Investigating the Effects of High School Climate on Non-Cognitive Strengths in College

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THESIS

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LIST OF ABBREVIATIONS

ACT  American College Testing
AI   Ambitious Instruction
AP   Advanced Placement
APCS Academic Primary Control Striving
BEL  Belonging
CCSR University of Chicago Consortium on School Research
CFA  Confirmatory Factor Analysis
CFI  Comparative Fit Index
CPS  Chicago Public Schools
CT   Collaborative Teachers
EL   Effective Leaders
ELL  English Language Learners
GPA  Grade Point Average
HSGPA High School Grade Point Average
IB   International Baccalaureate
ICC  Intraclass Correlation
IF   Involved Families
MOTIV Academic Motivation
PARINC Parent Income
RMSEA Root Mean Square Error of Approximation
SE   Supportive Environment
SEF  Self-Efficacy
SRL  Self-Regulated Learning
TIME  Time Management
UNMNEED  Unmet Need
SUMMARY

The current study was designed to better understand how high school climate and other school-level demographic factors relate to students’ non-cognitive skills and academic performance in the first year of college. The investigator conducted one quantitative study and a set of follow-up qualitative analyses to explore this question.

The quantitative study used data from three sources: University of Chicago Consortium on School Research's “My Voice, My School” survey, a Non-Cognitive Survey conducted at a large urban public university, and student data provided by the institution. In total, the current study used data from 2,822 students nested within 113 schools, with an average of 15 students per school. The current study tested and expanded upon the University of Chicago Consortium on School Research's non-cognitive model using multi-level structural equation modeling. The investigator then conducted analyses to explore the impact of the concentration of poverty at the school level on college outcomes. Follow-up qualitative analyses investigated the same questions through a series of small focus groups with non-transfer college sophomores (n = 8).

Results of the quantitative study indicated that non-cognitive variables in college did not cluster significantly by high school. Focus group findings, however, suggested a link between students’ individual experiences in high school and non-cognitive outcomes, although these results represent only the perspectives of eight students. Students’ first-term GPA in college, however, did cluster significantly by high school. The five essentials of school climate did not account for this clustering. Instead, the single best predictor of first-term GPA in college was the concentration of poverty at students’ high school. Follow-up quantitative analyses revealed key differences and similarities in school climate between high- and low-percentile poverty schools.
I. INTRODUCTION
A. Statement of the Problem

Although college enrollment is at an all-time high, graduation rates continue to be persistently low in the United States (National Center for Education Statistics, 2013). Only half of the three million students who enroll in college each year are expected to receive a degree (Digest of Education Statistics, 2014). At four-year institutions, 42% of students leave college before earning a degree (National Center for Education Statistics, 2014). At two-year institutions, the dropout rate is even higher: 60% of students leave before earning a degree (Aud et al., 2011).

Many students who leave college do so after the first year. Currently, at four-year institutions, 20% of enrolled first-year students did not return for a second year, and at two-year institutions, 41% of enrolled first-year students did not return for the second year (Kena et al., 2016). Retention rates vary significantly by institutional selectivity, with less selective institutions having lower retention rates than highly selective institutions (Skomsvold, Walton Radford, & Berkner, 2011). There are also differences in rates of first-to-second-year retention by racial/ethnic group (Skomsvold, Walton Radford, & Berkner, 2011). A national longitudinal study of first-time post-secondary students found that 17% of African American students and 19% of Latino/a students left college within the first year without transferring to another institution, as compared to 15% of White students and 6% of Asian/Pacific Island students. Students from low-income backgrounds were also three times more likely to leave college before the second year (16%) than high-income counterparts (5%) (Skomsvold, Walton Radford, & Berkner, 2011). Six years later, only 50% of the original cohort attained any degree...
or certificate from any institution of higher education (Skomsvold, Walton Radford, & Berkner, 2011).

Students, who leave college before earning a degree, experience more employment and financial difficulties than graduated peers (Cheeseman Day & Newburger, 2002; Bureau of Labor Statistics, 2017a; Bureau of Labor Statistics, 2017b). The rate of unemployment for those with a high school degree and some college (4.4%), is well above the rate for those with a college degree (2.7%) (Bureau of Labor Statistics, 2017a). Those who have completed high school and some college earned $34,540 annually compared to college graduates’ $71,530 (Bureau of Labor Statistics, 2017b). Likewise, college graduates’ lifetime earnings ($2.1 million) are significantly higher than the earnings of those with some college coursework ($1.5 million) (Cheeseman Day & Newburger, 2002).

With the stakes of college education on the rise, college completion has moved to the forefront of the national conversation. High school and university administrators are increasingly seeking strategies to better prepare students for college. Preparedness for college includes both academic preparedness for college-level coursework and social/emotional readiness to manage the challenges of college life.

B. Academic Preparedness and College Readiness

Academic preparedness refers to students’ academic knowledge (e.g., students’ writing abilities, mathematical knowledge, prior scientific training) before college (Barnes, Slate, & Rojas-LeBouef, 2010). These are the skills that high school grades and standardized tests are meant to capture. Academic preparedness is positively related to retention, college GPA, time-to-degree completion and the likelihood of graduating (D’Amico & Dika, 2013; Farruggia, Han, Watson, Moss, & Bottoms, 2016).
In contrast, college readiness refers to a broader range of behaviors, skills, attitudes, and strategies – often referred to as non-cognitive factors – which also help students to succeed in college (Nagaoka et al., 2013; Tracey & Sedlacek, 1987; Sedlacek, 2004). Despite what the term implies, “non-cognitive” factors encompass a number of internal cognitive processes that represent strengths in college. To earn a degree, students need more than academic proficiency; graduation requires confidence, motivation, perseverance, self-regulation, time management and goal setting (Barnes, Slate, & Rojas-LeBouef, 2010; Nagaoka et al., 2013; Sommerfeld, 2011; Tierney & Sablan, 2014; Tracey & Sedlacek, 1987).

C. Emerging Adulthood and the College Transition

These non-cognitive skills are important sources of strength during the challenging developmental period between high school and college. As youth transition from high school to college, they simultaneously transition into a distinct phase of development between adolescence and adulthood (Arnett, 2000). In earlier generations, the transition to adulthood generally followed shortly after graduation from high school, when young men and women generally entered the workforce, found long-term partners, and began to build a family unit (Arnett, 2000). Recent cultural shifts in education and employment norms have prolonged the transition from adolescence to adulthood; this developmental period between adolescence and adulthood is now termed “emerging adulthood” (Arnett, 2000). Within industrialized nations, many young people now enter an institution of higher education following high school, and remain partially reliant on parents for financial and emotional support throughout college, and for the first several years of employment (Arnett, 2000). Emerging adulthood is characterized as a period of extended identity exploration, and pseudo-independence from parents (Arnett, 2000). Emerging adults experience rapid changes in employment, family roles, romantic
relationships, and worldviews, and these rapid changes are accompanied by high residential mobility and financial instability (Arnett, 2000). First-year college students grapple with these issues of growing independence, identity-formation, and rapid change related to their new status as emerging adults just as they begin to navigate the unfamiliar academic and social terrain of college.

D. Development of Non-cognitive Strengths in Context

Young people develop the skills that they need to navigate this difficult period of transition within various developmental contexts. The University of Chicago Consortium on School Research (CCSR) has proposed a general model positing that students develop non-cognitive strengths within their broader sociocultural and educational context, and that these strengths then work together to promote student outcomes in high school and in college (see figure 1) (Farrington, et al., 2012; Nagaoka et al., 2013). According to this model, the various contexts within which students are nested shape students’ academic mindsets (e.g., self-efficacy, sense of belonging, motivation to learn), and promote students’ development of social skills, and use of learning strategies (e.g., time management, self-regulation, goal setting). Academic mindsets and learning strategies promote perseverance in the face of difficulty, and together, they all influence academic behaviors (e.g., attendance, completion of assignments, help-seeking, problem behaviors) and thus academic performance (e.g., grades, retention, graduation). The full model is presented below.
Figure 1. General non-cognitive model detailing how school context influences academic performance via non-cognitive factors (based on model originally published in Nagaoka et al., 2013).

E. Theories on Development and Context

1. Ecological Systems Theory. Bronfenbrenner’s ecological systems theory (1989) – now referred to as the “bioecological theory” (Bronfenbrenner, & Ceci, 1994) – proposed that individuals are concurrently nested within multiple contexts that continuously exert either direct or indirect influence on their cognitive development. He defined five levels of context: the microsystem, the mesosystem, the exosystem, macrosystem, and the chronosystem. The microsystem is the system with which the young person has the most regular direct contact. For example, youth have direct contact with parents and teachers, who thereby have an impact on youth development. In the next level of Bronfenbrenner’s theory, the mesosystem, the intersection between the different microsystem contexts, also exerts influence. For example, the family microsystem context and the classroom microsystem context might come together in the form of a cooperative parent-teacher relationship, which will have an impact on the young person’s development.

The next two levels of Bronfenbrenner’s theory represent ecological systems that affect youth development indirectly. One of these levels is the exosystem. A parent’s workplace is an
example of an exosystem. If a parent loses a job, there will be a corresponding effect on family income, likely reducing household resources and ultimately impacting a young person’s development. Another source of indirect influence, although on a broader level, is the macrosystem. This system refers to the broad cultural and ideological context in which all of Bronfenbrenner’s ecological systems are embedded. To illustrate, a government’s decision to decrease education funding, for example, may lead to the elimination of scholarship programs, which in turn may impact a young person’s educational and developmental trajectory. The final context, the chronosystem, represents the changes in the characteristics of the individual or any of the lower-level contexts over time. For example, a child’s stage of development (e.g., toddler, teenager) may influence the way that he/she reacts to a major life event, like the loss of a loved one, or a move across country. According to Bronfenbrenner, the relationship between the young person’s individual characteristics and context is bidirectional: all of these contexts interact with one another to influence a young person’s developmental trajectory, all while the young person’s individual characteristics exert an influence on the context.

2. Social Cognitive Theory. Bandura’s social cognitive theory (1986) offers a framework for understanding how certain contexts might foster the development of non-cognitive strengths, and how these non-cognitive strengths might influence academic performance in college. Bandura proposed that psychosocial functioning is the result of a dynamic interplay between the social environment, individual cognition, and behavior (Bandura, 1989). He proposed that individuals learn through observation and through the messages that they receive in the social environment. These messages influence the way that individuals think about themselves and the world, which in turn influences their behavior. He added that the relationships between these components are bidirectional, in that the individual’s
behavior also has the power to shape both the social environment, and the individual’s perceptions of him/herself (Bandura, 1989). In the college classroom, for instance, a student’s approach to a novel math problem (behavior) might be influenced by her perceptions of her math abilities (cognition). These perceptions may have been shaped by her high school environment, including interactions with teachers, conversations with peers, and the messages that she has received about mathematics growing up. Poor performance on the assignment (behavior) may feed back into the social environment to influence how the professor interacts with the student (environment), and how the student views math courses in the future (cognition).

F. Theories of Poverty and Development

There is a large literature dedicated to understanding the many ways in which high-poverty contexts exert a unique influence on the course of development.

1. Chronic Stress and Poverty. Poverty is associated with a number of associated chronic stressors. Low-income families generally have limited access to resources, often including basic needs like food (Slopen, Fitzmaurice, Williams, & Gilman, 2010; Kushel, Gupta, Gee, & Haas, 2006), clean water (Amrose, Burt, & Ray, 2015), stable housing (Kushel, et al., 2006), and healthcare (Lasser, Himmelstein, & Woolhandler, 2006). Children and families in poverty are also often exposed to an increased number of psychosocial stressors and adverse childhood experiences (e.g., familial instability, domestic violence, exposure to substance use, community violence) (Wade, Shea, Rubin, & Wood, 2014; Evans and English, 2002). Living in a neighborhood with a high concentration of poverty serves as an additional source of stress (Santiago, Wadsworth, & Stump, 2011). Neighborhoods with a high concentration of poverty often have less availability of community resources, higher rates of
unemployment and residential mobility, a weaker sense of community, and more crime than in more affluent neighborhoods (Wright & Fagan, 2013).

2. Biological Impacts of Chronic Stress Associated with Poverty. Biological theories of poverty explain how the chronic stress associated with poverty impacts biological processes in the body. These theories explain that adaptation to environmental stressors takes energy; the energetic burden placed on the body to adapt to the stressful environment is referred to as allostatic load (Goyman & Wingfield, 2004). When individuals’ stress-response system is taxed beyond their allostatic load, they enter “allostatic overload,” and the body’s biological response to stress changes (Goyman & Wingfield, 2004). When individuals are chronically exposed to the stressors of poverty, the body’s stress-response system becomes hyperactive, which, over time, has a negative impact on health (Kalmakis, Meyer, Chiodo, & Leung, 2015). Poverty has also been found to exert a negative influence on the development of brain structures and functioning via exposure to chronic stressors like nutritional deprivation and adverse life events (Kalmakis et al., 2015).

3. Social Capital, Poverty, and Education. Social capital theories posit that students living in poverty have limited access to social resources, referred to as social capital (Coleman, 1988). The term “social capital” encompasses the intangible resources available to students via their social networks including knowledge, information, opportunities, connections, and understanding of unspoken norms (Perna & Titus, 2005). More affluent students often have wider access to a network of college alumni and all of the insider knowledge embedded in those relationships, including knowledge about applying to college, securing scholarships, choosing classes, selecting a major, communicating with faculty, finding internships and securing employment (O’Connor, Hammack, & Scott, 2010). In contrast, students from low-
income backgrounds tend to have access to fewer individuals with the same college knowledge and connections within their social network than more affluent students (O’Connor, Hammack, & Scott, 2010). Such disparities in social resources help to perpetuate educational disparities between high-income and low-income students (Coleman, 1988).

G. Non-cognitive Skills in College

1. Academic Mindset in College. Academic mindset refers to students’ attitudes about themselves (i.e., self-efficacy), their sense of belonging in college, their attitudes about learning (i.e., motivation to learn). Academic self-efficacy, or a student’s belief in his or her ability to succeed in a given academic context, holds a historic place in educational research, and has been linked to numerous academic outcomes in college. For example, academic self-efficacy has been found to predict first-year GPA (Krumrei-Mancuso, Newton, Kim, & Wilcox, 2013; DeFreitas, 2012; Robbins et al., 2004), number of college credits earned (Zajacova, Lynch, & Espenshade, 2005), and retention (Robbins et al. 2004). ‘Sense of belonging’ refers to students’ subjective feelings of belonging or being a part of the college community (Farrington et al., 2012). Sense of belonging in college has been linked to students’ GPA and the number of credits earned in the first year of college (Farruggia et al., 2016). New evidence also suggests that a brief intervention focused on improving students’ sense of belonging in the first year had effects on students’ later academic performance, and self-rated health and well-being in college (Walton & Cohen, 2011). Students’ attitudes toward learning have been linked to a number of academic outcomes in college students. For example, students who find learning intrinsically rewarding and valuable have higher GPAs (Kaufman, Agars, & Lopez-Wagner, 2008; Turner, Chandler, & Heffer, 2009), and are more likely to be retained (Morrow & Ackermann, 2012; Allen, 1999) than their counterparts.
‘Academic mindset’ has also been found to predict academic perseverance and the learning strategies used by students (Farruggia et al., 2016). Students who see learning as a tool for growth are more likely than peers to persevere in the face of difficult problems (Dweck, 2007). These students see challenging problems as opportunities, and see errors as a necessary part of the learning process (Dweck, 2007). As such, these students are more likely to spend long hours preparing for exams, exhibit more effective learning strategies like time management, and are more likely to seek academic help, in the form of tutoring and remediation, in the face of difficulty (Bebenutty, 2009; McKenzie & Gow, 2004; Dweck, 2007).

2. Learning Strategies in College. Learning strategies refer to students’ abilities to manage their time (time management), and to independently learn the course material (self-regulated learning). Effective short-range time management strategies, like daily scheduling and goal setting, have been found to be positively related to academic performance. For example, several studies have found that time management predicts college GPA (McKenzie & Gow, 2004), over and above standardized test scores (Britton & Tesser, 1991) and personality factors (Macann, Fogarty, & Roberts, 2012). Self-regulated learning is another strategy that is important to success in college. Self-regulated learning refers to students’ abilities to learn course material on their own, and includes a planning phase, a self-monitoring phase and a reflection phase (Shell et al., 2005). Self-regulated learning is positively related to students’ college grades (Hartwig & Dunlosky, 2012; Al Khatib, 2010) and educational aspirations (Wang & Eccles, 2012). Another study found that first-year students who participated in a seminar on time management and study skills had higher grades and were significantly more likely to be retained and to graduate than peers who did not participate in the course (Tuckman
& Kennedy, 2011). Furthermore, in line with the CCSR model above, students who have developed strong time management and study strategies are more likely to persevere in college (Farrington et al., 2012).

3. Academic Perseverance in College. Academic perseverance refers to students’ abilities to continue to pursue long-term goals in the face of difficulty or failure (Duckworth, Peterson, Matthews & Kelly, 2007). Students who believe that they have the ability to complete college, and who see learning as intrinsically valuable may be more likely to persevere over several years to complete college. One measure of academic perseverance, “grit” (Duckworth et al., 2007), has been linked to numerous academic outcomes, including retention (Farruggia et al., 2016), educational attainment (Duckworth et al., 2007) and college GPA (Strayhorn, 2013). A second construct, academic primary control striving, refers to the process by which students adapt to setbacks by investing behavioral resources (e.g., spending time studying, attending and taking notes in class) to shape the environment towards achieving a specific goal (Heckhausen, Wrosch, & Schulz, 2010). Academic primary control striving has been found to positively predict students’ academic performance in the first year of college (Hamm, Stewart, Perry, Clifton, Chipperfield, & Heckhausen, 2013; Hall, Perry, Ruthig, Hladkyj, & Chipperfield, 2006). Academic primary control striving was also found to negatively predict course attrition (Hall et al., 2006).

4. School and Classroom Context. The general non-cognitive model (see Figure 1) suggests that school/classroom context can influence each of these three non-cognitive factors discussed above (Farrington et al., 2012). The classroom represents a microsystem for students’ non-cognitive development. For example, let us imagine a student who has just failed a big exam in mathematics. She is faced with a choice. She can persevere by staying after class
and studying hard for the next exam in order to improve her grade, or she can accept her grade with no consideration for altering her behavior for the next exam. In a school with a warm supportive environment, the teacher might approach our hypothetical student and express confidence in her abilities. The students’ self-efficacy in math (mindset) might increase as a result, in turn encouraging her to persevere in the face of this academic challenge (perseverance). Conversely, in a school with a less warm climate, students might receive little encouragement or even negative comments from teachers. In this school, the same student might develop low self-efficacy in math, and, viewing her effort as futile, might choose not to persevere. In these examples, classroom climate relates to students’ academic mindsets, and thus indirectly relates to students’ perseverance and outcomes.

In a similar vein, the non-cognitive model (see Figure 1) proposes that learning strategies may also be influenced by context (Farrington, et al., 2012). In classrooms with attentive teachers and rigorous curricula, students are likely to acquire skills that go beyond the given course material, including learning time management, self-regulation strategies, and study habits (learning strategies). The model proposes that school context may also relate to academic perseverance indirectly, via learning strategies: students who have built successful study habits have better tools to recover from setbacks.

**H. Cross-Contextual Effects: From High School to College**

Several studies have recently examined the extent to which high school context may have carry over effects on academic outcomes in college. For instance, several studies have found that high school organization and resources predict college admission, college selection, and enrollment decisions (Espenshade, Hale, & Chung, 2005; Hill, 2008; Engberg & Wolniak, 2010). Pike and Saupe (2002) found that high school characteristics like school size and
average ACT score predicted students’ college grades. Finally, Wolniak and Engberg (2010) found that school violence and the quality of high school resources predicted college grades, above and beyond students’ pre-college achievement. Given the value of the high school context in promoting college success, and that non-cognitive factors are positively related to college student outcomes, enhancing students’ non-cognitive strengths before entry to college may also be shown to positively affect the college experience. There is currently no research examining this avenue of inquiry.

The current study will fill this gap in the literature, specifically, which aspects of high school climate predict non-cognitive strengths in college. This topic represents an important first step in creating high school environments that help to prepare students for college life. The literature on high school context offers a point of departure in this inquiry.

I. High School Climate

The current prevailing theoretical model of school climate, the five essentials framework, was developed and tested by CCSR (Bryk, Sebring, Allensworth, Easton, & Luppescu, 2010). They outline five aspects of school climate that work together to promote school improvement in high school (see Figure 2). They argue that Effective Leaders serve as a catalyst for change in a school. These leaders help to build and shape the other areas of school climate. They reach out to Involve Families and communities in schooling. They help to promote a Supportive Environment, where students feel safe and cared for by teachers, and peers. They help to provide professional development to teachers and to build community and commitment among teachers (Collaborative Teachers). This safe/supportive environment for students and staff, together with professional development, promotes Ambitious Instruction in the classroom. In line with the ecological model, the Effective Leadership essential represents
an exosystem that influences the student development indirectly via its influence on the microsystem context (school/classroom resources and dynamics). The Involved Families essential represents a mesosystem, in that it captures the interaction between the home and classroom microsystem contexts. Finally, the Ambitious Instruction, Collaborative Teachers and Supportive Environment essentials represent aspects of the microsystemic climate that directly influence students.

Figure 2. Five essentials model of school improvement detailing how school leadership might influence student outcomes via the other core organizational elements (based on model originally published in Sebring, Allensworth, Bryk, Easton, & Luppescu, 2006).

CCSR suggests that these five essentials for school improvement are interrelated, and help to provide an engaging and safe environment where students are being challenged, are more likely to attend school, and are more likely to see improvements in their academic
outcomes (Bryk et al., 2010). A major longitudinal study of the Chicago Public School district found that more than 40% of schools that were strong in three or more of the five essentials showed substantial improvement in student reading and math scores over time (Bryk et al., 2010). In contrast, less than 10% of schools that were weak in three or more essentials showed substantial improvement in mathematics scores over time (Bryk et al., 2010). Parallel trends were also evident for improvement in attendance outcomes (Bryk et al., 2010), ACT scores and graduation rates (Klugman, Gordon, Sebring, and Sporte, 2015). While these five essentials appear to work together to predict student outcomes, each of the five essentials has also been linked individually to student outcomes and to one another.

1. **Effective Leaders.** The Effective Leaders essential captures how principals work together with faculty, staff and communities to implement a clear vision for school improvement. According to this model, Effective Leaders are actively involved in instructional improvement, hold high expectations for teaching, build trusting relationships with teachers, and incorporate teacher input into policies (Sebring, Allensworth, Bryk, Easton, & Luppescu, 2006; Bryk et al., 2010). Effective principal leadership has been positively linked to numerous student outcomes in high school, including achievement in reading, math, and social studies (Marks & Printy, 2003; Witziers, Bosker, & Krüger, 2003), attendance rates (Bryk et al., 2010), and engagement (Robinson, Lloyd, and Rowe, 2008). The CCSR model proposes that Effective Leadership serves as a catalyst for change for the other four essential supports. Strong principal leadership has been linked to teachers’ instructional practices and teaching strategies in the classroom (Wahlstrom & Louis, 2008; Blase & Blase, 2000; Sebastian & Allensworth, 2012), teachers’ sense of collective efficacy (Ross & Gray, 2006), and teachers’ sense of collaborative school culture (Demir, 2008). Similarly, several studies have found
relationships between principal leadership style and parent/community involvement in school activities (Griffith, 2001; Sebastian & Allensworth, 2012; Sanders & Harvey, 2002). Finally, strong leadership is positively associated with perceptions of safety, support and expectations in the school environment (Sebastian & Allensworth, 2012; Leithwood, Patten, & Jantzi, 2010).

2. Involved Families. The Involved Families essential measures the extent to which parents are involved in school activities and the school staff welcome and trust parents (Bryk et al., 2010). Parent involvement is a popular variable in the education literature, and has consistently been positively linked to students’ academic and non-cognitive outcomes. Meta-analytic data reveal that parent involvement has positive effects on students’ grades, standardized test scores, as well as students’ self-efficacy beliefs, engagement, and academic motivation (Jeynes, 2003; Jeynes, 2007; Fan & Williams, 2010; Gonzalez-DeHass, Willems, & Holbein, 2005). There is also evidence that family involvement has a reciprocal relationship with the Supportive Environment essential, such that increased family involvement has positive effects on school safety (Sheldon & Epstein, 2002) and safe schools encourage more parent involvement (Feuerstein, 2000).

3. Collaborative Teachers. The Collaborative Teachers essential assesses the extent to which teachers in a school are professionally supported, feel a sense of collective efficacy, and work together to improve student learning outcomes. In several studies, collective efficacy among teachers has been found to predict student grades and academic outcomes in reading, math, and writing (Caprara, Barbaranelli, Steca, & Malone, 2006; Goddard, Hoy, & Hoy, 2000; Bryk et al., 2010; Tschannen-Moran & Barr, 2004; Goddard, 2001; Moolenaar, Sleegers, & Daly, 2012). Likewise, meta-analytic data reveal that professional development
opportunities for teachers were related to student learning gains across multiple subjects (Yoon, Duncan, Lee, Scarloss, & Shapley, 2007). Furthermore, the Collaborative Teachers construct has been found to be positively related to attendance rates across schools, which often is used as a proxy for student engagement (Bryk et al. 2010; Klugman, et al., 2015).

4. **Supportive Environment.** The Supportive Environment essential measures the extent to which students feel safe and supported at school, have trusting and personal relationships with faculty, and receive help setting goals for the future. Students’ sense of support and mutual respect between students and faculty predicts students’ academic outcomes, including student grades, attendance, gains in reading, math, ACT scores, and high school graduation rates (Bryk et al., 2010; Reyes, Brackett, Rivers, White, & Salovey, 2012; Klugman, et al., 2015). Student engagement has been proposed as a mediator between students’ sense of support at school and academic outcomes, such that students who feel safe and supported are more engaged in learning and thus have higher grades than peers (Reyes et al., 2012). Additionally, students’ perceptions of teacher support have positive effects on student motivation and engagement in class (Ryan & Patrick, 2001; Klem & Connell, 2004; Patrick, Ryan, & Kaplan, 2007). The Supportive Environment essential has also been linked to some of the other essentials, including the Collaborative Teachers and Ambitious Instruction essentials. There is some evidence that there is a reciprocal relationship between the Supportive Environment and the Collaborative Teachers essentials. For example, in schools with low levels of teacher collaboration and professional support (*Collaborative Teachers*), teachers are more likely to experience burnout, and may thus be less able to build personal relationships with students (*Supportive Environment*) (Jennings & Greenberg, 2009). Likewise, when teachers perceive the school as being more orderly and as having quality teacher-student
relationships (*Supportive Environment*), they may feel a greater sense of collective efficacy and commitment to the school (*Collaborative Teachers*) (Collie, Shapka, & Perry, 2012; Byrne, 1994).

5. **Ambitious Instruction.** The Ambitious Instruction essential measures the extent to which students and faculty see coursework as clear, challenging, engaging and application-focused. Students are engaged by coursework that is both challenging and applied. For example, applied instruction, in contrast to a purely content-driven approach, is related to increased student learning and grades, across multiple subjects (Minner, Levy, & Century, 2010; Applebee, Langer, Nystrand, & Gamoran, 2003). Students also learn more when instructions and expectations are clear: instructional clarity predicts students’ academic outcomes, like course grades, as well as non-cognitive outcomes, like academic motivation and self-efficacy (Rodger, Murray, & Cummings, 2007).

There is some evidence that the Ambitious Instruction essential is also positively related to both the Supportive Environment and Collaborative Teachers essentials. In classrooms where teachers and students respect one another, students participate more in classroom discussions, and the quality/rigor of the discussions improves (Matsumura, Slater, & Crosson, 2008). Furthermore, in schools with ample opportunities for professional development teachers are able to build new skills and instructional techniques, which can then be applied in the classroom (Supovitz & Turner, 2000; Penuel, Fishman, Yamaguchi, & Gallagher, 2007).

**J. High Poverty Schools as a Unique Context**

Given the unique challenges faced by the student population, there is evidence that schools with a predominantly high-poverty student population represent a unique context, such that students in these schools are more responsive to different aspects of school culture/climate
than less impoverished peers (Battistich et al., 1995). For example, Mehta, Atkins, and Frazier (2013) found that, in high-percentage poverty schools, principal leadership was considered to be the primary factor accounting for the most variance in perceived school organizational health, followed by teacher collegiality and community relationships. Similarly, Taylor, Pearson, Clark and Walpole (2000) found that high-achieving, low-income schools shared a strong sense of collaboration among school staff, and a strong link to parents in the community. There is evidence that the other of the five essentials may also have greater effects on student outcomes in high-percentage poverty contexts than in lower-percentage poverty contexts. Basstich et al. (1995) found a significant interaction between a school’s sense of community and student poverty, where students in schools of a predominantly high-poverty population had significantly greater gains in motivation and engagement in class in response to high sense of community/quality relationships in school than did peers in well-off schools. Shouse (1996) found evidence that the combination of both a caring and academically rigorous environment was particularly effective in high-percentage poverty schools. Schools with a predominantly high-poverty population that emphasized such characteristics showed achievement levels rivaling that of more affluent schools. This body of evidence suggests that schools characterized by a predominantly high-poverty population constitute a unique context wherein all five of the essentials of school support seem particularly positively influential, especially those dealing with organization of the school and its relationship to the surrounding community.

K. Current Study

The current investigation examined whether the five essentials of high school climate predict non-cognitive skills in college. To answer this question, I conducted a quantitative study and a set of follow-up exploratory focus groups. In the quantitative study, I used data from three
sources, CCSR’s “My Voice, My School” survey, a Non-Cognitive Survey conducted at a large urban public university, and institutional data from the same university. These datasets were combined to form one longitudinal dataset that includes information about students’ high school context, and endorsements of non-cognitive strengths in the first semester of college, and college student demographic and academic outcome data. The quantitative study used multi-level structural equation modeling to test a combined five essentials/non-cognitive model.

Figure 3 represents a conceptual model. Specifically, I tested whether Effective Leadership in high schools predicted non-cognitive variables at the college level indirectly via the other four elements of organizational support. As a follow-up to the initial model, I conducted post-hoc analyses to better understand the relationships between high school context and other individual-level and school-level outcome variables, including school poverty. The qualitative focus groups explored students’ experiences of the transition from high school to college, and how students’ high school experience influenced their development of non-cognitive skills in college.

![Figure 3. Simplified conceptual model combining the five essentials model and the non-cognitive model.](image-url)
L. Quantitative Study Hypotheses

1. With regard to the main question of determining the predictive power of the five essentials of high school climate on non-cognitive skills at the college level:
   
a. I hypothesized that the Involved Families, Ambitious Instruction, Collaborative Teachers, and Supportive Environment essentials, would mediate the relationship between the Effective Leaders essential and academic mindsets/learning strategies. Furthermore, I predicted that academic mindsets/learning strategies would in turn predict academic perseverance.

b. In addition, I predicted that the essentials that describe ecological microsystem contexts (Ambitious Instruction, Collaborative Teachers, and Supportive Environment) and ecological mesosystem contexts (Involved Families) would have a stronger relationship with outcomes than would the essential representing the ecological exosystem (Effective Leaders).

c. Finally, in line with previous research on high-percentage poverty schools as a unique context (Basstich et al., 1995; Shouse, 1996), I predicted that all five essentials will be particularly positively related to student outcomes in high-percentage poverty contexts as compared to low-percentage poverty contexts.

M. Follow-up Qualitative Focus Group Hypotheses

1. I hypothesized that when students were asked to describe how their high schools influenced various non-cognitive strengths in college, they would most often discuss aspects on their microsystem (Ambitious Instruction, Collaborative Teachers, and Supportive Environment) and mesosystem (Involved Families) contexts. Those are the contexts with which students have the most direct contact. Students would be less likely
to discuss themes relating to the exosystem context (Effective Leaders), or other higher-level contexts (e.g., macrosystem, chronosystem), given that those contexts exert influence on development indirectly.
II. METHODS

A. Quantitative Study Methods

The current study is comprised of a quantitative study and a set of follow-up exploratory qualitative focus groups. The quantitative study used a multi-level mediation approach to investigate the effects of high school climate on non-cognitive strengths in college. This study used data from two sources. Individual-level student data came from the “Non-Cognitive Survey” conducted with freshmen at a large diverse urban public four-year university in September of 2014. The school-level high school data came from the “My Voice, My School Survey” which was administered to students and teachers in a total of 2,945 middle schools and high schools in March and April of 2014.

B. Non-Cognitive Survey Participants and Procedures

Surveys were administered to 2,822 first-year students who were enrolled in the first-year writing program at a large urban university in Chicago, IL. Surveys were administered in English classes at the end of the fall semester of 2014. Consent forms, surveys, pencils, and scantron response sheets were distributed to students by members of the research team from the Office of the Vice Provost for Undergraduate Affairs. Students were informed that participation was entirely voluntary, that their individual responses would be kept confidential (including to instructors) within the research team, and that their decisions to participate would have no bearing on their standing in the course or the university. Students who did not wish to participate were asked to return the blank materials when all other surveys were collected. Of the 2,904 students present on the day of the survey, 2,822 responded (97%). The sample was evenly split with regard to participant gender, with 52% identifying as female. Students came from a variety of racial/ethnic backgrounds: 19% identified as White, 29% as Asian/Pacific
Islander, 41% as Latino, 9% as African American, with the rest identifying as an ethnicity that was not represented in the above categories. Half of students in the sample reported being the first in their families to go to college. In terms of housing, one quarter of students reported that they lived on campus, as compared to three quarters who reported living off campus, either alone or with family/friends. On average, students in the sample earned a 3.30 GPA in high school, and scored a 24 composite score on the ACT, several points higher than the national average of 21. Table I presents frequency data regarding select participant demographic variables by participant race/ethnicity.
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<td>63%</td>
<td>81%</td>
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C. Non-Cognitive Survey Measures

1. **Academic Mindset.** Academic Mindset was measured using three separate scales: Academic Self-Efficacy, Belonging, and Academic Motivation. The Academic Self-Efficacy – Course Efficacy scale (Solberg, O’Brien, Villareal, Kennel, & Davis, 1993) consisted of seven items with a five-point Likert response scale ($\alpha = .84$). Students were asked to rate their confidence in a number of academic tasks, like researching a term paper, and keeping up-to-date with school work, from $1 = \text{not confident}$ to $5 = \text{a extremely confident}$. The Overall Sense of Belonging scale (Johnson et al., 2007) consisted of five items with a four-point Likert response scale from $1 = \text{never}$ to $4 = \text{very often}$ ($\alpha = .84$). Students were asked to rate statements such as “I feel comfortable on campus,” and “I feel that I am a member of the campus community,” from $1 = \text{never}$ to $4 = \text{very often}$. The Academic Motivation scale consisted of nine items to which participants responded on a five-point Likert scale ($\alpha = .86$). ranging from $1 = \text{not at all true of me}$ to $5 = \text{very true of me}$ (Pintrich & De Groot, 1990). Students were asked to rate statements such as “I prefer class work that is challenging so I can learn new things” and “I think that what I am learning in my classes is useful to know.”

2. **Academic Perseverance.** Academic perseverance was measured using two separate constructs, Grit, and Academic Primary Control Striving. The first construct, Grit, was measured using a modified version of the Grit-Perseverance of Effort scale (Duckworth, Peterson, Matthews, & Kelly, 2007). The scale had six items assessed on a five-point Likert scale ($\alpha = .85$), which asked students to rate statements such as “I am diligent” and “Setbacks don’t discourage me” (1= not at all like me to 5= very much like me). The Academic Primary Control Striving Behaviors construct was measured by the Optimization in Primary and Secondary Control (OPS) Goal Engagement: Primary Selective Control subscale (Heckhausen,
This scale contained three items on a five-point Likert scale from 1=*
not at all true of me* to 5=*very true of me* (α = .82). Students were asked to rate their agreement with the following items: “If I run into difficulties in college, I will work harder to overcome them,” and “If my educational opportunities become worse, I will try harder,” and “I will work hard to be successful in college.”

3. **Learning Strategies.** The Learning Strategies construct was measured by two separate scales: the Time Management Short-Range Planning scale (Britton & Tesser, 1991), and the Self-Regulated Strategy Use scale (Shell et al., 2005). The Time Management scale consisted of six items on a with a four point Likert response scale (α = .87). On this scale, students were asked to rate how often they engage in behaviors such as “Mak[ing] a list of things [they] have to do each day” and “Writ[ing] a set of goals for [them]selves.” The Self-Regulated Learning scale consisted of seven items, with responses on a five point Likert scale (α = .80) ranging from 1=*Almost Never* to 5=*Almost Always*. Students responded to items such as “In this class, I make plans for how I will study,” “In this class, I focus on understanding the important ideas in what I am reading or studying,” and “In this class, I use different ways to organize my thoughts, such as diagrams, charts, timetables, etc.”

**D. My Voice, My School Participants and Procedures**

Surveys were administered to students (n = 398,398) and teachers (n = 59,156) across a total of 2,945 middle schools and high schools (670 Chicago Public Schools and 2,255 other Illinois Public Schools). The current study only used the high school data. The student survey was conducted as a part of normal school procedures, and was thus not subject to consent requirements. For the student survey, network chiefs were notified of upcoming survey administration in a district newsletter several months prior to data collection. One month before
the survey, school principals received a newsletter providing details about survey administration and asking them to nominate a survey coordinator. Once nominated, coordinators served as the primary point of contact, and received logistical information about data collection via e-mail. During data collection, principals and coordinators each received an e-mail providing response rates on a weekly basis.

A few weeks prior to the opening of the survey window, coordinators sent a letter in English and Spanish to parents notifying them that the students would be taking a survey in the upcoming month. All students in 6th-12th grades were eligible to participate, including students with disabilities and English language learners. Spanish-speaking students had the option to take the survey in English or in Spanish. Surveys were administered online, and students took the survey at various times over the month-long administration window, typically as a class in a computer lab. Surveys took 15 to 30 minutes to complete. Students logged on to the survey website, and provided their student IDs and their date of birth. Of the 759,511 students who were eligible, 398,398 participated (52%).

The teacher survey was administered by CCSR, and was approved by both the University of Chicago’s and the Chicago Public School’s institutional review board. Teachers were eligible to participate if their primary responsibility in the school involved teaching students during the school day for the majority of the school year. Teachers each received an invitation to participate in the survey via e-mail, which included a randomly-generated username and password for login. They each received a reminder e-mail every two weeks until the end of the survey window, or until the survey was completed. Surveys took 15 to 30 minutes to complete. Of the 100,782 teachers who were eligible to take the survey, 59,159 participated (59%).
Once data were collected, measure scores were created for each individual respondent using Rasch analysis (“How Scores Are Calculated,” 2014); this analysis produces both an individual-level measure score and an individual-level standard error. These standard error scores provided an estimate of how reliable an individual’s responses were, and accounted for missing data. School-level average scores were adjusted by the average standard error for that school, so that less reliable scores were down-weighted, which is a process of statistically indicating that those scores should be less influential in the analyses. Researchers then subtracted the average of the appropriate “benchmark” for schools of the same grade level (i.e., the grand mean on that measure for either CPS or Illinois state average) and divided that number by the standard error of that benchmark. Researchers then multiplied this standardized adjusted score by 20 and added 50 to create a more easily interpretable final school measure score on a scale of 1 to 99. On this scale, a score of 1 signified that the score is at least 2.5 standard deviations below the benchmark average, and a score of 99 signified that a score is 2.5 standard deviations above the benchmark average.

These final measure scores were then averaged to create an overall “essential score” for each of the five essentials for each school. The adjusted standardized school-level measure scores, the essential scores, the school’s demographic information, and survey response rates were all made publicly available in a searchable database online. School-level data were only posted online if at least 50% of students and/or teachers from the same school responded to the survey.

E. My Voice, My School Measures

1. Effective Leaders. The first of the five essentials, Effective Leaders, captured the extent to which the leader sets a clear vision for the school and curriculum and creates a strong
collaborative working relationship with teachers. This essential was made up of four scales that were all administered to teachers: Principal Instructional Leadership, Program Coherence, Teacher Influence and Teacher-Principal Trust (“Essentials and Measures,” 2014). See Table II for a summary table of all five essential measures. The first scale, Principal Instructional Leadership, measured teachers’ opinions of the principal as an active instructional leader who holds high expectations for teaching and learning. This scale consisted of eight items (School-Level α = .72), such as “the principal communicates a clear vision for our school” and “understands how children learn,” to which teachers indicate agreement or disagreement on a four-point Likert scale (1= Strongly Disagree and 4= Strongly Agree).

The second scale, Program Coherence, measured teachers’ opinions about the consistency between school programming and school goals. Teachers were asked to indicate their agreement or disagreement with statements such as “we have so many different programs in this school that I can’t keep track of them all” and “there is consistency in curriculum, instruction, and learning materials among teachers in the same grade level at this school.” This scale consisted of five items (School-Level α = .74) with a four-point Likert response scale (1= Strongly Disagree and 4= Strongly Agree).

The third scale, Teacher Influence, measured the extent to which teachers feel that they have influence over school policies and programs. Teachers were asked to respond to six items (School-Level α = .72) on a four-point Likert scale where 1= None, 2= A Little, 3= Some, and 4= To a Great Extent. Teachers rated their perceived influence over a variety of areas, including “setting standards for student behavior” and “planning how discretionary school funds should be used.” The fourth scale, Teacher-Principal Trust, consisted of eight items with a four-point Likert response scale (School-Level α = .79) and measured teachers’ perceptions of mutual
respect and trust between teachers and school leaders. Teachers were asked to rate their agreement (1 = Strongly Disagree and 4 = Strongly Agree) with statements such as “I trust the principal at his/her word” and “The principal looks out for the personal welfare of the faculty members.”

2. Collaborative Teachers. The second of the five essentials, the Collaborative Teachers essential, captured the extent to which teachers feel connected to the school, trusting of one another, responsible for student learning, and professionally supported. This essential was made up of four scales that were administered to all teachers (see Table II): Collective Responsibility, School Commitment, Quality of Professional Development, and Teacher-Teacher Trust (“Essentials and Measures,” 2014). The Collective Responsibility scale measured teachers’ sense of shared responsibility for school improvement and student growth. This scale asked teachers to indicate how many teachers at the school do things like “help maintain discipline in the entire school, not just their classroom” and “feel responsible when students in the school fail.” The scale contained 6 items (School-Level α = .80) assessed on a five-point Likert scale where 1 = None, 2 = Some, 3 = About Half, 4 = Most, and 5 = Nearly All.

The second scale, the School Commitment scale, measuring teachers’ commitment to the school, consisted of four items assessed on a five-point Likert scale (School-Level α = .82) ranging from 1 = Strongly Disagree to 4 = Strongly Agree. Teachers responded to items such as “I usually look forward to each working day at this school,” and “I feel loyal to this school.”

The third scale, the Quality of Professional development scale, consisted of five items (School-Level α = .73), with a four-point Likert response scale (1 = Strongly Disagree to 4 = Strongly Agree) assessing the perceived rigor of professional development opportunities with a focus on student learning with such statements like “Overall, my professional development
experiences this year have… been sustained and coherently focused, rather than short-term and unrelated,” and “…included enough time to think carefully about, try, and evaluate new ideas.”

The fourth scale, Teacher-Teacher Trust (School-Level α = .75), measured teachers’ sense of support and respect among the faculty. It consisted of five items with a four-point Likert response scale (1 = Strongly Disagree to 4 = Strongly Agree), which included such items as “teachers in this school trust each other” and “it’s OK in this school to discuss feelings, worries, and frustrations with other teachers.”

3. Involved Families. The third essential, Involved Families, captured the extent to which school leaders, faculty, and staff built relationships with students’ families and the surrounding communities. This essential comprised three scales on the teacher survey (see Table II), Parent Involvement in School, Outreach to Parents, and Teacher-Parent Trust (“Essentials and Measures,” 2014). The first scale, Parent Involvement in School, measured the extent to which parents were actively involved in school activities. This scale was made up of four items assessed on a five-point Likert scale (School-Level α = .81) where 1 = None, 2 = Some, 3 = Half, 4 = Most, 5 = All. Teachers were asked “For the students you teach this year, how many of their parents…picked up their child’s last report card” and “…volunteered time to support the school (e.g., volunteer in classrooms, help with school-wide events, etc.).”

The second scale, Outreach to Parents, consisted of eight items, on a four-point Likert response scale (School-Level α = .76) which measured how welcoming and open the school is in communicating with parents. Teachers were asked to indicate their agreement (1 = Strongly Disagree to 4 = Strongly Agree) with statements such as “Teachers really try to understand parents' problems and concerns,” and “Parents are greeted warmly when they call or visit the school.”
The third scale, Teacher-Parent Trust, measured the extent to which teachers and parents work together and support one another in improving student learning. The six items in this scale (School-Level $\alpha = .82$) presented varied response options, with some on a four-point Likert scale and some on a five-point Likert scale. Items included questions such as “How many teachers at this school feel good about parent’s support for their work?” (1= None, 2= Some, 3= About Half, 4= Most, 5= Nearly All) and “Teachers and parents think of each other as partners in educating children” (1= Strongly Disagree, 4= Strongly Agree).

4. Supportive Environment. The Supportive Environment essential captured the extent to which students and teachers see the school as a safe, supportive, and encouraging environment. This essential was made up of five scales (see Table II): Safety, Academic Personalism, Expectations for Post-Secondary Education, School-Wide Future Orientation, and Student-Teacher Trust (“Essentials and Measures,” 2014). Each of these scales was administered either to students or to teachers.

The Safety scale was found on the student survey, and consisted of four items measured on a four-point Likert scale (School-Level $\alpha = .94$). It measured students’ perceptions of safety (1= Not Safe, 4= Very Safe) “in the hallways and bathrooms of the school,” “outside around the school,” “traveling between home and school,” and “in [their] classes.”

The second scale, Academic Personalism, was also on the student survey, and consisted of five items (School-Level $\alpha = .83$) (Likert scale: 1= Strongly Disagree to 4= Strongly Agree). This scale measured students’ perceived connection with teachers, and the level of personalized academic support that they received from teachers. Items asked students to indicate their agreement with statements like “The teacher for this class…helps me catch up if I am behind” and “…notices if I have trouble learning something.”
The third scale, Expectations for Post-Secondary Education, was a scale on the teacher survey that comprised five items (School-Level $\alpha = .91$) assessed on a four-point Likert scale ($1 = \text{Strongly Disagree}$ to $4 = \text{Strongly Agree}$). This scale measured the college-going culture at the school; it asked teachers to indicate their agreement with statements like “Teachers expect most students in this school to go to college,” and “The curriculum at this school is focused on helping students get ready for college.”

The fourth scale, School-Wide Future Orientation was found on the student survey and used a six-point Likert scale (School-Level $\alpha = .91$). This scale measured the extent to which the school engages students in goal setting and future planning. This scale asked students to indicate their agreement ($1 = \text{Strongly Disagree}$ to $4 = \text{Strongly Agree}$) with statements such as “Teachers make sure that all students are planning for life after graduation,” and “High school is seen as preparation for the future.”

The fifth scale, Student-Teacher Trust, measured students’ perceptions of the levels of mutual trust and respect between students and teachers. It consisted of five items assessed on a four-point Likert scale (School-Level $\alpha = .92$), where $1 = \text{Strongly Disagree}$ and $4 = \text{Strongly Agree}$. This scale asked students to rate their agreement with statements such as “my teachers will always listen to students’ ideas” and “I feel safe and comfortable with my teachers at this school.”

5. **Ambitious Instruction.** The final essential, Ambitious Instruction, represented the extent to which teachers and students find classwork to be clear, rigorous, engaging and application-focused. This essential was made up of four scales (see Table II): Quality of Student Discussion, Math Instruction, English Instruction, and Course Clarity (“Essentials and Measures,” 2014).
The first scale, Quality of Student Discussion, was a part of the teacher survey, and comprised five items (School-Level α = .71) on a four-point Likert scale. It measured teachers’ perceptions of student participation in group discussions, in terms of both quality and content. Teachers were asked to what extent certain characteristics described group discussions in their classroom (1= Never, 2= Rarely, 3= Sometimes, 4= Almost Always). Items included statements such as “students build on each other’s ideas during discussion” and “students use data and text references to support their ideas.” The second scale, Math Instruction, measured the extent to which math classes encourage collaboration, application and critical thinking. This scale was found on the student survey and was made up of eight items (School-Level α = .87) on a five-point Likert scale (1= Never; 2= Once or Twice a Semester; 3= Once or Twice a Month; 4= Once or Twice a Week; 5= Almost Every Day). Students indicated how often they “applied math to situations in life outside of school” and “discussed possible solutions to problems with other students.”

The third scale, English Instruction, consisted of six items (School-Level α = .87) measuring the extent to which English classes encourage collaboration, application and the development of critical reading and writing skills. Students responded to items about how often they “debated the meaning of a reading,” and “discussed connection between a reading and real life people or situations” on a five-point Likert scale (1= Never; 2= Once or Twice a Semester; 3= Once or Twice a Month; 4= Once or Twice a Week; 5= Almost Every Day). The fourth scale, Course Clarity, consisted of five items (School-Level α = .84) with response options on a four-point Likert scale ranging from 1= Strongly Disagree to 4= Strongly Agree. This scale measured the extent to which instruction, feedback, goals and expectations were
clear. Students were asked to indicate their agreement with items such as “It’s clear what I need to do to get a good grade” and “The work we do in class is good preparation for the test.”
### TABLE II

**NAMES AND PSYCHOMETRIC PROPERTIES OF THE SCALES MAKING UP THE FIVE ESSENTIALS**

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F. Demographic Variables and Outcome Variables

Other individual-level demographic variables, as well as student academic outcome variables were collected from students’ institutional records. Students’ race/ethnicity and gender demographics were collected from institutional records, as well as two measures of student financial need: 1) a binary variable representing students’ eligibility for the Pell Grant, and 2) a measure of “unmet need,” or the amount of money that families are responsible for paying after students are awarded with financial aid by the university. Two measures of academic performance were also collected from institutional records, high school GPA, and first-term college GPA, both measured on a 4-point scale.

School-level demographic and outcome variables were collected from publicly-available data published about each school by the Illinois State Board of Education. Demographic variables were collected, including the percentage of students in each school qualifying for free/reduced-cost lunch, the percentage of White students in each school, the percentage of English Language Learners (ELL) in each school, and the percentage of students in each school determined to be “college ready” with an ACT score greater than 21. Publicly-available data about each school’s admissions practices were also used to categorize each school as either “selective” or “non-selective.” Finally, two school-level outcome variables were collected for each school: the school’s four-year graduation rate, and the school’s rate of post-secondary enrollment.

G. Qualitative Focus Group Methods

A set of follow-up exploratory qualitative focus groups investigated the effects of high school climate on non-cognitive strengths in college qualitatively, through a series of focus groups. Focus group data were collected at the same university where the non-cognitive survey
was collected, in the Spring semester of 2016. Students had the option to enroll in the study in order to earn research credit for their Introduction to Psychology class. In order to participate in research for course credit, students were assigned a random identification number through PECOLSUS, an online system used to manage student research participation in the Introduction to Psychology course. To protect students’ identities, no demographic data about participants were made available to researchers beyond the data collected in any given study. Students in the Introduction to Psychology course had the option to sign-up for a short online screener survey to determine their eligibility for the focus group study. The screener survey asked students the name of the high school from which they graduated, the year that they graduated, age, current college class (e.g., freshman, sophomore), and whether or not they transferred to the current university.

In order to participate in the focus groups, students were required to be college sophomores who had not transferred from another institution. Student survey responses were screened for participation criteria. If students met criteria for the study, the investigator then searched through publicly-available data on each student’s high school socioeconomic demographics in order to determine whether they would be placed in a “high-percentage poverty school” or “low-percentage poverty school” focus group. Students were categorized as having attended a “high-percentage poverty” school if more than 50% of students in the school qualified for free/reduced-cost lunch. Students’ identification numbers were grouped accordingly, into high- and low-percentage poverty high school groups.

A total of 36 students participated in the screener survey. Of those 36, 15 students went to high-percentage poverty schools and 21 went to low-percentage poverty schools. Students were compensated .5 research credits for completion of the screener survey. A link to sign up
for the appropriate focus group study was then posted on PECOLSUS, with a list of qualifying student identification numbers listed beneath each session. PECOLSUS provides only basic information about the study to students, including the time commitment for each study, and the date/time of the study. Students who enrolled in the focus group study then learned more detailed information about the study on the day of the focus group session.

Focus groups were held in a private office located within the university’s community mental health clinic. Three focus groups were conducted in all, two low-percentage poverty focus groups \((n = 6\text{ total}, \text{female } = 30\%)\), and one high-percentage poverty focus group \((n = 2, \text{female } = 100\%)\). Participants were from diverse backgrounds; in order to protect student identities, the Institutional Review Board did not permit the researcher to formally collect further demographic data about participants as a part of the qualitative analyses. Participants were informed that the study would consist of a focus group about students’ experiences in high school, and the transition to college. Students were provided with informed consent documents, which were reviewed verbally. After participants provided their informed consent, the investigator conducted a one-hour semi-structured focus group session. Focus group prompts are available in the Appendix (see Appendix). Focus group sessions were audio recorded for later transcription. At the end of the focus groups, students were debriefed as a group, and were provided the opportunity to ask any questions. At this time students were then compensated 1 research credit via PECOLSUS.
III. Analyses

A. Quantitative Data

The current study used multi-level structural equation modeling to investigate which aspects of high school climate predict non-cognitive strengths in college. Individual students were nested within schools. Individual-level data were obtained from the non-cognitive survey of college freshmen. School-level data, which were drawn from the publicly-available online database of high school information, were linked to individual students from the corresponding high school. Schools were only included in analyses if the five essentials data for that school were available online and individual-level data from the non-cognitive dataset were available from at least three students within that school. In considering sample size for multi-level SEM, current research suggests that analyses are more sensitive to the number of clusters than to the number of individuals in each cluster (Preacher, Zypher, & Zhang, 2010; Muthén, 1991). Thus, when faced with choice, it is considered best practice to observe fewer individuals per cluster in favor of more clusters (Preacher, Zypher, & Zhang, 2010; Muthén, 1991). Experts in this analytic method recommend between 50 and 100 clusters (Preacher, Zypher, & Zhang, 2010; Muthén, 1991). Of the 2,945 high schools that participated in the five essentials survey, 113 schools had five essentials data available online, and were also in the non-cognitive dataset. In total, the current study used data from 1,514 students nested within 113 schools, with an average of 15 students per school.

Analyses were conducted in three steps. First, I conducted preliminary analyses to check for issues with multicollinearity and distribution of the data. During this preliminary step, I conducted a confirmatory factor analysis on the non-cognitive model to test whether the relationships between the indicators and the latent constructs were consistent with those
presented in the non-cognitive model. Second, I tested whether the four core organizational supports (Involved Families, Ambitious Instruction, Collaborative Teachers, and Supportive Environment) mediated the relationship between the Effective Leaders essential and Academic Mindsets/Learning Strategies using a multi-level structural equation modeling approach.

Finally, I conducted exploratory follow-up analyses of the data to better understand the relationships between all key variables, and to identify which other aspects of the high school context predicted non-cognitive variables and academic performance in college.

B. **Qualitative Data**

Once focus groups were completed, I transcribed audio recordings of each of the focus groups. Then, transcripts were analyzed using open coding, such that distinct concepts and themes were identified in the data. Themes were consolidated, and then the transcripts were re-coded for the consolidated themes.
IV. Results

A. Quantitative Results

1. Preliminary Analyses. Prior to hypothesis testing, descriptive analyses were conducted to test variable normality and multicollinearity. Preliminary analyses examined skew and kurtosis values for all non-cognitive variable and five-essential variable distributions. No variables required transformations. Bivariate correlations were also conducted for all key variables in the study, including all variables used in follow-up analyses. Table III includes all variables measured at the individual level, and Table IV includes all variables measured at the school level. Absolute values for correlations between individual-level variables ranged from 0.00 to 0.57 (see Table III). Absolute values of correlations between school-level variables ranged from 0.00 to 0.87 (see Table IV). Notably, at the school level, the Effective Leaders essential was found to be highly correlated with the Collaborative Teachers essential \((r = .86, p < .05)\), and the Involved Families essential \((r = .79, p < .05)\), which were also highly correlated with one another \((r = .80, p < .05)\). The Supportive Environment essential was highly correlated with the Ambitious Instruction essential \((r = .85, p < .05)\). The percentage of students in a given school, who were identified as “college ready” with an ACT score greater than 21, was highly correlated with that school’s graduation rate \((r = .77, p < .05)\), and post-secondary enrollment rate \((r = .78)\). “College readiness” rate was also negatively correlated with the percentage of English Language Learners in the school \((r = -.77, p < .05)\). Finally, the percentage of White students in a school was highly negatively correlated with the percentage of students qualifying for free/reduced-cost lunch \((r = -.87, p < .05)\). It was also notable that the five essentials generally were not highly correlated with the aggregated school-level non-cognitive variables, which are key outcomes in the current study (see Table IV).
TABLE III

BIVARIATE CORRELATIONS BETWEEN ALL NON-COGNITIVE VARIABLES AND INDIVIDUAL-LEVEL DEMOGRAPHIC VARIABLES MEASURED AT THE INDIVIDUAL LEVEL

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<td>13. %Pov</td>
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<td>16. %College</td>
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<td>17. %ELL</td>
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<td>.22</td>
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<td>-.74*</td>
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<tr>
<td>18. %ACT&gt;21</td>
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<td>.06</td>
<td>-.25*</td>
<td>.06</td>
<td>-.04</td>
<td>-.10</td>
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<td>.45*</td>
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<td>.51*</td>
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<td>19. HSGPA-Sch</td>
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<td>-.07</td>
<td>.07</td>
<td>-.20*</td>
<td>-.41*</td>
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<td>-.23*</td>
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<td>.05</td>
<td>.03</td>
<td>-.45*</td>
<td>.16*</td>
<td>-.19</td>
</tr>
</tbody>
</table>
A one-way MANOVA was performed to test for differences in non-cognitive variables by racial/ethnic group, and revealed a significant multivariate main effect, Wilks’ $\lambda = .92$, $F$ (28, 4353.30) = 3.46, $p < .01$. Post-hoc univariate analyses revealed racial/ethnic group differences in mean levels of Academic Self-Efficacy, $F$ (4,1213) = 5.74, $p < .01$, Academic Motivation, $F$ (4,1213) = 2.66, $p < .05$, and Grit, $F$ (4,1213) = 6.25, $p < .01$. Table V presents overall descriptive statistics of non-cognitive variables and five-essential variables by racial/ethnic group. Follow-up Tukey tests revealed that, with regards to Academic Self-Efficacy, African American students ($M = 3.33, SD = 0.72$) and White students ($M = 3.31, SD = 0.80$) reported significantly higher levels of Academic Self-Efficacy ($p < .05$) than did students who marked their race/ethnicity as “Other” ($M = 3.01, SD = 0.78$). With regard to Academic Motivation, students who identified as “Other” ($M = 2.94, SD = 0.72$) reported significantly lower levels of Academic Motivation than did students from all other racial/ethnic groups (see Table V). Latino/a students ($M = 3.41, SD = 0.78$) also reported significantly higher Academic Motivation than did White students ($M = 3.22, SD = 0.83$). With regards to Grit, Asian/Pacific Island students ($M = 3.64, SD = 0.75$) reported significantly lower levels of Grit than did White, Latino/a, and African American students (see Table V).

A one-way MANOVA was then performed to test for differences in five essentials variables by racial/ethnic group, revealing a significant multivariate main effect, Wilks’ $\lambda = .85$, $F$ (20, 8524.70) = 21.45, $p < .01$. Post-hoc univariate analyses revealed racial/ethnic group differences in mean levels of the Effective Leaders essential, $F$ (4,2574) = 5.74, $p < .01$, the Ambitious Instruction essential, $F$ (4,2574) = 29.56, $p < .01$, the Collaborative Teachers essential, $F$ (4,2574) = 7.32, $p < .01$, and the Supportive Environment essential, $F$ (4,2474) = 7.22, $p < .01$. African American students ($M = 48.33, SD = 22.13$) and White students ($M =
48.32, $SD = 17.36$) went to schools with significantly lower Effective Leaders essential scores than did Asian/Pacific Island students ($M = 51.30, SD = 15.83$) and Latino/a students ($M = 51.80, SD = 17.81$). Latino/a students ($M = 65.03, SD = 16.32$) went to schools with significantly higher Ambitious Instruction essential scores than did students from all other racial/ethnic groups (see Table V). With regard to the Collaborative Teachers essential, African American students ($M = 50.89, SD = 20.28$) went to schools with significantly lower scores than did Asian/Pacific Island students, Latino/a, and White students (see Table V). Additionally, Asian/Pacific Island students ($M = 57.68, SD = 16.21$) went to schools with significantly higher scores on the Collaborative Teachers essential than did Latino/a students, and White students (see Table V). Finally, with regard to Supportive Environment, African American students ($M = 55.45, SD = 17.95$) went to schools with significantly lower scores on this essential than all other groups (see Table V). In addition, Latino/a students ($M = 60.48, SD = 14.44$) went to schools with significantly higher Supportive Environment essential scores than did Asian/Pacific Island students ($M = 58.46, SD = 10.66$) and White students ($M = 58.46, SD = 10.67$).
TABLE V
DESCRIPTIVE STATISTICS OF NON-COGNITIVE VARIABLE AND FIVE ESSENTIALS VARIABLES BY RACE/ETHNICITY

<table>
<thead>
<tr>
<th>Variable</th>
<th>Total</th>
<th>Asian/Pacific Island</th>
<th>African American</th>
<th>Latino/a</th>
<th>White</th>
<th>Other</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Academic mindset</strong></td>
<td></td>
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</tr>
<tr>
<td>Academic self-efficacy (N=1828)</td>
<td>3.23(.77)</td>
<td>3.22(.74)</td>
<td>3.33(.72)</td>
<td>3.19(.79)</td>
<td>3.31(.80)</td>
<td>3.01(.78)</td>
<td>5.74*</td>
</tr>
<tr>
<td>Sense of belonging (N=1850)</td>
<td>2.87(.73)</td>
<td>2.88(.74)</td>
<td>2.86(.67)</td>
<td>2.85(.72)</td>
<td>2.87(.75)</td>
<td>2.86(.76)</td>
<td>0.19</td>
</tr>
<tr>
<td>Academic motivation (N=1811)</td>
<td>3.32(.77)</td>
<td>3.29(.74)</td>
<td>3.43(.70)</td>
<td>3.41(.78)</td>
<td>3.22(.83)</td>
<td>2.94(.72)</td>
<td>2.66*</td>
</tr>
<tr>
<td><strong>Academic perseverance</strong></td>
<td></td>
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<tr>
<td>Grit (N=1825)</td>
<td>3.77 (.73)</td>
<td>3.64 (.75)</td>
<td>3.89 (.72)</td>
<td>3.82 (.71)</td>
<td>3.81 (.74)</td>
<td>3.85 (.68)</td>
<td>6.25*</td>
</tr>
<tr>
<td>Academic Primary Control (N=1267)</td>
<td>4.33(.65)</td>
<td>4.28(.64)</td>
<td>4.41(.63)</td>
<td>4.35(.66)</td>
<td>4.35(.64)</td>
<td>4.46(.65)</td>
<td>1.38</td>
</tr>
<tr>
<td><strong>Learning strategies</strong></td>
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<tr>
<td>Time management skills (N=1851)</td>
<td>2.52(.87)</td>
<td>2.53(.86)</td>
<td>2.56(.85)</td>
<td>2.47(.88)</td>
<td>2.55(.89)</td>
<td>2.65 (.81)</td>
<td>1.35</td>
</tr>
<tr>
<td>Self-Regulated Learning (N=1269)</td>
<td>3.30(.83)</td>
<td>3.30(.82)</td>
<td>3.31(.80)</td>
<td>3.23(.83)</td>
<td>3.40(.83)</td>
<td>3.42(.72)</td>
<td>1.77</td>
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<tr>
<td><strong>Five Essentials</strong></td>
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</tr>
<tr>
<td>Effective Leaders (N=2818)</td>
<td>50.54(17.54)</td>
<td>51.30(15.83)</td>
<td>48.33(22.13)</td>
<td>51.80(17.81)</td>
<td>48.32(17.26)</td>
<td>48.54(16.75)</td>
<td>5.75*</td>
</tr>
<tr>
<td>Ambitious Instruction (N=2597)</td>
<td>61.25(15.29)</td>
<td>58.52(12.86)</td>
<td>60.42(16.51)</td>
<td>65.03(16.32)</td>
<td>57.99(13.96)</td>
<td>59.00(15.15)</td>
<td>29.56*</td>
</tr>
<tr>
<td>Collaborative Teachers (N=2818)</td>
<td>54.67(17.78)</td>
<td>57.68(16.21)</td>
<td>50.89(20.28)</td>
<td>53.49(18.35)</td>
<td>54.18(17.32)</td>
<td>54.45(17.29)</td>
<td>7.32*</td>
</tr>
<tr>
<td>Involved Families (N=1818)</td>
<td>65.38(16.86)</td>
<td>66.64(15.51)</td>
<td>64.14(20.10)</td>
<td>63.99(17.92)</td>
<td>66.34(15.23)</td>
<td>67.09(15.51)</td>
<td>2.19</td>
</tr>
<tr>
<td>Supportive Environment (N=2597)</td>
<td>59.05(13.19)</td>
<td>58.46(10.66)</td>
<td>55.45(17.95)</td>
<td>60.48(14.44)</td>
<td>58.46(10.67)</td>
<td>58.81(12.93)</td>
<td>7.22*</td>
</tr>
</tbody>
</table>
Descriptive statistics were calculated by race/ethnicity for each individual-level measure of participants’ academic performance and financial status (e.g., high school GPA, first-term GPA, Unmet Need), and for other school-level indicators (e.g., percentage of students qualifying for free/reduced-cost lunch, percentage of students determined to be college-ready (ACT>21), percentage of students graduating from high school within four years, percentage of students enrolling at a post-secondary institution). Descriptive statistics for each of these variables, by student race/ethnicity, are presented in Table VI.

Finally, a series of independent-samples t-tests were performed to test for differences between high-percentage poverty schools and low-percentage poverty schools on each of the five essentials of school climate. The current study found that there were no significant differences in reported leadership between high-percentage poverty \( (M = 50.16, SD = 17.32) \) and low-percentage poverty schools \( (M = 50.56, SD = 17.67) \). With regard to the Collaborative Teachers essential, teachers in high-percentage poverty schools endorsed less teacher collaboration \( (M = 51.59, SD = 18.68) \) than low-poverty schools \( (M = 58.78, SD = 15.18) \); \( t(2795) = 11.42, p < .01 \). With regard to instruction, both teachers and students reported higher levels of ambitious instruction in the classroom in high-percentage poverty schools \( (M = 64.35, SD = 14.59) \) as compared to low-percentage poverty schools \( (M = 55.41, SD = 15.16) \); \( t(1892) = -14.84, p < .01 \). Teachers and students reported that the environment was less supportive in high-percentage poverty schools \( (M = 58.16, SD = 14.19) \) as compared to low-percentage poverty schools \( (M = 60.09, SD = 11.22) \); \( t(2359) = 3.89, p < .01 \). Finally, teachers in high-percentage poverty schools reported that families were less involved in the school community \( (M = 60.72, SD = 16.66) \), than they were in low-percentage poverty schools \( (M = 71.95, SD = 14.79) \); \( t(2683) = 19.18, p < .01 \).
**TABLE VI**

DESCRIPTIVE STATISTICS OF INDIVIDUAL-LEVEL MEASURE OF ACADEMIC PERFORMANCE AND FINANCIAL STATUS, AND SCHOOL-LEVEL DEMOGRAPHIC VARIABLES

<table>
<thead>
<tr>
<th>Variable</th>
<th>Total</th>
<th>Asian/Pacific Island</th>
<th>African American</th>
<th>Latino/a</th>
<th>White</th>
<th>Other</th>
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<tr>
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<tr>
<td>High School GPA (N=2808)</td>
<td>3.30(.38)</td>
<td>3.39(.37)</td>
<td>3.18(.39)</td>
<td>3.26(.37)</td>
<td>3.29(.38)</td>
<td>3.27(.39)</td>
</tr>
<tr>
<td>First-Term GPA (N=2818)</td>
<td>2.70(.99)</td>
<td>2.91(.87)</td>
<td>2.60(.95)</td>
<td>2.47(1.06)</td>
<td>2.83(.95)</td>
<td>2.73(1.02)</td>
</tr>
<tr>
<td>Unmet Need (N=2658)</td>
<td>7220(5913)</td>
<td>7695(6034)</td>
<td>5577(6319)</td>
<td>7376(5669)</td>
<td>7029(6010)</td>
<td>702(5563)</td>
</tr>
<tr>
<td><strong>School-Level Variables</strong></td>
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<tr>
<td>Percent Free-Reduced Lunch</td>
<td>59.00(27.50)</td>
<td>50.51(26.01)</td>
<td>60.32(25.68)</td>
<td>72.34(23.98)</td>
<td>44.88(24.47)</td>
<td>48.44(26.38)</td>
</tr>
<tr>
<td>Percent with ACT&gt;21</td>
<td>52.99(25.94)</td>
<td>55.97(22.75)</td>
<td>49.85(27.07)</td>
<td>48.86(29.23)</td>
<td>58.92(21.30)</td>
<td>57.83(22.59)</td>
</tr>
<tr>
<td>Percent Graduated in 4yrs</td>
<td>88.97(8.02)</td>
<td>90.26(6.69)</td>
<td>91.05(7.47)</td>
<td>86.91(9.26)</td>
<td>90.39(6.50)</td>
<td>90.76(6.81)</td>
</tr>
<tr>
<td>Percent Post-Secondary Enrollment</td>
<td>73.98(11.10)</td>
<td>74.79(9.16)</td>
<td>74.48(10.30)</td>
<td>72.06(13.07)</td>
<td>76.68(8.87)</td>
<td>75.94(9.36)</td>
</tr>
</tbody>
</table>
2. **Confirmatory Factor Analysis.** Prior to performing a multi-level structural equation model, the hypothesized underlying measurement model had to be tested at both the individual level and the school level. To achieve this, I first created separate within- and between-level covariance matrices. Then I conducted a confirmatory factor analysis to test the proposed factor structure separately with each matrix. In all, seven latent factors were proposed: Academic Self-Efficacy, Academic Motivation, Belonging, Time Management, Self-Regulated Learning, Academic Perseverance, and Academic Primary Control Striving Behaviors. In addition, one higher-order latent factor, Mindset, was proposed, comprised of the Academic Self-Efficacy, Belonging, and Academic Motivation scales (Farrington, et al., 2012). At the individual level, an initial confirmatory factor analysis was conducted such that each of the 42 scale items loaded onto a factor with items from the scale measuring that construct. For example, the six items pulled from a scale measuring Academic Perseverance were loaded onto an Academic Perseverance factor, and the seven items from the scale measuring the Self-Regulated Learning were loaded onto a Self-Regulated Learning factor. In this individual-level CFA, one factor loading per factor was fixed at one and all other hypothesized factor loadings were free to vary. Factors were allowed to correlate freely, while residuals were not allowed to correlate with one another. By the most conservative metrics, the data was not found to adequately fit the proposed model, $\chi^2 = 5636.87$ (df = 806, $p < .001$). However, because the chi-square statistic is influenced by sample size and degrees of freedom, the current study’s large sample size increases the likelihood of finding significant results. Other fit statistics indicate that model fit is adequate. The Comparative Fit Index (CFI) ranges from 0.00 to 1.00; values greater than .90 are considered to reflect adequate fit, and values greater than .95 are considered to reflect good fit (Hooper, Coughlan, & Mullen, 2008). Root Mean Square Error of Approximation (RMSEA)
values range from 0.00 to 1.00; values less than or equal to .08 indicate adequate fit (Hooper, Coughlan, & Mullen, 2008). By these metrics, the initial individual-level CFA model fit the data adequately – CFI = .90, RMSEA = .06. Table VII presents fit indices of each model tested. Figure 4 presents the resulting individual-level measurement model.

TABLE VII

MODEL FIT INDICES FOR MEASUREMENT MODELS AND STRUCTURAL EQUATION MODELS

<table>
<thead>
<tr>
<th>Model</th>
<th>$\chi^2$</th>
<th>df</th>
<th>CFI</th>
<th>RMSEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Within CFA</td>
<td>5636.87***</td>
<td>806</td>
<td>.90</td>
<td>.06</td>
</tr>
<tr>
<td>Between CFA</td>
<td>278917.91***</td>
<td>794</td>
<td>.18</td>
<td>.43</td>
</tr>
<tr>
<td>Cross-Context Model No Latent</td>
<td>180.90***</td>
<td>15</td>
<td>.65</td>
<td>.07</td>
</tr>
<tr>
<td>School Climate Only No Latent</td>
<td>10.62</td>
<td>5</td>
<td>.99</td>
<td>.02</td>
</tr>
</tbody>
</table>
The same proposed measurement model was then tested on the between-level covariance matrix. The original model described above (seven factors plus one higher-order Mindset factor) did not converge when tested on the between-level covariance matrix. Modification indices were examined to determine which theoretically-appropriate changes could be made to improve model fit. After consulting modification indices, several items within
the same scale were allowed to correlate (e.g., Academic Motivation item 2 with Academic Motivation item 6). With these modifications, the between-level model converged, but model fit was poor – CFI = .18, RMSEA = .43. Given that the measurement model did not fit the data at the between-level, the structural multi-level model could not be tested with latent factors.

In order to test the multi-level structural equation model without the latent factors, items from each scale measuring non-cognitive outcomes were then averaged to create individual-level observed variable scores for each outcome. Intraclass correlations (ICCs) were calculated for each non-cognitive variable to determine the degree to which each non-cognitive variable clustered by school. Intraclass correlations for non-cognitive outcome variables were low, ranging from .006 to .023, which indicated that students’ endorsements of their own non-cognitive strengths did not cluster highly with scores of other students from the same high school. This indicates that there is not a strong relationship between the high school context and non-cognitive outcomes in college. The full hypothesized non-cognitive model did not converge.

In order to reduce the complexity of the model, a series of multi-level structural equation models were performed to test the simplified hypothesized cross-contextual model separately for each non-cognitive outcome. In the hypothesized model, the Effective Leaders essential predicted the other four essentials of school climate, Ambitious Instruction, Collaborative Teachers, Involved Families, and Supportive Environment. Each of those four essentials then predicted one selected non-cognitive outcome. To reduce the number of unknown parameters, all centered variable means were constrained to zero. Model fit indices for all cross-contextual models indicated that the model did not reflect the data (e.g., CFI = .65, RMSEA = .07) (see Table VII).
Given that non-cognitive outcome variables did not cluster significantly by school, and model fit indices for the cross-contextual model were poor, I performed one final simplified model, which included only the five essential school-level variables, to test the proposed relationship between the five essential variables. In this model, the Effective Leaders essential significantly predicted each of the other four essentials. Figure 5 presents the simplified school climate model. Model fit indices indicated that the model demonstrated good fit to the data—CFI = .99 RMSEA = .02 (see Table VII).

![Figure 5. Simplified structural model of relationships between school climate variables](image)

3. Post-Hoc Analyses. The results of the multi-level structural equation model suggests that non-cognitive skills do not significantly cluster by high school, and do not strongly relate to high school climate variables. Follow-up analyses were conducted to answer the following questions:
1) Are non-cognitive variables related to academic performance in college?

As the first post-hoc analysis, I conducted a series of simple regression analyses to investigate the effect of each non-cognitive variable on first-term GPA in college. Each regression controlled for students’ GPA in high school. The results of this set of analyses are presented in Table VIII. With the exception of Academic Motivation, all other non-cognitive variables predicted first-term GPA in college above and beyond high school GPA ($p < .05$).
TABLE VIII

RESULTS OF SEVEN SIMPLE REGRESSIONS WITH EACH OF THE INDIVIDUAL NON-COGNITIVE VARIABLES PREDICTING FIRST-TERM COLLEGE GPA, CONTROLLING FOR HIGH SCHOOL GPA

<table>
<thead>
<tr>
<th>Variable</th>
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<th>Beta</th>
<th>SE</th>
<th>R^2</th>
</tr>
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<td>.03</td>
<td>.14</td>
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<td>.86*</td>
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<td>.05</td>
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</tr>
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<td>2. Belonging</td>
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<td>.04</td>
<td>.03</td>
<td>.13</td>
</tr>
<tr>
<td>HSGPA</td>
<td>.88*</td>
<td>.36</td>
<td>.05</td>
<td></td>
</tr>
<tr>
<td>3. Motivation</td>
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<td>.01</td>
<td>.25</td>
<td>.13</td>
</tr>
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<td>HSGPA</td>
<td>.87*</td>
<td>.36</td>
<td>.05</td>
<td></td>
</tr>
<tr>
<td>4. Time Management</td>
<td>.11*</td>
<td>.10</td>
<td>.02</td>
<td>.14</td>
</tr>
<tr>
<td>HSGPA</td>
<td>.84*</td>
<td>.35</td>
<td>.05</td>
<td></td>
</tr>
<tr>
<td>5. Self-Regulated Learning</td>
<td>.11*</td>
<td>.10</td>
<td>.03</td>
<td>.12</td>
</tr>
<tr>
<td>HSGPA</td>
<td>.83*</td>
<td>.33</td>
<td>.07</td>
<td></td>
</tr>
<tr>
<td>6. Grit</td>
<td>.10*</td>
<td>.08</td>
<td>.03</td>
<td>.13</td>
</tr>
<tr>
<td>HSGPA</td>
<td>.84*</td>
<td>.35</td>
<td>.05</td>
<td></td>
</tr>
<tr>
<td>7. Academic Primary Control</td>
<td>.22*</td>
<td>.15</td>
<td>.04</td>
<td>.14</td>
</tr>
<tr>
<td>HSGPA</td>
<td>.82*</td>
<td>.33</td>
<td>.07</td>
<td></td>
</tr>
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</table>
2) What school-level variables predict GPA in college?

While non-cognitive variables did not significantly cluster by high school, post-hoc analyses revealed that first-term GPA in college did significantly cluster by high school (ICC = .09). Does high school climate account for that clustering? To answer this question, I conducted a series of simple regressions to investigate whether a school’s score on each of the five essentials predicted the average college GPA for students in that school. Results of these simple regressions are presented in Table IX. While the effect of each of the five essentials on first-term GPA was statistically significant, unstandardized coefficients were very small, ranging from an absolute value of .0007 to .005. Thus, these significant results may be an artifact of the study’s large sample size.

What other school-level predictors might account for the significant clustering of college first-term GPA by high school? To answer this question, I performed one hierarchical linear regression wherein various school-level independent variables were added to the regression equation in blocks, with first-term GPA in college as the outcome. In the first block, individual-level control variables were entered into the equation: high school GPA and Unmet Need. In the second block, a variable representing the percentage of students in the high school qualifying for free/reduced-cost lunch was added to the regression equation. In the third block, two other school demographic variables were added to the regression equation: the percentage of White students in the school, and the percentage of English Language Learners in the school. In the fourth block, two final school-level variables were added to the model: a variable representing the enrollment policy of the high school (i.e., selective enrollment or not), and a variable representing the four-year graduation rate of the high school. In a final block, non-cognitive variables, measured at the school level, were added to the model. Results of that regression are
presented in Table X. Model one accounted for only one percent of the variance in college first-term GPA. However, in model two, when the percentage of students in the high school qualifying for free/reduced-cost lunch was added to the regression equation, the model accounted for 47% of the variance in college GPA between schools. In Model three, when other school demographics were added to the model, there was no change in R-squared. When graduation rate, and selectivity of the school were added to the equation, the model accounted for 60% of the variance in college first-term GPA between schools. Finally, when all school-level non-cognitive variables were added to the equation, the full model accounted for 70% of the variance in college GPA between schools.
### TABLE IX

RESULTS OF SEVEN SIMPLE REGRESSIONS WITH EACH OF FIVE ESSENTIAL VARIABLES PREDICTING FIRST-TERM COLLEGE GPA, CONTROLLING FOR HIGH SCHOOL GPA

<table>
<thead>
<tr>
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<th>Estimate</th>
<th>Beta</th>
<th>SE</th>
<th>$R^2$</th>
</tr>
</thead>
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<tr>
<td>1. Effective Leaders</td>
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<td>.00</td>
<td>.03</td>
</tr>
<tr>
<td>HSGPA-Sch</td>
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<td>.14</td>
<td>.05</td>
<td></td>
</tr>
<tr>
<td>2. Ambitious Instruction</td>
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<td>.00</td>
<td>.05</td>
</tr>
<tr>
<td>HSGPA-Sch</td>
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<td>-.04</td>
<td>.03</td>
<td></td>
</tr>
<tr>
<td>3. Collaborative Teachers</td>
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<td>-.01</td>
<td>.00</td>
<td>.02</td>
</tr>
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<td>HSGPA-Sch</td>
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<td>.14</td>
<td>.05</td>
<td></td>
</tr>
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<td>4. Involved Families</td>
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<td>.00</td>
<td>.05</td>
</tr>
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<td>.05</td>
<td></td>
</tr>
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<td>5. Supportive Environment</td>
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<td>.00</td>
<td>.00</td>
</tr>
<tr>
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<td>.05</td>
<td>.06</td>
<td></td>
</tr>
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<td>-----</td>
<td>------</td>
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<td>.03*</td>
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<td>.00</td>
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<td>.00</td>
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<td>Selective Enrollment</td>
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<td>.00*</td>
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<td>Self-Reg-Sch</td>
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</tr>
<tr>
<td>Grit-Sch</td>
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<td>Time Manage-Sch</td>
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<tr>
<td>Academic Primary Control-Sch</td>
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<td></td>
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</tr>
</tbody>
</table>

Multiple $R^2 = .01$  Multiple $R^2 = .47$  Multiple $R^2 = .48$  Multiple $R^2 = .60$  Multiple $R^2 = .70$
3) Do the five essentials relate to any other school-level outcomes?

Previous analyses found that the five essentials of high school climate did not have a meaningful effect on first-term GPA. Do the five essentials predict any school-level outcomes, such as graduation rate or the rate of post-secondary enrollment at a given school? In order to answer this question, I performed two hierarchical linear regressions wherein the five-essentials, and other school-level independent variables were added to the regression equation in blocks, with the school’s graduation rate as the outcome variable in the first regression, and the school’s post-secondary enrollment rate as the outcome variable in the second regression. In the first block of each regression, the Effective Leaders essential was added into the regression equation. In the second block, the Ambitious Instruction essential was added into the regression equation. The Collaborative Teachers essential, Involved Families essential, and the Supportive Environment essential were added to the regression equation, in the third, fourth, and fifth blocks respectively. In the final block, three other school demographic variables were added to the regression equation: the percentage of students qualifying for free/reduced-cost lunch, the percentage of White students in the school, and the percentage of English Language Learners in the school. Results of these regressions are presented in Table XI and Table XII.

In the first regression, when the school’s graduation rate was the dependent variable, Model 1 accounted for 1% of the variance in graduation rate between schools (See Table XI). Model 2 and Model 3 each accounted for 6% of the variance in graduation rates between schools. When the Involved Families essential was added into the regression equation, that model, Model 4, accounted for 40% of the variance in graduation rate between schools. Model 5 accounted for 43% of the variance. Finally, when school-level racial/ethnic and socioeconomic
demographic variables were added into the regression equation, the model accounted for 60% of the variance in graduation rate between schools.

In the second regression, when the school’s post-secondary enrollment rate was the dependent variable, Model 1 accounted for 1% of the variance in post-secondary enrollment rates between schools (see Table XII). Models 2 and Model 3 each accounted for 19% and 21% of the variance in post-secondary enrollment rates between schools, respectively. Model 4 accounted for 38% of the variance in post-secondary enrollment rates between schools, and Model 5 accounted for 44% of the variance. Finally, when school-level racial/ethnic and socioeconomic demographic variables were added into the regression equation, the model accounted for 61% of the variance in post-secondary enrollment rates between schools.
### TABLE XI

**RESULTS OF THE HIERARCHICAL LINEAR REGRESSION WITH CENTERED SCHOOL-LEVEL VARIABLES PREDICTING GRADUATION RATE OF THE HIGH SCHOOL**

<table>
<thead>
<tr>
<th></th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
<th>Model 5</th>
<th>Model 6</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Beta</td>
<td>SE</td>
<td>B</td>
<td>Beta</td>
<td>SE</td>
</tr>
<tr>
<td>EL</td>
<td>-.05*</td>
<td>-.11</td>
<td>.01</td>
<td>-.12*</td>
<td>-.25</td>
<td>.01</td>
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<tr>
<td>AI</td>
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<td>.21</td>
<td>.01</td>
<td>-.02*</td>
<td>-.03</td>
<td>.00</td>
</tr>
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<td>.00</td>
<td>.00</td>
<td>.02</td>
<td>-.26*</td>
<td>-.57</td>
<td>.01</td>
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<td>-.07</td>
<td>.02</td>
</tr>
<tr>
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<td>-.46</td>
<td>.01</td>
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<td>-.12</td>
<td>.01</td>
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</tr>
</tbody>
</table>

Multiple $R^2 = .01$  Multiple $R^2 = .06$  Multiple $R^2 = .06$  Multiple $R^2 = .40$  Multiple $R^2 = .43$  Multiple $R^2 = .61$
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<thead>
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<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
<th>Model 5</th>
<th>Model 6</th>
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<tbody>
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<td>SE</td>
<td>B</td>
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</tr>
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<td>-.07*</td>
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<td>.48</td>
<td>.01</td>
<td>.35*</td>
<td>.48</td>
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<td>.76</td>
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<tr>
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<td></td>
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<td>.46*</td>
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<td>-.46</td>
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<td>.01</td>
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<td>Multiple R² = .20</td>
<td>Multiple R² = .38</td>
<td>Multiple R² = .44</td>
<td>Multiple R² = .61</td>
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</table>
4) *Are the relationships between the five essentials and school-level outcomes moderated by school poverty?*

To answer this question, a series of linear regression analyses were performed that assessed whether the relationship between each of the five essentials and both high school graduation rate and post-secondary enrollment rate were moderated by school poverty, controlling for the average high school GPA at the school. Table 13 presents the results of each of those regression equations. Overall, the relationships between each of the five essentials and each of the school-level outcomes were significantly moderated by school poverty, with the exception of the relationship between supportive environment and post-secondary enrollment rate (see Table XIII).

Simple slopes analyses were conducted to follow-up on significant interactions between five essentials variables and school poverty, when high school graduation rate was the outcome. First, the Effective Leaders essential positively predicted the graduation rate in schools with a low-percentage of students in poverty, $\beta = .12, t(2928) = 4.98, p < .01$, but negatively predicted graduation rate in high-percentage poverty schools $\beta = -.28, t(2928) = -13.69, p < .01$. In contrast, the Ambitious Instruction essential was a stronger predictor of graduation rate in high-percentage poverty schools $\beta = .38, t(2701) = 15.00, p < .01$ as opposed to low-percentage poverty schools $\beta = .22, t(2701) = 7.47, p < .01$. The collaborative teachers essential did not significantly predict graduation rate in low-percentage poverty schools $\beta = -.02, t(2928) = -.53, p = \text{n.s.}$, and it negatively predicted graduation rate in high-percentage poverty schools $\beta = -.27, t(2928) = -13.76, p < .01$. With regard to the Involved Families essential, family involvement was a weaker, but still a positive predictor of graduation rate at high-percentage poverty schools
\( \beta = .09, t(2928) = 4.07, p < .01 \) than at low-percentage poverty schools \( \beta = .27, t(2928) = 9.00, p < .01 \). Finally, the Supportive Environment essential was a weaker, but still positive, predictor of graduation rate in high-percentage poverty schools \( \beta = .26, t(2701) = 12.35, p < .01 \) than at low-percentage poverty schools \( \beta = .34, t(2701) = 10.06, p < .01 \).

Simple slopes analyses were conducted to follow-up on significant interactions between five essentials variables and school poverty, when the high school’s post-secondary enrollment rate was the outcome. First, the Effective Leaders essential did not significantly relate to the post-secondary enrollment rate in schools with a high percentage of students in poverty, \( \beta = .02, t(2928) = 1.18, p = \text{n.s.} \), whereas it was a positive predictor of post-secondary enrollment rate in low-percentage poverty schools \( \beta = .16, t(2928) = 6.43, p < .01 \). In contrast, the Ambitious Instruction essential was a stronger predictor of post-secondary enrollment rate in high-percentage poverty schools \( \beta = .68, t(2701) = 32.12, p < .01 \) as opposed to low-percentage poverty schools \( \beta = .15, t(2701) = 6.02, p < .01 \). With regard to Collaborative Teachers, while there was a significant interaction between the collaborative teachers and school poverty, simple slopes revealed that neither the slope for high-percentage poverty schools \( \beta = -.03, t(2928) = -1.31, p = \text{n.s.} \) nor the slope for low-percentage poverty schools \( \beta = .01, t(2928) = .30, p = \text{n.s.} \) were significantly different from zero. With regard to the Involved Families essential, family involvement was a stronger predictor of post-secondary enrollment rate at high-percentage poverty schools \( \beta = .36, t(2928) = 17.37, p < .01 \) than at low-percentage poverty schools \( \beta = .19, t(2928) = 6.70, p < .01 \). Finally, the Supportive Environment essential was a stronger predictor of post-secondary enrollment in high-percentage poverty schools \( \beta = .56, t(2701) = 31.27, p < .01 \) than at low-percentage poverty schools \( \beta = .12, t(2701) = 4.31, p < .01 \).
### TABLE XIII

RESULTS OF FIVE HIERARCHICAL LINEAR REGRESSIONS WITH EACH OF FIVE ESSENTIAL VARIABLES PREDICTING GRADUATION BY RATE AND POST-SECONDARY ENROLLMENT, WITH POVERTY AS AN INTERACTION TERM

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<th>Post-Secondary Enrollment</th>
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<th></th>
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</thead>
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<td>SE</td>
<td>$R^2$</td>
</tr>
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<td>-.00</td>
<td>1.05</td>
<td>.26</td>
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<td>.01</td>
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B. Qualitative Results

Analyses of the focus group transcripts revealed similar themes across high- and low- percentage poverty focus groups. As such, groups were consolidated and analyzed all together. Participants were assigned pseudonyms for results reporting.

1. Self-Efficacy. When participants were asked how their high schools impacted their belief in themselves in college, several themes emerged. Several students expressed that their teachers helped them to feel confident in their abilities by pushing them to enroll in higher-level courses:

I would say offering those [AP/IB] classes, since not everyone does it. And also, having teachers say ‘you are able to move up [to AP/IB],’ cuz sometimes you needed a signature from a teacher, and some wouldn’t give it to you, like, some teachers wouldn’t approve it, and some would say ‘I think that is too much for you,’ so having people supporting you felt good. (Shirley).

Other participants cited past success in challenging high school courses as a source of confidence entering college: “I would say just like offering AP classes, taking those higher level classes, I took AP chemistry, so when I started chem[istry], it was 112/113, those were easy for me so I felt comfortable and confident in those classes [in college].” (Alana). Another participant echoed this perspective, and added that her confidence entering college encouraged her to take classes that may have been too challenging for her during her first semester of college:

Yeah, high school made you feel really confident, about like good grades and how well you were doing academically, so like, my school was really, if you wanted to take a class that was kind of too hard for you, they would still let you take it, but then you
would do fairly well in it, but then you come to college and it’s like it is way too hard. It is way too out of your limit. (Jasmine).

Another student, Damian, said:

I think in high school, I was encouraged to take harder classes and expand my abilities, and stuff, and I kind of grew in confidence in myself. And I don’t know why, but like, my counselor here seems like really scared for me, and doesn’t want me to take neuroscience psych[ology], so I don’t know…. (Damian).

One student, Omar, said that he took a speech class in high school, which made him feel more confident in his abilities entering college. A number of students noted that their self-efficacy greatly decreased after struggling academically in the first semester of college; many students specifically identified introductory calculus as the course that most negatively impacted their academic self-efficacy in college. “I felt confident…until basically I took calculus, in my first semester, it was my second semester….” (Shirley). Another participant agreed: “Ya, that was hard. Especially since like you are a straight-A student, and you come here and take calc[ulus] and chem[istry] and everything together. It’s like…I thought I was smart, but now I’m not so sure.” (Alana).

2. Belonging. When participants were asked how their high schools impacted their sense of belonging in college, several themes emerged. Two participants felt that college represented a separate context from high school, and thus felt that high school did not influence their sense of belonging in college. Other participants felt that certain high school teachers took an interest in their development as students, which helped them to feel that they belonged in college:

Mine was more academic [belonging], because like of teacher support, and them being like ‘you are a good student, like you can go to AP classes, you can take an IB course,’
but here it is more like, the beginning, like after calculus I felt down, but I am here, I got
in for some reason, and that helped. (Shirley).

Another student said:

I think I would agree with her about how teachers motivated us, cuz I had some teachers
who would like talk to me after class, like physics, my teacher at the end of the school
year, and say ‘oh you should take AP physics, and chemistry.’ And my physics teacher
would ask me, ‘what do you want to do for a career?’ and would talk to me about
different paths I could take, and I felt like he would believe in me so I felt like I
belonged in college. (Alana).

Two participants, Omar and Damien, stated that having a group of friends from high school
who attended the same college positively influenced their sense of belonging entering college.
Conversely, another participant, Kim, felt lonely entering college, after being separated from
her friend group from boarding school:

My closest friends, we were all separated for college because we were all from different
states, and we were all used to being together for four years, and we were moving
together every year. So, I was used to being together with all of my friends, but here I
am by myself a lot, and at first it was kind of hard, but I got over it, and I got used to
being by myself, and now I think it is easy to be by myself because I can do whatever I
want. But, yeah, at first it was kind of hard, but it’s okay. (Kim).

3. Motivation/Goal-Setting. When students were asked how their high schools
influenced their motivation in college, several themes emerged across focus groups. Multiple
students mentioned that they experienced “senioritis” or burnout at the end of high school,
which continued to negatively affect motivation in early college: “I think towards the end [of
I had no more motivation for high school since I already got into college, so it was
like ‘okay I don’t need to try anymore,’ and then I think that carried over into college, so that
really messed me up.” (Jasmine). Other participants felt that motivation in college is an internal
drive, specific to the individual:

My parents always said you graduate high school because your parents want you to; you
graduate college because you want to…. The problem is I haven’t figured out if I want
to yet. It’s like, I want to, but at the same time I don’t care. That’s what’s killing me
right now. If I see it as something that’s worth it, if I see putting the work in as worth it,
I will put 2000% in, and I will excel, but if I don’t think its worth it then nothing
happens…. (Ron).

Ron went on to explain that he was not sure that he needed a college degree for his intended
career path in video game programming, which made him feel ambivalent about college
completion. Other participants were similarly internally motivated by their own goals to do well
in college and beyond:

I don’t feel like it [teacher support] really was motivating me, what was motivating me
was knowing you have to do well in college. In high school, senior year, I was still
motivated for college, like I still did well in my classes, but it was like your last
year…and like once I started college I knew I had to get myself together and do well.
And knowing that I am in college, and especially starting off strong in your freshman
year since it is your easier classes, you have to start off strong. Once you are in your
senior year you already applied, already in college, I had good grades all year, so I was
able to slack off a little bit. (Shirley).

Another participant stated:
Yeah, I realized like, I’ve got to work hard, it is not high school, I should not be happy with getting Cs, you still pass, but college is like commitment to your future and your life, you’ve got to work hard. Work hard, play hard, but you should still work hard. (Kim).

4. Perseverance. When students were asked how their high schools influenced their motivation in college, several themes emerged across focus groups. Several students felt that perseverance, like motivation, was an internally motivated process, which was not influenced by their experiences in high school. One student felt that his experience in organized sports positively impacted his perseverance in college:

So, I joined like the track team, and I only joined it because I wanted to say I was in sports for NHS [National Honors Society] or something, so I joined it, and I didn’t really like try out or anything. So, what’s it called…so the coach made me run some events, like, do the pole vault and stuff like that, and I wasn’t good at it at first, but after a while, I got good at it, and I don’t know, it kind of taught me that if I keep trying at something, I might get good at it. (Damien).

Another participant cited parent involvement as being important to his perseverance in high school, but that the same level of involvement did not carry over into college: “In my high school, we had parent teacher meetings, so if you didn’t bring your grades up, there were consequences, but here you have no consequences, so it is a little bit harder.” (Jamal).

One participant, Omar, said that his school helped him to develop perseverance by allowing students to re-take exams when they did poorly: “Um, ya, like having to like, you know, you can retake the test even if you do bad once you can redo it, so that is kind of like saying like ok, even if I do bad, I can kind of make it up, and that kind of keeps you going, like don’t give up, I
Another participant, Shirley, remembered a high school lecture about the importance of education for later employment outcomes, which helped her to persevere in college:

I feel like they really emphasized how you really need a college degree to get a job, because they told us what percentage of jobs require different types of degrees, and the salary difference, and how college degree can impact the amount of money you make, and it is harder to get a job without a degree, so that makes you want to push through. (Shirley).

Once in college, several participants noted that having friends in their classes helped them to persevere in the face of difficulty: “I feel like the friends thing is a big part because once you are taking these higher level classes, you have to make friends to work together and to help each other through these classes like calc[ulus].” (Shirley). Another student agreed, and added that college counselors and support services also helped her to persevere:

I agree with what she said. And, I didn’t realize until I got here [college], but talking to the counselors, and asking them about this stuff… and I feel like also having friends who are trying to get the degree, and seeing how they push themselves… and there is a support lady that I go talk to sometimes and she helps too. (Alana).

5. Self-Regulated Learning. When students were asked how their high schools influenced their abilities to study and learn independently in college, several themes emerged across focus groups. One student recalled a specific teacher in high school whose teaching style facilitated independent note-taking and studying:

We had this teacher who like really pushed you how to study, how you were supposed to study for college. And she was like the only one to teach you how to really study for college. Like, ‘you have to take notes, you have to do this, you have to do this,’ and that
was really helped me study was like this one teacher…. So, like, this is kind of the way she taught, and she said ‘this is how you are going to have to do it in college too,’ like she would give lectures, and she would say: ‘your job is to grab the most important details from these lectures and write it down, and do examples, and do diagrams, and that is how you will remember everything. (Jasmine).

One student, Alana, recalled that her teachers gave out study tips as well, but said that she did not recall implementing those study skills in class:

I don’t think it [high school] did [impact my study skills in college]. Although they did push us saying, it won’t be the same, it is going to be different, more time on your own, none of the teachers are going to tell you what to do, but I don’t think anyone is ready for it until you actually come and experience it. (Alana).

Other participants felt that the classes in high school were too easy, which made it difficult for them to transition to studying for more difficult classes in college. For example, Ron said: “…I breezed through high school. It was too easy. Then, getting to college, I was sinking fast, like …sink or swim. I thought I was going to swim.” Another participant agreed: “High school is so much easier, so it doesn’t really prepare you, so when you get here you have to figure out how to study all over again… you have to study like 50 times more.” (Omar). When asked what he wished his high school had done differently to better prepare him for college, one participant responded: “Maybe like encourage more independent studying, like learn it on your own, cuz I feel like all of my classes, I essentially teach myself. I feel like they babied you in high school and you get to college and…you’re on your own.” (Damian).

6. Time Management. When students were asked how their high schools influenced their time management in college, several themes emerged across focus groups. Several
participants recalled that their high school teachers provided advice about time management in college, but stated that they did not heed that advice: “I feel like teachers would tell us to sit down, make a schedule, pick a time to study during the day, but I feel like most people don’t really do that…. ” (Shirley). Another student agreed: “We didn’t take it seriously. We had a seminar, they told us, like, time management, we had a whole presentation on it, so I feel like people were there because they had to, and it was an easy class, but we didn’t take it seriously as much as we should have…. ” (Alana). Several participants felt overwhelmed by the number of hours spent studying for each class in college as compared to high school: “I don’t think I had time management in high school – just study a little bit and then do whatever you want. But it is different when you come here. You have to, like, see how many hours you need to do each day, and you have to plan it…. ” (Omar).

Another participant explained the difficulties of managing the many time commitments in college:

I would say, you know how they say, for every class hour you are supposed to study one hour…I feel like that is a lot, and I definitely did not do that. And distractions too… so if I am taking 3 classes, I need to study 9 hours, and I have so many other things … you’re not going to focus all that time to study. (Shirley).

Another participant, Jasmine, also experienced difficulty with time management in college:

Hmm, I think navigating school [was a challenge], because like everything was in a different building, so I had to manage my time. So, that was a big challenge for me, was just managing my time, and learning how to squeeze in all of my classes, and all of my homework, so it was easy to fall behind right away, cuz I wasn’t managing my time really well. (Jasmine).
Jasmine explained that work was spaced out more in high school than in college, which made time management challenging in college:

I think in high school you have a lot more time on your hands to study, and you have a lot more time finish all this work that’s put in front of you, and in college you just don’t have all that time and you have to learn how to manage… Maybe it is because in college you have so much work to do at once, but in high school everything was spaced out more, so you had time to get everything done by the right date, but then in college everything is probably going to be due on the same day. (Jasmine).

Another participant, Ron, agreed: “I was good at managing time in high school…I was good at getting shit done and still having time, but shit didn’t take as long in high school… It takes longer to do homework here, it takes longer to get other stuff done here, you need to study a lot more.” (Ron).

7. Academic Transition to College. When participants were asked to describe their transition to college, several themes relating to the academic transition to college coursework emerged. Several participants felt overwhelmed and intimidated by the size of the classes in college:

Um, transitioning, it was pretty smooth, but then like socially, it was easier to transition because the second we got here I made a lot of friends, I guess, but then academically, it was more challenging because I just wasn’t used to big classrooms, and big lectures, filled with so many people, so it was a little overwhelming because if you had a problem, I didn’t know how to go about it to like ask a professor. (Jasmine).

Shirley also reported feeling intimidated by the large class sizes:
I feel like it was kind of nerve-wracking at first since it was bigger classes and you don’t know anyone, and high school it is the same people every year. Lots of new people [in college], the bigger classes, and having to adjust to the learning. And I got used to it, and having to do it by myself. (Shirley).

Alana also felt overwhelmed by the class schedule that her advisor helped her to pick out:

I felt the same way, when I got here, the advisor that I went to wasn’t very helpful, so I feel like she just wanted me out of the office for some reason and they had a lot of students coming in at the same time, and it was nerve-wracking for them as well, but I felt that they didn’t take the time to see what classes I was taking, and if it was too much for us. The first semester was very overwhelming, with the big classes and all the people, and having a higher level, and you are not used to learning by yourself, and learning to study…. (Alana).

A number of students also had trouble adjusting to the pace of college coursework:

I’m not sure, I feel like they could have better, like…I’m not really sure…I think just like course content wasn’t as hard, and since like in college everything is squeezed into one semester, as opposed to like you learn everything throughout the whole year, that’s a big difference, and it was a lot harder…. Like in high school we would do probably like one section every two days and here we do three sections a day. (Jasmine).

Ron agreed: “Ya, like what my [high] school called two semesters of calculus, we call it one [in college]. That might be part of my problem. Ya, you do like one section a day like clockwork…” He clicked his fingers. “So, it’s either a section a day or three days on a section.” (Ron).
A number of students also noted that in college, the grading is less forgiving than in high school; more is expected of students in college in order to earn an ‘A’: “I think like in high school if I had a question, and say there is like a word or something like that, or a concept, you just have to know what that is, and you need to know the definition, but over here [in college] you have to understand it, you have to use it, you have to work it like backward and forward.” (Jamal). Omar made a similar observation: “In high school, if the teacher gives a study guide, and you go over it, you get the A, but here you have to read the book, look at the power point, and whatever else she gives you, and you still don’t know if you are gonna get an ‘A.’” (Omar). Another student expressed feeling frustrated with the strict grading criteria that he encountered in his college courses:

…That’s the thing I hate about calculus here… is it’s not about the calculus, it’s about the algebra. You can understand calculus concepts perfectly, and you can demonstrate that you know the calculus of it, but if you make an algebraic mistake along the line, your whole problem is going to run askew, and they are going to say you have no idea what you are doing. Well, I did the right steps, and I knew what I was doing, but I forgot to carry the two. But you get almost no points, because it looks like you didn’t know what you were doing, but I knew exactly what I was doing. It was easier to get the partial credit in high school, here you gotta work for that partial credit. (Ron).

Finally, a number of students noted that help and resources were more readily available and individualized in high school as compared to college, which made the transition to college challenging: “I feel like they [high school] had a lot of support and help with maybe like writing papers you could stay after school or before school like if you wanted it, you needed it, you could take advantage of it, based off students if they wanted it.” (Alana). Another participant
had a similar experience: “I feel like high school was like more like exclusive like for asking questions and stuff, because my high school was only 400 students, and here is like a lot of students, and I don’t think you get to do one-on-one tutoring.” (Kim). Another participant, Jamal, said: “Here like sometimes you spend like four hours on a homework assignment, but in high school you just talk to a teacher and the teacher will help you with it.” (Jamal).

Participants noted the availability of support resources in college as well:

I like that [the university] has a lot of resources we could use, like the science learning center, and the writing center, and the dorms, there are peer tutors, and the T[eaching]A[ssistants]s (TAs) have a lot of office hours you can go to, so I think that that really helped. I think that [the university] was really good to help you, kind of like, if you need help, there is always an option for you. (Jasmine).

However, a few students reported that they did not make use of those resources in the first year: “What I most commonly hear is: you sink or swim. They try to give you a lot of resources, they are meant to be a floaty so you don’t sink we’ll try to help you to swim. Maybe it is that I have not used them as much as I probably should, so I don’t know.” (Ron).

Two participants said it would be helpful to introduce students to the support resources and how to use them early on:

I would say like, for one of my English classes, we had to go to the writing and learning center and get help for a paper, just so we could get familiar with the tutoring center and feel comfortable, but the other classes didn’t do that, so I didn’t know where the math learning center was for a whole semester. And that was confusing. And sometimes for science I had difficulty finding the tutors, so maybe introducing students to those resources was helpful. (Shirley).
Other participants encountered similar difficulties accessing study resources: “…I feel like TAs here are never available. You go to math resource and there is nobody there, just a bunch of students there working together.” (Jamal). Another participant stated that this is a common occurrence in almost every tutoring center: “Every subject, I guess, except maybe English. English we’ve got them [tutors], but math, physics, there’s nobody there! You go there, there’s like no tutors there!” (Jamal). Kim had a similar experience: “Ya, like last week, I went to a computer science tutor session, and the tutor, he was supposed to be there but he didn’t show up. I had a question to ask but I couldn’t get to ask….“(Kim). Other participants explained that they were not sure how to use the academic support services when they first arrived on campus:

For calc[ulus], the first time I took it I had to drop it, cuz I was doing really bad, so once I retook it, I knew I needed tutoring or I wouldn’t get very far. So, the first year, it is a new school, so ya, I just wasn’t used to going [to tutoring], I didn’t know how it worked. (Shirley).

Another student felt intimidated to utilize support services offered at the university:

…There is another support lady that I go to sometimes, that helped me as well, but at first I was intimidated, I don’t know if anyone can go there, like, should I go there? Even the support person, teachers, office hours that the teachers have, I was scared to go because I was afraid she would think I was dumb or something. (Alana).
V. DISCUSSION

First-year college students grapple with issues of growing independence, identity-formation, and rapid change related to their new status as emerging adults just as they begin to navigate the challenges associated with the transition to college. Students develop skills, often called “non-cognitive skills,” that they need to navigate this difficult period of transition within various developmental contexts. The current study, which was grounded in ecological, developmental, social/cognitive, and poverty literatures, was designed to better understand how high school climate and other school-level demographic factors relate to students’ non-cognitive skills and academic performance in the first year of college.

The current study first tested the non-cognitive model developed by the University of Chicago Consortium on School Research (CCSR) (Farrington et al., 2012). Consistent with previous tests of the non-cognitive measurement model (Farruggia et al., 2016), the current study found that the non-cognitive variables were conceptually distinct from one another. Also in line with previous tests of the non-cognitive structural model, non-cognitive variables were generally positively related to students’ grades in college.

The current study then expanded upon the non-cognitive model by investigating what about the high school context predicts non-cognitive skills in college. Bronfenbrenner’s ecological systems theory (1989) provided a framework for understanding the role of context in a young person’s development of non-cognitive skills. Bronfenbrenner proposed that individuals are concurrently nested within multiple contexts – the microsystem, the mesosystem, the exosystem, macrosystem, and the chronosystem – that continuously exert either direct or indirect influence on their development. The current study predicted that the aspects of school climate representing microsystem contexts (Ambitious Instruction,
Collaborative Teachers, and Supportive Environment) and mesosystem contexts (Family Involvement) would have a stronger relationship with student outcomes than would the essential representing exosystem contexts (Effective Leaders).

Contrary to hypotheses, quantitative study findings showed that there was not a strong relationship between the high school context and non-cognitive skills in college. That is, there was no relationship between the high school that students attended, and their non-cognitive strengths in college. Focus group findings, however, suggested otherwise. Although these focus groups represented the experiences of only eight students, the findings are suggestive of a link between students’ individual experiences in high school and non-cognitive outcomes. For example, qualitative focus group participants offered examples of how supportive teachers and specific advanced courses in high school helped them to develop such non-cognitive college strengths as academic self-efficacy, belonging, perseverance, time management, and self-regulated learning.

Although students’ endorsements of non-cognitive outcomes did not differ significantly based on the high school that they attended, students’ first-year college grades did. But the five essentials of school climate did not explain this finding. Instead, the single best predictor of first-term GPA in college was the concentration of poverty at students’ high school (as indexed by the percentage of students qualifying for free/reduced-cost lunch at the school), which accounted for nearly half of the variance in college GPA between schools, in the current study.

These findings highlight the prominent role of poverty in students’ school experiences. The literatures on poverty and stress provide a framework for understanding this finding. At the individual level, as reviewed earlier, poverty is associated with a number of chronic stressors, including less access to basic resources like food, clean water, and stable housing (Slopen, et al.,
2010; Kushel et al., 2006; Amrose, Burt, & Ray, 2015; Lasser, Himmelstein, & Woolhandler, 2006), as well as increased exposure to psychosocial stressors like familial instability, domestic violence, substance use, and community violence (Wade et al., 2014; Evans & English, 2002). This chronic exposure to the stress and deprivation associated with poverty has an impact on the body’s stress-response system, which becomes chronically overactive, with corresponding effects on brain development, health, and mental health (Evans & English, 2002; Kalmakis et al., 2015).

At the school level, a large concentration of poverty among the student body may affect the dynamics of the broader environmental context. Just as neighborhoods with a high concentration of poverty often have limited community resources, schools with a large proportion of students in poverty (heretofore referred to as ‘high-poverty schools’) tend to have limited financial and structural resources (Evans, 2004). For example, high-poverty schools spend an estimated 800 dollars less per student annually than counterpart schools (Evans, 2004; Condron & Roscigno, 2003). In addition, high-poverty schools often have structural problems like leaky roofs, heating/cooling and ventilation concerns, plumbing issues, and problems with safety features like sprinklers and smoke detectors (Alexander & Lewis, 2014; Evans, 2004).

The scarcity of resources in high-poverty schools often extends to intangible social resources. For example, as discussed above, students in high-poverty schools tend to have less access to “social capital,” or the information, opportunities, and connections, needed to navigate the education system (Coleman, 1988; Perna & Titus, 2005). Likewise, parents tend to be less involved in high-poverty schools compared to parents in low-poverty schools (Evans, 2004; Noel, Stark, and Redford, 2013). Finally, compared with low-poverty schools, high-poverty schools report more violent incidents annually (Aud et al., 2010)
In terms of school climate, the current study added to our understanding of teacher
dynamics in high-poverty schools as well. The current findings suggested that in high-poverty
schools, teachers felt a decreased sense of professional community compared to teachers in
counterpart schools. They reported working less collaboratively with school administrators and
with one another. Teachers in high-poverty schools face many challenges. First, as discussed
above, as a result of the high-stress circumstances associated with living in poverty, students in
high-poverty settings may bring to school many social, emotional, and behavioral needs (Evans,
2004). High-poverty schools’ limited resources and the consequent limited professional
development opportunities can leave teachers without the unique training and means required
for addressing their students’ needs. In light of these difficulties, it is easy to imagine a high
school faculty that is taxed and lacking in the energy, enthusiasm, and commitment needed to
attend to the demands placed on them. Not surprisingly, many high-poverty schools also tend to
have high teacher and staff turnover (Allensworth, Ponisciak, & Mazzeo, 2009). Perhaps as a
result of all of the school dynamics discussed above, in the current study, students in high-
poverty schools reported receiving less personalized attention and less emotional support from
teachers, and also felt less safe at school than peers in low-poverty schools.

Parents of students in high-poverty schools are also affected. In the current study,
parents reported that they have weaker relationships with teachers, and are less involved in
decision-making at the school, as compared to parents in schools with more resources. There are
a number of factors that may serve as barriers to parent involvement in school. First, parents
living in poverty often have many demands placed on their time, sometimes working multiple
jobs, often while managing financial stressors, and related difficulties with transportation or
childcare (Weiss, et al., 2003). Families living in poverty also often struggle with cultural and
language differences that make it more difficult to fully participate in school meetings and events (Weiss et al., 2003). In these high-poverty environments, where all parties at school and at home are similarly taxed for resources and time, teachers and parents may fail to make this much needed connection.

Ironically, despite the lack of financial and professional resources in high-poverty settings, teachers and students reported that coursework is more rigorous than in low-poverty schools. This could be a reflection of recent political pressures faced by school administrators to produce higher school-wide standardized test scores in order to compete for school funding. This larger-scale pressure is passed on to teachers, who are then confined to a more structured and rigorous academic curriculum. It also may be that, as compared to students and teachers in low-poverty schools, students and teachers in high-poverty schools perceived the coursework as more rigorous and challenging relative to their own prior schooling experiences.

In the current study, the level of poverty at the school also determined the strength of the relationship between high school climate factors and the high school’s graduation rate and rate of college enrollment at the school. For example, in high-poverty schools, the effectiveness of school leaders and the degree of collaboration between teachers had little to do with the high school’s graduation rate and rate of enrollment in college. In contrast, in the current study family involvement in schooling and social/emotional support from teachers were particularly strongly related to students’ later college enrollment in high-poverty schools, compared to low-poverty schools. Notably, while these two areas of school climate were found to be particularly important for student body outcomes like college enrollment rate, these were the same areas that were identified as lacking in high-poverty school environments, in the current study. Finally, rigorous academic coursework during high school was more strongly related to both high school
graduation rate and college enrollment rate in high-poverty schools, in contrast to low-poverty schools, in the current study. This is noteworthy because, as discussed above, high-poverty schools surpassed low-poverty schools in terms of the rigor of coursework, which bodes well for the high school graduation and college enrollment outcomes of students in those schools. Without family involvement and teacher support, however, realizing the benefits of an academically rigorous curriculum may be challenging for youth in high-poverty schools.

These findings indicate that students in high-poverty schools in Chicago see the most benefit when families are more involved in high school, when teachers collaborate with one another, and when coursework is challenging and applied. These three aspects of school climate represent the nature of the support that students receive in their micro- and meso-system contexts. The nature of students’ support in these contexts may be especially critical because of the inherent academic and social disadvantage often faced by students in high-poverty settings. They may furthermore help to fill the resource gaps in high-poverty schools. These three factors are important areas for future school climate research, and are potentially worthwhile targets for intervention in schools characterized by a high concentration of students in poverty in Chicago.

Discussion of the findings with regard to poverty would be incomplete without addressing the intersection of race/ethnicity and socioeconomic status. The current study revealed that the higher the percentage of White students in a given school, the lower percentage of students in poverty in that school. This finding is particularly important given that the concentration of poverty at a student’s high school was found to be such a powerful predictor of academic performance in college. The current findings highlight the role of economic disadvantage in the perpetuation of racial/ethnic disparities in educational attainment. There is an ample literature documenting structural inequalities and racial/ethnic disparities
within the education system, starting as early as preschool (Caughy, O'campo, & Muntaner, 2004; Magnuson & Duncan, 2006; Burchinal et al., 2011). Current study findings suggest that educational disadvantages may follow students from one context to another, and that these disadvantages likely have a disproportionate impact on students of color. This is particularly problematic given the strong ties between educational attainment and later financial and employment outcomes.

Given the results of these studies, what can administrators, teachers, and policy-makers do to promote non-cognitive skills, and academic performance in the transition to college? Results of the quantitative study suggest that one step towards closing socioeconomic and racial/ethnic gaps in education in Chicago is to devote more resources towards understanding and ameliorating challenges faced by high-poverty schools. The quantitative data also point to the utility of school climate variables in predicting other larger school-level outcomes, like high school graduation rate, and the school’s post-secondary enrollment rate. It may be that school climate variables are most useful in predicting proximal outcomes within the same school context, but are less useful in forecasting distal outcomes in another academic context. Poverty, on the other hand, has been demonstrated to have distal and pervasive effects on youth development, and warrants closer attention at the school level.

Looking back on their time in high school, a small group of students also provided qualitative insights into the experiences in high school that were most influential to them in the transition to college. Those students pointed to both positive and negative aspects of enrollment in advanced high school coursework. While participants felt that early success in AP/IB coursework helped them to believe in their abilities and to feel confident that they belonged in college, they also reported that the rigor of high school coursework caused them to burn out at
the end of their senior year, and this burnout continued to negatively impact motivation into their first year of college. Students also recalled that high school coursework that is designed to mimic college coursework, requiring hands-on practice of note-taking and study skills, was helpful in preparing them to study and to manage their time in college. Finally, participants shared examples of how supportive words and encouragement from high school teachers and counselors stayed with them even after high school, and helped them to push through the challenges of the first year of college.

Focus group participants also spoke to some of the difficulties that they encountered during the transition to college. Some of these difficulties are not surprising. For example, students noted that the coursework in college was more difficult, and moved at a quicker pace than is the case with high school coursework. Many students expressed feeling lost in large introductory classes, and unsure of how to approach professors and teaching assistants. Students also drew attention to some lesser-known challenges faced in the transition to college. For example, students shed light on the many barriers that they encountered when attempting to access student-support services. Students initially felt self-conscious seeking help at tutoring centers, but even after overcoming that barrier, students had difficulty learning about the available services, and in identifying the tutors themselves. Furthermore, participants were emphatic about the negative impact of commuting on students’ income, time-management, and well-being. The perspectives of focus group students hint at a more complex picture in the experience of high school youth. More research with a larger sample size is needed to determine what and how such qualitative data might add to the understanding of the link between high school experience and the development of non-cognitive skills.
A. Limitations

One important limitation of the present study was that data from both studies were collected at the same large diverse urban public university. Although the quantitative study included data of students from 113 different high schools, ultimately, all students in the study attended the same university. The university is unique in a number of ways. First, it is one of the most diverse universities in the nation, with 66% of students identifying as a race/ethnicity other than White, and nearly a third of students identifying as Latino/a. Second, it is unique in that the majority of students commute to campus, often via public transportation. While the vast diversity of the student body is a distinguishing point of pride for the university, it also sets the university apart from many other four-year universities across the United States, which may limit the generalizability of study findings to other institutions. In addition, high school data was gathered exclusively from public schools and charter schools in Illinois, the majority of which are in the Chicago Public School system, which may also limit generalizability of findings. As such, these research questions must be examined in other school districts, and in other institutions of higher education.

Another limitation of the current study was the exclusion of individual-level data in the study design. For the quantitative study, investigators drew on publicly-available data on the five essentials of school climate, which was only available in aggregate form. The investigator was not able to gain access to the individual-level data from students and teachers that made up those aggregate five-essentials scores. The heterogeneity of the experiences observed in the qualitative study suggest that students’ individual perceptions of school climate may have been more strongly related to students’ non-cognitive skills in college than were aggregate measures of the broader high school climate. Relatedly, longitudinal data from earlier educational
contexts, like elementary school and middle school, would have provided the opportunity to investigate the development of non-cognitive strengths over time. Non-cognitive skills likely begin to develop well before high school, in both school and home contexts, and continue to change throughout students’ lives. As such, longitudinal data regarding students’ school and family contexts may also have proven useful in answering the study question. Family is a particularly important avenue of future investigation given the central role of poverty in predicting academic performance in college in the current study.

Selection bias was another important limitation of the current study. All students who took part in the non-cognitive survey in college had, by definition, already made it to college. Thus, the students in the current study share a set of personal and environmental characteristics that allowed them all to attend college at a large public 4-year public university. In that way, this study on high school factors relating to non-cognitive skills in college was biased in that it did not include any data from those students who did not enroll in college after high school. More research is needed to investigate current study questions with data from both college-bound high school graduates and those high school graduates who do not go on to college.

There were also important limitations related to measurement in the current study. Data on the five-essentials of high school climate were gathered from publicly-available data published by the Illinois State Board of Education. The five essentials variable scores were each made up of several subscales, which were aggregated and standardized to create an overall school-score for each essential. By using the overall, standardized, five-essential scores, the current study lost the unique variance explained by the individual subscales making up each essential. Furthermore, some of the essential scores incorporated data from two different sets of reporters. For example, the Ambitious Instruction and Supportive Environment essentials scores
included reports from both students and teachers at the school, whereas the Effective Leaders, Collaborative Teachers, and Involved Families essentials included only teacher reports. These differences in reporters between essentials may account for some of the differences in the predictive power of some five essentials variables over others on individual- and school-level outcomes.

The comparisons between high-percentage and low-percentage poverty schools were limited in that comparison groups were formed by splitting the sample in half. Schools were considered to be high-percentage poverty schools if more than 50 percent of students in the school qualified for free/reduced lunch, and schools were considered to be low-percentage poverty schools if less than 50 percent of students in the school qualified for free/reduced lunch. This is a potentially inadequate definition. For example, a school with 49% of the student body in poverty might not be that different from a school where 51% of the student body was in poverty. It may have been more reasonable to have compared schools at either end of the poverty distribution.

B. Conclusion

The current study sought to illuminate the role of high school context in promoting non-cognitive skills and academic performance in the transition to college. While non-cognitive variables did not vary between high schools, results of the current study revealed several other key school-level factors relevant to predicting academic performance in college, namely school demographic factors, like the concentration of poverty among the high school student body. The current study applied new multi-level structural equation modeling methods to the study of school climate and context, and discovered benefits and limitations of the method that may be useful to consider in future educational research. The current study also demonstrated the
potential promise of qualitative methods, like focus groups, as a complement to quantitative methods.

The findings of the current study call attention to socioeconomic and structural inequalities that still have a significant impact on student performance, even at the highest educational levels. The current study calls for further investigation into the role of school, classroom, and home climate in the development of non-cognitive college skills. Furthermore, the current study calls for increased research on high-percentage poverty schools as a unique context, with particular emphasis on understanding the mechanisms through which high-poverty school environments impact performance in later academic and employment contexts. These mechanisms, once understood, may potentially be the focus of new programs and policies to reduce educational disparities in the United States.
VI. CITED LITERATURE


development: Extracurricular activities, after-school and community programs, 85-109.


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VII. APPENDIX

Semi-Structured Interview Questions:

1. How do you feel your high school prepared you for college?
   a. What did your school do well in preparing you for college?
   b. What else could your school have done to prepare you?
2. Describe your transition to college.
   a. What was easy and/or easier than you thought it would be?
   b. What was difficult and/or more difficult than you thought it would be?
3. How did your high school influence your confidence in your abilities when you got to college?
4. How did your high school influence your motivation in college?
5. How did your high school influence your sense of belonging in college?
6. How did your high school influence your study skills in college?
7. How did your high school influence your time management in college?
8. How did your high school influence your perseverance in college?
9. What did the university do well to support you as you transitioned to college?
10. What could the university have done better to support you as you transitioned to college?
11. If you were a university leader for a day, what specific policy recommendations would you make to help students like you in the future?
VIII. VITA
Brittany R. Myers, M.A.
Bmyers6@uic.edu

University of Illinois at Chicago
Psychology Department
1007 West Harrison St. (M/C 285)
Chicago, IL 60607

625 West Madison St., 2411
Chicago, IL 60661
216-315-5993

EDUCATION

Ph.D. University of Illinois at Chicago (UIC), Clinical Psychology
With a Minor in Community and Prevention Research
Expected, 2017

Proposed Dissertation

Dissertation: Investigating the Effects of High School
Climate on Non-Cognitive Strengths in College

September, 2015

Committee: Marc Atkins, Kate Zinsser, Sue Farruggia, Lou Fogg
Advisor/Chair: Karina Reyes

Advanced to Doctoral Candidacy

Preliminary Exam: A Multi-level Longitudinal Investigation
of the Effect of School Climate on Juvenile Delinquency.

October, 2014

M.A. University of Illinois at Chicago, Clinical Psychology
October, 2013

Thesis: A Longitudinal Investigation of College Engagement
Predicting Graduation Outcomes in a Diverse Student Body

B.A. Northwestern University, Psychology and Spanish
Graduated Magna Cum Laude; GPA: 3.93
June, 2011

CAREER OBJECTIVES

I am committed to a career in clinical psychology working with young people from diverse
backgrounds in both clinical and educational settings. As a bilingual clinician, I am committed to
serving and advocating for Spanish-speaking youth and families. In my research, I aim to address
educational disparities by improving systemic supports for young people in schools. To the same
end, I work closely with university administrators to apply research to practice.

LANGUAGES

English (Native Proficiency)
Spanish (Bilingual Proficiency with Experience Conducting Clinical Work)
CLINICAL TRAINING

USC/Children’s Hospital of Los Angeles University Center for Excellence in Developmental Disabilities Pre-Doctoral Internship

Psychology Intern - Child/Family Therapy & Adolescent Medicine Track (2016-2017)

Responsible for:

Child/Family Rotation:

- Providing outpatient therapy to school age children to address a variety of presenting problems, including disruptive behavior, anxiety, depression, trauma, and suicidal ideation.
- Working with children with developmental disabilities to address comorbid mental health concerns.
- Providing therapy services to bilingual children/families in both English and Spanish.
- Providing case management services to families navigating educational, legal, medical, and immigration concerns.
- Providing collateral therapy to parents and families when indicated.
- Working collaboratively with interdisciplinary team including speech/language pathologists, occupational therapists, physical therapists, psychiatrists, and other medical providers to address client needs.
- Providing support to families in crisis.

Supervisor: Alexis Yetwin, Ph.D.

Adolescent Medicine Rotation:

- Providing outpatient therapy to adolescents ages 12-21 to address a variety of presenting problems including trauma, adjustment to newly diagnosed medical conditions, depression, anxiety, suicidal ideation and self-injurious behaviors.
- Working with adolescents with medical conditions and developmental disabilities to address comorbid mental health concerns.
- Providing therapy services to bilingual children/families in both English and Spanish.
- Providing case management services to families navigating educational, legal, medical, and immigration concerns.
- Providing collateral therapy to parents and families when indicated.
- Working collaboratively with interdisciplinary team including speech/language pathologists, occupational therapists, physical therapists, psychiatrists, and other medical providers to address client needs.
- Providing support to families in crisis.

Supervisor: Sophie de Figueiredo, Psy.D.

Assessment Rotation:

- Providing comprehensive psychological assessment services in English and in Spanish to school age children with a variety of presenting concerns, including attention problems, intellectual disabilities, autism spectrum disorders, learning disabilities, language disorder, PTSD, depression, anxiety, and executive functioning difficulties.
- Conducting semi-structured clinical interviews with children and families.
• Administering comprehensive assessments of language, attention, cognitive functioning, academic functioning, social/emotional functioning, and executive functioning.
• Conducting bilingual language assessment for bilingual Spanish-speaking clients.
• Writing comprehensive assessment reports.
  o (Expected Total: 6 comprehensive reports).
• Providing feedback to families in English and in Spanish.
Supervisor: Moises Rodriguez, Ph.D.

“Incredible Years” Parent Group Co-Leader:
• Co-leading 18-week “Incredible Years” Parent Group for School-Age Children
• Providing support to parents in learning child-directed play, effective praise, social, academic, persistence, and emotion coaching, use of incentives, rewards, and behavior charts, limit-setting, time-out, and, where appropriate, consequences.
• Providing emotional support to parents throughout the parenting group.
• Collaborating with child group leaders and other mental health providers.

Leadership Education in Neurodevelopmental and related Disabilities (LEND) Training:
• Participating in interdisciplinary training in neurodevelopmental disabilities.
• Working together with individuals from the following disciplines:

Training Experiences:
• Incredible Years – “Dina” and Parent Group Training
• Incredible Years Group Supervision Seminar
• Child/Family Didactic Seminar
• Adolescent Medicine Grand Rounds
• Adolescent Medicine Didactic Seminar
• Assessment Clinic Seminar
• Intake Clinic Seminar
• CHISTE Seminar for Bilingual Spanish-Speaking Clinicians

University of Chicago Medical Center Pediatric Neuropsychology Service
**Trained and Certified as a Neuropsychology Technician**
Psychology Extern (2015-2016)
Responsible for:
• Administering comprehensive neuropsychological assessments to children and adolescents (ages 6-16) with developmental disabilities (e.g., Autism Spectrum Disorder), genetic conditions, learning and intellectual disabilities.
• Conducting semi-structured psychological interviews.
• Writing integrated neuropsychological assessment reports.
  o (Total: 18 comprehensive reports)
• Providing feedback/diagnoses to the family.
Supervisors: Megan Scott, Ph.D. & Scott Hunter, Ph.D.
University of Illinois Community Clinic: Office of Applied Psychological Services  
*Psychology Extern (2012-2016)*  
Responsible for:  
- Conducting individual psychotherapy in both English and Spanish for adolescents and adults with psychological disorders including: depression, anxiety, PTSD, bulimia, OCD, ODD, bipolar disorder, agoraphobia, and borderline personality disorder.  
- Performing comprehensive psychological assessments in both English and Spanish for children, adolescents and adults with attention deficits, learning disabilities, genetic conditions, speech and language difficulties, and intellectual disabilities.  
- Writing integrated assessment reports for families in both English and Spanish  
  - *(Total: 8 comprehensive reports)*  
- Conducting semi-structured psychological interviews.  
Supervisors: Nancy T. Dassoff, Ph.D., Amanda Lorenz, Ph.D., & Gloria Balague, Ph.D.

University of Illinois at Chicago College Prep Charter High School  
*Psychology Extern (2014-2015)*  
Responsible for:  
- Developing curricula and leading group psychotherapy for diverse high school students to treat depression, anxiety, and self-injurious behaviors.  
- Providing individual psychotherapy to students in the group.  
- Coordinating care with the team of social workers at the school.  
Supervisor: Amanda Lorenz, Ph.D.

Akron Children’s Hospital  
*Summer Pediatric Research Scholar (2009)*  
Responsible for:  
- Organizing and analyzing data to evaluate the efficiency of the Psychiatric Intake Response Center (PIRC).  
- Shadowing psychologists and social workers in the Psychiatric Intake Response Center, the partial program and the inpatient unit (ages 12-18).

**RESEARCH TRAINING**

Dr. Karina Reyes’ Research Lab (UIC)  
*Lab Manager (2011-2016)*  
Project:  
- A 25-year longitudinal qualitative study of Latino adolescents.  
- Participants from original study in high-risk high school were located and interviewed 25 years later about high school experiences and life trajectories.

Office of the Vice Provost for Undergraduate Affairs Research Team (UIC)  
*Research Assistant (2012-2014)*  
Project:  
- A longitudinal effectiveness study of the Summer College program at UIC.  
- Compared academic, retention, and graduation outcomes of students who participated in the program to a group of matched controls.
Project:
- A secondary longitudinal data analysis of college student surveys and outcomes.
- Investigated how college engagement predicted students’ four-year graduation outcomes above and beyond demographic and academic background factors.
- Investigated how racial/ethnic group membership moderated the effect of engagement on college graduation outcomes.

Project:
- A quantitative prospective longitudinal study.
- Investigated the effect of students’ subjective social status on academic and retention outcomes in college, over and above objective measures of social status.

Dr. Susan Farruggia and Dr. Gary Germo’s Foster Youth Research Team (UIC)
Research Collaborator (2015-2016)
Project:
- A quantitative analysis investigating predictors of delinquency in foster youth using a variety of theoretical perspectives on juvenile offending.

Project:
- A quantitative analysis examining the direct and moderating effects of quality sibling relationships on the psychological well-being of older foster youth.

Project:
- A qualitative study to identify characteristics of very important non-parental adults (VIPs) in the lives of older foster youth, and the role these relationships play in facilitating youths’ transition from care.

Project:
- Mixed method study examining the plans, goals, and concerns foster youth approaching emancipation from care.

Project:
- Quantitative study examined relationships between maltreatment type, coping style, and longitudinal mental health outcomes among adolescents in foster care.

Dr. David Henry’s Research Lab at the Institute for Juvenile Research (UIC)
Research Collaborator (2012-2014)
Project:
- A multi-level longitudinal study using secondary data from the Multisite Violence Prevention Project.
- Used hierarchical linear modeling to investigate the effect of middle school climate on students’ delinquency outcomes over two years.
- Compared students’ and teachers’ reports of school climate in 43 schools.

Office of the Vice Provost for Academic Enrollment Services (UIC)
Research Assistant (2015-2016)
Project:
- Policy proposal advocating for more equitable admissions practices.
- Paper presents a literature review on relative predictive validity of various factors traditionally used in admissions, and argues for holistic review of students’ strengths beyond standardized tests.
**PUBLICATIONS**

Kodama, C. M., Han, C. W., Moss, T., **Myers, B.**, & Farruggia, S. P. (2016). Getting College Students Back on Track A Summer Bridge Writing Program. *Journal of College Student Retention: Research, Theory & Practice*, 1521025116670208.


**POLICY PAPERS**


**INVITED TALKS**


CONFERENCE PRESENTATIONS


Myers, B. R., Reyes, K., Janowiak, V., Todorovic, K., & Mendez, J. (2016, May). Latino High School Students' Experiences of Trauma and Violence Across Multiple Contexts: A 25-year Qualitative Study. Presentation at the annual meeting of the Association of Psychological Science, Chicago, IL.


**POLICY/LEADERSHIP**

**UIC Office of the Vice Provost for Academic Enrollment Services**
- Drafted two new admissions policies aimed at expanding access to college.
- Both proposals were approved, and will be implemented next year.

**UIC Office of the Vice Provost for Undergraduate Affairs**
- Coordinated the yearlong Student Success Plan Initiative. This initiative brought together almost 200 individuals on campus to make specific recommendations to improve the first-year college experience.
- As a part of the Thrive initiative, consulted with leaders from Chicago Public Schools, Chicago-land area community colleges and Universities, and various educational non-profit organizations to create a template syllabus for a senior seminar to be implemented in select Chicago Public High Schools.
- Evaluated effect of participation in UIC’s free Summer College preparatory courses on student outcomes in the first year of college.
- Helped to organize regular monthly meetings of Chicago Collaborative for Student Success, a convening of administrators from 13 Chicago-land area colleges/universities.

**UIC Psychology Department**
- Elected graduate student council representative for the psychology department.
- Conducted a student departmental climate survey to identify areas of need.
- Planned the first-annual interdepartmental cross-program conference with guest speaker, poster sessions, and roundtable discussion aimed at increasing cross-program collaboration within the department.
HONORS AND AWARDS

Liberal Arts and Sciences PhD Student Researcher Travel Award (UIC) (2014)
UIC Graduate College Student Researcher Travel Award (UIC) (2013, 2014)
UIC Psychology Department Travel Award (UIC) (2013, 2014)

Mary Lynn Gibbons Scholarship (Northwestern University) (2009-2011)
J.G. Nolan Scholarship (Northwestern University) (2009-2011)
Bette and Neison Harris Scholarship (Northwestern University) (2008-2009)

TEACHING

University of Illinois at Chicago, Psychology Department (2011-2016)
Teaching assistant.
- Introduction to Psychology (Two Semesters), Abnormal Psychology (One Semester),
- Interviewing (Three Semesters), Developmental Psychology (One Semester)
Responsible for:
- Modeling clinical skills, providing supervision to students in clinical courses, leading discussion sections, grading assignment and exams, mentoring students and providing support in career planning.

Northwestern University, Spanish Department (2008-2011)
Spanish Tutor.
- All Introductory and Intermediate Spanish Courses.
Responsible for:
- Teaching Spanish grammar and syntax, practicing conjugation and pronunciation, practicing conversational Spanish, and reviewing exams with students.
IX. IRB APPROVAL LETTERS

Exemption Granted

April 13, 2016

Brittany Myers, MA
Psychology
1007 W. Harrison Street, 3030
M/C 285
Chicago, IL 60612
Phone: (216) 315-5993

RE: Research Protocol # 2016-0378

“Investigating the Effects of High School Climate on Non-Cognitive Strengths in College”

Sponsors: None

Dear Ms. Myers:

Your Claim of Exemption was reviewed on April 13, 2016 and it was determined that your research protocol meets the criteria for exemption as defined in the U.S. Department of Health and Human Services Regulations for the Protection of Human Subjects [(45 CFR 46.101(b)]. You may now begin your research.

Exemption Period: April 13, 2016 – April 13, 2019
Performance Site: UIC
Number of Subjects: 4425 (Analysis of existing de-identified records only. No additional data collection)

The specific exemption category under 45 CFR 46.101(b) is:
(4) Research involving the collection or study of existing data, documents, records, pathological specimens, or diagnostic specimens, if these sources are publicly available or if the information is recorded by the investigator in such a manner that subjects cannot be identified, directly or through identifiers linked to the subjects.

You are reminded that investigators whose research involving human subjects is determined to be exempt from the federal regulations for the protection of human subjects still have responsibilities for the ethical conduct of the research under state law and UIC policy. Please be aware of the following UIC policies and responsibilities for investigators:
1. **Amendments** You are responsible for reporting any amendments to your research protocol that may affect the determination of the exemption and may result in your research no longer being eligible for the exemption that has been granted.

2. **Record Keeping** You are responsible for maintaining a copy all research related records in a secure location in the event future verification is necessary, at a minimum these documents include: the research protocol, the claim of exemption application, all questionnaires, survey instruments, interview questions and/or data collection instruments associated with this research protocol, recruiting or advertising materials, any consent forms or information sheets given to subjects, or any other pertinent documents.

3. **Final Report** When you have completed work on your research protocol, you should submit a final report to the Office for Protection of Research Subjects (OPRS).

   Please be sure to use your research protocol number (listed above) on any documents or correspondence with the IRB concerning your research protocol.

   **OPRS does not send hard copies via campus mail of protocol-related correspondence to investigators, research staff and Department Heads.** For more information, please refer to the following: [http://research.uic.edu/node/4117](http://research.uic.edu/node/4117)

We wish you the best as you conduct your research. If you have any questions or need further help, please contact me at (312) 355-2908 or the OPRS office at (312) 996-1711. Please send any correspondence about this protocol to OPRS at 203 AOB, M/C 672.

   Sincerely,

   Charles W. Hoehne  
   Assistant Director, IRB #7  
   Office for the Protection of Research Subjects

   cc: Susan Farruggia (faculty sponsor), Psychology, M/C 103
March 23, 2017

Brittany Myers, MA
Psychology
1007 W. Harrison Street, 3030
M/C 285
Chicago, IL 60612
Phone: (216) 315-5993

RE: Protocol # 2016-0047
“A Qualitative Investigation of the College Transition Experiences of Students Coming from High-Percentage Poverty High Schools and Non-High-Percentage Poverty High Schools.”

Dear Ms. Myers:

Please note that no eligibility screening or pre-testing instruments have been approved for use in the Psychology Student Subject Pool mass testing sessions.

Please note that stamped and approved .pdfs of all recruitment and consent documents will be forwarded as an attachment to a separate email. OPRS/IRB no longer issues paper letters and stamped/approved documents, so it will be necessary to retain these emailed documents for your files for auditing purposes.

Your Continuing Review was reviewed and approved by the Expedited review process on March 23, 2017. You may now continue your research.

Please note the following information about your approved research protocol:

**Protocol Approval Period:** April 5, 2017 - April 5, 2018

**Approved Subject Enrollment #:** 50 (Currently 36 subjects enrolled).

**Additional Determinations for Research Involving Minors:** The Board determined that this research satisfies 45CFR46.404, research not involving greater than minimal risk. Therefore, in accordance with 45CFR46.408, the IRB determined that only one parent's/legal guardian's permission/signature is needed. Wards of the State may not be enrolled unless the IRB grants
specific approval and assures inclusion of additional protections in the research required under 45CFR46.409. If you wish to enroll Wards of the State contact OPRS and refer to the tip sheet.

**Performance Sites:**

UIC

**Research Protocol(s):**

a) A Qualitative Investigation of the College Transition Experiences of Students from High-Percentage Poverty High Schools and Non-High-Percentage Poverty Schools; Version 3; 03/11/2016

**Recruitment Material(s):**

a) Qualtrics Default Question Block (eligibility screening; secondary; no footer - not for mass testing)

b) Psychology Student Subject Pool procedures will be followed - no mass testing instruments; secondary subject screening will take place after potential subjects have initially responded to the opportunity

**Informed Consent(s):**

a) Debriefing; Version 1; 01/10/2016

b) Investigating the Transition to College; Version 3; 03/11/2016

c) A waiver of documentation (electronic consent/no written signature obtained) and an alteration of consent have been granted for the online secondary subject screening - not for mass testing under 45 CFR 46.117(c)(2) and 45 CFR 46.116(d) (minimal risk; no identifiable data retained)

**Parental Permission(s):**

a) A waiver of parental permission has been granted under 45 CFR 46.116(d) and 45 CFR 46.408(c); however, as per UIC Psychology Subject Pool policy, as least one parent must sign the Blanket Parental Permission document prior to the minor subject’s participation in the UIC Psychology Subject Pool.

Your research meets the criteria for expedited review as defined in 45 CFR 46.110(b)(1) under the following specific category(ies):

(6) Collection of data from voice, video, digital, or image recordings made for research purposes., (7) Research on individual or group characteristics or behavior (including but not limited to research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies.

**Please note the Review History of this submission:**

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<th>Receipt Date</th>
<th>Submission Type</th>
<th>Review Process</th>
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<td>03/23/2017</td>
<td>Approved</td>
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Please remember to:

→ Use your research protocol number (2016-0047) on any documents or correspondence with the IRB concerning your research protocol.

→ Review and comply with all requirements on the guidance, "UIC Investigator Responsibilities, Protection of Human Research Subjects" (http://research.uic.edu/irb/investigators-research-staff/investigator-responsibilities).

Please note that the UIC IRB has the prerogative and authority to ask further questions, seek additional information, require further modifications, or monitor the conduct of your research and the consent process.

Please be aware that if the scope of work in the grant/project changes, the protocol must be amended and approved by the UIC IRB before the initiation of the change.

We wish you the best as you conduct your research. If you have any questions or need further help, please contact OPRS at (312) 996-1711 or me at (312) 413-1518. Please send any correspondence about this protocol to OPRS at 203 AOB, M/C 672.

Sincerely,

Alma Milat, BS
IRB Coordinator, IRB # 2
Office for the Protection of Research

Subjects

Enclosure(s): will be forwarded as an attachment to a separate email.

1. Informed Consent Document(s):
   a) Debriefing; Version 1; 01/10/2016
   b) Investigating the Transition to College; Version 3; 03/11/2016

2. Recruiting Material(s):
   a) Qualtrics Default Question Block (eligibility screening; secondary; no footer - not for mass testing)
   b) Psychology Student Subject Pool procedures will be followed - no mass testing instruments; secondary subject screening will take place after potential subjects have initially responded to the opportunity

cc: Michael E. Ragozzino, Psychology, M/C 285
    Karina Olga Reyes, Faculty Sponsor, Psychology, M/C 285