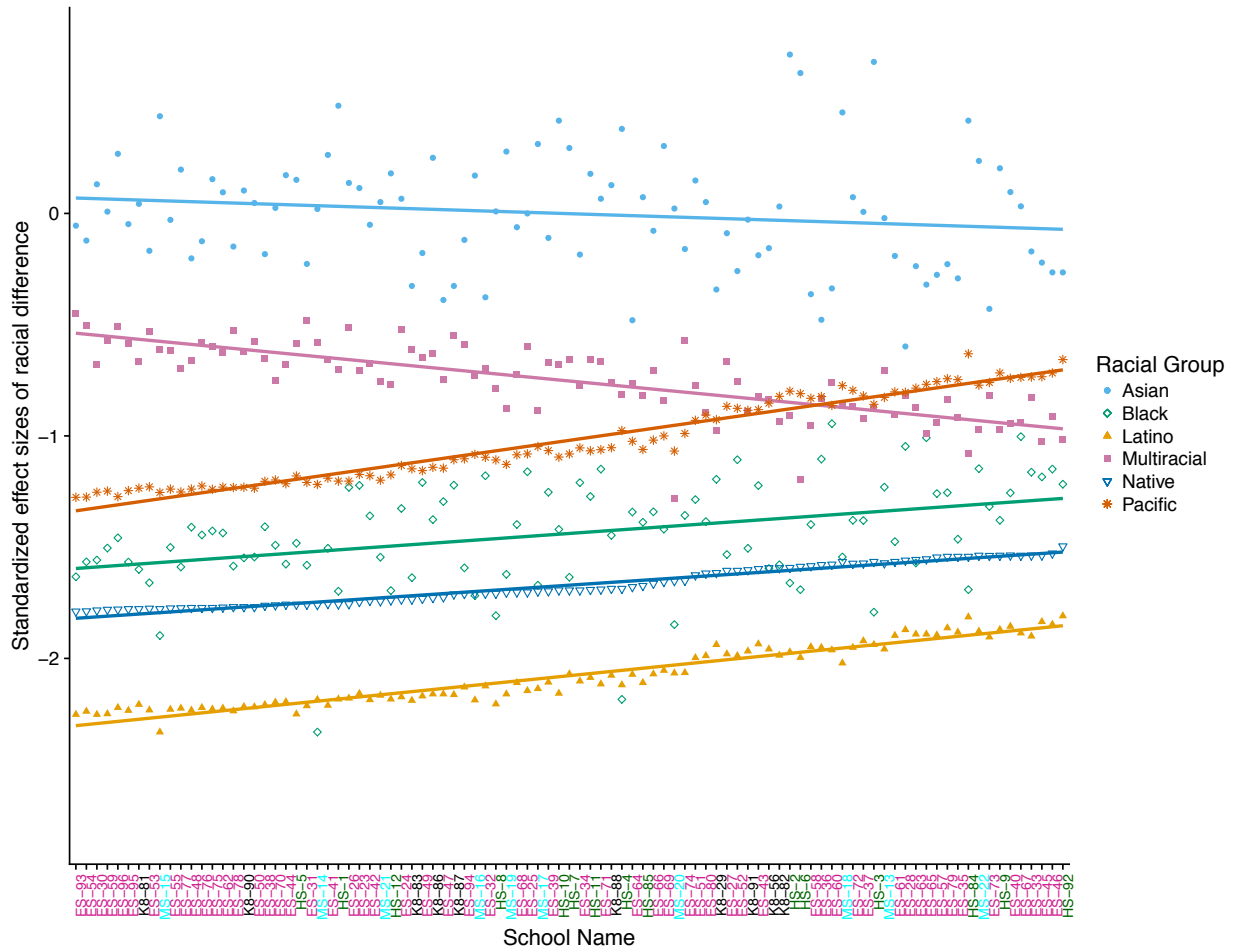


Figure 3.3. Model estimates of the magnitude of race differences in grades by school poverty

Note: Highest school poverty on the left to lowest school poverty on the right, in standard deviation units. The intercept is significant for all groups except Asian students, the slope is significant for all groups except Asian and Black students. ES=Elementary School (pink), MS=Middle School (Blue), HS=High School (Green), K8=K8 School (Black).

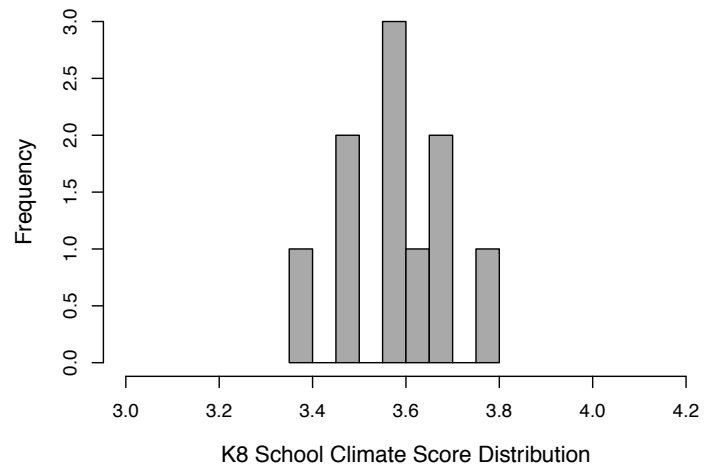
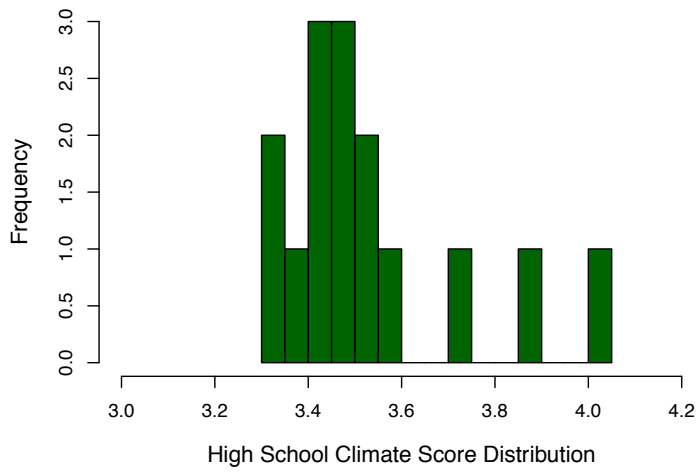
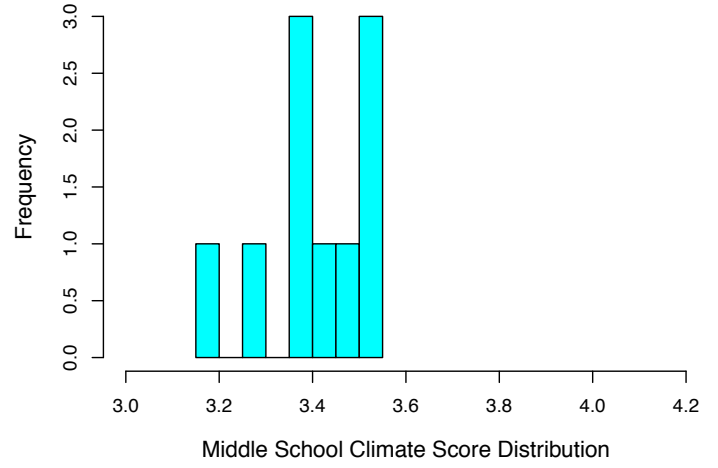
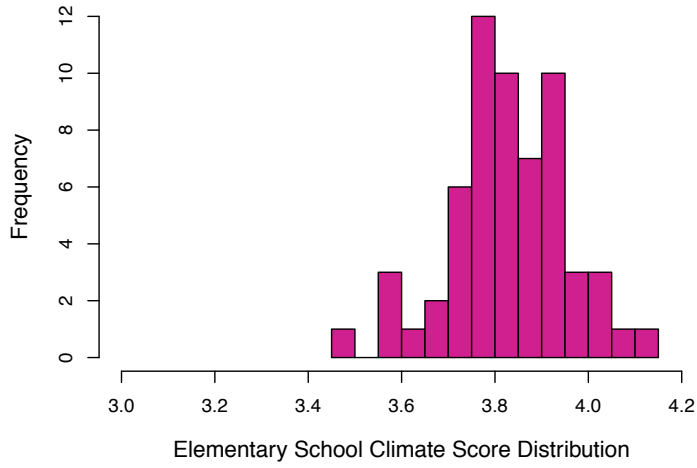


Figure 3.4. Distribution of climate scores across schools in original scale units

References

- Benbenishty, R., Astor, R., Roziner, I., & Wrabel, S. (2016). Testing the causal links between school climate, school violence, and school academic performance: A cross-lagged panel autoregressive model. *Educational Researcher*, *45*(3), 197-206. doi:10.3102/0013189X16644603
- Berkowitz, R., Glickman, H., Benbenishty, R., Ben-Artzi, E., Raz, T., Lipshtat, N., & Astor, R.A. (2015). Compensating, mediating, and moderating effects of school climate on academic achievement gaps in Israel. *Teachers College Record*, *117*, 1–34.
- Berkowitz, R., Moore, H., Astor, R. A., & Benbenishty, R. (2016). A research synthesis of the associations between socioeconomic background, inequality, school climate, and academic achievement. *Review of Educational Research*, *87*(2), 425-469. doi:10.3102/0034654316669821
- Betancourt, H., & López, S. R. (1993). The study of culture, ethnicity, and race in American psychology. *American Psychologist*, *48*(6), 629-637.
- Bond, L., Butler, H., Thomas, L., Carlin, J., Glover, S., Bowes, G., & Patton, G. (2007). Social and school connectedness in early secondary school as predictors of late teenage substance use, mental health, and academic outcomes. *Journal of Adolescent Health*, *40*(4), 357-e9.
- Brookover, W. B., Schweitzer, J. H., Schneider, J. M., Beady, C. H., Flood, P. K., & Wisenbaker, J. M. (1978). Elementary school social climate and school achievement. *American Educational Research Journal*, *15*(2), 301-318.
- Burchinal, M., McCartney, K., Steinberg, L., Crosnoe, R., Friedman, S. L., McLoyd, V., & Pianta, R. (2011). Examining the Black–White achievement gap among low-income children using the NICHD study of early child care and youth development. *Child Development*, *82*(5), 1404–1420.
- Brown-Jeffy, S. (2006). The race gap in high school reading achievement: Why school racial composition still matters. *Race, Gender & Class*, *13*, 268–294.
- Carter, P., Skiba, R., Arredondo, M., & Pollock, M. (2016). You can't fix what you don't look at: Acknowledging race in addressing racial discipline disparities. *Urban Education*, *52*(2), 207-235.
- Chapman, R. L., Buckley, L., Sheehan, M. & Shochet, I. (2013). School-based programs for increasing connectedness and reducing risk behavior: A systematic review. *Educational Psychology*, *25*(1), 95–114. Retrieved from <http://link.springer.com/article/10.1007/s10648-013-9216-4>
- Cohen, J., McCabe, L., Michelli, N., & Pickeral, T. (2009). School climate: Research, policy, practice, and teacher education. *Teachers College Record*, *111*(1), 180-213.
- Crosnoe, R. (2009). Low-income students and the socioeconomic composition of public high schools. *American Sociological Review*, *74*(5), 709-730.

- Demmert, W. G., Grissmer, D., & Towner, J. (2006). A review and analysis of the research on Native American students. *Journal of American Indian Education*, 45(3), 5-23.
- Farrington, C. A., Roderick, M., Allensworth, E., Nagaoka, J., Keyes, T., Johnson, D. W., & Beechum, N. O. (2012). Teaching adolescents to become learners: The role of noncognitive factors in shaping school performance—A critical literature review. Chicago, IL: University of Chicago Consortium on Chicago School Research. Retrived from <https://ccrcenter.org/products-resources/resource-database/teaching-adolescents-become-leaders-role-noncognitive-factors>
- Garibaldi, M., Ruddy, S., Kendziora, K., & Osher, D. (2015) Assessment of climate and conditions for learning. In J. A. Durlak, C. E. Domitrovich, R. P. Weissberg, & T. P. Gullotta (Eds.), *Handbook of social and emotional learning: research and practice* (pp. 348-359). New York, NY: Guilford.
- Gutiérrez, R. (2008). A “gap-gazing” fetish in mathematics education? Problematizing research on the achievement gap. *Journal for Research in Mathematics Education*, 39(4), 357-364.
- Hopson, L., Lee, E., & Tang, N. (2014). A multi-level analysis of school racial composition and ecological correlates of academic success. *Children and Youth Services Review*, 44, 126–134.
- Kao, G., & Thompson, J. (2003). Racial and ethnic stratification in educational achievement and attainment. *Sociology*, 29(1), 417–442. doi:10.1146/annurev.soc.29.010202.100019
- Kim, H. Y., Schwartz, K., Cappella, E., & Seidman, E. (2014). Navigating middle grades: Role of social contexts in middle grade school climate. *American journal of community psychology*, 54(1-2), 28-45.
- Kuncel, N. R., Credé, M., & Thomas, L. L. (2005). The validity of self-reported grade point averages, class ranks, and test scores: A meta-analysis and review of the literature. *Review of Educational Research*, 75(1), 63-82.
- Kwong, D., & Davis, J. (2015). School climate for academic success: A multilevel analysis of school climate and student outcomes. *Journal of Research in Education*, 25(2), 68-81.
- Ladson-Billings, G. (2006). From the achievement gap to the education debt: Understanding achievement in US schools. *Educational Researcher*, 35(7), 3-12.
- Ladson-Billings, G. (2007). Pushing past the achievement gap: An essay on the language of deficit. *The Journal of Negro Education*, 76(3), 316-323.
- Ladson-Billings, G. (2013). Lack of achievement or loss of opportunity? In P. Carter & K. Welner (Eds.), *Closing the opportunity gap: What America must do to give every child an even chance* (pp. 11-22). New York, NY: Oxford University Press.
- Lee, J. (2002). Racial and ethnic achievement gap trends: Reversing the progress toward equity? *Educational Researcher*, 31(1), 3–12. doi:10.3102/0013189X031001003

- Love, B. (2004). Brown plus 50 counter-storytelling: A critical race theory analysis of the “Majoritarian Achievement Gap” Story. *Equity & Excellence in Education*, 37(3), 227–246. doi:10.1080/10665680490491597
- Lubienski, S. T., & Gutiérrez, R. (2008). Bridging the gaps in perspectives on equity in mathematics education. *Journal for Research in Mathematics Education*, 39(4), 365-371.
- Milner IV, H. R. (2008). Critical race theory and interest convergence as analytic tools in teacher education policies and practices. *Journal of Teacher Education*, 59(4), 332–346. doi:10.1177/0022487108321884
- Milner IV, H. R. (2012). Rethinking achievement gap talk in urban education. *Urban Education*, 48(1), 3–8. doi:10.1177/0042085912470417
- Monahan, K. C., Oesterle, S., & Hawkins, J. D. (2010). Predictors and consequences of school connectedness. *The Prevention Researcher*, 17(3), 3-6.
- Muthén, L. K., & Muthén, B. O. (2010). Mplus User’s Guide (6th ed.). Los Angeles, CA: Authors.
- Palardy, G. (2013). High school socioeconomic segregation and student attainment. *American Educational Research Journal*, 50(4), 714–754. doi:10.3102/0002831213481240
- Pang, V. O., Han, P. P., & Pang, J. M. (2011). Asian American and Pacific Islander students: Equity and the achievement gap. *Educational Researcher*, 40(8), 378-389.
- Perry, L. B., & McConney, A. (2010) Does the SES of the school matter? An examination of socioeconomic status and student achievement using PISA 2003. *Teachers College Record* 112(4), 1137-1162.
- Powell, J. A. (2012). *Racing to justice: Transforming our conceptions of self and other to build an inclusive society*. Bloomington, IN: Indiana University Press.
- Reardon, S. F., Robinson-Cimpian, J. P., & Weathers, E. F. (2015). Patterns and trends in racial/ethnic and socioeconomic academic achievement gaps. In H. A. Ladd & M. E. Goertz (Eds.), *Handbook of research in education finance and policy* (2nd ed.) (pp. 491–509). New York, NY: Routledge.
- Reid, J. L., & Ready, D. D. (2013). High-quality preschool: The socioeconomic composition of preschool classrooms and children's learning. *Early Education & Development*, 24(8), 1082-1111.
- Schwerdt, G., & West, M. R. (2012). The impact of alternative grade configurations on student outcomes through middle and high school. *Journal of Public Economics*, 97, 308-326.
- Seattle Public Schools. (2017). 2016-2017 District scorecard: Research & Evaluation Department. Retrieved from https://www.seattleschools.org/UserFiles/Servers/Server_543/File/District/Departments/School%20Board/17-18%20agendas/20171108/SPS%20District%20Scorecard%202016-17%20Board%20Presentation_ADA.pdf

- Seidman, E., Allen, L., Aber, L., Mitchell, C., & Feinman, J. (1994). The impact of school transitions in early adolescence on the self-system and perceived social context of poor urban youth. *Child Development, 65*(2), 507–522. doi:10.1111/j.1467-8624.1994.tb00766.x
- Thapa, A., Cohen, J., Guffey, S., & Higgins-D'Alessandro, A. (2013). A review of school climate research. *Review of Educational Research, 83*(3), 357-385
- U.S. Department of Education. (2008). New race and ethnicity guidance for the collection of federal education data. Retrieved from: <https://www2.ed.gov/policy/rschstat/guid/raceethnicity/index.html>
- Voight, A., Hanson, T., O'Malley, M., & Adekanye, L. (2015). The racial school climate gap: Within-school disparities in students' experiences of safety, support, and connectedness. *American Journal of Community Psychology, 56*(3-4), 252–267. doi:10.1007/s10464-015-9751-x
- Voight, A., & Hanson, T. (2017). How are middle school climate and academic performance related across schools and over time? REL 2017-212. *Regional Educational Laboratory West*. Retrieved from <https://eric.ed.gov/?id=ED572366>
- Wang, M.-T., & Dishion, T. J. (2012). The trajectories of adolescents' perceptions of school climate, deviant peer affiliation, and behavioral problems during the middle school years. *Journal of Research on Adolescence, 22*(1), 40–53. <http://doi.org/10.1111/j.1532-7795.2011.00763.x>
- Wang, M. T., Selman, R. L., Dishion, T. J., & Stormshak, E. A. (2010). A tobit regression analysis of the covariation between middle school students' perceived school climate and behavioral problems. *Journal of Research on Adolescence, 20*(2), 274–286. <http://doi.org/10.1111/j.1532-7795.2010.00648.x>
- Wang, M. T., & Eccles, J. S. (2011). Adolescent behavioral, emotional, and cognitive engagement trajectories in school and their differential relations to educational success. *Journal of Research on Adolescence, 22*(1), 31-39.
- Wang, W., Vaillancourt, T., Brittain, H., McDougall, P., Krygsman, A., Smith, D., ... Hymel, S. (2014). School climate, peer victimization, and academic achievement: Results from a multi-informant study. *School Psychology Quarterly, 29*(3), 360-377. doi:10.1037/spq0000084
- Wang, M.-T., & Degol, J. (2016). School Climate: A Review of the Construct, Measurement, and Impact on Student Outcomes. *Educational Psychology Review, 28*(2), 315–352. doi:10.1007/s10648-015-9319-1

CONCLUSION

This dissertation focused on racial equity in self-reported grades, as it relates to school climate and social emotional learning (SEL). Data were from students in the Seattle Public Schools (SPS). The first paper aimed to assess the quality of the student survey through a series of psychometric tests. The second paper investigated race differences in students' perceptions of school climate and their own SEL, the extent to which school climate and SEL account for race differences in grades, and whether they are associated with self-reported grades to the same extent. The third paper examined students' perceptions of school climate aggregated to the whole school level, and whether school climate explains variation in the magnitude of race differences in grades.

For the first paper, I found that the psychometric properties of the student survey were adequate, and the survey is a reliable measure of student perceptions of school climate and student self-reported social emotional learning. After some adjustment, the survey instrument is invariant to race, gender, and home language. Findings from the second paper indicated that students from different racial groups report different average levels of climate and SEL, with students of color reporting lower levels of SEL. School climate and SEL did not meaningfully account for race differences in self-reported grades. In addition, the association between SEL and grades was smaller for most student groups of color compared to the association for white students. Further research is needed to examine the association between SEL and academic outcomes, and the extent to which SEL skills are related to academic outcomes for students from different racial groups.

Findings from the third paper found evidence that schools in which students overall reported positive school climates also have smaller race differences in grades. The moderating effect of school climate on race differences in grades remained after accounting for and students' own perceptions of climate at their school and the poverty level of the school. This moderating effect may, however, be confounded by the effects of school category (i.e., elementary, middle, or high)

since perception of positive school climate was lower in middle and high schools than in elementary schools and race differences in grades were in secondary schools.

School climate shows more promise as being a factor related to racial equity in academic outcomes compared to SEL. School climate surveys provide data on aspects of the school experience such that schools can focus to improve student's experience, which may in turn, promote racial equity in academic outcomes. A focus on school climate in secondary school is particularly important, as less positive climate appears linked to racial differences in student grades. Overall, the findings of this dissertation highlight the need to empirically examine whether programs or intervention targets related to school climate and SEL promote racial equity in academic outcomes, and to not assume that what works on average will contribute to racial equity. When implementing school-wide programs such as school climate improvement strategies or SEL interventions, it is critical to consider whether the school context is one characterized by racial disparities.

There are a number of directions that future research can take to further understanding of the role of school climate and SEL on racial equity in schools. Future research would benefit from using stronger measures of academic achievement, including achievement scores and high school completion. Additional outcome measures should also be considered, including student behavioral health and race disparities in discipline. More research on racial equity in SEL and its relation to grades is warranted, especially to address shortcomings in this study around the measurement of self-reported SEL. There is much more to be learned about the role of SEL in racial equity, especially whether SEL is a culturally relevant construct, and how it might better consider the experiences of students of color. Future research should also examine the effects of existing school climate and SEL interventions on racial equity in academic outcomes. In general, research should seek to understand more deeply into the role of power, privilege and oppression and how it relates to SEL, school climate and racial equity in academic outcomes.

BIBLIOGRAPHY

- Annamma, S., & Morrison, D. (2014). Disproportionality fills in the gaps: Connections between achievement, discipline and special. *Berkeley Review of Education*, 5(1), 53-87.
doi.org/10.5070/B85110003
- Anyon, Y., Zhang, D., & Hazel, C. (2016). Race, exclusionary discipline, and connectedness to adults in secondary schools. *American Journal of Community Psychology*, 57(3-4), 342–352.
doi:10.1002/ajcp.12061
- Barblett, L., & Maloney, C. (2010). Complexities of assessing social and emotional competence and wellbeing in young children. *Australasian Journal of Early Childhood*, 35(2), 13-18.
- Baum, S., Ma, J., & Payea, K. (2010). Education pays, 2010: The benefits of higher education for individuals and society. Trends in Higher Education Series. *College Board Advocacy & Policy Center*.
- Bear, G., Gaskins, C., Blank, J., & Chen, F. (2011). Delaware School Climate Survey—Student: Its factor structure, concurrent validity, and reliability. *Journal of School Psychology*, 49(2), 157–174.
<https://doi.org/10.1016/j.jsp.2011.01.001>
- Benbenishty, R., Astor, R., Roziner, I., & Wrabel, S. (2016). Testing the causal links between school climate, school violence, and school academic performance a cross-lagged panel autoregressive model. *Educational Researcher*, 45(3), 197-206. doi:10.3102/0013189X16644603
- Berg, J., Osher, D., Moroney, D., & Yoder, N. (2017). *The intersection of school climate and social emotional development*. Washington DC: American Institutes for Research.
- Berkowitz, R., Glickman, H., Benbenishty, R., Ben-Artzi, E., Raz, T., Lipshtat, N., & Astor, R.A. (2015). Compensating, mediating, and moderating effects of school climate on academic achievement gaps in Israel. *Teachers College Record*, 117, 1–34.
- Berkowitz, R., Moore, H., Astor, R. A., & Benbenishty, R. (2016). A research synthesis of the associations between socioeconomic background, inequality, school climate, and academic achievement. *Review of Educational Research*, 87(2), 425-469. doi:10.3102/003465431666982
- Betancourt, H., & López, S. (1993). The study of culture, ethnicity, and race in American psychology. *American Psychologist*, 48(6), 629. doi:10.1037/0003-066x.48.6.629
- Blanco-Vega, C., Castro-Olivo, S., & Merrell, K. (2008). Social–emotional needs of Latino immigrant adolescents: A sociocultural model for development and implementation of culturally specific interventions. *Journal of Latinos and Education*, 7(1), 43–61.
doi:10.1080/15348430701693390
- Bond, L., Butler, H., Thomas, L., Carlin, J., Glover, S., Bowes, G., & Patton, G. (2007). Social and school connectedness in early secondary school as predictors of late teenage substance use, mental health, and academic outcomes. *Journal of Adolescent Health*, 40(4), 357-e9.

- Bonilla-Silva, E. (2014). *Racism without racists: Color-blind racism and the persistence of racial inequality in the United States*. Plymouth, UK: Rowman and Littlefield.
- Bonilla-Silva, E. (2017). *Racism without racists: Color-blind racism and the persistence of racial inequality in America*. Plymouth, UK: Rowman & Littlefield.
- Bonny, A., Britto, M., Klostermann, B., Hornung, R., & Slap, G. (2000). School disconnectedness: identifying adolescents at risk. *Pediatrics*, *106*(5), 1017–1021. doi:10.1542/peds.106.5.1017
- Bottiani, J., Bradshaw, C., & Mendelson, T. (2017). A multilevel examination of racial disparities in high school discipline: black and white adolescents' perceived equity, school belonging, and adjustment problems. *Journal of Educational Psychology*, *109*(4), 532-545.
- Brackett, M., Rivers, S., Shiffman, S., Lerner, N., & Salovey, P. (2006). Relating emotional abilities to social functioning: A comparison of self-report and performance measures of emotional intelligence. *Journal of Personality and Social Psychology*, *91*(4), 780. doi:10.1037/0022-3514.91.4.780
- Brookover, W. B., Schweitzer, J. H., Schneider, J. M., Beady, C. H., Flood, P. K., & Wisenbaker, J. M. (1978). Elementary school social climate and school achievement. *American Educational Research Journal*, *15*(2), 301-318.
- Brown-Jeffy, S. (2006). The race gap in high school reading achievement: Why school racial composition still matters. *Race, Gender & Class*, *13*, 268–294.
- Bryan, J., Moore-Thomas, C., Gaenzle, S., Kim, J., Lin, C. H., & Na, G. (2012). The effects of school bonding on high school seniors' academic achievement. *Journal of Counseling & Development*, *90*(4), 467-480.
- Burchinal, M., McCartney, K., Steinberg, L., Crosnoe, R., Friedman, S. L., McLoyd, V., & Pianta, R. (2011). Examining the Black–White achievement gap among low-income children using the NICHD study of early child care and youth development. *Child Development*, *82*(5), 1404-1420.
- Campbell, S., Denham, S., Howarth, G., Jones, S., Whittaker, J., Williford, A., ... Darling-Churchill, K. (2016). Commentary on the review of measures of early childhood social and emotional development: Conceptualization, critique, and recommendations. *Journal of Applied Developmental Psychology*, *45*, 19-41. <https://doi.org/10.1016/j.appdev.2016.01.008>
- Carter, P., Skiba, R., Arredondo, M., & Pollock, M. (2016). You can't fix what you don't look at: Acknowledging race in addressing racial discipline disparities. *Urban Education*, *52*(2), 207-235.
- CASEL. (2013). *2013 CASEL Guide: Effective social and emotional learning programs - preschool and elementary school edition*. Chicago, IL: Collaborative for Academic, Social and Emotional Learning.
- CASEL. (2015). *2015 CASEL Guide: Effective Social and emotional learning programs - middle and high school edition*. Chicago, IL: Collaborative for Academic, Social, and Emotional Learning.

- Castro-Olivo, S. (2014). Promoting social-emotional learning in adolescent Latino ELLs: A study of the culturally adapted "Strong Teens" program. *School Psychology Quarterly*, 29(4), 567-577. <https://doi.org/10.1037/spq0000055>
- Catalano, R., Berglund, M., Ryan, J., Lonczak, H., & Hawkins, J. (2004). Positive youth development in the United States: Research findings on evaluations of positive youth development programs. *The Annals of the American Academy of Political and Social Science*, 591(1), 98–124. doi:10.1177/0002716203260102
- Chain, J., Shapiro, V., LeBuffe, P., Bryson, A., & Committee, A. (2017). Academic achievement of American Indian and Alaska Native students: Does social emotional competence reduce the impact of poverty? *American Indian and Alaska Native Mental Health Research (Online)*, 24(1), 1–29. doi:10.5820/aian.2401.2017.1
- Chapman, R. L., Buckley, L., Sheehan, M. & Shochet, I. (2013). School-based programs for increasing connectedness and reducing risk behavior: A systematic review. *Educational Psychology*, 25(1), 95–114. Retrieved from <http://link.springer.com/article/10.1007/s10648-013-9216-4>
- Chen, F. (2007). Sensitivity of goodness of fit indexes to lack of measurement invariance. *Structural Equation Modeling: A Multidisciplinary Journal*, 14(3), 464–504. <https://doi.org/10.1080/10705510701301834>
- Cheung, G., & Rensvold, R. (2002). Evaluating goodness-of-fit indexes for testing measurement invariance. *Structural Equation Modeling: A Multidisciplinary Journal*, 9(2), 233–255. doi:10.1207/s15328007sem0902_5
- Coburn, C. E., Penuel, W. R., & Geil, K. E. (2013). *Research-practice partnerships: A strategy for leveraging research for educational improvement in school districts*. New York, NY: William T. Grant Foundation.
- Cohen, J. (1992). A power primer. *Psychological Bulletin*, 112(1), 155-159.
- Cohen, J., McCabe, L., Michelli, N., & Pickeral, T. (2009). School climate: Research, policy, practice, and teacher education. *Teachers College Record*, 111, 180-213.
- Colorado Education Initiative. (2012). Measuring school climate: A toolkit for districts and schools. Denver, CO: Colorado Education Initiative and Colorado Department of Education.
- Crosnoe, R. (2009). Low-income students and the socioeconomic composition of public high schools. *American Sociological Review*, 74(5), 709-730.
- Crowe, L. M., Beauchamp, M. H., Catroppa, & Anderson, V. (2011). Social function assessment tools for children and adolescents: A systematic review from 1988 to 2010. *Clinical Psychology Review*, 31(5), 767–785. doi:10.1016/j.cpr.2011.03.008
- Darling-Hammond, L., Bae, S., Cook-Harvey, C. M., Lam, L., Mercer, C., Podolsky, A., & Stosich, E. L. (2016). Pathways to new accountability through the Every Student Succeeds Act. Palo Alto, CA: Learning Policy Institute.

- De Pedro, K., Gilreath, T., & Berkowitz, R. (2016). A latent class analysis of school climate among middle and high school students in California public schools. *Children and Youth Services Review, 63*, 10–15. doi:10.1016/j.chilyouth.2016.01.023
- Debnam, K., Johnson, S., Waasdorp, T., & Bradshaw, C. (2014). Equity, connection, and engagement in the school context to promote positive youth development. *Journal of Research on Adolescence, 24*(3), 447–459. doi:10.1111/jora.12083
- Demmert, W. G., Grissmer, D., & Towner, J. (2006). A review and analysis of the research on Native American students. *Journal of American Indian Education, 45*(3), 5-23.
- Denham, S. A. (2015). Assessment of SEL in educational contexts. In J. A. Durlak, C. P. Domitrovich, R. E. Weissberg, & T. P. Gullotta (Eds.). *Handbook of social and emotional learning: research and practice* (pp. 285–300). New York, NY: Guilford.
- Denham, S., Bassett, H., Mincic, M., Kalb, S., Way, E., Wyatt, T., & Segal, Y. (2012). Social-emotional learning profiles of preschoolers' early school success: A person-centered approach. *Learning and Individual Differences, 22*(2), 178–189. <https://doi.org/10.1016/j.lindif.2011.05.001>
- Denham, S., & Brown, C. (2010). “Plays Nice With Others”: Social–Emotional Learning and Academic Success. *Early Education & Development, 21*(5), 652–680. doi:10.1080/10409289.2010.497450
- DeVellis, R. F. (1991). *Scale development: Theory and applications* (Vol. 26). Thousand Oaks, CA: Sage.
- Domitrovich, C., Durlak, J., Staley, K., & Weissberg, R. (2017). Social-emotional competence: An essential factor for promoting positive adjustment and reducing risk in school children. *Child Development, 88*(2), 408–416. doi:10.1111/cdev.12739
- Duckworth, A. L., Peterson, C., Matthews, M. D., & Kelly, D. R. (2007). Grit: Perseverance and passion for long-term goals. *Journal of Personality and Social Psychology, 92*(6), 1087–101. <https://doi.org/10.1037/0022-3514.92.6.1087>
- Duckworth, A., & Seligman, M. (2005). Self-discipline outdoes IQ in predicting academic performance of adolescents. *Psychological Science, 16*(12), 939–944. doi:10.1111/j.1467-9280.2005.01641.x
- Duckworth, A., & Yeager, D. (2015). Measurement matters. *Educational Researcher, 44*(4), 237–251. doi:10.3102/0013189x15584327
- Durlak, J. A., Weissberg, R. P., Dymnicki, A. B., Taylor, R. D., & Schellinger, K. B. (2011). The impact of enhancing students' social and emotional learning: a meta-analysis of school-based universal interventions. *Child Development, 82*(1), 405–432. <https://doi.org/10.1111/j.1467-8624.2010.01564.x>
- Dweck, C. (2015). Carol Dweck revisits the 'growth mindset'. *Education Week, 35*(5), 20-24.

- Dweck, C. S. (2006). *Mindset: The new psychology of success*. New York, NY: Random House Incorporated.
- Dweck, C. S., Walton, G. M., & Cohen, G. L. (2011). *Academic tenacity: Mindsets and skills that promote long-term learning*. Gates Foundation. Seattle, WA: Bill & Melinda Gates Foundation. Retrieved from <https://ed.stanford.edu/sites/default/files/manual/dweck-walton-cohen-2014.pdf>
- Elias, M. J. (2006). The connection between academic and social-emotional learning. In M. J. Elias & H. Arnold (Eds.). *The Educator's guide to emotional intelligence and academic achievement* (pp. 4-14). Thousand Oaks, CA: Corwin Press.
- Elias, M. J., & Haynes, N. M. (2008). Social competence, social support, and academic achievement in minority, low-income, urban elementary school children. *School Psychology Quarterly*, 23(4), 474-495.
- Elias, M., White, G., & Stepney, C. (2014). Surmounting the challenges of improving academic performance: Closing the achievement gap through social-emotional and character development. *Journal of Urban Learning, Teaching, and Research*, 10, 14-24.
- Elliott, S., Davies, M., Frey, J., Gresham, F., & Cooper, G. (2017). Development and initial validation of a social emotional learning assessment for universal screening. *Journal of Applied Developmental Psychology*, 55, 39-51. doi:10.1016/j.appdev.2017.06.002
- Espinoza, O. (2007). Solving the equity–equality conceptual dilemma: a new model for analysis of the educational process. *Educational Research*, 49(4), 343-363.
- Farrington, C. A., Roderick, M., Allensworth, E., Nagaoka, J., Keyes, T.S., Johnson, D.W., & Beechum, N.O. (2012). Teaching adolescents to become learners. The role of noncognitive factors in shaping school performance: A critical literature review. Chicago, IL: University of Chicago Consortium on Chicago School Research. Retrieved from <https://ccrscenior.org/products-resources/resource-database/teaching-adolescents-become-leaders-role-noncognitive-factors>
- Frohlich, K., & Potvin, L. (2008). Transcending the known in public health practice: the inequality paradox: the population approach and vulnerable populations. *American Journal of Public Health*, 98(2), 216–221. doi:10.2105/AJPH.2007.114777
- Fryberg, S. A., & Leavitt, P. A. (2014). A sociocultural analysis of high-risk Native American children in schools. In J. A. Burack & L. A. Schmidt (Eds.), *Cultural and contextual perspectives on developmental risk and well-being* (pp. 57-80). Cambridge, UK: Cambridge University Press.
- Garces, L., Ishimaru, A., & Takahashi, S. (2017). Introduction to beyond interest convergence: Envisioning transformation for racial equity in education. *Peabody Journal of Education*, 92, 291-293. doi:10.1080/0161956x.2017.1324654
- Garibaldi, M., Ruddy, S., Kendziora, K., & Osher, D.. (2015). Assessment of climate and conditions for learning. In J. A. Durlak, C. P. Domitrovich, R. E. Weissberg, & T. P. Gullotta (Eds.). *Handbook of social and emotional learning: research and practice* (pp. 348-360). New York, NY: Guilford Press.

- Garner, P. W. (2006). Prediction of prosocial and emotional competence from maternal behavior in African American preschoolers. *Cultural Diversity and Ethnic Minority Psychology, 12*(2), 179-198. doi: 10.1037/1099-9809.12.2.179
- Garner, P., Mahatmya, D., Brown, E., & Vesely, C. (2014). Promoting desirable outcomes among culturally and ethnically diverse children in social emotional learning programs: A multilevel heuristic model. *Educational Psychology Review, 26*(1), 165–189. doi:10.1007/s10648-014-9253-7
- Gillborn, D. (2005). Education policy as an act of white supremacy: whiteness, critical race theory and education reform. *Journal of Education Policy, 20*(4), 485–505. doi:10.1080/02680930500132346
- Gokiert, R., Georgis, R., Tremblay, M., Krishnan, V., Vandenberghe, C., & Lee, C. (2014). Evaluating the adequacy of social-emotional measures in early childhood. *Journal of Psychoeducational Assessment, 32*(5), 441–454. <https://doi.org/10.1177/0734282913516718>
- Gottfredson, G., Gottfredson, D., Payne, A., & Gottfredson, N. (2005). School climate predictors of school disorder: Results from a national study of delinquency prevention in schools. *Journal of Research in Crime and Delinquency, 42*(4), 412–444. doi:10.1177/0022427804271931
- Gregory, A., & Fergus, E. (2017). Social and emotional learning and equity in school discipline. *The Future of Children, 27*, 117-136.
- Gregory, A., Skiba, R. J., & Noguera, P. A. (2010). The achievement gap and the discipline gap: Two sides of the same coin?. *Educational Researcher, 39*(1), 59-68.
- Gutiérrez, R. (2008). A “gap-gazing” fetish in mathematics education? Problematizing research on the achievement gap. *Journal for Research in Mathematics Education, 39*(4), 357-364.
- Hicken, M., Kravitz-Wirtz, N., Durkee, M., & Jackson, J. (2018). Racial inequalities in health: Framing future research. *Social Science & Medicine, 199*, 11-18. doi:10.1016/j.socscimed.2017.12.027
- Hoffman. (2009). Reflecting on social emotional learning: A critical perspective on trends in the United States. *Review of Educational Research, 79*(2), 533–556. <https://doi.org/10.3102/0034654308325184>
- Holsen, I., Iversen, A., & Smith, B. (2009). Universal social competence promotion programme in school: Does it work for children with low socio-economic background? *Advances in School Mental Health Promotion, 2*(2), 51–60. doi:10.1080/1754730X.2009.9715704
- Hopson, L., Lee, E., & Tang, N. (2014). A multi-level analysis of school racial composition and ecological correlates of academic success. *Children and Youth Services Review, 44*, 126–134.
- Howard, T. C. (2010). *Why race and culture matter in schools: Closing the achievement gap in America's classrooms* (Vol. 39). New York, NY: Teachers College Press.
- Howes, C. (1987). Social competence with peers in young children: Developmental sequences. *Developmental Review, 7*(3), 252-272.

- Howse, R. B., Calkins, S. D., Anastopoulos, A. D., Keane, S. P., & Shelton, T. L. (2003). Regulatory contributors to children's kindergarten achievement. *Early Education and Development, 14*(1), 101-120.
- Humphrey, N., Kalambouka, A., Wigelsworth, M., Lendrum, A., Deighton, J., & Wolpert, M. (2011). Measures of social and emotional skills for children and young people. *Educational and Psychological Measurement, 71*(4), 617–637. doi:10.1177/0013164410382896
- Ishimaru, A., & Takahashi, S. (2017). Disrupting Racialized Institutional Scripts: Toward Parent-Teacher Transformative Agency for Educational Justice. *Peabody Journal of Education, 00–00*. doi:10.1080/0161956x.2017.1324660
- Izard, C., Fine, S., Schultz, D., Mostow, A., Ackerman, B., & Youngstrom, E. (2001). Emotion knowledge as a predictor of social behavior and academic competence in children at risk. *Psychological Science, 12*(1), 18-23.
- Jenkins, L., Demaray, M., Wren, N., Secord, S., Lyell, K., Magers, A., ... Tennant, J. (2014). A critical review of five commonly used social-emotional and behavioral screeners for elementary or secondary schools. *Contemporary School Psychology, 18*(4), 241–254. doi:10.1007/s40688-014-0026-6
- Ji, P., Flay, B., & DuBois, D. (2013). Social-Emotional and Character Development Scale: Development and initial validation with urban elementary school students. *Journal of Research in Character Education, 9*.
- Jones, D. E., Greenberg, M., & Crowley, M. (2015). Early social-emotional functioning and public health: The relationship between kindergarten social competence and future wellness. *American Journal of Public Health, 105*(11), 2283-2290
- Jones, S. M., & Bouffard, S. M. (2012). Social and emotional learning in schools: From programs to strategies. Social Policy Report. Volume 26, Number 4. *Society for Research in Child Development*. Retrieved from <https://eric.ed.gov/?id=ED540203>
- Jones, S., Zaslow, M., Darling-Churchill, K., & Halle, T. (2016). Assessing early childhood social and emotional development: Key conceptual and measurement issues. *Journal of Applied Developmental Psychology, 45*, 42–48. <https://doi.org/10.1016/j.appdev.2016.02.008>
- Kao, G., & Thompson, J. (2003). Racial and ethnic stratification in educational achievement and attainment. *Sociology, 29*(1), 417–442. doi:10.1146/annurev.soc.29.010202.100019
- Kim, H. Y., Schwartz, K., Cappella, E., & Seidman, E. (2014). Navigating middle grades: Role of social contexts in middle grade school climate. *American journal of community psychology, 54*(1-2), 28-45.
- Kistner, J., Metzler, A., Gatlin, D., & Risi, S. (1993). Classroom racial proportions and children's peer relations: Race and gender effects. *Journal of Educational Psychology, 85*(3), 446-452.
- Kline, R. B. (2015). *Principles and practice of structural equation modeling*. New York, NY: Guilford Press.

- Konold, T., Cornell, D., Shukla, K., & Huang, F. (2016). Racial/ethnic differences in perceptions of school climate and its association with student engagement and peer aggression. *Journal of Youth and Adolescence*, *46*(6), 1289–1303. doi:10.1007/s10964-016-0576-1
- Koth, C., Bradshaw, C., & Leaf, P. (2008). A multilevel study of predictors of student perceptions of school climate: The effect of classroom-level factors. *Journal of Educational Psychology*, *100*(1), 96-104. doi:10.1037/0022-0663.100.1.96
- Kuncel, N. R., Credé, M., & Thomas, L. L. (2005). The validity of self-reported grade point averages, class ranks, and test scores: A meta-analysis and review of the literature. *Review of Educational Research*, *75*(1), 63-82.
- Kuperminc, G., Leadbeater, B., & Blatt, S. (2001). School social climate and individual differences in vulnerability to psychopathology among middle school students. *Journal of School Psychology*, *39*, 141-159. [https://doi.org/10.1016/S0022-4405\(01\)00059-0](https://doi.org/10.1016/S0022-4405(01)00059-0)
- Kurlaender, M., & Yun, J. (2005). Fifty Years after Brown: New Evidence of the Impact of School Racial Composition on Student Outcomes. *International Journal of Educational Policy, Research, and Practice: Reconceptualizing Childhood Studies*, *6*(1), 51-78.
- Kwong, D., & Davis, J. (2015). School climate for academic success: A multilevel analysis of school climate and student outcomes. *Journal of Research in Education*, *25*, 68-81.
- Ladson-Billings, G. (2006). From the achievement gap to the education debt: Understanding achievement in US schools. *Educational Researcher*, *35*(7), 3-12.
- Ladson-Billings, G. (2007). Pushing past the achievement gap: An essay on the language of deficit. *The Journal of Negro Education*, *76*(3), 316-323.
- Ladson-Billings, G. (2013). Lack of achievement or loss of opportunity? In P. Carter & K. Welner (Eds.), *Closing the opportunity gap: What America must do to give every child an even chance* (pp. 11-22). New York, NY: Oxford University Press.
- Lee, J. (2002). Racial and ethnic achievement gap trends: Reversing the progress toward equity? *Educational Researcher*, *31*(1), 3–12. doi:10.3102/0013189X031001003
- Leighton, J., Guo, Q., Chu, M.-W., & Tang, W. (2018). A pedagogical alliance for academic achievement: Socio-emotional effects on assessment outcomes. *Educational Assessment*, *23*(1), 1-23. doi:10.1080/10627197.2017.1411188
- Liew, J., McTigue, E. M., Barrois, L., & Hughes, J. N. (2008). Adaptive and effortful control and academic self-efficacy beliefs on achievement: A longitudinal study of 1st through 3rd graders. *Early Childhood Research Quarterly*, *23*(4), 515-526.
- Lorenc, T., Petticrew, M., Welch, V., & Tugwell, P. (2013). What types of interventions generate inequalities? Evidence from systematic reviews. *Journal of Epidemiology and Community Health*, *67*(2), 190–193. doi:10.1136/jech-2012-201257

- Love, B. (2004). Brown plus 50 counter-storytelling: A critical race theory analysis of the “Majoritarian Achievement Gap” Story. *Equity & Excellence in Education*, 37(3), 227–246. doi:10.1080/10665680490491597
- Lubienski, S. T., & Gutiérrez, R. (2008). Bridging the gaps in perspectives on equity in mathematics education. *Journal for Research in Mathematics Education*, 39(4), 365–371.
- Mattison, E., & Aber, M. (2007). Closing the achievement gap: The association of racial climate with achievement and behavioral outcomes. *American Journal of Community Psychology*, 40(1-2), 1–12. doi:10.1007/s10464-007-9128-x
- McCoy, D., Roy, A., & Sirkman, G. (2013). Neighborhood crime and school climate as predictors of elementary school academic quality: A cross-lagged panel analysis. *American Journal of Community Psychology*, 52(1-2), 128–140. doi:10.1007/s10464-013-9583-5
- McGuinn, P. (2016). From no child left behind to the every student succeeds act: Federalism and the education legacy of the Obama administration. *Publius: The Journal of Federalism*, 46(3), 392–415.
- Milner IV, H. R. (2008). Critical race theory and interest convergence as analytic tools in teacher education policies and practices. *Journal of Teacher Education*, 59(4), 332–346. doi:10.1177/0022487108321884
- Milner IV, H. R. (2012). Rethinking achievement gap talk in urban education. *Urban Education*, 48(1), 3–8. doi:10.1177/0042085912470417
- Monahan, K. C., Oesterle, S., & Hawkins, J. D. (2010). Predictors and consequences of school connectedness. *The Prevention Researcher*, 17(3), 3-6.
- Morton, N. (2018, January 12). Racial equity in Seattle schools has a long frustrating history- and it’s getting worse. Retrieved from: <https://www.seattletimes.com/education-lab/racial-equity-in-seattle-schools-has-a-long-frustrating-history-and-its-getting-worse/>
- Muthén, B. O., & Satorra, A. (1995). Complex sample data in structural equation modeling. *Sociological Methodology*, 25, 267-316.
- Muthén, L. K. & Muthén, B. O. (2010). *Mplus User’s Guide* (6th ed.). Los Angeles, CA: Authors.
- Muthén, L. K., & Muthén, B. O. (2017). *Mplus. Statistical analysis with latent variables. Version 8.* Los Angeles, CA: Authors.
- Naglieri, J. A., LeBuffe, P., & Shapiro, V. B. (2011). Universal screening for social-emotional competencies: A study of the reliability and validity of the DESSA-mini. *Psychology in the Schools*, 48(7), 660-671.
- Nasir, N. S., Snyder, C. R., Shah, & Ross, K. M. (2013). Racial storylines and implications for learning. *Human Development*, 55(5-6), 285–301. doi:10.1159/000345318

- National Center for Education Statistics. (2016). ED school climate surveys national benchmark study 2016: Appendix D. Washington, DC: U.S. Department of Education.
- National Center on Safe Supportive Learning Environments. (2014, August). *Summary table of Office of Safe and Healthy Students approved school climate surveys*. Washington, DC: American Institutes for Research.
- National School Lunch Program. (2017) The National School Lunch Program fact sheet. Retrieved from <https://fns-prod.azureedge.net/sites/default/files/cn/NSLPFactSheet.pdf>
- Nitardy, C. M., Duke, N. N., Pettingell, S. L., & Borowsky, I. W. (2015). Racial and ethnic disparities in educational achievement and aspirations: Findings from a statewide survey from 1998 to 2010. *Maternal and Child Health Journal*, *19*(1), 58-66.
- Osher, D, Kidron, Y, & Brackett, M. (2016). Advancing the science and practice of social and emotional learning: Looking back and moving forward. *Review of Research in Education*, *40*, 644-681. <https://doi.org/10.3102/0091732X16673595>
- Palardy, G. (2013). High school socioeconomic segregation and student attainment. *American Educational Research Journal*, *50*(4), 714–754. doi:10.3102/0002831213481240
- Pang, V. O., Han, P. P., & Pang, J. M. (2011). Asian American and Pacific Islander students: Equity and the achievement gap. *Educational Researcher*, *40*(8), 378-389.
- Paschall, K. W., Gershoff, E. T., & Kuhfeld, M. (2018). A Two decade examination of historical race/ethnicity disparities in academic achievement by poverty status. *Journal of Youth and Adolescence*, *47*, 1164–1177.
- Paunesku, D., Walton, G. M., Romero, C., Smith, E. N., Yeager, D. S., & Dweck, C. S. (2015). Mind-set interventions are a scalable treatment for academic underachievement. *Psychological Science*, *26*(6), 784-793.
- Perry, L. B., & McConney. A. (2010) Does the SES of the school matter? An examination of socioeconomic status and student achievement using PISA 2003. *Teachers College Record* *112*(4), 1137-1162.
- Phillips, S., & Rowley, J. (2016). The Tripod School Climate Index: An Invariant measure of school safety and relationships. *Social Work Research*, *40*(1), 31–39. <https://doi.org/10.1093/swr/svv036>
- Powell, J. A. (2012). *Racing to justice: Transforming our conceptions of self and other to build an inclusive society*. Bloomington, IN: Indiana University Press.
- Reardon, S. F., Robinson-Cimpian, J. P., & Weathers, E. F. (2015). Patterns and trends in racial/ethnic and socioeconomic academic achievement gaps. In H. A. Ladd & M. E. Goertz (Eds.), *Handbook of research in education finance and policy* (2nd ed.) (pp. 491–509). New York, NY: Routledge.

- Reardon, S. F. Ho., A. D., Shear, B. R., Fahle, E. M., Kalogrides, D., & DiSalvo, R. (2017). Stanford Education Data Archive (Version 2.0). Retrieved from: <http://purl.stanford.edu/db586ns4974>.
- Reid, J. L., & Ready, D. D. (2013). High-quality preschool: The socioeconomic composition of preschool classrooms and children's learning. *Early Education & Development, 24*(8), 1082-1111.
- Reskin, B. (2012). The race discrimination system. *Annual Review of Sociology, 38*, 17-35. doi:10.1146/annurev-soc-071811-145508
- Rhemtulla, M., Brosseau-Liard, P. É., & Savalei, V. (2012). When can categorical variables be treated as continuous? A comparison of robust continuous and categorical SEM estimation methods under suboptimal conditions. *Psychological Methods, 17*(3), 354-373. <https://doi.org/10.1037/a0029315>
- Ross, C. E., & Wu, C. L. (1995). The links between education and health. *American Sociological Review, 60*, 719-745.
- Ross, C. E., & Wu, C. L. (1996). Education, age, and the cumulative advantage in health. *Journal of Health and Social Behavior, 37*, 104-120.
- Ross, K. M., & Tolan, P. (2017). Social and emotional learning in adolescence: Testing the CASEL model in a normative sample. *The Journal of Early Adolescence, 0272431617725198*.
- Rowe, H., & Trickett, E. (2017). Student diversity representation and reporting in universal school-based social and emotional learning programs: Implications for generalizability. *Educational Psychology Review, 30*, 1–25. doi:10.1007/s10648-017-9425-3
- Rudasill, K., Snyder, K., Levinson, H., & Adelson, J. (2017). Systems view of school climate: A theoretical framework for research. *Educational Psychology Review, 30*(1), 35-69. doi:10.1007/s10648-017-9401-y
- Sancassiani, F., Pintus, E., Holte, A., Paulus, P., Moro, M., Cossu, G., ... Lindert, J. (2015). Enhancing the emotional and social skills of the youth to promote their wellbeing and positive development: A systematic review of universal school-based randomized controlled trials. *Clinical Practice & Epidemiology in Mental Health, 11*(1), 21–40.
- Schwerdt, G., & West, M. R. (2012). The impact of alternative grade configurations on student outcomes through middle and high school. *Journal of Public Economics, 97*, 308-326.
- Seattle Public Schools. (2017). 2016-2017 District scorecard: Research & Evaluation Department. Retrieved from https://www.seattleschools.org/UserFiles/Servers/Server_543/File/District/Departments/School%20Board/17-18%20agendas/20171108/SPS%20District%20Scorecard%202016-17%20Board%20Presentation_ADA.pdf

- Seidman, E., Allen, L., Aber, L., Mitchell, C., & Feinman, J. (1994). The impact of school transitions in early adolescence on the self-system and perceived social context of poor urban youth. *Child Development, 65*(2), 507–522. doi:10.1111/j.1467-8624.1994.tb00766.x
- Shapiro, V., Kim, E., Accomazzo, S., & Roscoe, J. (2016). Predictors of rater bias in the assessment of social-emotional competence. *International Journal of Emotional Education, 8*(2), 25-44.
- Shirley, E., & Cornell, D. (2012). The contribution of student perceptions of school climate to understanding the disproportionate punishment of African American students in a middle school. *School Psychology International, 33*(2), 115–134. doi:10.1177/0143034311406815
- Shukla, K., Konold, T., & Cornell, D. (2016). Profiles of student perceptions of school climate: Relations with risk behaviors and academic outcomes. *American Journal of Community Psychology, 57*(3-4), 291–307. doi:10.1002/ajcp.12044
- Taylor, R., Oberle, E., Durlak, J., & Weissberg, R. (2017). Promoting Positive youth development through school-based social and emotional learning interventions: A meta-analysis of follow-up effects. *Child Development, 88*(4), 1156–1171. doi:10.1111/cdev.12864
- Thapa, A., Cohen, J., Guffey, S., & Higgins-D'Alessandro, A. (2013). A review of school climate research. *Review of Educational Research, 83*, 357-385. <https://doi.org/10.3102/0034654313483907>
- Traub, R. E. (1994). *Reliability for the social sciences: Theory and applications* (Vol. 3). Thousand Oaks, CA: SAGE.
- U.S. Department of Education, Office of Safe and Healthy Students. (2016). *Quick guide on making school climate improvements*. Washington, DC: Author.
- U.S. Department of Education. (2008). *New race and ethnicity guidance for the collection of federal education data*. Retrieved from: <https://www2.ed.gov/policy/rschstat/guid/raceethnicity/index.html>
- Vavrus, F. (2017). From gap to debt: Rethinking equity metaphors in education. *International Education Journal: Comparative Perspectives, 16*(3), 5-16.
- Voight, A., & Hanson, T. (2012). *Summary of existing school climate instruments for middle school*. San Francisco, CA: Regional Education Laboratory West at WestEd.
- Voight, A., & Hanson, T. (2017). *How are middle school climate and academic performance related across schools and over time?* REL 2017-212. San Francisco, CA: Regional Educational Laboratory West. Retrieved from <https://eric.ed.gov/?id=ED572366>
- Voight, A., & Nation, M. (2016). Practices for improving secondary school climate: A systematic review of the research literature. *American Journal of Community Psychology, 58*(1-2), 174–191. doi:10.1002/ajcp.12074

- Voight, A., Hanson, T., O'Malley, M., & Adekanye, L. (2015). The racial school climate gap: Within-school disparities in students' experiences of safety, support, and connectedness. *American Journal of Community Psychology*, *56*(3-4), 252–267. doi:10.1007/s10464-015-9751-x
- Wang, M.-T., & Degol, J. (2016). School climate: A review of the construct, measurement, and impact on student outcomes. *Educational Psychology Review*, *28*(2), 315–352. doi:10.1007/s10648-015-9319-1
- Wang, M.-T., & Degol, J. (2016). School Climate: A Review of the Construct, Measurement, and Impact on Student Outcomes. *Educational Psychology Review*, *28*(2), 315–352. doi:10.1007/s10648-015-9319-1
- Wang, M.-T., & Dishion, T. J. (2012). The trajectories of adolescents' perceptions of school climate, deviant peer affiliation, and behavioral problems during the middle school years. *Journal of Research on Adolescence: The Official Journal of the Society for Research on Adolescence*, *22*(1), 40–53. <http://doi.org/10.1111/j.1532-7795.2011.00763.x>
- Wang, M. T., & Eccles, J. S. (2011). Adolescent behavioral, emotional, and cognitive engagement trajectories in school and their differential relations to educational success. *Journal of Research on Adolescence*, *22*(1), 31-39.
- Wang, M. T., Selman, R. L., Dishion, T. J., & Stormshak, E. A. (2010). A tobit regression analysis of the covariation between middle school students' perceived school climate and behavioral problems. *Journal of Research on Adolescence*, *20*(2), 274–286. <http://doi.org/10.1111/j.1532-7795.2010.00648.x>
- Wang, W., Vaillancourt, T., Brittain, H., McDougall, P., Krygsman, A., Smith, D., ... Hymel, S. (2014). School climate, peer victimization, and academic achievement: Results from a multi-informant study. *School Psychology Quarterly*, *29*(3), 360-377. doi:10.1037/spq0000084
- Way, N., Reddy, R., & Rhodes, J. (2007). Students' perceptions of school climate during the middle school years: associations with trajectories of psychological and behavioral adjustment. *American Journal of Community Psychology*, *40*(3-4), 194–213. doi:10.1007/s10464-007-9143-y
- Weissberg, R. P., Durlak, J.A., Domitrovich, C. E., & Gullotta, T. P. (2015). Social and emotional learning: Past, present and future. In J. A. Durlak, C. P. Domitrovich, R. E. Weissberg, & T. P. Gullotta (Eds.). *Handbook of social and emotional learning: research and practice* (pp. 348-360). New York, NY: Guilford Press.
- Weissberg, R. P., Goren, P., Domitrovich, C., & Dusenbury, L. (2013). *Effective social and emotional learning programs: Preschool and elementary school edition*. Chicago, IL: Collaborative for Academic, Social, and Emotional Learning.
- West, M. R., Kraft, M. A., Finn, A. S., Martin, R. E., Duckworth, A. L., Gabrieli, C., & Gabrieli, J. (2015). Promise and paradox: Measuring students' non-cognitive skills and the impact of schooling. *Educational Evaluation and Policy Analysis*, *38*(1), 148–170. doi:10.3102/0162373715597298

- Yates, T., Ostrosky, M., Cheatham, G., Fettig, A., Shaffer, & Santos, R. (2008). *Research synthesis on screening and assessing social-emotional competence*. Nashville, TN: Vanderbilt University. The Center on the Social and Emotional Foundations for Early Learning. Retrieved from http://csefel.vanderbilt.edu/documents/rs_screening_assessment.pdf
- Yosso, T. J. (2005). Whose culture has capital? A critical race theory discussion of community cultural wealth. *Race Ethnicity and Education*, 8(1), 69–91. Taylor & Francis. doi:10.1080/1361332052000341006
- Zhou, M., & Ee, J. (2012). Development and validation of the social emotional competence questionnaire (SECQ). *The International Journal of Emotional Education*. Retrieved from <http://www.enseceurope.org/journal/Papers/ENSECV4I2P2.pdf>
- Zins, J. E., & Elias, M. J. (2007). Social and emotional learning: Promoting the development of all students. *Journal of Educational and Psychological Consultation*, 17(2-3), 233-255. <https://doi.org/10.1080/10474410701413152>
- Zins, J., Bloodworth, M., Weissberg, R., & Walberg, H. (2007). The Scientific base linking social and emotional learning to school success. *Journal of Educational and Psychological Consultation*, 17(2-3), 191–210. doi:10.1080/10474410701413145
- Zuberi, T., & Bonilla-Silva, E. (Eds.). (2008). *White logic, white methods: Racism and methodology*. Lanham, MD: Rowman & Littlefield Publishers.

CURRICULUM VITAE

Tiffany M. Jones Ph(c) MSW MFT*Curriculum Vitae*

University of Washington School of Social Work
 4101 15th Ave. NE
 Seattle, WA 98105

tjones03@uw.edu

EDUCATION

PhD	University of Washington Social Welfare Certificate in Statistics, Center for Statistics and the Social Sciences Dissertation: Understanding race differences in academic achievement, social emotional learning and school climate to promote equity and policy reform. Committee: Todd Herrenkohl (Chair), Amelia Gavin, Charles Fleming	August 2018 2017
MSW	University of Washington Social Work Concentration: Children, Youth and Families	June 2016
MA	Loyola Marymount University Marital and Family Therapy with Specialization in Clinical Art Therapy Masters Research Project: Theories of change in art therapy.	May 2007
BA	Syracuse University <i>Summa Cum Laude</i> Psychology and Art, with Honors Honors Thesis: Comparing Montessori education and conventional education on aspects of creativity.	May 2005

FELLOWSHIPS AND AWARDS

TL1 Interdisciplinary Translational Research Fellowship (TL1 TR000422) National Institutes of Health, Institute for Translational Health Science	2017-2018
TL1 Interdisciplinary Translational Research Fellowship (TL1 TR000422) National Institutes of Health, Institute for Translational Health Science	2016-2017
Doctoral Dissertation Award	2018
Early Career Preventionist Network, Society for Prevention Research Travel Award	2018
Graduate and Professional Student Senate Travel Award	2017
School of Social Work Travel Award	2017
Early Career Preventionist Network, Society for Prevention Research Travel Award	2017
Center for Statistics and the Social Sciences Peer Reviewed Travel Award	2016
Graduate School Fund for Excellence and Innovation Travel Award	2016
University of Washington School of Social Work Travel Award	2015

University of Washington School of Social Work Boeing Fellowship	Spring 2014
Early Career Preventionist Network, Society for Prevention Research Travel Award	2014
University of Washington School of Social Work Travel Award	2014
Graduate School Fund for Excellence and Innovation Fellowship Award	Fall 2013
Allport Scholar Award, Syracuse University	2005
Allport Applied Scholar Award, Syracuse University	2005

PUBLICATIONS

Peer Reviewed Journals

- Gavin, A., **Jones, T.M.**, Kosterman, R., Lee, J.O., Cambron, C., Hill, K. G., & Hawkins, J. D. (In Press). Race differences in mechanisms linking BMI and childhood SES. *Journal of Adolescent Health*.
- Jones, T. M.**, Nurius P., Fleming, C., Song, C. (In press). Modeling life course pathways from adverse childhood experiences to adult mental health. *Child Abuse and Neglect*.
- Lee, J. O., **Jones, T. M.**, Rhew, I. C., Kosterman, R., Lovasi, G., Hill, K. G., Catalano, R. F., & Hawkins, J. D. (2017). The association of unemployment from age 21 to 33 with substance use disorder symptoms at age 39: The role of childhood neighborhood characteristics. *Drug and Alcohol Dependence*, 174, 1-8.
- Guttmanova, K., Kosterman, R., White, H. R., Bailey, J. A., Lee, J. O., Epstein, M., Jones, T. M., & Hawkins, J. D. (2017). The association between regular marijuana use and adult mental health outcomes. *Drug and Alcohol Dependence*, 179, 109-116.
- Kristman-Valente, A. N., Hill, K. G., Epstein, M., Kosterman, R., Bailey, J. A., Steeger, C. M., **Jones, T. M.**, Abbott, R. D., Johnson, R. M., Walker, D., & Hawkins, J. D. (2017). The relationship between marijuana and conventional cigarette smoking behavior from early adolescence to adulthood. *Prevention Science*, 18(4), 428-438.
- Jones, T. M.**, Hill, K. G., Epstein, M., Lee, J.O., Hawkins, J. D., & Catalano, R. F. (2016). Understanding the interplay of individual and social-developmental factors in the progression of substance use and mental health from childhood to adulthood. *Development and Psychopathology*, 28(03), 721-741.
- Guttmanova, K., Wheeler, M., Hill, K. G., Hartigan, L. A., & **Jones, T. M.** (2016). Conducting culturally relevant, sustainable prevention in Indian country. *Journal of Community Psychology*. 45, 346-362.
- Lee, J. O., Kosterman, R., **Jones, T. M.**, Herrenkohl, T. I., Rhew, I. C., Catalano, R. F., & Hawkins, J. D. (2016). Mechanisms linking high school graduation to health disparities in young adulthood: A longitudinal analysis of the role of health behaviors, psychosocial stressors, and health insurance. *Public Health*, 139, 61-69.
- Kosterman, R., Bailey, J. A., Guttmanova, K. G., **Jones, T. M.**, Eisenberg, N., Hill, K. G., & Hawkins, J. D. (2016). Recreational marijuana legalization and parents' attitudes, use and parenting in Washington State. *Journal of Adolescent Health*, 59(4), 450-456.

Kristman-Valente, A. N., Oesterle, S., Hill, K. G., Wells, E. A., Epstein, M., **Jones, T. M.**, & Hawkins, J. D. (2016). The relationship between interpersonal violence victimization and smoking behavior across time and by gender. *Journal of Social Work Practice in the Addictions*, 16(1-2), 132-159.

Manuscripts Under Review

Jones, T. M., Epstein, M., Hill, K., & Hawkins, J. D. (under review). General and specific predictors of comorbid mental health and substance use problems from adolescence to age 33.

Lee, J. O., **Jones, T. M.**, Kosterman, R., Cambron, C., Rhew, I. C., Herrenkohl, T. I., & Hawkins, J. D. (under review). The link between childhood neighborhood context and substance use disorder symptoms at age 39: The role of socioeconomic status.

Jones, T. M., Eisenberg, N., Kosterman, R., Lee, J.O., Bailey, J. A., & Haggerty, K. (under review). "It's everywhere": Parents' perceptions of adolescent exposure to marijuana following legalization in Washington State.

Eisenberg, N., **Jones, T. M.**, Kosterman, R., Lee, J. O., Roe, S., Cortes, R.C., Casey-Goldstein, M., & Haggerty, K. (under review). Parenting practices in the context of legal marijuana: Voices from Seattle parents.

Manuscripts in Preparation

Jones, T. M., Fleming, C., Gavin, A. (in preparation). The generalizability of social emotional learning programs to racially diverse students: A comprehensive literature review.

Lee, J. O., **Jones, T. M.**, Kosterman, R., Hawkins, J. D. (in preparation). Accumulative unemployment from age 21 to 33 and mental health disorders at age 39: The role of childhood neighborhood characteristics.

Herrenkohl, T. I., Favia, L., McFarland, E., **Jones, T. M.**, Herrenkohl, L. R. (in preparation). Sustaining high quality social emotional learning and academic instruction in schools.

PEER-REVIEWED CONFERENCE PRESENTATIONS

Jones, T. M., Fleming, C., & Gavin A. (2018, May). *Generalizability of social emotional learning programs to racially diverse students: A comprehensive literature review*. Oral Presentation. Society for Prevention Research, Washington DC.

Jones, T. M., Fleming, C., & Gavin A. (2018, May). *Racial disparities in student perceptions of school climate and student achievement*. Oral Presentation. Society for Prevention Research, Washington DC.

Jones, T. M., Kagy, R., & Herrenkohl, T. I. (2018, February). *Development of a regional social emotional learning research consortium for program quality and sustainability in schools and community-based organizations*. Oral Presentation, Washington Educational Research Association Annual Conference, SeaTac, WA.

Jones, T. M., Fleming, C., Beaver, J., Bindman, S., & Herrenkohl, T. I. (2018, January). *Racial differences in student reports of school climate and social emotional skills*. Oral Presentation, Society for Social Work Research, Washington, DC.

- Jones, T. M.,** Fleming, C., Beaver, J., Bindman, S., & Herrenkohl, T. I. (2018, January). *Survey redesign to monitor progress towards eliminating the opportunity gap: a research practice partnership with seattle public schools*. Poster, Society for Social Work Research, Washington, DC.
- Jones, T. M.,** Herrenkohl, T. I., Fleming, C., & Gavin, A., & Seattle Public Schools Research and Evaluation team. (2017, May). *Assessing the relevance and meaning of social emotional learning and school climate across racial groups*. Poster, Society for Prevention Research, Washington DC.
- Lee, J. O., **Jones, T. M.,** Kosterman, R., Cambron, C., Rhew, I. C., Herrenkohl, T. I., & Hill, K. G. (2017, May). *The link between childhood neighborhood characteristics and adult substance use disorder symptoms*. Organized Symposium, Society for Prevention Research Conference, Washington DC.
- Jones, T. M.,** Herrenkohl T. I., & Gavin, A. (2017, April). *Culture and race in social emotional learning programs: A comprehensive literature review*. Poster, European Social Work Research Conference, Aalborg, Denmark.
- Jones, T. M.,** Herrenkohl, T. I., & Gavin, A. (2017, January). *Culture and race in social emotional learning programs: a new conceptual model*. Organized Symposium, Society for Social Work Research, New Orleans.
- Jones, T. M.,** Epstein, M., Hill, K., & Hawkins, J. D. (2017, January) *General and specific predictors of comorbid mental health and substance use problems from adolescence to age 33*. Oral presentation, Society for Social Work Research, New Orleans.
- Jones, T. M.,** Herrenkohl T. I., & Favia, L. (2016, November). *A collaborative model of cross disciplinary doctoral Social work education*. Oral presentation, Council on Social Work Education, Atlanta GA.
- Jones, T. M.,** Hill, K. G., Epstein, M., Lee, J.O., Hawkins, J. D., & Catalano, R. F. (2016, June). *Understanding the interplay of individual and social-developmental factors in the progression of substance use and mental health from childhood to adulthood*. Organized Symposium, Society for Prevention Research Conference, San Francisco, CA.
- Jones, T. M.,** Gavin, A. Kosterman, R., Lee, J.O., Cambron, C., Hill, K. G., & Hawkins, J. D. (2016, June). *Are there race differences in mechanisms linking BMI and childhood socioeconomic status?* Poster, Society for Prevention Research Conference, San Francisco, CA.
- Jones, T. M.,** Hill, K. G., Epstein, M., Lee, J. O., Hawkins, J. D., & Catalano, R. F. (2016, January). *Understanding the interplay of individual and social-developmental factors in the progression of substance use and mental health from childhood to adulthood*. Poster, Society for Social Work Research Conference, Washington DC.
- Jones, T. M.,** Eisenberg, N., Kosterman, R., Lee, J. O., Cortes, R., Casey-Goldstein, M., & Haggerty, K. (2015, May) *"It's Everywhere!" What parents are saying about the impacts of marijuana legalization on youth exposure in Seattle*. Poster, Society for Prevention Research Annual Meeting, Washington DC.
- Eisenberg, N., **Jones, T. M.,** Kosterman, R., Lee, J. O., Cortes, R. C., Casey-Goldstein, M., & Haggerty, K. (2015, May). *Results from focus groups with Seattle-area parents of children aged 8 to 15*. Organized Symposium, Society for Prevention Research Annual Meeting, Washington DC.

- Kosterman, R., Bailey, J. A., Hanson, K., Eisenberg, N., **Jones, T. M.**, Guttmanova, K., & Hill, K. G. (2015, May). *Parents' marijuana-related attitudes, use, and parenting behaviors, Part I: Results from the 2014 survey of the Seattle Social Development Project*. Organized Symposium, Society for Prevention Research Annual Meeting, Washington DC.
- Lee, J.O., Kosterman, R., Herrenkohl, T. I., Rhew, I. C., **Jones, T. M.**, & Hawkins J. D. (2014, May) *Mechanisms linking low educational attainment with health problems in young adulthood: Examining three competing hypotheses*. Organized Symposium, Society for Prevention Research Annual Meeting, Washington DC.
- Guttmanova, K., Hill, K. G., Bailey, J., Hartigan, L. A., **Jones, T. M.**, Small, C. M., & Hawkins, J. D. (2014, May) *Parental alcohol use, parenting and child on time development*. Organized Symposium, Society for Prevention Research Annual Meeting, Washington DC.

RESEARCH EXPERIENCE

Project Director Aug 2017- present

3DL Partnership, University of Washington

Developing a Regional Research Consortium for the Study and Advancement of Social Emotional Learning
(PI: Todd Herrenkohl)

Create partnerships with local youth development agencies and school districts to assess progress and challenges of Social Emotional Learning (SEL) assessment and evaluation. Develop a strategic plan to support the use of data to improve SEL practice across the region.

TL1 Multidisciplinary Pre-doctoral Clinical Research Program Fellow 2016-present

Institute for Translational Health Sciences, University of Washington and Seattle Public Schools

2017-18: Enhancing Data-Driven Decision Making for School Improvement at the Seattle Public Schools

In partnership with district, made recommendations to redesign student climate survey to align to school improvement practices based on psychometric analysis and coordination with stakeholders.

2016-17: Assessment Strategies for Social and Emotional Learning in the Seattle Public School District

Analyzed the measurement properties of student school climate and social emotional learning survey, including whether constructs are meaningful across sociocultural factors.

Research Analyst and Assistant 2013- 2016

Social Development Research Group, University of Washington

Social and Genetic Factors in the Development of Tobacco and Alcohol Dependence (PI: Karl G. Hill)

Investigated the role of social environmental factors on mental health and substance use problems using structural equation modeling with longitudinal data from the Seattle Social Development Project.

Environmental Mechanisms for Health, Drug Abuse and HIV Risk (PI: Rick Kosterman)

Used qualitative and quantitative methods to examine the effect of built and social environments on mental health and substance use problems across the life course, including the effects of marijuana legalization.

Fostering Higher Education (PI: Amy Salazar)

Facilitated focus groups with youth aging out of foster care and community stakeholders in higher education to develop an evidenced-based intervention to support youth aging out of foster care achieve their goals of higher education.

Research Practicum

2015

School of Social Work, University of Washington

Mentor: Amelia Gavin. Analyzed longitudinal data for race differences in adolescent mechanisms linking childhood poverty to growth in BMI in adulthood using growth multiple group modeling.

Observational Coder

Summer 2013

Social Development Research Group, University of Washington

The Intergenerational Project (PI: Karl Hill)

Conducted observational coding of parent-child interactions using Social Development Model principles.

Art Therapy Research Collaborative Member

2012-2013

Marital and Family Therapy and Clinical Art Therapy, Loyola Marymount University

Designed and implemented survey of evidence-based practice use by Art Therapists in California, collaborated on art based analyses of clinical case studies.

Masters Research Project

2006-2007

Marital and Family Therapy and Clinical Art Therapy, Loyola Marymount University

Masters Research Project: *Theories of Change in Art Therapy*. Developed a framework for mechanisms of change in art therapy using qualitative research principles from grounded theory.

Honors Thesis

2004-2005

Psychology Department, Syracuse University

Honors Thesis: *Comparing Montessori Education and Conventional Education on Aspects of Creativity*. Used two tests of creativity (Thematic Apperception Test and ratings of creativity on collage) to examine differences in creativity for students in different educational programs.

TEACHING INTEREST AND EXPERIENCE

Interests

Macro and micro practice; evidence based practices; social emotional learning; assessment, treatment and prevention of mental disorders; child mental health, school social work; research methods; art therapy.

Experience

- Invited Lecture: Social Justice in Research and Research Practice Partnerships** February, 2018
Social Work Research Methods
 MSW Program, University of Washington
- Social Justice Orientation Co-facilitator** Sept 2017
First year student orientation
 Doctoral program, University of Washington
- Instructor** Winter 2017
Poverty and Inequality
 Required class in MSW Program, University of Washington
- Social Justice Orientation Co-facilitator** Sept 2016
First year student orientation
 Doctoral program, University of Washington
- Invited Lecture: Focus Groups and Interviews in Qualitative Research** April 2016
Social Work Research Methods and Evaluation
 MSW Program, University of Washington
- Teaching Team Member - 3DL Collaborative** (mentor: Todd Herrenkohl) Winter 2016
Social Emotional Learning Theory
 Doctoral Program, University of Washington
- Invited Lecture: Using Art in Social Work Clinical Practice** February, 2016
Advanced Practice with Diverse Children and Families Child Mental Health
 MSW Program, University of Washington
- Invited Lecture: A Critical Approach to Evidence Based Practices** March 2015
Human Behavior and the Social Environment
 BASW Program, University of Washington
- Invited Lecture: Focus Groups – Applications and Considerations** Feb 2015, April 2015
Foundations of Social Work Research Methods
 MSW Program, University of Washington

Co-Instructor (teaching mentor: James DeLong) <i>Practice I: Introduction to Social Work Practice</i> MSW Program, University of Washington	Winter 2015
Co-Instructor (teaching mentor: James DeLong) <i>Practice II: Intermediate Direct Practice with Families and Groups</i> MSW Program, University of Washington	Fall 2014
Invited Lectures: Art Interventions for Non-Art Therapists <i>Training for MSW, MFT and PsyD Clinicians and Interns</i> Enki Health and Research Systems, Los Angeles, CA	2008, 2009 & 2011
Teaching Intern in Undergraduate Social Psychology <i>Teaching Internship Program</i> Syracuse University, Syracuse, NY	Fall 2004

PROFESSIONAL PRACTICE EXPERIENCE

Clinical Licenses

Licensed Marriage and Family Therapist

California MFC 48631, in inactive status (can renew at any time)	2010
Washington LMFT LF 60327020, in inactive status (can renew at any time)	2013

Registered Art Therapist

License 09-231, in inactive status (can renew at any time)	2009
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Practice Experience

Research-Practice Partnership Collaborator 2016- present

Seattle Public Schools, Research and Evaluation, Seattle

Organizational practice in partnership with district leaders tasked with supporting schools to make data-driven practice decisions about the implementation and improvement of various school climate and social emotional learning initiatives and evidence based practices.

Advanced MSW Practicum 2015-2016

Collaborative Schools for Innovation and Success, Seattle

Supported behavioral data analysis for use with Positive Behavioral Intervention Support intervention at Roxhill Elementary School. Provided direct service to students in social skill building groups.

Foundation MSW Practicum 2014-2015

Social Development Research Group, University of Washington, Seattle

Collaborated on the development of parenting program intervention materials for a project testing feasibility of a parenting program delivered online and with support through a Facebook group.

Unit Supervisor 2009-2013*Enki East Los Angeles Mental Health, Los Angeles, CA*

Served as supervisor and clinical lead for four programs for a racially and culturally diverse community of severely mentally ill adults. Managed the implementation of four different Evidence Based Practices and associated outcome measures. Provided clinical and administrative supervision.

Mental Health Therapist 2007-2009*Enki Youth and Family Services, Los Angeles, CA*

Conducted art and verbal therapy for children and their families in Day Treatment, Outpatient, Family Preservation, and Multidisciplinary Assessment Team programs.

Marriage and Family Therapy Trainee 2006-2007*Los Angeles Unified School District, Los Angeles, CA*

Conducted art therapy in school-based and clinic settings with elementary school students for the School Mental Health program. Assisted in crisis support services post tragic school events.

Marriage and Family Therapy Trainee 2006*Little Company of Mary Hospital, San Pedro, CA*

Provided group and individual art therapy for severely mentally ill adults in the inpatient and partial hospitalization programs.

PROFESSIONAL AFFILIATIONS AND SERVICE

Academic Service

Member Race and Equity Council, School of Social Work	2016 - present
Member Social Justice Committee, School of Social Work	2016 - present
Member Health Sciences Library Graduate Student Advisory Committee	2016 - present
Advisor for Anti-Racist White Allyship Student Group	2015 - present
Elected Awards Committee Alternate Student Representative	2015- 2016
Elected Awards Committee Student Representative	2014- 2015

Reviewer Activities

Special Issue Article Review	2017
<i>Journal for the Social of Social Work and Research</i>	
Mentored review with Dr. M. Epstein	2016
<i>Journal of Research on Adolescence.</i>	
Mentored review with Dr. M. Epstein	2016
<i>Psychology of Men & Masculinity.</i>	

Mentored review with Dr. J. O. Lee
Psychiatry Research 2014

Professional Development

Positive Behavioral Intervention Supports Tier I Training, Seattle Public Schools	2015
RULER Family Engagement Training, Seattle Public Schools	2015
Interpersonal Psychotherapy Level A, Los Angeles Department of Mental Health	2012
Seeking Safety Training, Los Angeles Department of Mental Health	2012
Cognitive Behavioral Therapy, Los Angeles Department of Mental Health	2010
Trauma Focused Cognitive Behavioral Therapy, Online Training	2010
Art Therapy in Disasters Training Series, Loyola Marymount University	2008
Multidisciplinary Assessment Team Training	2007
0-5 Mental Health Assessment Training	2007

Affiliations and Memberships

Institute of Translational Health Sciences, University of Washington	2016-present
Council on Social Work Education	2016-present
Society for Social Work Research	2015-present
Society for Prevention Research	2014-present
American Association of Marriage and Family Therapy	2012-2013
American Art Therapy Association	2007-2013
California Association of Marriage and Family Therapy	2007-2013