College-Going Behaviors: Are there School Effects for the Rural Student?

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Abstract

This study considered the school effects of college going behavior for rural students. Of interest were the effects of location and college-going culture within a given school. The research questions asked, included:

1. What are the effects of rural school location and college-going culture on public high school graduation?
2. What are the effects of rural school location and college-going culture on college enrollment?
3. For the public high school graduates who enrolled in college, what are the effects of rural school location and college-going culture on the control structure of the college program enrolled?
4. For the public high school graduates who enrolled in college, what are the effects of rural school location and college-going culture on type of college program enrolled (two-year vs. four-year)?
5. For the public high school graduates who enrolled in college, what are the effects of rural school location and college-going culture on full-time vs. part-time enrollment?

The study used data from the HSLS:09 survey. The data was analyzed using Hierarchical Generalized Linear Modeling. This study found that the odds of attending college decreased 18.7% for rural students. There was also a 4.8% decrease in the odds of college enrollment by students from majority White high schools. School's with high mean GPA's were more likely to have students graduate from high school, enroll in college, and attend 4-year institutions. High rates of school problems negatively affected students and demonstrated decreased odd of high

school graduation and college enrollment. The role of counselors had demonstrated effects on students. Schools with counseling offices who focused a high number of hours on college counseling increase the odds their students graduate would from high school and attend a 4-year institution. Students attending high schools with a college counselor dedicated to college applications were 4.30 times more likely to attend a not-for-profit institution than a for-profit institution.

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General Audience Abstract

This study looks at the influence the high school students attend on their college going behavior. Using data from a national survey, it seeks to answer whether the high school a student attends influences their high school graduation, enrollment in college, and what type of college that student chooses to attend.

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Chapter 1

Introduction

In the decade between 2000 and 2011, the percentage of the population receiving a college education in the United States grew a scant 1.4 %. In comparison, countries in the OECD (Organization for Economic Co-operation and Development) saw an average of 3.3% growth in the percentage of their populations gaining a college education (Perna, Klein, & McLendon, 2014). For a sub-set of the United States population, this growth has been even smaller. While nearly 33% of urban adults had a college education in 2015, only 19% of rural adults did. From 2000 to 2015 the gap between urban adult college completion and rural adult college completion grew from an 11% gap in 2000 to a 14% gap in 2015 (United States Department of Agriculture [USDA], 2017). In 2014, 43.2% of the total adult population 18-24 is enrolled in any college program, for rural areas this rate is only 29.3% (National Center of Education Statistics [NCES], 2015). This slow growth is concerning not just for the United States in general, but for its individual citizens as well. Enrolling in college creates benefits for both the individual college enrollee as well as the nation as a whole (Baum, Ma, & Payea, 2013). Despite the noted benefits of a college education and resources expended on the postsecondary sector, U.S. college enrollment lags behind societal expectations that it will increase and increase greatly.

Every step up the educational ladder improves an individual's income. Even for college enrollers who do not receive a degree, the act of attending a college or university increases earning potential (Baum, et. al., 2013b; Baum, Kurose, & Ma, 2013; Jepsen, Troske, & Coomes, 2014). On average, students who enroll in community college but do not earn a certificate or degree earned $1,200 USD more per year than students who have a high school diploma but spent no time in college (Jepsen, et al., 2014). On an hourly scale, wages increase 17.5% for each level attained in education, while family income increased 21% for the same upward movement (Hout, 2012). For students who enroll in college, the return on investment in terms of increased income is 9% and higher than returns on any other monetary investment (Greenstone, Looney, Patashnik, & Yu, 2013). These seemingly small differences in income accumulate to significant differences in lifetime earnings. While an individual with a high school diploma will earn on average $1.3 million in their lifetime, this amount increases to $1.5 million for college enrollers without a degree, and up to $1.7 and $2.25 million for Associates and Bachelor degree recipients respectively (Carnevale, Rose, & Cheah, 2013).

While the monetary benefits of college enrollment are clear, the act of enrolling in college also buffers participants from labor force fluctuations and poverty (Baum, et. al. 2013a; Baum, et. al. 2013b). Even during the recent economic downturn students who enrolled in college experienced lower unemployment rates (Baum, et al., 2013b; Hout, 2012). During this time, high school graduates experienced unemployment rates of 7.4% for men and 5.2% for women. Women and men with at least some college education saw unemployment rates less than 5%, while workers with a bachelor's degree experienced unemployment at a rate less than 3% (Hout, 2012). In rural America the populations' education level directly influences unemployment level, with rural counties that are considered low-education having unemployment rate nearly 2% higher than rural counties without the low-education designation (USDA, 2017). The level of education individuals complete also influences their labor participation rates. The higher the degree of education, the more likely the individual is to participate in the labor market. This participation is a buffer against poverty (Baum, et.al., 2013a; Baum, et. al., 2013b).

Enrolling in college enables students to both protect themselves from poverty and experience social mobility for themselves and their families (Baum, et. al., 2013a; Baum et. al., 2013b; Greenstone, et. al., 2013). In 2011, only 2% of individuals with bachelor's degrees lived in households receiving SNAP (Supplemental Nutritional Assistance Program) benefits, while households with individuals who had only received a high school diploma received SNAP at a 12% rate (Baum, et. al., 2013b). The overall poverty rate also dropped as the educational completion level rose. When considering all households, 14% of households housing high school diploma recipients lived in poverty, compared to 11% of households with some college education, and 8% of households with an Associate's degree (Baum, et. al. 2013b). Earning a college degree creates social mobility. College graduates who were born in the lowest income quintile have chances of remaining in that quintile of only 16%, while their chance of breaking into the top quintile is 19% (Greenstone, 2013). College enrollment, even without degree completion can change the future of those who enroll.

While individuals benefit from college enrollment, society does as well. From a monetary perspective, higher earners contribute greater amounts to state and federal tax revenues (Baum et. al. 2013a, Hout, 2012). However, research has also shown that with each year of education, rates of smoking, heavy drinking, and BMI levels decreased. Better educated Americans had higher quality diets and rates of exercise, appropriate health screenings, seat belt and smoke detector use rose with each additional year of education (Cutler, Llera-Muney, and Vogel, 2008; Herian, Tay, Hamm, & Diener, 2014; Hiza, Casavale, Guenther, & Davis, 2013;). Individuals with higher education levels self-report fewer health issues as they age and lower rates of physical impairment (Mirowsky & Ross, 2008; Ross & Mirowsky, 2010; Ross, Masters, & Hummer, 2012). Higher education levels also raise levels of civic engagement, volunteerism, and knowledge of current events (Baum et. al. 2013a; Baum et. al. 2013b; Hout, 2012). A better-educated society is a happier, healthier, and more engaged society. For the United States to reach its full potential, more students should enroll in college.

However, there are certain locations in the United States where issues of low college enrollment are magnified. Areas of high poverty or concentrated poverty (Farrigan &Parker, 2012; Lichter, Parisi, and Taquino, 2012) face the troublesome consequences of lower education rates, including lower high school graduation and college enrollment by their students. These locations are predominately found in rural and urban areas where the poverty rate exceeds the national average by 6 and 7 percentage points respectively (HAC Rural Research Brief, 2012). Rural areas are finding their poverty rates increasing, between 2006 and 2010 193 non-metro counties were newly added as high poverty areas, compared to just 55 metro counties (Farrigan & Parker, 2012). Although rural areas face the same plight as urban areas, rural areas are often not studied with the same intensity as urban areas, thus leaving a large component of poverty and education research unattended (Lichter et. al. 2012; McDonough, Gildersleeve, and Jarsky, 2010; Wilcox, Angelis, Baker, and Lawson, 2014).

The number of students enrolled in rural schools is significant. More than 18% of school age children, nearly 9 million students, attend a rural school, and rural schools make up 28.5% of all school districts in the Unites States. These schools are not just facing higher poverty rates but the newest statistics show rural districts have high rates of minority student, English Language Learers (ELL), Individual Education Plan (IEP) holders, and students receiving free and reduced lunch (Showalter, D., Klein, R., Johnson, J., & Hartman, S. 2017). Rural students receiving free or reduced lunch at a rate of 48.2%, with 25.2% of rural students being minority, 3.5% needing ELL services and 13.4% needing services associated with an IEP. With the clear gap of educational attainment for rural students and an increased rate of poverty it is vital to focus research on rural schools.

Rural schools' challenges begin with higher dropout rates for their neediest students. While the overall dropout rate in rural areas is 11%, equal to the overall U.S. high school dropout rate, the dropout rate for rural students living below the poverty threshold is 23% the highest rate for any location or poverty level including urban students living below the poverty level who drop out at a rate of 18% (Provasnik, KewalRamani, Coleman, Gilbertson, Herring, and Xie, 2007). This creates an overabundance of both very poor and undereducated people residing in areas with the least resources.

Rural students do not only experience high dropout rates, (Peguero, Ovink, & Li, 2015; Provasnik, et. al., 2007; Roscigno, Tomaskovi-Dvey, & Crowley, 2006) but they are also less likely to enroll in any college. In 2016, just 61% of rural students enroll in college the fall after graduation (National Student Clearinghouse, Research Center [NSC}, 2017). If they do enroll, they are more likely to attend a two-year college and less likely to attend a selective university (Koricich, 2014). Studies show that place, whether geographic location or the particular school attended, is an important component in students' aspirations and decision-making (Demi, Coleman-Jensen, & Snyder, 2010; McDonough, 1997; Palardy, Rumberger, & Butler, (2015); Storer, Mienko, Chang, Kang, Miyawaki, & Schultz, 2012). With place a significant component of college choice, it is crucial that exploration focused on rural areas is included in the college choice research conversation.

There are multiples studies that consider college choice. The models they use are varied. The work by Hossler and Gallagher, (1987) laid the groundwork for the research on the process students use to make college related decisions. Desjardins, Ahlburg, and McCall, (2006), looks at student level phenomenon to model the odds of students attending college and most importantly the amount of aid the student expects. However, the focus on the individual is only one part of college choice process. There are additional factors that influence students' college going behavior. Using Bourdieu's (1977) idea of habitus, McDonough (1997) illustrates the way schools influence students' college going behavior. Perna (2006) uses McDonough's work to inform her four-level model of student college choice, specifically Perna's second context level, the school and community context. The conversation on college going behavior and college going choice cannot be truly understood unless school factors are considered, specifically for rural students.

Statement of the Problem

The rate in which the United States is creating new college graduates has lagged behind other industrialized nations (Perna, et. al., 2014). This is a concerning trend because college enrollment improves the outcomes for both the individual and American society (Baum, et. al., 2013a; Baum et. al., 2013b; Jepsen et. al., 2014, Greenstone, 2013). Increased levels of education lead to increased income and lower poverty rates for both individuals and families (Baum, et. al., 2013a; Baum et. al., 2013b; Carnevale et. al., 2011, Hout, 2012; Jepsen, 2014). Higher levels of education also lead to greater social mobility, more civic awareness, and healthier lifestyles overall (Baum, et. al., 2013a; Baum et. al., 2013b; Cutler & Llera-Muney, 2008, Hout, 2012, Mirowsky & Ross, 2008). The need for higher levels of education is most acute in rural areas of the United States where changing demographics (Farrigan & Parker, 2012; Johnson, et. al. 2014; Peguero et. al., 2015; Provasnik, et. al., 2007) have placed increased pressure on school systems and communities.

The college choice model and work on understanding students' college going behaviors has deep roots in research related to college enrollment, attendance, and successful college graduation. The model considers both student level characteristics and to a lesser degree school level characteristics. Perna (2006) used this methodology to identify the multiple contexts that effect a student's college choice.

Most scholarship on college choice considers college persistence and graduation. Research that looks at college choice often simply considers those who enroll and the type of institution they choose to attend; however, researchers often fail to consider the entire college choice pipeline including failure to complete high school, nor the type of enrollment students choose (full-time or part-time). Moreover, many of these studies look at specific populations based on student characteristics as opposed to school characteristics. In cases where school characteristics are considered, research often focuses on the urban student and school. My study fills the void by considering school differences in relation to college choice. By reviewing school differences within the college choice continuum from high school graduation, to college enrollment, to college enrollment type (full-time vs. part-time), as well as college institutional type, the existence and significance of school differences can be considered and addressed at the institutional level and beyond.

Conceptual Framework

There are many frameworks to that consider college choice and process students use to make those choices. However, since I have chosen to use HGLM as my method of statistical analysis, past research that used levels to explain students' college choice or college going behavior best represents my studies parameters. Perna's (2006) college enrollment model considers four levels of context that influence students' college choice. For the purpose of this research, only the first two levels of context will be considered. The first level of context is the individual student's habitus. In Perna's (2006) model, a student's habitus includes three domains. The first domain within a student's habitus is demographic characteristics, such as Gender, Race/Ethnicity, and Socioeconomic Status. The second domain of an individual's habitus is cultural capital. Unlike the consumer choice model, or rational choice model, a model including cultural capital considers a student's background and current existence as an influencer in their college choices (McDonough, 1997). Perna's (2006) cultural capital domain consists of two parts: cultural knowledge, and the value of college attainment. The final domain in level one of Perna's (2006) college choice model is social capital. Social capital in this model is defined as information about college and assistance with the college process. Level one of Perna's (2006) theory, the individual habitus domains, will serve as context for the level one or student level variables in my statistical analysis.

The second context level in Perna's college choice model is the school and community context. This level consists of three domains: (a) the availability of resources at a school, (b) the types of resources available, and (c) the structural supports and barriers. Previous work with Perna's school and community context level have defined these domains in a variety of ways. For the purpose of this study, I will use Engberg and Gilbert's, (2014) conceptual relationship of the high school organization habitus, with a focus on counseling opportunity structure to understand the college-going culture of rural schools.

The first layer of explanation in Engberg and Gilbert's (2014) conceptual relationship model describing college-going culture, was the high school organization habitus. This level contains three areas of interest: (a) school characteristics, (b) school population, and (c) school norms. My research uses all three areas of interest, combining school characteristics and school populations into the collection of variables labeled 'school environment.' The variables described by Engberg and Gilbert, (2014) and labeled as school norms have been renamed school behavioral norms for my study. Engberg and Gilbert's (2014) second layer, counseling opportunity structure, includes two spheres: norms and resources. The norms sphere considers three measures: (a) a counselor's average caseload, (b) hours spent by individual counselors on college counseling, and (c) how primary the goal of college counseling was to the schools counseling structure. My statistical analysis included one of Engberg and Gilbert's (2014), resources: the availability of college courses which has been relocated to level one under school environment. However, to extend the research, the school's resources will be redefined as a school's college preparation orientation. This sphere will include variables on hours spent on college counseling, the primary goals of counselors, the primary goals of counseling by administrators, and the alignment of these goals. Additional college preparation orientation variables include the existence of a counselor dedicated towards college and the existence of a counselor dedicate towards college applications. The domains and areas of interest included in Engberg and Gilbert's (2014) conceptual relationship model will serve as level two variables, or school level variables in my statistical analysis.

Purpose of the Study

This study examined school effects on college choice. Specifically, I was interested in the effects of rural high school location and college-going culture have on students' college-going behavior when controlling for both school and student level characteristics. The framework combined Perna's (2006) layer one, student habitus and layer two, school and community context layer of her four-layer college choice model using the "college-going culture" definition by Engberg and Glibert (2014). The college-going culture defined by Engberg and Gilbert (2014) focused on school resources, their type, availability, and how these resources are structured within a school.

The sample for this study included students attending public high schools where data on their school's college-going culture were available. Individual students' college-going behavior data also needed to be available for inclusion. Data from the High School Longitudinal Study 2009 (HSLS, 2009) were used to interpret the effects of location and college-going culture on college choice decisions. Data were analyzed using hierarchical generalized linear model for dichotomous outcome variables. The research questions asked, included:

1. What are the effects of rural school location and college-going culture on public high school graduation?
2. What are the effects of rural school location and college-going culture on college enrollment?
3. For public high school graduates who enrolled in college, what are the effects of rural school location and college-going culture on the control structure of the college program enrolled?
4. For the public high school graduates who enrolled in college, what are the effects of rural school location and college-going culture on type of college program enrolled (two-year vs. four-year)?
5. For the public high school graduates who enrolled in college, what are the effects of rural school location and college-going culture on full-time vs. part-time enrollment?

Significance of the Study

A variety of constituencies might find the results of this study important. College admissions offices and professionals are one constituency that might benefit from the findings. The study provided them with information on which school level factors influence the students' college choice decisions. Admission professionals could use the findings to better understand students from specific high schools and design recruitment strategies accordingly.

High school guidance counselors are another constituency that would benefit from these findings. The study's findings provided school characteristics that influence students' college choices. The study also indicated how essential creating college-going culture is. High school guidance counselors might use this information to create college guidance programs specifically designed for their students and institution.

Non-profits specializing in improving college access for high school students are another group who would benefit from reviewing the data from this study. By reviewing the data provided, non-profits can identify school locations and college-going cultures that would be best served by outside funding and resources to improve college access.

This study also served as the basis for future research. I considered school-based factors of college choice and the creation of a college-going culture using quantitative methods.

Additional studies concerning college-going culture could consider college choice based on school level characteristics within high schools of differing socio-economic status levels. By considering schools not by location, but by SES researchers can identify school systems in which time and resources need to be allocated to improve their college-going culture.

Further studies could also consider college graduation rates of students based on high school level characteristics. In considering college graduation rates, researchers could identify high schools and college-going cultures that best prepared their students not just for college enrollment but college completion as well.

Finally, my work informed future policy. This study examined the importance of college-going culture on students' college choice. The college-going culture of individual schools was measured by institutionally available college information at the high school. Policy makers may find these data useful when considering creating district or statewide mandates on the amount and type of college information available at the individual school level.

A second way my study informed future policy was by considering the availability of high-level academic courses as a part of creating a college-going culture and their influence on college choice. By considering factors such as the availability of Advanced Placement (AP) and International Baccalaureate (IB) courses, policy makers may find these data useful when considering funding for curricular offerings such as AP and IB courses.

Furthermore, my study informed future policy by focusing on school location. Policymakers interested in increasing college enrollment among students in particular geographic area, such as rural areas could benefit from this study. The results provided them with information concerning differences in school location and what effect this has on students' college choices. Policymakers might use this information to create policies concerning college enrollment specific to certain geographical locations.

Limitations

There are four identified limitations to the study. First, generalizability is a limitation of this study. Since the sample only included public schools, the data can only be generalized to other public high schools. This limits the study's usefulness to a select number of schools.

A second limitation is the changing definition of rural. The HSLS:09 had the addition of Town to its geographical descriptors. Previous studies (ELS:02), used three levels of geographic descriptors (Urban, Suburban, and Rural) to define school locale. In 2013, there were 7,156 public school districts categorized as rural but in 2003 there were 8,220 rural districts categorized by the CCD data, which was used in the ELS:02 study. The recategorization of more than 1,000 districts makes comparison to previous studies more difficult.

Another limitation of this study concerned the data set. Because variables were derived from an existing data, they may not have fit the needs of the study precisely. For example, college-going culture is composed of a collection of variables as found in HSLS (2009). A different data set might include alternative variables concerning college-going culture. In defining college-going culture with a different set of variables, the results may be affected.

Furthermore, some variables are self-reported from school faculty and staff. While the researchers assured the participants of the anonymous nature of their responses, it is possible school faculty and staff were not accurate or forthcoming with the correct data.

Despite the limitations, my study provided unique findings concerning the relationship between location and college-going culture and college choice for public school students.

Organization of the Study

This study is organized around five chapters. I began with a discussion of the topic, the research questions, and the significance of the study. A review of the appropriate literature related to the study comprises Chapter Two. In the third chapter, the sampling strategy, data collection, and analysis procedures are discussed. Chapter Four includes a description of the results. In the final chapter, the results are presented in terms of their implications for future practice, research, and policy.

Chapter 2

Review of the Literature

This chapter is a literature review of the existing works regarding school effects on college-going. The literature review is organized around the variables associated with my study. First, I review current and historical framework on college access, college choice, and college going. Next, I discuss school variables, including school location, type, percentage of students on free or reduced lunch, percentage of students participating in AP courses, and the racial makeup of schools. Third, I evaluate the literature associated with school behavioral norms, including school culture, and school discipline problems. In the fourth section, I discuss the literature relating to a school's college preparation orientation. In section five, I review literature pertaining to student level variables including students' sex, race, SES, and GPA. In the sixth section I review literature concerning my dependent variables, high school completion, college enrollment, college control, college program level, and college program time. In the final section, I summarize the existing literature and discuss the ways my study is different than previous works.

Conceptual Frameworks

As detailed in Chapter 1, this study uses the work of Perna, (2006) to inform the lens in which the variables chosen are viewed. Perna's (2006) model, updated and arranged specifically for variables available in the HSLS: 09 by Engberg and Gilbert, (2014) is the basis of both my theoretical and methodological framework. Perna (2006) describes her own work as moving away from college-choice behavior theory that considers "access" based on weighing decisions to attend college or not attend college (Hossler & Gallagher, 1987) and broadens it to include thoughts on not only college attendance, but where to attend. The model Perna created in 2006, uses Bourdieu's, (1977) idea of habitus but expands it to include not only the individual, but also their school and community, higher education, and the state level financial and policy influencers in ever widening spheres. This is not the first such expansion. McDonough, (1997) used Bourdieu's, (1977) idea of habitus and expands it from the original existence in families and communities to include organizations and the notion of organizational habitus. Perna (2006) attributes the second level of her model, the school and community level to McDonough's (1997) conception of "organizational habitus" specifically the role of high schools. The work by Perna (2006) and McDonough (1997) use and extend Bourdieu's (1977) ideas on habitus and cultural capital to inform a new theoretical approach to college choice and college going behavior.

One of the ways Perna's (2006) work differed from previous frameworks was the acknowledgment that students were different based upon individual characteristic of themselves and their communities and schools. The field as a whole is shifting from large all-inclusive models to models like Perna's that consider the individual student (Bergerson, (2009). However, these large all-inclusive models cannot be ignored because they created the foundation for research on student's college going. One of the most informative and influential models was produced by Hossler and Gallagher (1987). This model contains three phases that students move through in a given time. The first stage is called "predisposition" where students garner information from their surroundings about college, future ambitions, and expectations. The second stage is the search phase. In this phase, students gather information and complete tasks to make themselves college ready like taking the ACT or SAT's. Unlike newer works (Belasco, 2013; McDonough, 1997; Robinson & Roksa, 2016; Pham & Kennan, 2011) Hossler and Gallagher (1987) focused mainly on parental dissemination of knowledge of college for their students. The final stage of Hossler and Gallagher's model, is the choice stage. Students' chose and enroll in a college program and their choices and are most influenced by the secondary institutions themselves.

A few years after Hossler and Gallagher's model was created, Michael Paulsen wrote a lengthy report on college choice for ASHE. This monograph (Bergerson, 2009) was an informative collection of ideas and facts for colleges and institutions to explain the college going process students experience and how and why they chose certain institutions. Paulsen's work is process focused with an economic lens (Paulsen & St. John., 2002; Toutkoushian., & Paulsen, 2016). Building on Hossler and Gallaher's (1987) model, his five stages detail the process both students and their families experience when making college choices. The stages are predisposition, initial search, application, admission, and enrollment. This model is process based, meaning a student would need to make a decision at each stage of the process to move on to the next stage of the process. The structure makes assumptions about both who makes college decisions (students and families) which may or not be the case, and that students decision is finalized before they move to the next stage in the process. This process-based model focuses economic theories of rational thinking and economic returns on the college process (Paulsen & St. John, 2002). The use of economic theory, more specifically the human capital model, has been used throughout higher education and college choice literature it is often found in the work of Stephen DesJardins and his co-authors (DesJardins, Dundar, & Hendel, 1999; DesJardins, S., Ahlburg, & McCall, 2006; Leeds, & DesJardins, 2015. His body of work focuses on using human capital to explain college choice decisions students make in relation to the financial aid they receive. While his newer work looks specifically at underrepresented groups, a critique of economics-based works is the treatment of students from differing backgrounds as similar. (Furquim, Glasener, Oster, McCall, & DesJardins, 2017). Perna's (2006) work uses economic factors within her model, however the focus is on the relationship between these factors and the individual student and not solely on the process or the economic factors. While both process and economics-based studies demonstrate important aspects of college going behavior they did not fit my theoretical and methodological approach.

Dependent Variables

High School Completion

This study has five dependent variables. The first was *High School Completion*. To participate in college-going, students must graduate from high school or earn a high school equivalency diploma. The ability to consistently and correctly discern dropout rates is a challenge researchers face. Depending upon which data set used, the dropout rate varies significantly (Heckman & LaFontaine, 2010). Some studies indicate that urban and rural schools have higher dropout rates than their suburban counterparts (Peguero, Ovink, & Li, 2015; Roscigno, et al., 2006; Strange, 2011). Other studies have shown that there is no statistical difference in the dropout rates by the urbanicity of the school (Jordan, et al., 2012; Mykerezi, Konstandini, Jordan, & Melo, 2014).

Besides urbanicity, other school characteristics contribute to the dropout rate. The socio-economic status of the school can greatly affect the dropout rate. Students in poorer schools are more likely to dropout (Peguero, et al., 2015). A school's behavioral norms also affect dropout rates. Schools with higher rates of disorder have students who are more likely to dropout (Jordan, et al., 2012; Peguero, et al., 2016, Peguero, et al., 2015). Schools with strong teacher student relationships are shown to have lower dropout rates (Barile, et al., 2012).

Dropout rates vary by gender and race. Black, Hispanic, Native American, and Multiracial students are shown by some studies to drop out at higher rates than White students

(Heckman &LaFontaine, 2010; Peguero, et al., 2016). However, Jordan et al. (2012) found that in rural areas Hispanic and Black men were more likely to graduate high school that White men.

College Enrollment

The second dependent variable was *College Enrollment*. The variable *College Enrollment* is defined by a student enrolling in college classes towards a degree by the Fall after they graduate high school. Enrollment patterns vary greatly across the population. Students who attend high SES schools are more likely than students in either middle SES or low SES schools to enroll in a college program versus no college enrollment (Engberg & Wolniak, 2014). In one study, students at low and middle SES schools reported that counselors did not promote college but instead promoted high school graduation as the ultimate educational goal (Martinez & Deil-Amen, 2015). Schools with high level of college counseling, including offering financial aid assistance and college fairs, saw higher college enrollment (Engberg & Gilbert, 2014). The urbanicity of schools also influences the college enrollment behavior of students. Students who live in rural areas were less likely to enroll in college than students living in metropolitan areas (Koricich, 2011).

College Program Level

The third dependent variable was *College Program Level*. This variable, describes the type of program a student enrolls, either two years or four years. Students who attend high SES schools are more likely to enroll in four-year programs compared to their middle and low SES school counterparts. Both middle and low SES schools saw more students enroll in two-year colleges than high SES schools. Low SES schools had higher rates of non-enrollment in college than enrollment in two-year programs (Engberg & Wolniak, 2010; Engberg & Wolniak, 2014). The urbanicity of schools also influences the college program level in which students enroll. Students who live in rural areas were much more likely to enroll in two-year programs than their metropolitan counterparts (Koricich, 2011). Schools with strong college preparatory orientations have higher four-year college enrollment (Engberg & Wolnick, 2010; Robinson & Roksa, 2016).

Just as students in lower SES schools are less likely to enroll in a four-year degree program, so are students with lower family income. Students in the lowest income levels are the least likely to enroll in college and if they do enroll much less likely to enroll in a four-year program than their wealthier peers (Daun-Barnett, 2013, Klasik, 2011, Koricich, 2011). Other student characteristics are significantly related to enrollment in four-year institutions. A student's race, particularly for men, has influence on college program level enrollment behavior. As previously noted, Black students are both applying to and enrolling in four-year colleges at a significantly higher rate than White students (Belasco, 2013; Engberg & Wolniak, 2009; Grodsky & Riegle-Crumb, 2010; Koricich, 2011; Stephan & Rosenbaum, 2013).

College Control and College Program Time

The final two dependent variables were *College Control* and *College Program Time*. The college control variable describes the type of postsecondary environment a student enrolls. Recently, there has been great deal of public debate concerning college control specifically between for profit and nonprofit schools. This variable considers whether the college enrolled is a for-profit institution, or a non-profit public, or a non-profit private institution. Few researchers consider this difference when discussing rurality or college-going culture. Some research shows that rural students are more likely to attend public institutions (Korichich, 2011). Low-income students were also shown to apply to more public institutions (Engberg, 2012). The limited amount of research considering this variable makes it a valuable addition.

The variable *College Program Time* considers whether a student enrolls full-time or part-time in an institution directly after college. Data on this phenomenon is even scarcer than

College Control. While many studies look at part-time learners, they do not consider them from high school effects standpoint.

Student Variables

Student Sex

In this study, *Student Sex* is included as a student variable. It is widely known that women are enrolling in college at a greater percentage than men (Klevan, Wienberg, & Middleton, 2015; Korichich, 2014). The extent of this difference is commonly debated and can differ depending upon other variables (Belasco, 2013). Men are less likely to graduate from high school than women (Heckman & LaFontaine, 2008). The sex enrollment difference can be seen early in college consideration. Most studies show more girls have the intention and expectation of going to college than boys (Byun, et al., 2012b; Chenoweth & Galliher, 2004; Wells, et al., 2011). However, work by Byun et.al, (2012a) indicated male students in rural areas had higher educational expectations than women if they had high teacher expectations placed upon them. Women were more likely to use “admission-enhancing strategies,” i.e. college visits and test preparation services according to Wells, et al. (2016, p. 20). While the sex differential in college-going, behavior was found across the board, it is more pronounced within certain demographics, specifically between Latino men and women. Latina’s are three times as likely to enroll in a 4-year university when compared to Latino men (Nuñez & Kim, 2012).

Student Race

In this study, *Student Race* is included as a student level variable. The role a student’s race plays in high school completion and college attendance is vast and multilayered. A well-documented shift in college attendance in recent years, finds Black students are both applying to and enrolling in four-year colleges at a significantly higher rate than White students (Belasco, 2013; Engberg & Wolniak, 2009; Grodsky & Riegle-Crumb, 2010; Koricich, 2011; Stephan &

Rosenbaum, 2013). Some are finding similar data for Hispanic students in both college enrollment and likelihood of applying to a four-year institution (Belasco, 2013; Grodsky & Riegle-Crumb, 2010). Other studies show Asian students with the highest four-year enrollment rates and Hispanic students with the lowest four-year enrollment rates. Black and White students falling in between and with no statistical difference between the Black and White student's four-year enrollment. (Kim & Nuñez, 2013).

The enrollment differences between Black and White students can be traced to college preparation behavior. Black students are more likely to participate in test prep and have higher expectations of the college degree they will receive (Park & Becks, 2015; Wells, 2010). Black and Asian students are also less likely to under match when completing college applications (Rodriguez, 2013). One study found there is a significant racial difference only when looking at enrollment rates. While students were accepted to college at the same proportion in which they applied, Hispanic and Native American students were less likely to accept enrollment than their Asian counterparts. Black and White student's acceptance rates at four-year institutions were very similar. However, Black students were 25% less likely to enroll most likely due to differences in SES and college preparation (Klasik, 2012).

Where students live in conjunction with their race influences their college-going rates. Black students living in a metro area were less likely to attend college by nearly 60 percentage points, while Hispanic and Asian students were more likely to attend college if they resided in a metro area versus a non-metro area (Koricich, 2011). Another study found that Hispanic and Black men who reside in rural areas are more likely to graduate high school than their White male counterparts. The graduation rate differences were found after holding for all other influences and may be due to a low sample size or less peer group influences according to the authors (Jordan, Kostandini & Mykerezi, 2012). However, other studies found that African America, Native America, Latino/a, and multiracial students were more likely to dropout overall. These differences are most likely linked to greater chance of minority children growing up in disadvantaged families than in the past and compared to White children and the higher chance these students will attend schools with high dysfunction rates (Heckman & LaFontaine, 2008; Peguero, et al., 2016).

Student SES

In this study, *Student SES* is a composite variable on a continuous scale, accounting for more than a student's family income, but including other important considerations of a student's SES including parental schooling and employment. It is well documented that students from lower SES households are more likely to drop out of high school and less likely to enroll in college, particularly four-year institutions (Barile, Donohue, Anthony, Baker, Weaver, & Henrich, 2012; Blesco, 2012; Byun, Meece, & Irving, 2012; Kim & Nuñez, 2013; Korichich, 2014; Oseguera & Hwang, 2014; Robinson & Roksa, 2016). A study found that high-income students were 19% more likely to enroll in college than middle-income students and twice as likely to enroll in college than students with family incomes less than $25,000 (Klasik, 2012). One study found the difference in enrollment by SES was particularly true for low-income rural students who are less likely to enroll in college compared to their low-income suburban and urban counterparts (Byun, et al., 2012a). However, a different study showed the effect of SES on college enrollment was less pronounced for non-metro students than it was for students residing in a metropolitan area (Korichich, 2014).

Low SES students' relationship with their academic environment does influence their college-going. Low SES students who seek guidance from a counselor concerning college found it as constructive as their higher SES peers (Robinson & Roksa, 2016). In some cases, the effect size of meeting with a counselor concerning college was greater for low-income students than their higher SES classmates (Belasco, 2012). The more college information low-income students sought the greater the likelihood of attending a two-year college vs. not attending (Engberg & Wolniak, 2014). Income is also an important and significant predictor in whether a student will complete applications and take college admissions test (Duan-Barnett, 2013).

Student GPA

In this study, two iterations of the variable *X3TGPATO* (X3TGPATO, Student GPA) were included as a student variables to demonstrate final high school GPA. Students who achieve a higher GPA were more likely to attend college and to attend a 4- year institution (Engberg & Wolniak, 2009; Klevan, et al., 2015; Stephan & Rosenbaum, 2013). While many studies examined test scores to indicate likelihood of college enrollment, one study found that a student's GPA was a better predictor of college enrollment then their ACT score (Roderick, Nagoka, & Coca, 2009). An increase in students' GPA made them more likely to attend a two-year school vs. not attending college, attend a four-year school vs. not attending college, and more likely to attend a four-year school instead of a two-year school (Belasco, 2013).

School Variables

School Environment

School location. For this study, the variable *School Location* describes the urbanicity of the community in which the school is located. According to NCES, (2006), a city is any territory within an urbanized area and a principled city with at least 100,000 people. They define a suburb as an area outside a city but inside an urbanized area. A town is defined as area inside an urban cluster. Finally, rural areas are defined as areas outside both an urban cluster and outside an urbanized area (NCES, 2014). Urbanicity of schools and how it relates to college-going has been widely studied. However, these studies often focus on urban schools. Rural students and their schools face many of the same challenges urban students and schools face, but also face challenges that are unique. Rural students are significantly less likely to enroll in college than urban students (Koricich, 2014; Hu, 2013). One significant reason is rural students have a lower overall SES status (Byun, Meece & Irvin, 2012). The location of a low SES school is three times more likely to be in a rural area (Palardy, 2015). Enrolling in a four-year college is also significantly less likely for rural students (Koricich, 2014; Wells, Seifert, Padgett, Park, & Umbach, 2011). Low income rural students who have access to highly selective universities are more likely to under match than their urban counterparts (Koricich, 2014; Belasco & Trivette, 2015).

The difference between urban and non-urban schools goes beyond college enrollment, non-urban schools have lower educational expectations for their students than urban schools. Counselors in rural schools believe their students will stay closer to home, and join the workforce or military directly after college more often than counselors at urban schools. (Neale-McFall & Owens, 2016; Wells, 2010). Rural schools are also the significantly underfunded compared to non-rural schools (Neal-McFall & Owens, 2016; Roscigno, et. al., 2006). Students in rural schools are found to have higher academic involvement but a weaker commitment to school, were less likely to aspire to college or graduate schools, had lower academic achievement, and were more likely to drop out (Irvin, Meece, Byun, Farmer, Hutchins; 2012; Meece, Hutchins, Byun, Farmer, Irvin, & Weiss, 2013; Peguero, et. al., 2015; Roscigno, et. al. 2006). While SES status is often a buffer against dropping out, higher income in rural areas has a negative impact on high school graduation (Jordan, Kostandini, & Mykerezi, 2012). Black male students living in rural areas holding other factors constant (academic achievement and SES) have significantly lower educational aspirations in terms of what college degree they hope to hold at age 30, than their suburban counterparts (Strayhorn, 2009). However, another study showed that Hispanic and Black males in rural areas were more likely to graduate high school than rural White males (Jordan, Kostandini, & Mykerezi, 2012).

School type. Few studies consider *School Type* beyond comparing public and private schools. This study only considers public schools and the *School Type* variable describes the type of public school in which a student is enrolled (i.e., charter school, special program school, technical school, alternative school and general education school). With the advancement of school choice, differing types of public schools are more common than they were for past data sets. Students who attend high schools considered college preparatory instead of vocational, general, or other were more likely to say they were college bound (Chenoweth & Galliher, 2004).

School lunch and School Mean SES. For this study, there are two variables to act as proxies for a school's socio-economic status. The variable *X2Freelunch* describes the percentage of students within a school receiving free and reduced lunch. *School Mean SES* takes the composite SES value from *X2SES* and creates an average for students within the given school. Both variables are regularly used as proxies for a school's economic status (Roscigno, et. al. 2006; Wells, Wolniak, Engberg, & Manly, 2016). Some studies have found low SES schools, or schools where a high percentage of students receive free and reduced lunch differ significantly in college enrollment rates and the type of college in which their students enroll (Grodsky & Riegle-Crumb, 2010; Plardy, 2015). Students attending schools with high rates of free and reduced lunch recipients also have lower college choice organizational habitus, and are less likely to be encouraged to attend or actually to attend a four-year institution, and are more likely to enroll in a two-year institution or not enroll (Blesco, 2013; Engberg & Wolniak, 2011; Nuñez

& Kim, 2012; Plardy, 2015). The more students in a given school receiving free and reduced lunch, the greater the likelihood a student of that school will drop out (Peguero, Merrin, Hong, & Johnson, 2016). However, other studies did not find significant differences in college-going rates when comparing the SES of the high schools attended (Engberg & Gilbert, 2013).

School AP and Mean School GPA. For this study there are two variables associated with students' academic strength. *School AP*, which is presented in two ways, indicates the percentage of students taking AP courses in a bivariate manner (cut-off of 40%) and *A1AP* is the AP rate identified in a continuous manner. *Mean School GPA* is a variable constructed by averaging the GPA's of the participating students in a given school. Both mean school GPA and AP participation rates are common proxies for schools' academic strength (Black, Lincove, Cullinane, & Veron, 2014; Byun et. al. (2012); Rodriquez, 2013). Availability of AP courses varies between schools, however students attending rural schools are less likely to take academically challenging courses than their urban and suburban counterparts (Byun, Meece, & Irvin, 2012). Nearly half of rural districts offer no AP courses, compared with only 2.6% of urban districts not offering AP options (Gagnon & Mattingly, 2015). Offering AP courses to students is directly related to a school's college preparation orientation (Park & Becks, 2015). Schools with a high college preparation orientation are more likely to have students enroll in four-year colleges (Engberg & Wolniak, 2010). However, even students in rural areas who take the AP course still face disadvantage, rural students have lower rates of AP success, even when a student's socioeconomic status is considered (Gagnon & Mattingly, 2015).

School race. For this study, school race is identified in two ways. First, *School Race* is the percent of minority students who attend a given school as a bivariate value (cut off is 50%). Secondly, *X1schwhite* is used as a continuous variable identifying the percent of White students enrolled in a given school. These variables are considered a proxy for a school's social capital and often included in research on school effects (Rodriguez, 2013). For rural students, specifically, the effect school race has on students' college choices is unclear. Unlike previous studies, Byun, et al. (2012b) found that after holding other variables constant, school race did not have an impact on student's educational aspirations. This same group of researchers (Irvin, Meece, Byun, Farmer, & Huchins, 2011) previously found that in rural high poverty communities, a higher proportion of Black students projected higher educational achievement, while in low poverty communities a higher proportion of Black students predicted lower educational achievement. In one study, higher rates of Black and Latino students led to a higher dropout rate for girls. While for boys, when holding constant all other factors, only a greater percentage of Black students dropped out (Peguero, et al., 2016). A study by Black (2014), found that grade points dropped .08 with a one standard deviation increase in Black students. While aspirations, achievement and grade points are important to college-going, other studies have shown that school race does not influence the college enrollment or college-going rates (Engberg & Wolniak, 2010; Engberg & Gilbert, 2014).

School Behavioral Norms

In this study, school behavioral norms are analyzed by using two separate variables, *School Climate,* a variable which looks at violence within a school and *School Problem* which includes student academic behavior, parental involvement, and school related expectations. Some studies showed for both male and female students as their perception of school disorder rises, so does the likelihood they will drop out of high school (Jordan, Kostandini, & Mykerezi, 2012; Kotok, Ikoma, & Bodovski, 2016; Peguero, et al., 2016). Yet, a study by Kim, Gendron, Toro, and Fairborn (2011), showed no statistical significance between school climate and dropping out.

The picture is even less clear when considering college enrollment and school behavioral norms. A study examining absenteeism, found no statistical difference in the rate of enrollment in either 2- year or 4- year institutions and a school's rate of absenteeism (Kim & Nuñez, 2013). However, other studies showed that as the frequency of violence at a school increased, the college enrollment rates decreased (Engberg & Gilbert, 2014). There is a connection between school environment and educational outcomes. Students who perceive hostility at their high schools have lower rates of academic achievement, a precursor for college enrollment (Irvin, et al., 2011; Ripski & Gregory, 2009). This finding was true for both individual students, as well as a student body's collective perception of hostility. Students of different genders and races often perceive the same school's climate differently. However, these were student level differences and were not statistically related to school variables such as free and reduced lunch or school size (Fan, Williams, & Corkin, 2011). Another study found schools had a significant effect on attending student's behavior (Palardy, et al., 2015). One study showed the college enrollment rate increased 42% for low SES students and 41.5% for high-income students if their parents perceived the school they attended safe (Oseguera & Hwang, 2014).

College Prep Orientation

For this study, an analysis of schools' college preparation orientation included six variables. The first variable was *Administrator,* which was the primary college goal of the administrator. The second variable was *Counselor,* which represents the primary goal of the college counselor. The third variable *Aligned* was a composite of the previously mentioned variables which indicated whether goals are aligned between the administrator and the counselor and if the primary goal for the counseling office was postsecondary preparation. Multiple studies have discussed the importance of creating a school wide college-going culture. However, few have conducted a quantitative analysis of the existence of school wide alignment and then used it to understand its effects on students' pursuit of college. The importance of both counselors and administrators believing college-going to be the number one goal of the counseling office is an important first step in creating and supporting a school wide college-going culture. The alignment of these goals illustrates that the college-going focus is school wide and helps to strengthen it. Without support school wide, the creation of a college-going culture is difficult. (Jarsky, McDonough, & Nuñez, 2009). Higher expectations of students within a school result in higher educational attainment (Byun, et al., 2012b; Jarsky, et al., 2009; Roderick, Coca, & Nagaoka, 2011; Vela, Flamez, Sparrow, & Lerma, 2016). In high performing, low income, rural schools, the school's college-going culture was one of collaboration and the belief that all students could succeed post-graduation. These schools saw higher graduation rates for their most at-risk students when compared to low performing schools that did not possess the college-going collaboration and belief (Wilcox, et al. 2014). Students attending schools with high and moderate college-going cultures were much more likely to attend a four-year college versus not applying at all than students who attended a school with a low college-going culture. This finding held even when considering a range of school characteristics (Robinson & Roksa, 2016). The creation of a school wide college-going culture buoys students' expectations of themselves. In one example, students described their college-going ambitions being supported by the entire school, with teachers assigning homework related to the college search process, the principal making college announcements, and almost all naming their counselor as their primary source of college information (Means, Clayton, Conzelmann, Baynes, & Umback, 2016). Yet, Grodsky and Riegle-Crumb (2010) found that students' college-going behavior was not influenced by their school's college-going culture.

Low-income rural students were more likely to talk to teachers than counselors about their future, and found teachers the most helpful in these conversations (Griffin, Hutchins, & Meece, 2011). The more representatives low-income students sought college information from the more likely they were to attend either a two-year or 4- year college versus no college (Engberg & Wolniak, 2011). However, while there are multiple sources for college support, the role of the counselor cannot be overlooked (Nelson, 2016). A recent study confirmed that counselors were the greatest resource for college information (Robinson & Roksa, 2016).

In addition to considering the effects of the primary goals of administrator and counselor and their alignment, the fourth, fifth, and sixth variables were analyzed to create a complete picture of a school's college preparation orientation. The fourth variable was, *Counselor Hours (*VHHOURS, HHOURS, AHOURS, LHOURS, VLHOURS) which identified the number of hours counselors spent working on college. The fifth variable *C2select* indicated the existence of a dedicated counselor for college. Finally, the sixth variable *C2clgapp* was the existence of a dedicated counselor for college applications. While the variable tracking the number of hours counselors spent on college has been reviewed by prior studies, the fifth and sixth variables are new to the HSLS:09 and have very little literature directed toward these considerations. Students who have less access to college counselors are less likely to attend college, and if they do enroll they are more likely to under match at the college in which they enroll (Rodriguez, 2013). Depending on either the district-wide or statewide policies, the occurrences of dedicated college counselors vary greatly (Perna, Rowan-Kenyon, Thomas, Bell, Anderson, & Li, 2011). The role the counselors play within a school varies greatly. Urban counselors are more likely to spend time on postsecondary planning with their students than rural counselors, and rural counselors are likely to have less experience in their position (Neale-McFall & Owens, 2016). The availability of a counselor is directly related to the rate in which students, including low income and first-generation students, enrolled in four-year colleges (Belasco, 2013; Robinson & Roksa, 2016; Pham & Kennan, 2011). Students who speak with a counselor were also more likely to partake in college entrance exam preparation (Park & Becks, 2015). Students who attended schools with less available counselors acutely felt the shortage and often did not seek their assistance. They also took college entrance exams at lower rates (Holland, 2010; Woods & Domina, 2014). Students with college counselors dedicated to college guidance expressed "a familiarity with and a great deal of confidence in the knowledge, reliability and helpfulness of this person" (Bell, Rowan-Kenyon, & Perna, 2009, p. 674).

Summary

In summary, this work is using a conceptual framework by Perna, (2006) updated by Engberg and Gilbert (2014). Perna's work grows from the previous work of McDonough, (1997) and Bourdieu, (1977). The literature illustrates, both school and student characteristics affect a student's college-going behavior. Students enrolled in rural high schools are less likely to enroll in four-year colleges than their urban peers (Koricich, 2014; Wells, et al., 2011). These students are also more likely to have lower academic achievement, weaker commitment to school, less likely to aspire to college, and more likely to drop out (Irvin, et al., 2011; Meece, et al., 2013; Peguero et al., 2015; Roscigno, et al., 2006). High schools described as college preparatory, and with high levels of student engagement in AP courses, showed higher rates of four-year college enrollment (Chenoweth & Galliher, 2004; Engberg & Wolniak, 2010; Park & Becks, 2015). Students attending poorer schools as indicated by high numbers of students receiving free or reduced lunch are less likely to enroll in college, less likely to enroll in a four-year college or university, and more likely to attend a high school with a lower level of college preparation orientation (Blesco, 2013; Engberg & Wolniak, 2011; Nuñez & Kim, 2012; Plardy, 2015).

The racial composition of a school can affect students' college-going behavior. However, the effects of these characteristics are less clear-cut than the previously discussed school characteristics. Studies have shown a school's racial composition does not influence the college enrollment or college-going rates of the students within that school (Engberg & Wolniak, 2010; Engberg & Gilbert, 2014). While other studies have shown the racial composition of a school significantly effects aspirations, achievement, and GPA's, which are important precursors for college-going behavior. (Black, 2014; Byun, et al., 2012b).

Like a school's racial composition, school norms or the level of disorder found in a school does not have clear cut relationship to a student's college-going behavior. One author found no significant relationship between dropping out and school climate (Kim, et al., 2011). While other studies illustrated a higher likelihood of dropping out with higher perceptions of school disorder (Jordan, Kostandini, & Mykerezi, 2012; Kotok, et al., 2016; Peguero, et al., 2016).

Finally, a school's college preparation orientation can positively affect students' college-going behavior. Schools experience higher educational attainment as the academic expectations of the students increase (Byun, et al., 2012b; Jarsky, et al., 2009; Roderick, et al., 2011; Vela, et al., 2016). Students who attend a school with a high level of college preparation orientation are more likely to enroll in four-year colleges (Belasco, 2013; Robinson & Roksa, 2016; Pham & Kennan, 2011). Enrollment in four-year colleges is also positively influenced by the availability of a college counselor (Belasco, 2013; Robinson & Roksa, 2016; Pham & Kennan, 2011).

Student characteristics affect a student's college-going behavior in a multitude of ways. Students from low SES households are less likely to enroll in college, less likely to enroll in a four-year college or university, and more likely to have dropped out of high school (Barile, et al., 2012; Blesco, 2012; Byun, et al., 2012a; Kim & Nuñez, 2013; Korichich, 2014; Oseguera & Hwang, 2014; Robinson & Roksa, 2016).

A student's race and gender also influence college-going behavior. Men's likelihood of enrolling in college is significantly less than women's (Klevan, et. al, 2015; Korichich, 2014). Women are also more likely to graduate from high school (Heckman & LaFontaine, 2008). Students of color (Black, Latino/a, Native American, and multiracial students) are more likely to drop out of high school than White and Asian students. (Heckman & LaFontaine, 2008; Peguero, et al., 2016). However, White students enroll and attend four-year colleges at a significantly lower rate than Black students (Belasco, 2013; Engberg & Wolniak, 2009; Grodsky & Riegle-Crumb, 2010; Koricich, 2011; Stephan & Rosenbaum, 2013).

Finally, a student's GPA influences their college-going behavior. Studies have found that GPA is a more appropriate metric for college preparation because it demonstrates academic aptitude as well as school engagement and rule following behaviors. The likelihood of a student attending college and attending a four-year school increases as a student's GPA increases (Engberg & Wolniak, 2009; Klevan, et al., 2015; Stephan & Rosenbaum, 2013).

Most of the existing data on college-going behavior simply examines at college enrollment and college program time. While my research considers these variables, it also includes high school graduation. Students cannot enroll in college without a high school diploma or an equivalency certificate. As such, I consider high school graduation as an important marker for college-going behavior. Virtually no studies investigate college control through the lens of the high school attended, therefore this variable is an important addition. Finally, like college control, considering college program time through the lens of the high school attended has not been greatly studied making it a strong addition.

In using Hierarchical Generalized Linear Modeling (HGLM), I continue the growing number of researchers using this method as a tool to considered nested groups. By using this method with HSLS:09 data, I am at the forefront of work on the recently released follow up to the data set. This data set, with its construction and focus on college-going behavior and college preparation by schools, offered strong and newly conceived variables that will add to the discussion on school effects of college-going. Finally, by considering the urbanicity of schools with a focus on rural schools, an important and under researched population is given academic consideration.

Chapter 3

Methodology

This study examined school effects on college choice. Specifically, I was interested in the effects high school location and college-going culture have on students' college-going behavior when controlling for both school and student level characteristics. The framework combined Perna's (2006) layer one, student habitus and layer two, school and community context layer, of her four-layer college choice model using the "college-going culture" definition by Engberg & Glibert (2013). The college-going culture defined by Engberg & Gilbert (2013) focused on school resources, their type, availability, and how these resources are structured within a school.

The sample for this study included students attending public high schools, where data on their school's college-going culture were available. Individual students' college-going behavior data also needed to be available for inclusion. Data from the High School Longitudinal Study 2009 (HSLS, 2009) were used to garner the effects of location and college-going culture on college choice decisions. Data were analyzed using hierarchical generalized linear model for dichotomous outcome variables. The research questions asked were:

1. What are the effects of rural school location and college-going culture on public high school graduation?
2. What are the effects of rural school location and college-going culture on college enrollment?
3. For the public high school graduates who enrolled in college, what are the effects of rural school location and college-going culture on the control structure of the college program enrolled?

4. For the public high school graduates who enrolled in college, what are the effects of rural school location and college-going culture on type of college program enrolled (two-year vs. four-year)?
5. For the public high school graduates who enrolled in college, what are the effects of rural school location and college-going culture on full-time vs. part-time enrollment?

This chapter describes the data analysis procedure used for this study. First, I provided a description of the HSLS '09 dataset used for this study. Second, I examined the variables included in this study. Third, I described the data analysis procedure used for this study. The results of this study are discussed in Chapter 4. In Chapter 5, based on the results, I discussed the implications of this study for future practice, research, and policy.

High School Longitudinal Study of 2009

The High School Longitudinal Study of 2009 was designed to "explore secondary to postsecondary transition plans and the evolution of those plans" (Ingles et. al, 2013, pg. 7). This study allows for the review of both student, and institutional, effects on outcomes. The study also shifts from the structure of prior research to follow students from their 9th grade year through graduation, and into adulthood. Unlike prior studies, which examined students in 8th grade, 10th grade, 11th grade, and 3 years out of high school with a freshening of the data to establish multiple nationally representative grade cohorts; the HSLS:09 follows the 2009 cohort of 9th grade students and therefore is only representative of 9th graders in 2009.

The HSLS:09 data set contains variables from a base year survey collected in 2009 from students, parents, Math and English teachers, school administrators, and school counselors. In addition, students were also asked to complete an algebraic reasoning assessment. The first-follow up was conducted in the spring of 2012, or spring of the student's 11th grade year. Again, students, parents, school administrators and school counselors were surveyed. A second student algebraic reasoning assessment was distributed and a special questionnaire for dropouts was introduced. A postsecondary update was completed in the summer or fall of 2013 and focused on student's secondary plans as well as collection of transcripts. The second follow-up took place in 2016, with a third follow up and postsecondary transcript collection scheduled for 2024.

Instrument Sampling

The participants for the HSLS: 09 survey were selected by the study's researchers in a two-phase process. In the first phase, schools were selected through stratified random sampling and school recruitment. Although 1,889 eligible schools were identified, only 944 schools chose to participate in the study. The second phase of the sampling process was random selection of students from participating schools. The students were selected randomly from the 2009, 9th grade enrollment lists provided by the schools participating in the study. In a second stage of sampling for students involved, the researchers included lists defining students by race to meet the analytic goals of the survey. As a result, Asian students were oversampled. Slightly more than 25,000 students (25,206) were eligible to participate, with 21,444 completing the student questionnaire. The sample of schools and students were a nationally representative sample. (Ingles et. al. 2009 executive summary).

Unlike previous studies, the HSLS: 09 did not freshen the student population in the follow up sample. As a result, the sample and resulting data, in its entirety, is only representative of the 9th grade cohort from 2009. (Ingles et. al. 2015)

Weighting

The survey designers used sampling weights in each round of study to create estimates of the target population. This allows researchers to use the individual surveys from the study and the data from multiple studies across time. I selected the weight *W3W1W2STUTR* to use in my computations. The HSLS:09 researchers created 18 individual weights to be used depending upon the surveys and data selected. My research study used data from multiple surveys and included transcript data, therefore following survey researchers suggestions "analyses associated with change across the base year, first follow-up, and the 2013 Update and incorporate high school transcript data (W3W1W2STUTR)" this weight was selected. (Ingles et.al, 2015, p. 80). The weight provided is an expansion weight and as such cannot be used directly. As a result, I created a relative weight to use in my calculations. By creating a relative weight t tests and X^2 test can reproduce the actual sample size in addition to the sampling weight. To calculate the relative weight, the sum of the expansion weights for the selected sample is divided by the number of cases (*N*). This is the mean expansion weight. For each individual case, the calculated expansion weight is divided by the mean expansion weight to create the relative weight for the sample selected (Lee & Forthofer, 2006).

Sample Selection

The purpose of this study examined school effects on college choice. Specifically, I was interested in the effects rural high school location and college-going culture have on the college choices students' make while controlling for both school and student level characteristics. Since this study focused on school effects, I wanted to compare similar schools. Using variable X1Control, I removed schools that were coded as Catholic as well as other private school categorizations. The students associated with these schools were also removed, so only public schools and their students were included. The range of public schools was vast and included all school types: charter, magnet, vocational, and alternative schooling. Continuing to focus on the school portion of the sample, schools with a status change such as a closure were removed along with the student participants for that school. Finally, schools and their students that did not provide the needed information from the counselor and administrator surveys were removed.

The next step in sample selection was focused on students. Students were removed from the sample if they had no student level data. Next, students who had attended two different high schools during the survey period were removed from the sample. The students who remained in the sample attended the same public school all four years of their high school experience and provided information on the variables in which this study sought to examine.

Variable Selection

Dependent Variable

There were five dependent variables considered in this study; one for each of the research questions asked. The first dependent variable was *High School Completion*. This variable was constructed from a composite created by HSLS to gage student's high school completion status (X3HScompstat). Students who had graduated or received a GED, or other HS equivalent were coded as 1. Students who had dropped out or received a certificate of attendance from high school were coded as 0. Students who were still enrolled in high school were not included.

The second dependent variable was *College Enrollment*. This variable was constructed using a variable created by HSLS to detail a sample member's degree level in college (X3programlevel) and composite to gage high school completion status, (*High School Completion*) Students with recorded data of Bachelor's degree or Associate's degree program in variable X3programlevel were coded as 1. Students with recorded data of certificate or diploma that provides occupational training, no specific program but taking classes, other, or 'I do not know' in variable X3programlevel were coded as 0. Students who had been coded as dropped out or received a certificate of attendance in *High School Completion* were also coded as 0.

From the dependent variable *College Enrollment* a subsample was created. Included in this subsample were any students who were coded as 1 in the College Enrollment variable. From this subset three additional dependent variables were created. The third dependent variable was

College Control. The creation of this variable identified the type of college (not-for-profit or for-profit) students are attending. This variable was constructed from the HSLS composite variable (S3clgcntrl) and the *College Enrollment* variable detailing a student's enrolled college control type using IPEDS data and student interviews. Students who were enrolled in college and were attending a not-for-profit, were coded as 1. For comparison, students who were attending a for-profit college were also included and coded as 0.

The fourth dependent variable was *College Program Level.* This variable details the program level a student is enrolled (two-year, four-year) and was constructed using HSLS X3programlevel and my *College Enrollment* variables. Students with recorded data, from variable X3programlevel, indicating they were enrolled in Bachelors programs (four-year) were coded as 1. For comparison students who enrolled in Associates degree programs (two-year) were also included and were coded as 0. Students who indicated they were enrolled in certificate or diploma programs that provided occupational training, no specific program but taking classes, other, or I do not know and coded as 0 in *College Enrollment* were not included.

The fifth and final dependent variable was *College Program Time*. This variable identifies the enrollment time (full time, part time) a student indicates. This constructed variable used the HSLS variable (S3clgft) asking, "Were you enrolled in college full time or part time as of November 1st" and my *College Enrollment* variable. Students who indicated they were enrolled full-time were coded 1. For comparison students who indicated they were enrolled in college part-time were also included and were coded as 0. Students who indicated they were enrolled in certificate or diploma programs that provided occupational training, no specific program but taking classes, other, or 'I do not know' and coded as 0 in *College Enrollment* were not included.

Table 1

Dependent Variables

Research Variables			Original HSLS:09 Variable	Variable Description
High School Completion				
High School Completion	The student completed high school.	Yes=1, No =0	X3HScompstat	High school completion status (transcript and GED source updated)
College Enrollment				
College Enrollment	The student enrolled in college. (HS completers only)	Yes=1, No =0	X3programlevel	Program level for sample member degree in college.
College Control (Public and Private not for profit, for profit)				
College Control	The student enrolled in a public or private not for profit college. (HS completers only)	Yes=1, No =0	S3clgcontrol	Control code loaded from 2012 IPEDS Institutional Characteristics file and supplemented by the student interview when not on IPEDS file
College Program Level (2-year, 4-year)				
College Program Level	The student enrolled in a 4-year program. (HS completers only)	Yes=1, No =0	X3programlevel	Program level for sample member degree in college.
College Program Time (full-time, part-time)				
College Program Time	The student enrolled in a full-time program (HS completers only)	Yes=1, No =0	S3clgft	Will/Were/Was] [you/your teenager][be] enrolled in school full-time or part-time as of November 1st? 1=Full-time 2= Part-time 3=Don't know

Independent Variables

The independent variables for this study were measures of either student level characteristics or School level characteristics. The school level variables included contextual and environmental variables, such as location. The school level variables also included indicators of the schools' behavioral and safety climate and the schools' college preparation orientation.

Student level variables.

The student level variables used were race, sex, student's SES, and final high school GPA as a proxy for achievement. The variables used to identify race are *Hispanic* (X2HISPANIC), *White* (X2WHITE), *Black* (X2BLACK), *Asian* (X2ASIAN), *Pacific Islander* (X2PSCISLE), and *American Indian* (X2AMINDIAN). Taking variable X2SEX, a dummy variable was created to represent a student's sex.

A student's high school achievement was defined by two variables, *X3TGPATO* and *Student GPA*. The variable *X3TGPATO* was an original continuous HSLS variable and offered students final high school GPA on a scale of 0.04 – 4.98. A second variable *Student GPA* was created from *X3TGPATO.* Dummy variables were created. The highest third was labeled *High GPA*, for a high weighted GPA, the middle third was labeled as *Middle GPA*, and the lower third labeled *Low GPA.* The *Middle GPA* was treated as the reference category. *X3TGPATO* was used in the HGLM modeling but *Student GPA* was used to provide additional descriptive information.

To identify a student's social economic status HSLS variable, *X2SES* was used in two ways. This variable consisted of a composite of parent's education, occupation, and family income. The use of a composite SES variable is suggested by the NCES instead of a single variable or multiple single SES variables (NCES, 2012). From this variable, *Student SES*, thirds were calculated. From these thirds dummy variables were created. The highest third was labeled *High SES* for very high SES. The middle third was labeled *Middle SES*. The lowest third was labeled *Low SES* and *Middle SES* acting as the reference category. The variable *X2SES* was used unchanged as secondary measure to view the variable in a continuous manner and HGLM modeling. It looks at the student's SES on a scale of -1.7501 - 2.2824.

Table 2

School Level Variables

Research Variables			Original HSLS:09 Variable	Variable Type/Description
Student Characteristics				
Student Sex				
Male	Student is Male	Yes=1, No =0	x2SEX	The composite is based on data from the BY student questionnaire, parent questionnaire, and/or school-provided sampling roster, and then updated when missing with data from the F1 student questionnaire.
Female (Reference Category)	Student is Female	Yes=1, No =0		
Student Race				
WHITE (reference category)	Student is White	Yes=1, No =0	X2WHITE	The sample member's race/ethnicity is characterized by a series of six dichotomous composite variables
HISPANIC	Student is Hispanic	Yes=1, No =0	X2HISPANIC	
BLACK	Student is Black	Yes=1, No =0	X2BLACK	
ASIAN	Student is Asian	Yes=1, No =0	X2ASIAN	
Race all Others	Student is Pacific Islander or American Indian	Yes=1, No =0	X2PSCISLE, X2AMINDIAN	
Student GPA				
High GPA	Top 3rd	Yes=1, No =0	X3TGPATO	Dummy variables created form the scale of the overall GPA, . Scale 0.04 - 4.00
Middle GPA (Reference)	Middle 3rd	Yes=1, No =0		
Low GPA	Bottom 3rd	Yes=1, No =0		
X3TGPATO	Continuous	Scale	X3TGPATO	Overall GPA,. Scale 0.04 - 4.00

Student Socioeconomic Status				
High SES	Top 3rd	Yes=1, No =0		Dummy variables create from composite of family income, parental occupation, parental education. Scale -1.7501 - 2.2824
Middle SES (Reference)	Middle 3rd	Yes=1, No =0	X2SES	
Low SES	Bottom 3rd	Yes=1, No =0		
X2SES	Continuous	Scale	X2SES	Composite of family income, parental occupation, parental education. Scale -1.7501 - 2.2824

School Level Variables

School Environment. The school environment variable considered the contextual variables associated with a school. The first contextual variables are dummy variables created from X1Locale. These variables describe the geographic location of the school *Urban, Suburban, Town, Rural.* Suburban is the normative category.

The second set of contextual variables was school type. Dummy variables were created from A1SCHTYPE. School type variables (detailed in table) described the type of curriculum offered at the school, Dummy variables constructed are *Regular, Charter, Special program or Magnet school, Vocational* or *technical school,* and *Alternative school*. The normative category is regular schools as identified by the survey.

The third set of contextual variables was the percent of student body receiving free and reduced lunch. The variable school lunch *School Lunch* is constructed from an HSLS composite variable detailing the percentage of students in the school on free and reduced lunch (X2FREELUNCH). Schools with more than 40% of students receiving free or reduced lunch were coded at 1. Schools with less than 40% of students receiving free or reduced lunch were coded as 0. I used 40% as the cut off because it created a binary or dichotomous variable and it is the percentage in which schools can use Title 1 funding to support school wide programs. Schools with less than 40% of students receiving free or reduced lunch must focus Title 1 funding on low-income students only (NCES, 2015). The variable, *X2Freelunch* was used as secondary measure to view the variable in a continuous manner and was used in the HGLM modeling.

The fourth set of contextual variables was percent of student body enrolled in AP courses. This variable, school AP course *School AP* was constructed from the HSLS variable indicating the percentage of students enrolled in AP courses (A1AP). Schools with more than 40% of their students enrolled in AP are coded as 1. Schools with less than 40% of their students enrolled in AP are coded as 0. This scale was used because it created a binary or dichotomous variable and the national rate of public school students completing an AP exam was 33.2% (College Board, 2015). Due to the limited data available from College Board on the number of students enrolled in AP courses, I choose to use 40% as the cut off for student's completing AP courses. I reasoned it would be above the national rate of students taking AP exams (33.2%) and account for students who take the class but do not complete an exam. The variable, *A1AP* was also used unchanged as secondary measure to view the variable in a continuous manner and for HGLM modeling.

The fifth and final set of contextual variables was percent of student body that is non-White. The variable for race *School Race* was constructed from the HSLS composite variable indicating the percentage of a school that is White (X1Schwhite). Schools with more that 50% students of color are coded as 1. Schools with less than 50% of students of color are coded as 0. This scale was used for two reasons. First, it created a binary or dichotomous variable. Second I considered the high minority school definition by the National Student Clearinghouse Research

Center in which schools with more that 40% of Hispanic or Black students is considered high minority. This definition coupled with the fact that native students are more likely to live in rural areas (Provansik, et, al., 2007) and should be considered in the count, I chose a cut off of 50% to identify high minority schools. The variable *X1Schwhite* was also used as secondary measure to view the variable in a continuous manner and for HGLM modeling. It looks at the ratio of White students in a school of a scale of 0 -11.

Table 3
School Level Variables

Research Variables			HSLS:09 Variable	Variable Type/Description
			School Environment	
School Location				
Urban	Student attends Urban School	Yes=1, No =0	X1Locale	Characterizes the locale (urbanicity) of the sample member's base year school as either City, Suburb, Town, or Rural, as indicated in the source data for sampling: the Common Core of Data (CCD) 2005-2006 and the Private School Survey (PSS) 2005-2006.
Town	Student attends Town School	Yes=1, No =0		
Rural	Student attends Rural School	Yes=1, No =0		
SCHLOCATIONS (Reference category	Student attends Suburban School	Yes=1, No =0		
School Type				
Charter	Student attends Charter School	Yes=1, No =0	A1SCHTYPE	Which of the following best describes your high school? Would you say...a regular school [-- not including magnet or charter schools]
Special Program	Student attends school with Special Program	Yes=1, No =0		A charter school (a school that in accordance with an enabling state statute, has been granted a charter exempting it from selected state or local rules and regulations)
Technical School	Student attends Technical School	Yes=1, No =0		A special program school [or magnet school] --such as a science or math school, performing arts school, talented or gifted school, or a foreign language immersion school
Alternative School	Student attends Alternative School	Yes=1, No =0		A vocational or technical school or
Regular (Reference Category)	Student attends Regular School	Yes=1, No =0		An alternative school (a school that offers a curriculum designed to provide nontraditional education to students -- for example, to students at risk of school failure or dropout in a traditional setting)?

Free Lunch				
School Lunch	> 40% of students receive free lunch	Yes=1, No =0	X2FREELUNCH	Recalculated to represent high school lunch populations within schools. Categorized version of the continuous administrator questionnaire variable A2FREELUNCH. This variable indicates the percentage of students enrolled in the school in 2011 who receive free or reduced-price lunch.
X2FREELUNCH	Continuous	Scale	X2FREELUNCH	Categorized version of the continuous administrator questionnaire variable A2FREELUNCH. This variable indicates the percentage of students enrolled in the school in 2011 who receive free or reduced-price lunch. (0-11)
Student Body Enrolled in AP Courses				
School AP	> 50% of students are enrolled in AP Courses	Yes=1, No =0	A1AP	Recalculated to represent schools with high AP enrollment. What percentage of the total student body in [your school]... (Please enter '0' if none.) are enrolled in College Board Advanced Placement (AP) courses
A1AP	Continuous	Scale	A1AP	What percentage of the total student body in [your school]... (Please enter '0' if none.) are enrolled in College Board Advanced Placement (AP) courses [either at your school or] off-site?
School Race				
School Race	> 50% of the students are students of color	Yes=1, No =0	X1Schwhite	Recalculated to represent high minority schools by creating a bivariate from categorized version of the continuous administrator questionnaire variable A1WHITESTU. This variable indicates the percentage of students enrolled in the school who are identified as White or Caucasian.
X1Schwhite	Continuous	Scale	X1Schwhite	Categorized version of the continuous administrator questionnaire variable A1WHITESTU. This variable indicates the percentage of students enrolled in the school who are identified as White or Caucasian. (0-11; 0%-100%)

Student Population				
School Mean SES	Continuous	Scale	X2SES	Composite of family income, parental occupation, parental education calculated by school population to find mean. (Scale -1.28 - 1.26)
School Mean GPA	Continuous	Scale	X3TGPATO	Overall GPA, calculated by school population to find school mean Scale (.68-3.77)

School Behavioral Norms. In considering student level variables school behavioral norms were included. The first school behavioral norm variable was *X2schoolclimate*. This variable was the HSLS scale composite variable (X2schoolclimate) of administrators answers to questions about violence within their school. This included questions on conflict, robbery, vandalism, drug use, alcohol, drug sale, weapons, physical abuse, tension, cyber bullying, other bullying, verbal, misbehavior, disrespect, and gangs. This variable is a continuous variable with a scale of (-3.36 – 1.92). A second variable *School Climate* was created from the scale. This scale was divided into thirds and dummy variables were created for each third. The highest third was labeled *Positive Climate* for very positive assessment of the school's climate. The middle third was labeled, *Middle Climate*, for a middle assessment of the school's problems. The final third was labeled, *Negative Climate*, for a negative assessment of the school's climate. The *Middle Climate* assessment of school problems, this was used as the reference category. The School Climate variables were used for comparison as descriptive variables. Variable *X2schoolclimate* was used for HGLM modeling.

The second variable associated with school norms was severity of school problems. This variable *X2Problem* was the HSLS:09 scaled composite variable of administrator's answers to questions about problems within the school. These included questions on tardiness, student absenteeism, students cutting class, students dropping out, student apathy, parental involvement, available resources, unpreparedness, and student health. A second set of variables *School Problem* were created. The scale was divided into thirds and dummy variables were created for each third. The highest third was labeled High Problems for high occurrences of school problems. The second third was labeled, *Middle Problems*, for an middle occurrence of the school's problems. The lowest third was labeled, *Low Problems*, for a low occurrence of the school's problems. The middle third or an average assessment of school problems, this was used as the reference category. The *School Problem* variables were used for comparison as descriptive variables. Variable *X2schoolproblem* was used for HGLM modeling.

Table 4

School Norms

Research Variables			HSLS:09 Variable	Variable Type/Description
School Climate				
Positive Climate	High Climate Scores	Yes=1, No =0	X2schoolcli	Dummy Variables created from a scale of the administrator's assessment of his/her school's climate. Higher values represent more positive assessments of the school's climate (i.e. fewer problems are indicated). Variable was created through principal components factor analysis and standardized to a mean of 0 and standard deviation of 1. The inputs to this scale were A2CONFLICT, A2ROBBERY, A2VANDALISM, A2DRUGUSE, A2ALCOHOL, A2DRUGSALE, A2WEAPONS, A2PHYSABUSE, A2TENSION, A2CYBERBULLY, A2OTHERBULLY, A2VERBAL, A2MISBEHAVE, A2DISRESPECT, and A2GANG.
Middle Climate	Middle Climate Scores	Yes=1, No =0		
Negative Climate	Low Climate Scores	Yes=1, No =0		
X2schoolclimate	Continuous	Scale	X2schoolcli	This variable is a scale of the administrator's assessment of his/her school's climate. Higher values represent more positive assessments of the school's climate (i.e. fewer problems are indicated). Variable was created through principal components factor analysis and standardized to a mean of 0 and standard deviation of 1. The inputs to this scale were A2CONFLICT, A2ROBBERY, A2VANDALISM, A2DRUGUSE, A2ALCOHOL, A2DRUGSALE, A2WEAPONS, A2PHYSABUSE, A2TENSION, A2CYBERBULLY, A2OTHERBULLY, A2VERBAL, A2MISBEHAVE, A2DISRESPECT, and A2GANG.

School Problems				
High Problems	High rate of problems	Yes=1, No =0	X2problem	Dummy Variables create from a scale of the administrator's assessment of his/her school's problems. (- 2.14 - 2.94) Higher values represent more negative assessments of the school's problems. Variable was created through principal components factor analysis and standardized to a mean of 0 and standard deviation of 1. The inputs to this scale were A2TARDY, A2STUABSENT, A2CUT, A2DROPOUT, A2APATHY, A2PRNTINV, A2RESOURCES, A2UNPREP, A2HEALTH
Middle Problems	Middle rate of problems	Yes=1, No =0		
Low Problems	Low Problems	Yes=1, No =0		
X2Problem	Continuous	Scale	X2problem	This variable is a scale of the administrator's assessment of his/her school's problems. (- 2.14 - 2.94) Higher values represent more negative assessments of the school's problems. Variable was created through principal components factor analysis and standardized to a mean of 0 and standard deviation of 1. The inputs to this scale were A2TARDY, A2STUABSENT, A2CUT, A2DROPOUT, A2APATHY, A2PRNTINV, A2RESOURCES, A2UNPREP, A2HEALTH

School's College Preparation Orientation. The third set of school level variables was associated with a high schools' college preparation orientation focus on the schools' college climate, college focus, and the alignment of goals associated with a college-going climate. The first college preparation orientation variable was the number one goal of the school's counseling office as expressed by the school counselor, *Counselor*. This variable was constructed from the HSLS variable that asked school counselors what was the number one goal of the high school's counseling office (C1goal1). The newly created *Counselor* variable, indicates that college preparation is the number one goal of the school's counseling office. Counselors who answered helping students plan and prepare for postsecondary schooling were coded at 1. Counselors who indicated that helping students plan and prepare for their work roles after high school, helping students with personal growth and development, or helping students improve their achievement in high school, was the number one goal of the counseling office were coded as 0.

The second college preparation orientation variable indicated whether planning and preparing students for college was the number one goal of the school's counseling office from an administrator's perspective, *Administrator*. This variable was created using the HSLS variable asking administrators what was the number one goal of the school's counseling office (A2goal1). Answers that indicated college preparation was the number one goal of the school's counseling office were coded as 1. Administrators who answered that one of the following: helping students plan and prepare for their work roles after high school, helping students with personal growth and development, or helping students improve their achievement in high school, were the primary goal of the school's counseling office was coded as 0.

The third college preparation orientation variable was created to indicate whether the number one goal of an individual school's counseling office was college, and whether the counselors' and administrators' answers concerning these goals aligned. This variable, *Aligned* was constructed using the prior variables *Administrator* and *Counselor*. Schools in which the counselor and the administrator both considered the primary goal of the counseling office to be helping students plan and prepare for postsecondary schooling were identified as aligned and coded as 1. Schools where the primary goal for the counseling office (either by the administrator or counselor) was not college or the answers of the counselor and administrator did not align were coded a 0.

The fourth college preparation orientation variable *Counselor Hours* originated from the HSLS variable (C2HRScollege) asking counselors the percentage of work hours the counseling staff spends assisting students with college readiness, selection and applications. The scale used by the researchers was reorganized into dummy variables. This scale was also found in current research on the topic. (Cholewa, B, Burkhardt, C.K. & Hull, M.F., 2016; Mau, W.J., Li, J., Hoetmer, K., 2016). Responses of 50% or higher were considered a very high percentage of hours spent on college and labeled *VHHOURS*. Responses between 21% - 50% of counseling hours spent on college were considered high and labeled *HHOURS*. Counselor responses with a percentage of 6% - 10% of counseling work hours spent on college was considered low and labeled *LHOURS*. Counseling offices that reported spending less than 5% of their time on college readiness, selection, and applications was considered very low and labeled *VLHOURS*. The reference category was average percentage of hours spent on assisting students for college (11 - 20%) this variable was labeled *AHOURS*.

The fifth college preparation orientation variable indicated whether or not a school has a counselor designated for college selection, *C2selec*t. This variable was taken directly from the HSLS question, "Does your school have one or more counselors whose primary responsibility is assisting students with college selection?" Schools with one or more counselors whose "primary responsibility is assisting student with college selection" were coded as 1. Schools with no counselor designated for college selection were coded as 0.

The sixth and final college preparation orientation variable indicated whether or not a school has a counselor designated for college applications, *C2clgapp*. This variable was taken directly from the HSLS question, “Does your school have one or more counselors whose primary responsibility is assisting students with college application?” Schools with “one or more counselors whose primary responsibility is assisting students with college applications were coded as 1. Schools with no counselor designated for college selection was coded as 0.

Table 5

School College Preparation Orientation

Research Variables			HSLS:09 Variable	Variable Type/Description
Most Important Counseling Goal is College				
Counselor	College is #1 Goal for counseling office from Counselor	Yes=1, No =0	C1goal1	Which one of the following goals does your school's counseling program emphasize the most? Would you say...helping students plan and prepare for postsecondary schooling
Administrator	College is #1 Goal for counseling office from Administrator	Yes=1, No =0	A2goal1	Which one of the following goals does your school's counseling program emphasize the most? 3=Helping students plan and prepare for postsecondary schooling
Aligned	College is #1 Goal for both Administrator and Counselor	Yes=1, No =0	A2goal1 and C1goal1	Schools were marked at Yes (1) if both the Counseling goal and the Administrative goal was college.

Percentage of Counselor Work Hours Spent on College				
VHOURS	> 50%	1=5% or less	C2HRScollege	What percentage of work hours did your school's counseling staff spend delivering the following services to high school students? Assisting students with college readiness, selection, and applications
HHOURS	21% -50%	2=6%-10%		
AHOURS (Reference Category)	11%-20%	3=11%-20%		
LHOURS	6%-10%	4=21%-50%		
VLHOURS	5% or less	5=More than 50%		
Counselor Designated for College Selection				
C2select	There is a designated counselor for college selection	Yes=1, No =0	C2SELECT	Does your school have one or more counselors whose primary responsibility is assisting students with... College selection?
Counselor Designated for College Applications				
C2clgapp	There is a designated counselor for college applications	Yes=1, No =0	C2CLGAPP	Does your school have one or more counselors whose primary responsibility is assisting students with... College applications

Data Analysis

For the purpose of this study, hierarchical generalized linear modeling (HGLM) was employed as the statistical model to answer the research questions. The HSLS: 09 data set contained data from both students and schools. This stratified organization of data is not uncommon in educational data. Researchers refer to this phenomenon as hierarchical or nested data (Hox, 2010, Raudenbush & Bryk, 2002). This type of hierarchical or nested data requires specific analysis where the researcher is interested in identifying the relationships between the variables at the different levels. In this case, using multilevel research (Hox, 2010) was appropriate since a group of students was nested within schools and I was interested in the organizational effects of the schools on the students (Raudenbush & Bryk, 2002). In my research, it was conceptualized that student were nested within schools and a two-level multilevel model was considered as the statistical model for the analysis.

The intricacies of my data and the research questions asked, introduced further considerations in the use of HLM. The variables studied were dichotomous or binary (e.g.. Did a student graduate from High School 1 = Yes, 0 = No). With binary variables, assumptions held during traditional HLM, (i.e., assumption of normality and of continuous scores) are violated (Hox, 2010). With this violation, a conversion is needed. In using hierarchical generalized linear modeling (HGLM) this conversion was incorporated in the statistical analysis (Hox 2010). Bearing this in mind I choose to use HGLM over HLM because it prevented violations and incorporated the needed conversion within the model. My decision to use HGLM over HLM is confirmed by the number of comparable studies on school effects using this model (Engberg and Wolniak, 2010; Engberg and Wolniak, 2014; and Nunez and Kim, 2012)

In the analysis, the final outcome from using a two-level HGLM is the odds that an event is going to occur, this is also known as the odds of success. To reach the odds of events occurring, HGLM uses an error distribution, a linear regression equation, and a logit function (Hox, 2010). In this study I used the log of the odds of success as the logit function. The predicted value (η_{ij}) is the log of the odds of success, and p is the probability and where the subscript i identifies a student and j as a high school such that student i who attended school j..

$$\eta_{ij} = log_e(\frac{p_{ij}}{1-p_{ij}}) \quad (1)$$

Once the log odds have been calculated, they are computed back into odds.

$$\frac{p_{ij}}{1-p_{ij}} = e^{\eta_{ij}} \quad (2)$$

Finally, the probabilities can be obtained by computing the odds ratio back to probabilities

$$p_{ij} = \frac{1}{1 + \text{odds}}. \quad (3)$$

While probabilities can be calculated, to align myself with similar research, I reported all results in odds. Since I am interested in considering the effect of the student's school on their college-going behavior, I used a unit-specific model of analysis also known as a school specific model (Raudenbush & Bryk, 2002). The model is as follows.

HGLM Model

In order to address the research questions posed, the HGLM models were fitted in three steps. First the unconditional model (model 1) was fitted. Second, is the level 2 model. In this model the student level (Level-1) variables are included as the Level -1 (L-1) predictors. The third step takes the school level variables into consideration at Level -2 (L-2). These variables act as school level predictors added to model 2's L-1 predictors to create model 3. In the models below, both students and schools are considered.

The student level model (Level 1)

$$\eta_{ij} = \beta_{0j} + \beta_{1j}\left(Student\ GPA_{ij}\right) + \beta_{2j}\left(Studnet\ GPA_{ij}\right) + \beta_{3j}\left(Hispanic_{ij}\right) + \beta_{4j}\left(Black_{ij}\right) + \beta_{5j}\left(Asian_{ij}\right) + \beta_{6j}\left(RaceALLOthers_{ij}\right) + \beta_{7j}\left(Male_{ij}\right) \tag{4}$$

The school level model (Level 2)

$$\begin{aligned}\beta_{0j} = {} & y_{00} + y_{01}\left(FreeLunchC_j\right) + y_{02}\left(SchoolRaceC_j\right) + y_{03}\left(SchoolProblem_j\right) \\ & + y_{04}\left(SchoolClimate_j\right) + y_{05}(StudentAPC_j) + y_{06}(Urban_j) \\ & + y_{07}(Town) + y_{08}(Rural_j) + y_{09}(SchoolcollegegoalA_j) \\ & + y_{010}(SchoolcollegegoalC_j) + y_{o11}(SchoolCollegeGoalAllign_j) \\ & + y_{o12}(HRSCOLLEGEVH_j) + y_{o13}(HRSCOLLEGEH_j) \\ & + y_{o14}(HRSCOLLEGEL_j) + y_{o15}(CollegeSelection_j) \\ & + y_{o16}(CollegeApplication_j) + y_{o17}(SchoolMeanGPA_j) \\ & + y_{o18}(SchoolMeanSES_j) + u_{0j}\end{aligned} \tag{5}$$

The HGLM analyses included in this work were conducted by HLM version 7 software (Raudenbush, Bryk, Cheong, Congdon, & du Toit, 2011). The analysis used the full maximum likelihood method of estimation with Adaptive Gaussian Quadrature option with the number of nodes equal to 20 in which this optional specification is considered to provide unbiased estimates.

Conclusion

The research completed in this study examined the school effects on students' college choices. As illustrated in the Chapter 2 literature review, the impact high schools have on individual students is significant, as is the phenomenon of an institution's "college-going culture." As specified in Chapter 3, I used HGLM to reach statistical conclusions based on the research questions asked and using the HSLS: 09 data set. In Chapter 4, I describe the results garnered from the statistical analysis of the data. In the final chapter, Chapter 5, the results are discussed with regard to their implications for future practice, research, and policy.

Chapter 4

Results

This study considered the school effects of college going behavior for rural students. Of interest were the effects of location and college-going culture within a given school. The research questions asked, included:

1. What are the effects of rural school location and college-going culture on public high school graduation?
2. What are the effects of rural school location and college-going culture on college enrollment?
3. For public high school graduates who enrolled in college, what are the effects of rural school location and college-going culture on the control structure of the college program enrolled?
4. For public high school graduates who enrolled in college, what are the effects of rural school location and college-going culture on type of college program enrolled (two-year vs. four-year)?
5. For public high school graduates who enrolled in college, what are the effects of rural school location and college-going culture on full-time vs. part-time enrollment?

Chapter 4 discusses the results of the five research questions posed. First the demographics for the school and student sample pertaining to High School graduation and College Enrollment are detailed. Next, the results for the first two research questions are described by reviewing the demographic statistics and finally the HGLM results. Then the demographics for the school and student sample containing only college graduates are discussed, followed by the results for the final three research questions. Since the research questions focus on school level variables, the results for student level variables are not discussed in the descriptive statistic sections. However, information pertaining to these variables can be found in the tables provided.

Descriptive Statistics of Student Characteristics

The analytic sample of selected cases consisted of 494 schools, enrolling 7,310 students in this sample. All the analyses reported applied the relative weight so that the results can be generalized to the target population of high school seniors graduating in 2013. For multilevel analysis using HGLM, the results were reported for the unit-specific model using the full maximum likelihood method of estimation with adaptive Gaussian quadrature integration.

Table 6

Descriptive Statistics of Student and School Characteristics

Variables	n	%
Student	7,310	
Categorical Variables		
Student Race		
White	5,577	76.3%
Hispanic (X2HISPANIC)	1,422	19.5%
Black (X2BLACK)	1,237	16.9%
Asian (X2ASIAN)	445	6.1%
All Others (RACEOFALLOTHERS)	885	12.1%
Student Sex		
Male (MALE)	3,778	51.7%
Female	3,532	48.3%
School Location		
Urban	1,895	25.9%
Town	1,081	14.8%
Rural	1,934	26.5%
Suburban	2,400	32.8%
Type		
Regular	6,724	92.0%
Charter	161	2.2%
Special	358	4.9%
Technical	56	0.8%
Alternative	56	0.8%
Student Population		
School Lunch		
Yes	3,935	53.8%
No	2,789	46.2%
School AP		
Yes	283	3.9%
No	7,027	96.1%
School Race		
Yes	2,248	30.7%
No	5,062	69.3%

Counseling Office Goals					
Counselor					
Yes	3,389	46.4%			
No	3,921	53.60%			
Administrator					
Yes	4,058	55.5%			
No	3,252	44.5%			
Aligned					
Yes	2,143	29.3%			
No	5,167	70.7%			
Counseling Office Time					
50% or greater	242	3.3%			
Between 21%-50%	2,956	40.4%			
Between 11%-20%	2,941	40.2%			
Between 6%-10%	900	12.3%			
5% or Less	271	3.7%			
Counselor Assignments					
C2Select					
Yes	2,509	34.3%			
No	4,801	65.7%			
C2ClgApp					
Yes	2,630	36.0%			
No	4,680	64.0%			
Continuous Variables	n	M	SD	Min	Max
SES (X2SES)	7,310	-0.06	0.70	-1.75	2.15
GPA (X3TGPATO)	7,310	2.73	0.78	0.00	4.00
School	494				
Categorical Variables	n	%			
School Location					
Urban (URBAN)	106	21.5%			
Town (TOWN)	65	13.2%			
Rural (RURAL)	143	28.9%			
Suburban	180	36.9%			

School Type		
Regular	460	93.1%
Charter	12	2.4%
Special	16	3.2%
Technical	2	0.4%
Alternative	2	0.4%
Student Population		
School Lunch		
Yes	275	55.7%
No	219	44.30%
School AP		
Yes	21	4.3%
No	473	95.7%
School Race		
Yes	126	25.5%
No	368	74.5%
Counseling Office Goals		
Counselor (COUNSELOR)		
Yes	233	47.2%
No	261	52.8%
Administrator (ADMINISTRAOTR)		
Yes	259	52.4%
No	235	47.6%
Aligned (ALIGNED)		
Yes	138	27.9%
No	356	72.1%
Counseling Office Time		
50% or greater (VHHOURS)	15	3.0%
Between 21%-50% (HHOURS)	187	37.9%
Between 11%-20%	194	39.3%
Between 6%-10% (LHOURS)	75	15.2%
5% or Less (VLHOURS)	23	4.7%
Counselor Assignments		
Select College (C2SELECT)		
Yes	166	33.6%
No	328	66.4%

Apply College (C2CLGAPP)					
Yes	172	34.8%			
No	322	65.2%			
Continuous Variables	n	M	SD	Min	Max
X2FreeLunch (X2FREELUNCH)	494	4.99	2.30	0.00	11.00
X1schwhite (X1SCHWHITE)	494	7.29	2.80	0.00	11.00
X2Schoolclimate (X2SCHOOLCLIMATE)	494	-0.07	0.87	-3.36	1.92
X2Schoolproblem (X2PROBLEM)	494	0.14	0.95	-2.14	2.94
A1AP (A1AP)	494	14.94	12.05	0.00	80.00
SchoolMeanSES (SCHOOLMEANSES)	494	0.02	0.37	-1.28	1.26
SchoolMeanGPA (SCHOOLMEANGPA)	494	2.79	0.37	0.68	3.77

Note. Variable names appeared in parentheses after descriptive name as capital letter are the variables that were used in HGLM analyses that will appear later in the tables such as Table 8.

After selecting the cases the analytic sample consisted of 7,310 students. Slightly more than a quarter, 26.5% (*n* = 1934) of students lived in rural areas. More than half, 53.8% (*n* = 3935) of the students attended schools with 40% or more of the student body receiving free or reduced lunch. Nearly a third, 30.7% (*n* = 2248), of students attended a minority majority high school. Only 3.9% (*n* = 283) of students attended a school where more than 40% of students were enrolled in AP courses. Almost half of students, 46.4% (*n* = 3389), attended a school where the primary goal of the counseling office was college related. More than half, 55.5% (*n* = 4058), of the students attended a school where administrator's primary for the counseling office was college related. However, only 29.3% (*n* = 2143), of students attended a school where these goals aligned. Close to a third, 34.3% (*n* = 2509), of students attended schools where there were personnel dedicated to college related tasks. Nearly the same amount, 36% (*n* = 2630), attended a school with an employee dedicated to college applications. A majority of students attended schools where counselors spent between 11-20% (40.2%, *n* = 2,941) or 21-50% (40.4%, *n* =

2,956) of their time working on college related responsibilities. The mean school climate for students was -.096 and the mean level of problems for students was .058. The mean school SES was -.069, and the mean school GPA was 2.73 for students.

Descriptive Statistics of School Characteristics

The selected cases created analytic sample of 494 schools. The distribution of schools for this sample showed 28.9% (n = 143) of schools were located in rural areas. A majority of schools 93.1% (n = 460) were regular type schools. More than half of the schools, 55.7% (n = 275) had more than 40% of the student body receiving free or reduced lunch. A quarter of the schools, 25.5% (n = 126) were a majority students of color. Only 4.3% (n = 21) of schools had more that 40% of their students enrolled in AP courses. Nearly half, 47.2% (n = 233), of the schools reported college as the primary goal of counselors for their offices. Just slightly more than half, 52.4% (*n* = 259), of the schools reported the primary administrators' goal for the counseling office as college. However, a much smaller percentage, 27.9% (*n* = 138), of schools reported that these goals aligned. The amount of time counselors used for college related tasks varied. The majority of schools had counseling offices spending between 11-20% (39.3%, *n* = 194) and 21-50% (37.9%, *n* = 187). A third of schools, 33.6% (*n* = 166), had personnel dedicated to college related tasks. Another third, 34.8% (*n* = 172), had personnel designated to handle college applications. The overall average for school climate was -.0725 (-3.36-1.92), while the overall average for school problems was .1421 (-2.14-2.94).

High school completion. The student level comparisons associated with the first research question, *What are the effects of rural school location and college-going culture on public high school graduation?* demonstrated a very high graduation rate, with 94.1% (*n* = 6,876) of students graduating from high school. Students who dropped out came from all locations, school types, and college preparation orientation

Table 7

Student Level Comparison by High School Completion

Variable	Did Not Graduate			Graduated		
	n	Row %	Column %	n	Row %	Column %
High School Graduation						
Completion Rate	434	5.9%		6,876	94.1%	
Student level						
Categorical						
Student Race						
White	285	5.1%	65.8%	5,292	94.9%	77.0%
Hispanic (X1HISPANIC)	89	6.3%	20.5%	1,333	93.7%	19.4%
Black (X1BLACK)	119	9.6%	27.5%	1,118	90.4%	16.3%
Asian (X1ASIAN)	22	4.9%	5.1%	423	95.1%	6.1%
All Others (RACEOFALLOTHERS)	47	5.3%	10.8%	838	94.7%	12.2%
Student Sex						
Male	260	6.9%	60.0%	3,517	93.1%	51.1%
Female	173	4.9%	40.0%	3,359	95.1%	48.9%
School Location						
Urban	109	5.8%	25.2%	1,786	94.2%	26.0%
Town	91	8.4%	21.1%	990	91.6%	14.4%
Rural	86	4.4%	19.7%	1,848	95.6%	26.9%
Suburban	148	6.2%	34.0%	2,252	93.8%	32.8%
School Type						
Regular	392	5.8%	90.4%	6,332	94.2%	92.1%
Charter	6	3.5%	1.3%	156	96.5%	2.3%
Special	26	7.2%	5.9%	332	92.8%	4.8%
Technical	5	9.3%	1.2%	51	90.7%	0.7%
Alternative	5	9.3%	1.2%	51	90.7%	0.7%
Student SES						
Low SES	287	10.7%	66.1%	2,385	89.3%	34.7%
Middle SES	107	4.3%	24.7%	2,358	95.7%	34.3%
High SES	40	1.8%	9.2%	2,133	98.2%	31.0%
Student GPA						
High GPA	5	0.2%	1.2%	2,238	99.8%	32.5%
Middle GPA	37	1.4%	8.4%	2,536	98.6%	36.9%
Low GPA	392	15.7%	90.4%	2,102	84.3%	30.6%

Continuous Variables		n	M	SD	Min	Max	n	M	SD	Min	Max
X2SES		434	-0.50	0.59	-1.75	1.91	6,876	-0.03	0.70	-1.75	2.15
X3TGPATO		434	1.47	0.72	0.00	3.64	6,876	2.81	0.71	0.00	4.00
School level											
Categorical Variables											
Student Population[c,d,e]											
School Lunch											
	Yes	307		7.8%		70.7%	3,628		92.2%		52.8%
	No	127		3.8%		30.3%	3,248		96.2%		47.2%
School AP											
	Yes	15		5.4%		3.5%	267		94.6%		3.9%
	No	419		6.0%		96.5%	6,609		94.0%		97.1%
School Race											
	Yes	168		7.5%		38.8%	2,079		92.5%		30.2%
	No	266		5.3%		61.2%	4,797		94.7%		69.8%
Counseling Office Goals											
Counselor		147		4.3%		33.8%	3,242		95.7%		47.1%
Administrator		214		5.3%		49.4%	3,844		94.7%		55.9%
Aligned		101		4.7%		23.4%	2,041		95.3%		29.7%
Counseling Office Time											
50% or greater (VHHOURS)		19		7.7%		4.3%	224		92.3%		3.3%
Between 21%-50% (HHOURS)		137		4.6%		31.5%	2,819		95.4%		41.0%
Between 11%-20% (AHOURS)		220		7.5%		50.7%	2,721		92.5%		39.6%
Between 6%-10% (LHOURS)		51		5.7%		11.8%	849		94.3%		12.3%
5% or Less (VLHOURS)		7		2.8%		1.7%	263		97.2%		3.8%
Counselor Assignments											
C2Select		160		6.4%		37.0%	2,348		93.6%		34.2%
C2clgapp		176		6.7%		40.5%	2,455		93.3%		35.7%

School Climate[a]										
Positive Climate	121		5.0%		28.0%	2,294		95.0%		33.4%
Middle Climate	136		6.0%		31.4%	2,132		94.0%		31.0%
Negative Climate	176		6.7%		40.6%	2,450		93.3%		35.6%
School Problem[b]										
High Problem	208		8.7%		47.9%	2,181		91.3%		31.7%
Middle Problem	134		5.7%		30.8%	2,226		94.3%		32.4%
Low Problem	92		3.6%		21.3%	2,470		96.4%		35.9%
Continuous Variables	n	M	SD	Min	Max	n	M	SD	Min	Max
X2FreeLunch	434	5.83	2.26	0.00	11.00	6,876	4.80	2.26	0.00	11.00
X1schwhite	434	6.36	3.13	0.00	10.00	6,876	6.93	2.97	0.00	11.00
Schoolclimate	434	-0.19	0.85	-3.24	1.76	6,876	-0.09	0.90	-3.36	1.92
Schoolproblem	434	0.48	0.97	-1.94	2.94	6,876	0.03	0.92	-2.14	2.94
A1AP	434	12.51	10.72	0.00	60.00	6,876	15.60	12.60	0.00	80.00
SchoolMeanSES	434	-0.14	0.30	-0.98	0.77	6,876	0.04	0.35	-1.28	1.26
SchoolMeanGPA	434	2.56	0.42	0.68	3.35	6,876	2.81	0.33	0.68	3.77

Note: 1The subscript letters a,b,c,d,e indicate categorical values created from their associated continuous variables.

Note: 2 Row % and Column % represent the percentage of frequency counts within each category of a variable and the percentage of frequency counts of each categorical variable.

Student's attending schools in towns had the highest rate drop out with 8.4% (n = 91) of students dropping out, while rural students dropped out at a rate of 5.9% (n = 86) and equated to a smaller percent of dropouts than their population distribution. The dropout rate by school type found that students enrolled in regular schools dropped out at a rate of 5.8% (n = 392).

The behavioral norms of the school a student attended demonstrated differing dropout rates. While 53.8% of students attended a school with more than 40% of the population on free and reduced lunch, they were 70.7% of all dropouts, with 7.8% (n = 307) of these students dropping out of High School. Schools with more than 40% students enrolled in AP courses had a lower dropout rate of 5.4% (n =15). Finally, 7.5% (n =168) of students attending a majority minority high school dropped out. Students attending a school identified as having a negative climate had a dropout rate of 6.7% (n = 167) and accounted for 40% of total dropouts. Nearly half of all dropouts, 47.9%, were enrolled in a high problem school. Students attending high problem schools had an 8.7% (n = 208) dropout rate compared to the rates of 5.7% (n = 134) and 3.6% (n = 92) at average problem and low problem schools respectively.

The college preparation orientation of a school saw differing rates of dropping out. Students attending schools where the number one counseling goal by the counselors was college had dropout rate of 4.3% (n = 147), while the dropout rate for administrator college goal and goal alignment were 5.3% (n = 214) and 4.7% (n = 101) respectively. Schools with dedicated personnel for college selection and identified staff members for college applications saw almost identical dropout rates at 6.4% (n =160) and 6.7%(n = 176) respectively. The work hours of counselors had no linear effect on dropout rates. With schools spending more than 50% of counseling time on college having a dropout rate of 7.7% (n = 19) while just 2.8% (n = 7) of students attending schools with 5% or less of counselor time spent on college dropped out.

HGLM Results. To answer the question: *What were the effects of rural school location and college going culture on high school graduation* using HGLM, I used the three-step approach of model building that was detailed in Chapter 3. All the results were shown in Table 8.

Table 8

HGLM Results for High School Completion as dependent variable (Graduate =1, Did Not Graduate =0)

	Unconditional Model (Model 1)		L-1 Only Explanatory Model (Model 2)		L-1 and L-2 Explanatory Model (Model 3)	
Variable	Coefficient	(SE)	Coefficient	(SE)	Coefficient	(SE)
Intercept, γ00	3.18***	(.09)	4.52***	(0.18)	4.34***	(0.17)
Student Level Variables						
X2SES γ10			0.24*	(0.12)	0.34**	(0.12)
X3TGPATO γ20			2.47***	(0.12)	2.36***	(0.11)
X2HISPANIC γ30			0.22	(0.19)	0.38*	(0.19)
X2BLACK γ40			-0.01	(0.18)	0.28	(0.18)
X2ASIAN γ50			0.03	(0.27)	-0.01	(0.27)
RACEOFALLOTHERS γ60			0.06	(0.2)	0.06	(0.2)
MALE γ70			0.12	(0.14)	0.11	(0.14)
School Level Variables						
X2FREELUNCH, γ01					0.08	(0.05)
X1SCHWHITE, γ02					0.05	(0.04)
X2SCHOOLCLIMATE, γ03					-0.07	(0.1)
X2PROBLEM, γ04					-0.22*	(0.1)
A1AP, γ05					0.01	(0.01)
URBAN, γ06					-0.09	(0.21)
TOWN, γ07					-0.09	(0.23)
RURAL, γ08					0.12	(0.19)
COUNSELOR,γ09					0.59*	(0.23)
ADMINISTOR,γ010					0.35	(0.2)
ALLIGNED, γ011					-0.43	(0.32)
VHHOURS, γ012					-0.27	(0.4)
HHOURS, γ013					0.51*	(0.18)
LOWHOURS, γ014					-0.17	(0.21)
VLHOURS, γ015					0.35	(0.43)
C2SELECT, γ016					0.35	(0.33)
C2CLGAPP, γ017					-0.33	(0.33)
SCHOOLMEANSES, γ018					0.86*	(0.34)
SCHOOLMEANGPA, γ019					1.92***	(0.27)
Variance Component						
T	0.9***		.178***		0.50***	

*p<.05, ** p<.01, ***p<.001

The first model that was fitted was the unconditional model in which no predictors at either level 1 and level 2 were included in the model. The overall mean estimate of the fixed effects parameter was 3.184, which equated to a probability of .96 of a student graduating from high school. This illustrated that the overall average rate of graduation was 0.96. This corresponds to the 94.1% sample mean graduation rate as stated in Table 7. In terms of variance component parameter, the between-school's variance of the school mean rate of graduation was estimated as 0.90 and it was statistically significant at $p < .001$ level, demonstrating there were differences in high school graduation rates among schools.

In Model 2, which is referred to as the Level-1 (L-1) only explanatory model in Table 10, some of the predictors showed statistical significance. Student level variables such as gender, race/ethnicity, sex, and high school GPA) were added to the level 1 model as predictors. All dummy variables were uncentered and all continuous variables were group mean centered. The results indicated that two variables *X2SES* and *X3GPATOT* were statistically significant predictors. Race and gender were not found to be significant predictors for this model.

In the third model (Model 3), school level (Level 2) predictors were added to the model on top of Model 2 that included level-1 predictors. The variables that were added included X2FreeLunch, X1Schwhite, X2SchoolClimate, X2Problem, A1AP, Urban, Rural, Town, Counselor, Administrator, Aligned, Counselor Hours, C2Select, C2clgApp, SchoolMeanSES and SchoolMeanGPA. Again, dummy variables such as those associated with Counselor Hours were uncentered and all other continuous variables were grand mean centered. Multiple variables exhibited as statistically significant predictors. The regression coefficient (or slope) -0.22 (p = .032) for the variable *X2PROBLEMS* indicates that the odds of graduating high school for students who enrolled in a high school with one unit higher problems are exp [-.22] = .803 times of the odds for students who attended a high school with one unit lower X2Problems, holding for all other variables in the model and the random effect u_{0j}, i.e., *ceteris peribus*. In other words, the value -0.22 equates to a 19.7% decrease in odds of graduating high school if a student attends a school with one unit higher school problems than an otherwise-similar student who attends a similar school with the level of problems one unit lower. The variable *COUNSELORGOALS* was statistically significant, with a regression coefficient or log odds-ratio of .587 (p = .012) and a 79.9% increase in the odds of a student graduating from high school if they attended a school where the counselors number one goal was college. Schools with *HIGHHOURS* of counselor time dedicated to college work was significant with a log odds-ratio of .508 (p = .004) indicating a 66% increase in the odds that a student would graduate from high school if they attend a high school where counselors spend significant time on college preparation compared to other schools. Two other school variables were significant, both the *SCHOOLMEANSES* and *SCHOOLMEANGPA* were statistically significant predictors of high school graduation. As S*CHOOLMEANSES* increased by one unit a student is ($\gamma_{02\,1}$= .856, p = .013), or exp [0.856] = 2.35 times more likely to graduate high school *ceteris paribus*. Similarly, as *SCHOOLMEANGPA* increased by one unit a student is (γ_{022}=1.924, p = <.0001) or exp [1.926]= 6.85 times more likely to graduate high school *ceteris paribus*.

At the student level, three student level variables were significant predictors of high school graduation. Both *X2SES* and *X3TGPATO* continued to be significant. The variable X2ES with an increase in the odds of a student graduating from high school of 40% (γ_{10} = .336, p = .005) for every unit of higher SES. The variable X3TGPATO had an odds increase 959% (γ_{20}= 2.36, p = <.001). This equates to a student with one unit higher GPA being 10.59 (exp[2.36] =10.59) times more likely than a similar student with a unit lower GPA to graduate high school.

The third student level variable was not significant in the unconditional model but is significant in the structural model. The *X2HISPANIC* variable representing Hispanic identifying students shows a 47% (γ_{30} = .383, p = .042) increase in odds of graduating from high school compared to White student holding all other student and school level variables constant.

The between school variability was significant for both the unconditional model and the structural model. The between school variability decreased from the unconditional model from τ = .89996 to τ = .49888. However, 45% of the overall variance was explained by the Model 3.

College Enrollment. The student level comparisons of variables associated with the second research question: *What were the effects of rural school location and college going culture on college enrollment* demonstrated a college enrollment rate of 53.9% (n = 3,939).

Table 9

Student Level Comparison of Variables by College Enrollment

Variable	Did Not Enroll			Enrolled		
	n	Row %	Column %	n	Row %	Column %
College Enrollment Completion	3,371	46.1%		3,939	53.9%	
Student Level						
Categorical Variables						
Student Race						
White (X1WHITE)	2,440	43.8%	72.4%	3,137	56.2%	79.6%
Hispanic (X1HISPANIC)	760	53.4%	22.5%	662	46.6%	16.8%
Black (X1BLACK)	676	54.6%	20.0%	562	45.4%	14.3%
Asian (X1ASIAN)	141	31.8%	4.2%	303	68.2%	7.7%
All Others (RACEOFALLOTHERS)	490	55.4%	14.5%	395	44.6%	10.0%
Student Sex						
Male	1,890	50.0%	56.1%	1,887	50.0%	47.9%
Female	1,481	41.9%	43.9%	2,052	58.1%	52.1%
School Location						
Urban	895	47.2%	26.6%	1,000	52.8%	25.4%
Town	556	51.5%	16.5%	525	48.5%	13.3%
Rural	921	47.6%	27.3%	1,013	52.4%	25.7%
Suburban	998	41.6%	29.6%	1,402	58.4%	35.6%
School Type						
Regular	3,120	46.4%	92.6%	3,604	53.6%	91.5%
Charter	68	41.9%	2.0%	94	58.1%	2.4%
Special	138	38.6%	4.1%	220	61.4%	5.6%
Technical	35	63.0%	1.0%	21	37.0%	0.5%
Alternative	35	63.0%	1.0%	21	37.0%	0.5%

Student SES										
Low SES	1,708		63.9%	50.7%		963		36.1%		24.5%
Middle SES	1,134		46.0%	33.6%		1,331		54.0%		33.8%
High SES	529		24.3%	15.7%		1,645		75.7%		41.7%
Student GPA										
High GPA	375		16.7%	11.1%		1,868		83.3%		47.4%
Middle GPA	1,107		43.0%	32.8%		1,466		57.0%		37.2%
Low GPA	1,888		75.7%	56.0%		606		24.3%		15.4%
Continuous Variables	n	M	SD	Min	Max	n	M	SD	Min	Max
X2SES	3,371	-0.32	0.63	-1.75	2.15	3,939	0.16	0.68	-1.60	2.15
X3TGPATO	3,371	2.30	0.76	0.00	4.00	3,939	3.09	0.60	0.58	4.00
School Level										
Categorical Variables	n	Row %		Column %		n	Row %		Column %	
Student Population[c,d,e]										
School Lunch										
Yes	2,134		54.2%		63.3%	1,801		45.8%		45.7%
No	1,237		36.7%		36.7%	2,138		63.3%		54.3%
School AP										
Yes	91		32.3%		2.7%	191		67.7%		4.9%
No	3,280		44.8%		97.3%	3,748		55.2%		95.1%
School Race										
Yes	1,134		50.5%		33.6%	1,113		49.5%		28.3%
No	2,237		44.3%		66.4%	2,826		55.7%		71.7%
Counseling Office Goals										
Counselor	1,491		44.0%	44.2%		1,898		56.0%		48.2%
Administrator	1,805		44.5%	53.6%		2,252		55.5%		57.2%
Alligned	948		44.3%	28.1%		1,194		55.7%		30.3%
Counseling Office Time										
50% or greater (VHHOURS)	129		53.1%	3.8%		114		46.9%		2.9%
Between 21%-50% (HHOURS)	1,263		42.7%	37.5%		1,693		57.3%		43.0%
Between 11%-20% (AHOURS)	1,421		48.3%	42.1%		1,520		51.7%		38.6%

Between 6%-10% (LHOURS)	428		47.6%	12.7%		472		52.4%		12.0%
5% or Less (VLHOURS)	130		47.9%	3.9%		141		52.1%		3.6%
Counselor Assignments										
C2Select	1,208		48.2%	35.8%		1,301		51.8%		33.0%
C2clgapp	1,266		48.1%	37.5%		1,365		51.9%		34.6%
School Climate[a]										
Positive Climate	1,038		43.0%	30.8%		1,378		57.0%		35.0%
Middle Climate	1,089		48.0%	32.3%		1,179		52.0%		29.9%
Negative Climate	1,244		47.4%	36.9%		1,382		52.6%		35.1%
School Problem[b]										
High Problem	1,304		54.6%	38.7%		1,084		45.4%		27.5%
Middle Problem	1,116		47.3%	33.1%		1,243		52.7%		31.6%
Low Problem	950		37.1%	28.2%		1,611		62.9%		40.9%
	n	M	SD	Min	Max	n	M	SD	Min	Max
X2FreeLunch	3,371	5.38	2.23	0.00	11.00	3,939	4.41	2.21	0.00	11.00
X1schwhite	3,371	6.71	3.03	0.00	11.00	3,939	7.05	2.93	0.00	11.00
Schoolclimate	3,371	-0.15	0.90	-3.36	1.92	3,939	-0.05	0.88	-3.36	1.92
Schoolproblem	3,371	0.22	0.93	-2.14	2.94	3,939	-0.08	0.91	-2.14	2.65
A1AP	3,371	14.08	11.47	0.00	80.00	3,939	16.56	13.24	0.00	80.00
SchoolMeanSES	3,371	-0.07	0.34	-1.28	1.26	3,939	0.11	0.34	-0.98	1.26
SchoolMeanGPA	3,371	2.72	0.35	0.68	3.77	3,939	2.86	0.31	0.68	3.77

Note: 1The subscript letters a,b,c,d,e indicate categorical values created from their associated continuous variables.

Note: 2 Row % and Column % represent the percentage of frequency counts within each category of a variable and the percentage of frequency counts of each categorical variable.

School Environment variables showed differences in college enrollments. Rural students enrolled in college, with rates of enrollment of 52.4% (n = 1013) respectively, lower than the enrollment rates for urban and suburban students but higher than the enrollment rates for town students. Students attending Regular schools, enrolled in college at a rate of 53.6% (n = 3,604), lower than Charter schools who had an enrollment rate of 58.1% (n = 94). Students who attended schools with 40% or more of students enrolled in the free or reduced lunch program entered college at a rate of just 45.8% (*n* = 1,801). These students made up 53.8% of the total population but just 45.7% of the college enrollers. More than three quarters of students, 67.7% (*n* = 191), who attended high AP percentage schools attended college. Students from majority minority schools were less likely than average to enroll in college with just 49.5% (*n* = 113) of students from these schools enrolling.

The school behavior norms and the college preparation orientation affected college enrollment as well. The enrollment rates for students were relatively stable across climate, with 57% (*n* = 1,378) of students from a positive climate high school enrolling in college compared to 52.6% (*n* = 1,382) of students from negative climate high schools. The differences in college enrollment among schools based on the level of problems were stark. Schools that reported low problems had 62.9% (*n* = 1,611) of their students enroll in college or 40% of all college enrollers. Schools that reported high rates of problems had just 45.4% (*n* = 1,084) of their students enroll in college making up just 27.5% of students enrolled in college. Schools identified as having counseling office goals related to college were more likely to have students enroll in college than average. The enrollment rates were 56% (*n* = 1,898), 55.5% (*n* = 2,252), and 55.7% (*n* = 1,194) of students enrolled in college who attended schools where college was the primary goal of the college counselor, the administrator, and where these goals aligned respectively. Schools with dedicated college personnel for college and assigned staff members for college applications had lower than average college enrollment rates of 51.8% (*n* = 1,301) and 51.9% (*n* = 1,365) respectively. Only students who attending schools with 21-50% of counselor time appointed to college related activities enrolled in college at a higher than average rate of 57.3% (*n* = 1,693).

HGLM Results. The HGLM results for the second research question was: *What were the effects of rural school location and college going culture on college enrollment*. I used the three-step approach of model building that was detailed in Chapter 3. All the results were shown in Table 10.

Table 10

HGLM Results for College Enrollment as dependent variable (Enrolled =1, Did Not Enroll =0)

	Unconditional Mode (Model 1)		L-1 Only Explanatory Model (Model 2)		L-1 and L-2 Explanatory Model (Model 3)	
Variable	Coefficient	(SE)	Coefficient	(SE)	Coefficient	(SE)
Intercept, γ 00	0.16***	(.042)	0.33***	(0.06)	0.25***	0.05
Student Level Variables						
X2SES γ10			0.53***	(0.05)	0.55***	0.05
X3TGPATO γ 20			1.69***	(0.05)	1.7***	0.05
X2HISPANIC γ 30			-0.01	(0.09)	0.17	0.09
X2BLACK γ 40			0.21*	(0.09)	0.33***	0.09
X2ASIAN γ 50			0.13	(0.1)	0.02	0.1
RACEOFALLOTHERS γ 60			-0.2*	(0.1)	-0.18	0.1
MALE γ 70			-0.06	(0.06)	-0.04	0.06
School Level Variables						
X2FREELUNCH, γ01					-0.06*	(0.02)
X1SCHWHITE, γ02					-0.05**	(0.02)
X2SCHOOLCLIMATE, γ03					0.004	(0.04)
X2PROBLEM, γ04					-0.13**	(0.05)
A1AP, γ05					0.01*	(0.003)
URBAN, γ06					-0.04	(0.09)
TOWN, γ07					-0.02	(0.11)
RURAL, γ08					-0.21**	(0.08)
COUNSELOR,γ09					-0.06	(0.1)
ADMINISTOR,γ010					-0.06	(0.09)
ALLIGNED, γ011					0.16	(0.13)
VHHOURS, γ012					-0.26	(0.19)
HHOURS, γ013					0.11	(0.07)
LOWHOURS, γ014					0.002	(0.1)
VLHOURS, γ015					0.06	(0.17)
C2SELECT, γ016					0.07	(0.15)
C2CLGAPP, γ017					0.1	(0.15)
SCHOOLMEANSES, γ018					1.07***	(0.15)
SCHOOLMEANGPA, γ019					0.86***	(0.13)
Variance Component						
τ	.38***		.65***		0.088***	

*p<.05, ** p<.01, ***p<.001

The unconditional model includes no predictors at either Level 1 the student level or level 2 the school level. The overall mean estimate of the fixed effects parameter was .280, which equated to a probability of .57 of a student enrolling in college. This illustrated that the overall average rate of college enrollment was 0.57. This corresponds to the 53.9% sample mean college enrollment rate as stated in Table 9. In terms of variance component parameter, the between-school's variance of the school mean rate of graduation was estimated as 0.297 and it was statistically significant at $p < .001$ level, demonstrating there were differences in college enrollment rates among schools.

In Model 2, the Level -1 (L-1) only explanatory model, which added student level variables, some of the coefficients exhibited statistical significance. Four variables *X2SES*, *X3GPATOT*, *X2BLACK*, *RACEOFALLOTHERS*, were statistically significant predictors. Gender was not a significant predictor for this model.

In the third model (Model 3), or the L-1 and L-2 explanatory model, school level (Level 2) predictors were added to the model on top of Model 2 that included Level -1 predictors. In this model multiple variables were statistically significant predictors. The variable *X2FREELUNCH* was a predictor ($\gamma_{01} = -0.060$, $p = .012$). equated to a 5.8% decrease in odds of enrolling in college if a student was enrolled in a school with a high ratio of students receiving free or reduced lunch when holding for all other variables. The variable *X1SCHWHITE* was a significant predictor ($\gamma_{02} = -0.0496$, $p = .003$) for college enrollment. It equated to a 4.8% decrease in odds of enrolling in college if a student is enrolled in a school with higher proportions of White students while holding for all other variables. The variable *X2PROBLEMS* was a significant predictor ($\gamma_{04} = -0.134$, $p = .003$) for college enrollment it equated to a 13% decrease in odds of enrolling in college if a student was enrolled in a school with high problems when holding for all other variables. The variable *A1AP* was a significant predictor ($\gamma_{05} = 0.0065$, p = .035) for college enrollment. However, it equated to a less than 1% increase in odds of enrolling in college if a student is enrolled in a school with AP course enrollment when holding for all other variables. The variable *RURAL* was statistically significant, ($\gamma_{08} = -.206814$, , p = .012), which indicated that students' attending a school in a rural district had a 18.7% decrease in the odds of enrolling in college when compared to students in suburban schools. Two other school variables were significant, both the *SCHOOLMEANSES* and *SCHOOLMEANGPA* were statistically significant predictors of college enrollment. For each unit increase of *SCHOOLMEANSES* a student was($\gamma_{018} = 1.072$, $p = < .001$) (exp[1.072] = 2.92) 2.92 times more likely to enroll in college. Similarly, for each unit of increase for *SCHOOLMEANGPA*($\gamma_{019} = .861$, $p = < .0001$) as student was (exp[.861] =2.36) 2.36 times more likely to enroll in college holding all else constant.

At the student level, three student level variables were significant predictors of college enrollment. Both *X2SES* and *X3TGPATO* continue to be significant with an increase in the odds of a student enrolling in college. One-unit higher level of SES increased the odds of attending college by 73% ($\gamma_{10} = .5454$, $p = <.001$). While a unit higher GPA ($n = \gamma_{20} =1.701$, $p = <.001$) made it (exp[1.701] =5.48) 5.48 times more likely a student would attend college *ceteris peribus*. The *X2BLACK* variable representing students' identifying as Black, indicated a 40% ($n = \gamma_{30}=.333$, $p = <.001$) increase in odds of enrolling in college compared to their White counterparts and holding all else equal. The variable RACEOFALLOTHERS is no longer significant in Model 3.

The between school variability was significant for both the unconditional model and the structural model. The between school variability decreased from the unconditional model from $\tau = .29735$ to $\tau = .08839$. However, 77% of the original variance is explained by Model 3.

Students Enrolled in College

The last three reference questions considered choices only enrolled college students made. A sub-sample of students who graduated high school and their associated schools was made. In this sample, there were 489 schools and 3,939 students. The student sample of college-enrolled students consisted of 3,939 subjects. Students who attended Suburban schools made up 35.6% (*n* = 1,402) of the group, while rural students account for 25.7% (*n* = 1,013) of college enrollers. The majority of enrolled college students attended regular high schools (91.5%, *n* = 3,604).

Students in the college enrollment sample attended high schools with 40% or more students receiving free lunch at a rate of 45.7% (*n* = 1,801). Only 4.9% (*n* = 191) of students in the enrolled sample attending schools where more than 40% of students took AP courses. A little more than a quarter of students, 28.3% (*n* = 1,113), attended majority minority high schools. Nearly half, 48.2% (*n* = 1,898), of the students enrolled in college attended high schools where the number one goal for the college counseling office was college. Even more enrolled college students, 57.2% (*n* = 2,252), attended a high school where the administrator identified college as the goal of the counseling office. In 30.3% (*n* = 1,194) of the cases, students attended schools where these two goals aligned. Almost half of students, 43% (*n* = 1,693), attended high schools in which 21-50% of counseling time was spent on college. Having a dedicated counselor for college and a staff member assigned to college applications accounted for 33% (*n* = 1,301) and 34.6% (*n* = 1,365) of the students' experiences respectively. The students in this sample attend schools with a mean climate of -.0526 (-3.36-1.92). The mean level of school problems for students who enrolled in college was -.0788 (-2.14-2.65). This sample had a mean SES of .1587 (-1.60 -2.15) and a mean GPA of 3.0904 (0.58 – 4.00), both which were higher than the stated means for the larger sample.

Table 11

Descriptive Statistics for College Enroller Sub Sample

Variable		n	%
Student Level		3,939	
Categorical Variables			
Race			
White (X1WHITE)		3,137	79.6%
Hispanic (X1HISPANIC)		662	14.3%
Black (X1BLACK)		562	16.8%
Asian (X1ASIAN)		303	7.7%
All Others (RACEOFALLOTHERS)		395	10.0%
Sex			
Male		1,887	47.9%
Female		2,052	52.1%
Location			
Urban		1,000	25.4%
Town		525	3.3%
Rural		1,013	25.7%
Suburban		1,402	35.6%
Type			
Regular		3,604	91.5%
Charter		94	2.4%
Special		220	5.6%
Technical		21	0.5%
Alternative		21	0.5%
Student Population			
School Lunch			
	Yes	1,801	45.7%
	No	2,138	54.3%
School AP			
	Yes	191	4.9%
	No	3,748	95.1%
School Race			
	Yes	1,113	28.3%
	No	2,826	71.7%

Counseling Office Goals					
Counselor					
Yes	1,898	48.2%			
No	2,041	51.8%			
Administrator					
Yes	2,252	57.2%			
No	1,687	42.8%			
Aligned					
Yes	1,194	30.3%			
No	2,745	69.7%			
Counseling Office Time					
50% or greater (VHHOURS)	114	2.9%			
Between 21%-50% (HHOURS)	1,693	43.0%			
Between 11%-20% (AHOURS)	1,520	38.6%			
Between 6%-10% (LHOURS)	472	12.0%			
5% or Less (VLHOURS)	141	3.6%			
Counselor Assignments					
C2Select					
Yes	1,301	33.0%			
No	2,638	67.0%			
C2ClgApp					
Yes	1,365	34.6%			
No	2,574	65.4%			
Continuous Variables	n	M	SD	Min	Max
X2SES	3,939	0.16	0.68	-1.60	2.15
X3TGPA	3,939	3.09	0.60	0.58	4.00

School Level	489	
Categorical Variables	n	%
Location		
Urban	104	21.3%
Town	65	13.3%
Rural	142	29.0%
Suburban	178	36.4%
Type		
Regular	458	93.7%
Charter	12	2.5%
Special	16	3.3%
Technical	2	0.4%
Alternative	2	0.4%
Student Population		
School Lunch		
Yes	271	55.4%
No	218	44.6%
School AP		
Yes	21	4.3%
No	468	95.7%
School Race		
Yes	124	25.4%
No	365	74.6%
Counseling Office Goals		
Counselor		
Yes	233	47.6%
No	256	52.4%
Administrator		
Yes	258	52.8%
No	231	47.2%
Aligned		
Yes	138	28.2%
No	351	71.8%

	n	% / M	SD	Min	Max
Counseling Office Time					
50% or greater (VHHOURS)	15	3.1%			
Between 21%-50% (HHOURS)	186	38.0%			
Between 11%-20% (AHOURS)	193	39.5%			
Between 6%-10% (LHOURS)	74	15.1%			
5% or Less (VLHOURS)	21	4.3%			
Counselor Assignments					
C2Select					
Yes	164	33.5%			
No	325	66.5%			
C2ClgApp					
Yes	170	34.8%			
No	319	65.2%			
Continuous Variables	n	M	SD	Min	Max
X2FreeLunch	489	4.98	2.28	0.00	11.00
X1schwhite	489	7.30	2.76	0.00	11.00
Schoolclimate	489	-0.07	0.86	-3.36	1.92
Schoolproblem	489	0.13	0.94	-2.14	2.65
A1AP	489	15.03	12.50	0.00	80.00
SchoolMeanSES	489	0.02	0.36	-0.98	1.26
SchoolMeanGPA	489	2.79	0.36	0.68	3.77

The subsample of college enrollers consisted of 489 schools, this is 5 less schools than the original sample. The schools that dropped out of the subsample were from urban (2), rural (1), and suburban (2) areas. These schools were not included in the sub-sample because they had no students enrolling in college who were included in the student sample. Of the 489 schools 21.3% (*n* = 104) were urban, 13.3% (*n* = 65) were located in a Town, 29% (*n* = 142) were rural, and the largest proportion 36.4% (*n* = 178), were suburban schools. A vast majority of the schools were Regular (93.7%, *n* = 458). The other schools made up much smaller proportion of the total with Charter schools accounting for 2.5% (*n* = 12), Special Programs, 3.3% (*n* = 16), Technical Schools, 0.4% (*n* = 2) and Alternative schools 0.4% (*n* = 2). Over half of the schools, 55.4% (*n* = 271) had more than 40% of their student body on free and reduced lunch. A quarter of schools, 25.4% (n = 124) had a majority minority population, with more than 50% students of color. Only 4.3% (n = 21) of schools had more than 40% of their student population enrolled in AP courses. The schools included in the sample had counselor college goal rate of 47.6% (n = 233) and an administrator college goal rate of 52.8% (n = 258). Only 28.2% (n = 138) of schools included in the enrolled student sample had these goals aligned. Most schools, had counseling offices that devoted between 11-20%, or 21-50% with rates of 39.5% (n =193) and 38%, (n =186) of their time to college respectively. More than a third of schools identified dedicated personnel for college (33.5%, n = 164), or had a staff member assigned to college applications (34.8%, n = 170). The mean climate for the school sample was -.0663 (-3.36-1.92). The mean self-reported number of problems in the school was .1254, with a range of (-2.14 – 2.65).

College Control. Using the sample of college enrolled students, to review the third research question *What were the effects of rural school location and college going culture on college control* with a sample size of 3,939 students, 96.9% (n = 3,819) of students attended not-for-profit institutions.

Table 12

Student Level Comparison of Variables by College Control

Variable	For Profit (n=120)			Not for Profit (n=3819)		
	n	Row %	Column %	n	Row %	Column %
College Control						
Enrollment	121		3.10%	3,819		96.90%
Student Level						
Categorical Variables						
Student Race						
White (X1WHITE)	93	3.00%	77.30%	3,043	97.00%	79.70%
Hispanic (X1HISPANIC)	31	4.60%	25.30%	3,187	95.40%	16.50%
Black (X1BLACK)	23	4.10%	19.00%	539	95.90%	14.10%
Asian (X1ASIAN)	5	1.50%	3.80%	299	98.50%	7.80%
All Others (RACEOFALLOTHERS)	10	2.60%	8.60%	384	97.40%	10.10%
Student Sex						
Male	72	3.80%	59.90%	1,815	96.20%	47.50%
Female	48	2.40%	40.10%	2,003	97.60%	52.50%
School Location						
Urban	38	3.80%	31.70%	962	96.20%	25.20%
Town	14	2.70%	11.80%	510	97.30%	13.40%
Rural	23	2.20%	18.70%	990	97.80%	25.90%
Suburban	46	3.30%	37.80%	1,356	96.70%	35.50%
School Type						
Regular	117	3.20%	97.00%	3,487	96.80%	91.30%
Charter	0	0.00%	0.00%	94	100.00%	2.40%
Special	2	1.10%	2.00%	217	98.90%	5.70%
Technical	1	5.50%	0.90%	20	94.50%	0.50%
Alternative	1	5.50%	0.90%	20	94.50%	0.50%
Student SES						
Low SES	54	5.60%	44.60%	910	94.40%	23.80%
Middle SES	44	3.30%	36.40%	1,287	96.70%	33.70%
High SES	23	1.40%	19.00%	1,622	98.60%	42.50%
Student GPA						
High GPA	29	1.50%	23.80%	1,839	98.50%	48.20%
Middle GPA	62	4.30%	51.70%	1,403	95.70%	36.70%
Low GPA	30	4.90%	24.50%	576	95.10%	15.10%

Continuous Variables	n	M	SD	Min	Max	n	M	SD	Min	Max
X2SES	121	-0.24	0.61	-1.41	1.27	3,819	0.17	0.68	-1.60	2.15
X3TGPATO	121	2.79	0.60	0.67	4.00	3,819	3.10	0.59	0.58	4.00

School Level						
Categorical Variables	n	Row %	Column %	n	Row %	Column %
Student Population[c,d,e]						
School Lunch	69	3.80%	57.10%	1,732	96.20%	45.40%
School AP	3	1.60%	2.50%	188	98.40%	4.90%
School Race	33	2.90%	27.10%	1,081	97.10%	28.30%
Counseling Office Goals						
Counselor	45	2.40%	37.20%	1,853	97.60%	48.50%
Administrator	53	2.30%	43.70%	2,200	97.70%	57.60%
Aligned	18	1.50%	15.10%	1,176	98.50%	30.80%
Counseling Office Time						
50% or greater (VHHOURS)	1	1.00%	0.90%	113	99.00%	3.00%
Between 21%-50% (HHOURS)	45	2.70%	37.50%	1,647	97.30%	43.10%
Between 11%-20% (AHOURS)	49	3.20%	40.70%	1,471	96.80%	38.50%
Between 6%-10% (LHOURS)	20	4.30%	16.80%	452	95.70%	11.80%
5% or Less (VLHOURS)	5	3.50%	4.10%	136	96.50%	3.60%
Counselor Assignments						
C2Select	39	3.00%	32.50%	1,261	97.00%	33.00%
C2clgapp	36	2.70%	30.00%	1,329	97.30%	34.80%
School Climate[a]						
Positive Climate	37	2.70%	30.30%	1,341	97.30%	35.10%
Middle Climate	39	3.30%	32.50%	1,140	96.70%	29.90%
Negative Climate	45	3.20%	37.20%	1,338	96.80%	35.00%
School Problem[b]						
High Problem	43	3.90%	35.40%	1,042	96.10%	27.30%
Middle Problem	30	2.40%	24.80%	1,214	97.60%	31.80%
Low Problem	48	3.00%	39.80%	1,563	97.00%	40.90%

Continuous Variables	n	M	SD	Min	Max	n	M	SD	Min	Max
X2FreeLunch	121	5.32	2.32	1.00	11.00	3,819	4.38	2.20	0.00	11.00
X1schwhite	121	6.98	2.84	0.00	10.00	3,819	7.05	2.93	0.00	11.00
Schoolclimate	121	-0.13	0.81	-2.33	1.63	3,819	-0.05	0.89	-3.36	1.92
Schoolproblem	121	-0.02	0.99	-1.95	2.26	3,819	-0.08	0.91	-2.14	2.65
A1AP	121	13.83	12.03	0.00	80.00	3,819	16.64	13.27	0.00	80.00
SchoolMeanSES	121	-0.03	0.32	-0.83	0.91	3,819	0.11	0.34	-0.98	1.26
SchoolMeanGPA	121	2.72	0.32	1.76	3.64	3,819	2.87	0.31	0.68	3.77

Note: 1 The subscript letters a,b,c,d,e indicate categorical values created from their associated continous variables.
Note: 2 Row % and Column % represent the percentage of frequency counts within each category of a variable and the percentage of frequency counts of each categorical variable.

There were differences in not-for-profit attendance based on school characteristics. Students' attending urban and suburban schools choose not-for-profits less often than rural students. Students from rural areas attended not-for-profit schools 97.8% (n = 990) of the time. Regular school graduates choose to attend not-for-profit schools at a rate of 96.8% (n = 3,487), a lower rate than Charter school students, who all chose to attend not-for-profit schools. Students who attended high schools with high AP enrollment choose to attend not-for-profit schools at a rate of 98.4%, n = 188). However, students who attended schools with high levels of free lunch and majority minority schools choose not-for-profits less often at rates of 96.2% (n = 1,732) and 97.1% (n = 1,081) of the time respectively. Students who attended schools with college as the number one counselor goal, administrator goal, and where these goals aligned were more likely than the overall group to attend not-for-profit schools with rates of attendance of 97.6% (n = 1,853), 97.7% (n = 2,200), and 98.5% (n = 1,176) respectively. Students from high schools with counselor college work percentages above 50% went to not-for-profit institutions 99% (n = 113) of the time. Students with dedicated college personnel and staff members assigned to college applications were more likely than the overall group to attend a not-for-profit institution and experienced attendance rates of 97% (n = 1,261) and 97.3% (n = 1,329) respectively. Climate had little impact of the not-for-profit going rates of students with student going rates of 97.3% (*n* = 1,421) for positive climate schools and 96.8% (*n* = 1,341) for negative climate schools. Students who attended high problem schools chose not-for-profit intuitions 96.1% (*n* = 1,042) which was a lower rate than students attending average or low problem schools.

HGLM Results. The HGLM results for the second research question was: *What were the effects of rural school location and college going culture on college control*. The unconditional model included no predictors at either Level 1, the student level, or Level 2, the school level. I used the three-step approach of model building that was detailed in Chapter 3. All the results were shown in Table 13.

Table 13

HGLM Results for College Control as dependent variable (Not for Profit =1, For Profit =0)

	Unconditional Model (Model 1)		L-1 Only Explanatory Model (Model 2)		L-1 and L-2 Explanatory Model (Model 3)	
Variable	Coefficient	(SE)	Coefficient	(SE)	Coefficient	(SE)
Intercept, γ 00	4.16***	(.11)	4.49***	(0.17)	4.38***	(0.18)
Student Level Variables						
X2SES γ10			0.32	(0.17)	0.37	(0.17)
X3TGPATO γ 20			0.91***	(0.18)	0.91***	(0.18)
X2HISPANIC γ 30			-0.5	(0.27)	-0.36	(0.28)
X2BLACK γ 40			-0.3	(0.27)	-0.23	(0.29)
X2ASIAN γ 50			-0.19	(0.31)	-0.27	(0.32)
RACEOFALLOTHERS γ 60			-0.32	(0.3)	-0.29	(0.31)
MALE γ 70			0.06	(0.2)	0.06	(0.2)
School Level Variables						
X2FREELUNCH, γ01					-0.07	(0.08)
X1SCHWHITE, γ02					-0.02	(0.06)
X2SCHOOL, γ03					0.11	(0.14)
X2PROBLEM, γ04					0.24	(0.15)
A1AP, γ05					0.004	(0.01)
URBAN, γ06					0.26	(0.3)
TOWN, γ07					0.31	(0.37)
RURAL, γ08					0.28	(0.28)
COUNSELOR,γ09					0.04	(0.32)
ADMINISTOR,γ010					-0.06	(0.29)
ALLIGNED, γ011					0.25	(0.44)
VHHOURS, γ012					0.71	(0.81)
HHOURS, γ013					-0.15	(0.25)
LOWHOURS, γ014					-0.72*	(0.31)
VLHOURS, γ015					-0.47	(0.52)
C2SELECT, γ016					-1.41**	(0.53)
C2CLGAPP, γ017					1.46**	(0.54)
SCHOOLMEANSES, γ018					0.96	(0.5)
SCHOOLMEANGPA, γ019					0.54	(0.42)
Variance Component						
τ	1.4***		1.46***		1.03***	

*p<.05, ** p<.01, ***p<.001

The overall mean estimate of the fixed effects parameter was 4.161, which equated to a probability of 0.98 of a student attending a not-for-profit institution. This illustrated that the overall average rate of not-for-profit enrollment was 0.98. In terms of variance component parameter, the between-school's variance of the school mean rate of graduation was estimated as 1.38 and it was statistically significant at $p < .001$ level, demonstrating there were differences in college enrollment rates among schools.

In Model 2, the Level-1 (L-1) only explanatory model, which added student level variables, some of the coefficients exhibited statistical significance. Two variables *X2SES* and *X3GPATOT*, were statistically significant predictors. Neither Race nor Gender was significant predictors for this model.

In the third model, (Model 3) or the L-1 and L-2 explanatory model, school level (Level 2) predictors were added to the model on top of Model 2 that included Level-1 predictors. In this model multiple variables were statistically significant predictors. The variable *LOWHOURS was* a predictor ($\gamma_{014} = -.721$ $p = .019$). equated to a 51% decrease in odds of enrolling in a not-for-profit university if the student attended a high school where counselors spent less time on college related tasks than average while holding for all other variables. The variable *C2SELECT* was a significant predictor ($\gamma_{016} = -1.41$, $p = .008$) for not-for-profit enrollment. It equated to a 76% decrease in odds of enrolling in a not-for-profit institution if a student is enrolled in a school with a counselor dedicated to college selection when compared to students who attended schools who did not have a counselor dedicated to selection and holding all else. The variable *C2CLGAPP* was a significant predictor ($\gamma_{04} = 1.46$, $p = .008$) for not-for-profit enrollment. This means a student with a counselor assigned to applications was 4.30 (exp[1.46] = 4.30) times more likely to enroll in a not-for-profit institution than their counterparts.

At the student level, three student level variables were significant predictors of not-for-profit attendance. Both *X2SES* and *X3TGPATO* continue to be significant with an increase in the odds of a student enrolling at a not-for-profit college. X2SES by 44% (γ_{10} = .366, p = .033) and (γ_{20} =.910, p = <.001) for every unit change in X3TGPATO students were 2.48 (exp[.910] =2.48) times more likely to enroll in a not-for-profit institution compared to a similar student with a unit lower GPA.

The between school variability was significant for both the unconditional model and the structural model. The between school variability decreased from the unconditional model from τ = 1.38 to τ = 1.03416. This finds 25% of the original variance was explained by Model 3.

College Program Level. The student level comparison of variables associated with college program level found just over half, 54.9%, (n = 2291) of the students who enrolled in college, enrolled in a 4-year program. The high school environment showed effects on 4-year college enrollment rates.

Table 14

Student Level Comparison of Variables by College Program Level

Variable	2- year			4- Year		
	n	% in Variable	% in Population	n	% in Variable	% in Population
College Program Level						
Enrollment	1,778		45.10%	2,161		54.90%
Student						
Categorical Variables						
Student Race						
White (X1WHITE)	1,386	44.10%	77.80%	1,754	55.90%	81.20%
Hispanic (X1HISPANIC)	441	66.60%	24.80%	221	33.40%	10.20%
Black (X1BLACK)	299	53.20%	16.80%	263	46.80%	12.20%
Asian (X1ASIAN)	109	35.90%	6.10%	195	64.10%	9.00%
All Others (RACEOFALLOTHERS)	237	59.90%	13.30%	158	40.10%	7.30%
Student Sex						
Male	848	44.90%	47.70%	1,039	55.10%	48.10%
Female	930	45.30%	52.30%	1,122	54.70%	51.90%
School Location						
Urban	454	45.40%	25.60%	545	54.60%	25.20%
Town	258	49.20%	14.50%	267	50.80%	12.30%
Rural	461	45.60%	26.00%	551	54.40%	25.50%
Suburban	604	43.10%	34.00%	798	56.90%	36.90%
School Type						
Regular	1,609	44.70%	90.50%	1,995	55.30%	92.30%
Charter	53	56.90%	3.00%	40	43.10%	1.90%
Special	94	42.80%	5.30%	126	57.20%	5.80%
Technical	20	97.00%	1.10%	1	3.00%	0.00%
Alternative	20	97.00%	1.10%	1	3.00%	0.00%
Student SES						
Low SES	622	64.60%	35.00%	341	35.40%	15.80%
Middle SES	671	50.40%	37.70%	660	49.60%	30.50%
High SES	485	29.50%	27.30%	1,160	70.50%	53.70%
Student GPA						
High GPA	531	28.40%	29.80%	1,337	71.60%	61.90%
Middle GPA	757	51.60%	42.60%	709	48.40%	32.80%
Low GPA	490	80.90%	27.60%	116	19.10%	5.40%

Continuous Variables	n	M	SD	Min	Max	n	M	SD	Min	Max
X2SES	1,778	-0.07	0.62	-1.56	1.97	2,161	0.35	0.67	-1.60	2.15
X3TGPATO	1,778	2.84	0.62	0.58	4.00	2,161	3.30	0.49	0.71	4.00
School Level										
Categorical Variables										
Student Population[c,d,e]										
School Lunch	951		52.80%		53.50%	850		47.20%		39.30%
School AP	64		33.30%		3.60%	128		66.70%		5.90%
School Race	601		53.90%		33.80%	513		46.10%		23.70%
Counseling Office Goals										
Counselor	790		41.60%		44.40%	1,108		58.40%		51.30%
Administrator	1,005		44.60%		56.50%	1,248		55.40%		57.70%
Aligned	503		42.10%		28.30%	691		57.90%		32.00%
Counseling Office Time										
50% or greater (VHHOURS)	64		56.60%		3.60%	49		43.40%		2.30%
Between 21%-50% (HHOURS)	692		40.90%		38.90%	1,000		59.10%		46.30%
Between 11%-20% (AHOURS)	741		48.70%		41.70%	779		51.30%		36.00%
Between 6%-10% (LHOURS)	214		45.30%		12.00%	258		54.70%		12.00%
5% or Less (VLHOURS)	67		47.30%		3.80%	74		52.70%		3.40%
Counselor Assignments										
C2select	653		50.20%		36.70%	647		49.80%		29.90%
C2clgapp	693		50.80%		39.00%	672		49.20%		31.10%
School Climate[a]										
Positive Climate	632		45.90%		35.60%	745		54.10%		34.50%
Middle Climate	517		43.90%		29.10%	662		56.10%		30.60%
Negative Climate	628		45.40%		35.30%	754		54.60%		34.90%
School Problem[b]										
High Problem	553		51.00%		31.10%	532		49.00%		24.60%
Middle Problem	590		47.50%		33.20%	653		52.50%		30.20%
Low Problem	635		39.40%		35.70%	977		60.60%		45.20%

Continuous Variables	n	M	SD	Min	Max	n	M	SD	Min	Max
X2FreeLunch	1,778	4.88	2.24	0.00	11.00	2,161	4.03	2.11	0.00	11.00
X1schwhite	1,778	6.61	3.07	0.00	11.00	2,161	7.41	2.76	1.00	11.00
Schoolclimate	1,778	-0.09	0.93	-3.36	1.92	2,161	-0.02	0.85	-3.24	1.92
Schoolproblem	1,778	0.03	0.88	-2.14	2.65	2,161	-0.17	0.93	-2.14	2.65
A1AP	1,778	15.39	12.55	0.00	80.00	2,161	17.52	13.72	0.00	80.00
SchoolMeanSES	1,778	0.03	0.32	-0.98	0.97	2,161	0.18	0.34	-0.87	1.26
SchoolMeanGPA	1,778	2.81	0.31	0.68	3.60	2,161	2.91	0.31	1.73	3.77

Note: 1The subscript letters a,b,c,d,e indicate categorical values created from their associated continuous variables.

Note: 2 Row % and Column % represent the percentage of frequency counts within each category of a variable and the percentage of frequency counts of each categorical variable.

Rural students saw 4-year college enrollment rates of rates of 54.4% (n = 551), a lower rate than both suburban and urban students. Students attending Regular schools, enrolled in 4-year colleges at a rate of 55.3% (n = 1,995). Almost half, 47.2% (n = 850) of students from high schools with high levels of free and reduced lunch enrolled in 4-year programs. This is compared to 66.7% (n = 128) of students at high AP school who choose 4-year enrollment. Students who attended majority minority schools choose to enroll in 4-year programs at a rate of 46.1% (n = 513). Students attending schools with the number one goal of the counseling office being college from a counselor or an administrator choose 4-year colleges 58.4% (n = 1,108) and 55.4% (n = 1,248) of the time respectively. Students who attended schools where these goals aligned had a 57.9% (n = 691) rate of 4-year college enrollment. Counselors who worked 21-50% on college had the highest rate of student enrollment in 4-year college at a rate of 59.1% (n = 1000). Having dedicated college personnel and a staff member assigned to college applications led to 4-year enrollment rates of 49.8% (n = 647) and 49.2% (n = 672) respectively. The percentage of time counselors worked on college related tasks did not demonstrate great changes to the rate in which students at these schools attended 4-year schools. Unlike with college enrollment, school climate did little to change the ratio of students who applied to 4-year colleges from each group. More than half of the students attending positive, average, and negative climate schools attended 4-year colleges. School problems did equate to differences in the 4-year enrollment rates. Students who attended low problem schools attended 4-year colleges 60.6% (n = 977) of the time, compared to college enrollers from high problem schools who only enrolled in 4-year programs at a rate of 49% (n = 532).

HGLM Results. The HGLM results for the second research question: *What were the effects of rural school location and college going culture on college program level*, showed significance. The unconditional model included no predictors at either Level 1, the student level, or Level 2, the school level. I used the three-step approach of model building that was detailed in Chapter 3. All the results were shown in Table 15.

Table 15

HGLM Results for College Program Level as dependent variable ((4-year college =1, 2-year college =0)

	Unconditional Model (Model 1)		L-1 Only Explanatory Model (Model 2)		L-1 and L-2 Explanatory Model (Model 3)	
Variable	Coefficient	(SE)	Coefficient	(SE)	Coefficient	(SE)
Intercept, γ 00	0.33***	(0.04)	0.27***	(0.074)	0.13	(0.07)
Student Level Variables						
X2SES γ10			0.61**	(0.06)	0.64***	(0.06)
X3TGPATO γ 20			1.68***	(0.08)	1.72***	(0.084)
X2HISPANIC γ 30			-0.5***	(0.13)	-0.27*	(0.13)
X2BLACK γ 40			0.34**	(0.12)	0.53***	(0.13)
X2ASIAN γ 50			0.21	(0.12)	0.21	(0.12)
RACEOFALLOTHERS γ 60			-0.06	(0.14)	-0.02	(0.14)
MALE γ 70			0.2**	(0.08)	0.20*	(0.07)
School Level Variables						
X2FREELUNCH, γ01					-0.0005	(0.04)
X1SCHWHITE, γ02					0.04	(0.02)
X2SCHOOL, γ03					0.00	(0.07)
X2PROBLEM, γ04					-0.04	(0.07)
A1AP, γ05					0.01	(0.004)
URBAN, γ06					0.05	(0.14)
TOWN, γ07					-0.08	(0.168)
RURAL, γ08					-0.01	(0.13)
COUNSELOR,γ09					0.14	(0.16)
ADMINISTOR,γ010					-0.08	(0.14)
ALLIGNED, γ011					0.07	(0.21)
VHHOURS, γ012					-0.32	(0.32)
HHOURS, γ013					0.25**	(0.12)
LOWHOURS, γ014					0.10	(0.16)
VLHOURS, γ015					0.11	(0.26)
C2SELECT, γ016					0.13	(0.25)
C2CLGAPP, γ017					-0.41	(0.25)
SCHOOLMEANSES, γ018					1.15***	(0.23)
SCHOOLMEANGPA, γ019					0.51*	(0.2)
Variance Component						
τ	.51***		.80***		0.48	

*p<.05, ** p<.01, ***p<.001

The overall mean estimate of the fixed effects parameter was 0.331, which equated to a probability of 0.58 of a student attending a 4-year institution. This illustrated that the overall average rate of 4-year enrollment was 0.58. This corresponds to the 54.9% sample mean 4-year college enrollment rate as stated in Table 14. In terms of variance component parameter, the between-school's variance of the school mean rate of graduation was estimated as 0.51 and it was statistically significant at $p < .001$ level, demonstrating there were differences in college enrollment rates among schools.

In Model 2, or the L-1 only explanatory model in Table 15, which added student level variables, predictors *X2SES*, *X3GPATOT*, X2HISPANIC, X2BLACK, and MALE were statistically significant. Neither X2ASAIN nor RACEALLOTHERS was significant predictors for this model.

In the third model (Model 3), school level (Level 2) predictors were added on top of student level predictors in Model 2. The intercept was not significant. Meaning there was no difference in 4-year college vs. 2-year college enrollment when considering school level variables. However individual school and student variables were significant predictors of attending a 4-year institution. The variable *HHOURS was* a predictor ($\gamma_{013} = .25$ $p = .012$). equated to a 28% increase in odds of enrolling in a 4-year university if the student attended a college where counselors spent the maximum amount of time on college related tasks while holding for all other variables. *SchoolMeanSES* and *SchoolMeanGPA* were also significant predictors of 4-year college enrollment. The variable *SchoolMeanSES* ($\gamma_{018} = 1.15$ $p = .023$) equated to a 216% increase in odds of enrolling in a 4-year institution. This equates to a student being (exp[1.15] =3.15) 3.15 times more likely to attend a 4-year institution with every unit increase of SES. The variable *SchoolMeanGPA* ($\gamma_{019} = .51$ $p = .02$) equated to a 66% increase in odds of a student attending a 4-year institution compared to a similar student with a unit lower GPA and holding all else constant.

At the student level, five student level variables were significant predictors of 4-year college enrollment. Variables *X2SES*, *X3TGPATO, X2Black, and Male* continued to be significant with an increase in the odds of a student enrolling in a 4-year institution. The variable X2SES increased the odds of attending a 4 year institution by 89.6% (γ_{10} = .64, p = <.001) for a unit increase in SES and holding all other factors constant. The variable X3TGPATO increased the likelihood of a student attending a 4-year college by 458 % (γ_{20} = 1.72, p = <.001) or (exp[1.72] = 5.58) 5.58 times more likely compared to a student with one unit lower GPA and holding all else constant. The variable, X2Black, indicated that Black students had 70 % (γ_{40} = .53, p = <.001) greater odds of attending a 4-year college than their White counterparts. Males were also more likely to attend a 4-year institution than Females. The variable *Male*, showed that men had a 22% (γ_{70} = .20, p = .011) increase in odds of attending a 4-year institution. The *X2HISPANIC* variable representing students' identifying as Hispanic indicated a 23.7% (γ_{20}= -0.27, p = <.003) decrease in odds of enrolling in a 4-year college.

College Program Time. The student level comparison of variables for the fifth and final research question: *What were the effects of rural school location and college going culture on college program time,* showed that more than 90% (n = 3,570) of students who enrolled in college, enrolled in a full-time program

Table 16

Student Level Comparison of Variables by College Program Time

Variable	Part-Time			Full-Time		
	n	% Row	% Column	n	% Row	% Column
College Program Time						
Enrollment	369		9.40%	3,570		90.60%
Student						
Categorical Variables						
Student Race						
White (X1WHITE)	259	8.30%	70.20%	2,878	91.70%	80.60%
Hispanic (X1HISPANIC)	105	15.90%	28.60%	557	84.10%	15.60%
Black (X1BLACK)	78	14.00%	21.20%	483	86.00%	13.50%
Asian (X1ASIAN)	31	10.20%	8.40%	272	89.80%	7.60%
All Others (RACEOFALLOTHERS)	35	8.90%	9.50%	360	91.10%	10.10%
Student Sex						
Male	179	9.50%	48.50%	1,708	90.50%	47.90%
Female	190	9.30%	51.50%	1,862	90.70%	52.10%
School Location						
Urban	123	12.30%	33.30%	877	87.70%	24.60%
Town	36	6.90%	9.80%	488	93.10%	13.70%
Rural	88	8.70%	23.80%	925	91.30%	25.90%
Suburban	122	8.70%	33.10%	1,280	91.30%	35.80%
School Type						
Regular	324	9.00%	87.70%	3,281	91.00%	91.90%
Charter	15	16.20%	4.10%	78	83.80%	2.20%
Special	17	7.80%	4.70%	202	92.20%	5.70%
Technical	12	58.30%	3.30%	9	41.70%	0.20%
Alternative	12	58.30%	3.30%	9	41.70%	0.20%
Student SES						
Low SES	162	16.80%	43.80%	802	83.20%	22.50%
Middle SES	14	9.30%	33.50%	1,208	90.70%	33.80%
High SES	84	5.10%	22.70%	468	94.90%	43.70%
Student GPA						
High GPA	67	3.60%	18.20%	1,569	96.40%	50.40%
Middle GPA	167	11.20%	44.40%	1,379	88.80%	36.50%
Low GPA	138	22.70%	37.30%	468	77.30%	13.10%

Continuous Variables	n	M	SD	Min	Max	n	M	SD	Min	Max
X2SES	369	-0.19	0.62	-1.60	2.12	3,570	0.20	0.68	-1.60	2.15
X3TGPATO	369	2.63	0.63	0.67	4.00	3,570	3.14	0.57	0.58	4.00
School Level										
Categorical Variables										
Student Population[c,d,e]										
School Lunch	232		12.90%		62.90%	1,569		87.10%		43.90%
School AP	8		4.00%		2.10%	184		96.00%		5.10%
School Race	146		13.10%		39.60%	967		86.90%		27.10%
Counseling Office Goals										
Counselor	156		8.20%		42.40%	1,742		91.80%		48.80%
Administrator	188		8.40%		51.00%	2,064		91.60%		57.80%
Aligned	86		7.20%		23.40%	1,108		92.80%		31.00%
Counseling Office Time										
50% or greater (VHHOURS)	18		15.60%		4.80%	6		84.40%		2.70%
Between 21%-50% (HHOURS)	138		8.20%		37.50%	1,554		91.80%		43.50%
Between 11%-20% (AHOURS)	158		10.40%		42.90%	1,361		89.60%		38.10%
Between 6%-10% (LHOURS)	42		9.00%		11.50%	429		91.00%		12.00%
5% or Less (VLHOURS)	12		8.60%		3.30%	129		91.40%		3.60%
Counselor Assignments										
C2select	138		10.60%		37.40%	1,162		89.40%		32.60%
C2clgapp	144		10.50%		39.00%	1,221		89.50%		34.20%
School Climate[a]										
Positive Climate	126		9.10%		34.10%	1,252		90.90%		35.10%
Middle Climate	125		10.60%		34.00%	1,054		89.40%		29.50%
Negative Climate	118		8.50%		31.90%	1,265		91.50%		35.40%
School Problem[b]										
High Problem	104		9.60%		28.30%	980		90.40%		27.50%
Middle Problem	132		10.60%		35.90%	1,111		89.40%		31.10%
Low Problem	132		8.20%		35.80%	1,479		91.80%		41.40%

Continuous Variables	n	M	SD	Min	Max	n	M	SD	Min	Max
X2FreeLunch	369	5.46	2.31	0.00	11.00	3,570	4.30	2.17	0.00	11.00
X1schwhite	369	5.87	3.08	0.00	11.00	3,570	7.17	2.88	0.00	11.00
Schoolclimate	369	-0.08	0.94	-3.24	1.71	3,570	-0.05	0.88	-3.36	1.92
Schoolproblem	369	0.02	0.92	-2.14	2.65	3,570	-0.09	0.91	-2.14	2.65
A1AP	369	12.82	10.12	0.00	67.00	3,570	16.94	13.47	0.00	80.00
SchoolMeanSES	369	-0.02	0.34	-0.83	0.97	3,570	0.12	0.33	-0.98	1.26
SchoolMeanGPA	369	2.73	0.37	0.68	3.46	3,570	2.88	0.30	1.37	3.77

Note: 1The subscript letters a,b,c,d,e indicate categorical values created from their associated continuous variables.

Note: 2 Row % and Column % represent the percentage of frequency counts within each category of a variable and the percentage of frequency counts of each categorical variable.

Students attending rural schools choose to attend college full-time at a rate of 91.3% (*n* = 925). Regular and Special Program students had the highest rate of full-time attendance with 91% (*n* = 2,878) and 92.2% (*n* = 202) of these students enrolled full-time respectively. Students attending schools where the counselor's number one counseling goal was college attended full-time programs 91.8% (*n* = 1,742) of the time. This was a very similar number to students who attended schools where the administrators' number one counseling goal was college, 91.6% (*n* = 2,064) of those students attended college full-time. The rate of full-time attendance rose to 92.8%(*n* = 1,108) for students who attend high schools where the counselor and administrator's counseling goals align. The amount counselors' work on college related tasks and full-time college enrollment did not have a linear relationship. Students' attending schools with counselors than spent greater than 50% of time on college tasks and between 11-20% of time on college tasks had the lowest rates of full-time enrollment with 84.4% (*n* = 96) than 89.6% (*n* = 1,361) of these students choosing to enroll full-time respectively. Having a dedicated college personnel or an assigned staff member for college applications equated to full-time enrollment rates of 89.4% (*n* = 1,162) and 89.5% (*n* = 1,221) respectively. School climate levels showed very small differences in full time enrollment rates with 90.9% (*n* =1,252) of students attending a positive climate school enrolling full-time, and 91.5% (*n* = 1,265) of students attending a negative climate school enrolled in college full-time. Similarly, to climate, school problem levels showed very small differences in full time enrollment rates, with full-time enrollment rates of 90.4% (*n* =980) for high problem school students, and 91.8% (*n* = 1,479) for low problem school students.

HGLM Results. The HGLM results for the fifth research question was: *What were the effects of rural school location and college going culture on program time*. I used the three-step approach of model building that was detailed in Chapter 3. All the results were shown in Table 17.

Table 17

HGLM Results for Program Time as dependent variable (Full-time =1, Part-time =0)

	Unconditional Model (Model 1)		L-1 Only Explanatory Model (Model 2)		L-1 and L-2 Explanatory Model (Model 3)	
Variable	Coefficient	(SE)	Coefficient	(SE)	Coefficient	(SE)
Intercept, γ 00	2.69***	(0.07)	3.11***	(0.11)	2.94***	(0.11)
Student Level Variables						
X2SES γ10			0.44***	(0.1)	0.5***	(0.11)
X3TGPATO γ 20			1.37***	(0.11)	1.39***	(0.11)
X2HISPANIC γ 30			-0.79***	(0.17)	-0.52**	(0.18)
X2BLACK γ 40			-0.17	(0.17)	0.12	(0.19)
X2ASIAN γ 50			-0.5**	(0.18)	-0.47**	(0.18)
RACEOFALLOTHERS γ 60			0.27	(0.21)	0.3	(0.21)
MALE γ 70			0.11	(0.12)	0.07	(0.12)
School Level Variables						
X2FREELUNCH, γ01					-0.05	(0.05)
X1SCHWHITE, γ02					0.1**	(0.03)
X2SCHOOL, γ03					-0.1	(0.09)
X2PROBLEM, γ04					0.07	(0.1)
A1AP, γ05					0.02**	(0.01)
URBAN, γ06					-0.21	(0.19)
TOWN, γ07					0.01	(0.25)
RURAL, γ08					-0.14	(0.18)
COUNSELOR,γ09					-0.14	(0.21)
ADMINISTOR,γ010					-0.12	(0.2)
ALIGNED, γ011					0.4	(0.29)
VHHOURS, γ012					-0.6	(0.39)
HHOURS, γ013					0.06	(0.16)
LOWHOURS, γ014					0.14	(0.22)
VLHOURS, γ015					0.42	(0.4)
C2SELECT, γ016					0.06	(0.33)
C2CLGAPP, γ017					-0.03	(0.33)
SCHOOLMEANSES, γ018					0.16	(0.32)
SCHOOLMEANGPA, γ019					0.61*	(0.27)
Variance Component						
τ	.854***		.966***			.652***

*p<.05, ** p<.01, ***p<.001

The unconditional model included no predictors at either Level 1, the student level, or Level 2, the school level. The overall mean estimate of the fixed effects parameter was 2.69, which equated to a probability of 0.94 of a student attending a university full-time. This illustrated that the overall average rate of full-time enrollment was 0.94. This corresponds to the 90.6% sample mean full-time enrollment rate as stated in Table 16. In terms of variance component parameter, the between-school's variance of the school mean rate of graduation was estimated as .85 and it was statistically significant at $p < .001$ level, demonstrating there were differences in college enrollment rates among schools.

In Model 2, or the Level -1 L-1 only explanatory model, in Table 17, some predictors showed statistical significance. Five variables *X2SES*, *X3GPATOT*, X2HISPANIC, and X2ASIAN were statistically significant predictors. Gender was not a significant predictor for this model.

In the third model (Model 3), school level (Level 2) predictors were added ot the model on top of Model 2 that included level-1 predictors. Multiple variables were statistically significant. The variable *X1SCHWHITE was* a predictor ($\gamma_{02} = .099$ $p = .004$). equated to a 10% increase in odds of enrolling in a university full-time if the student attended a high school that was a majority White while holding for all other variables. The variable *A1AP* was a significant predictor ($\gamma_{05} = .022$, $p = .001$) for full-time college enrollment. It equated to a 22% increase in odds of enrolling in an institution full-time if a student is enrolled in a high school with higher levels of AP course enrollment. The variable *SCHOOLMEANGPA* was a significant predictor ($\gamma_{019} = .608$, $t(469) = 2.264$, $p = .024$) for full-time college enrollment. It equated to an 84% increase in odds of enrolling at an institution full-time with each unit increase in GPA.

At the student level, three student level variables were significant predictors of full time enrollment. Both *X2SES* and *X3TGPATO* continued to be significant with an increase in the odds of a student enrolling in full-time by 65% (γ_{10} = .501, , p = <.001) and 315% (γ_{20} = 1.39, p = <.001) respectively. The *X2HISPANIC* variable representing students' identifying as Hispanic indicated a 40% (γ_{20}= -0.5152, p = <.003) decrease in odds of enrolling in a college full-time compared to their White counterparts and holding all other factors constant. The *X2ASIAN* variable representing students' identifying as Asian indicated a 37.6% (γ_{30}= -0.472, p = <.010) decrease in odds of enrolling in college full-time compared to their White counterparts and holding all else constant.

The between school variability was significant for both the unconditional model and the structural model. The between school variability decreased from the unconditional model from τ = .854 to τ= .065. However, 92% variance is explained by Model 3.

The results associated with the five research questions asked, showed that location and aspects of college going culture can have an effect on high school graduation, college enrollment, college control, college program level, and college program time. These effects are different for each of the five research questions and will be discussed in detail in Chapter 5.

Chapter 5

Discussion and Conclusions

This study examined school effects on college choice. Specifically, I was interested in the effects that rural high school location and college-going culture have on students' college-going behavior when controlling for both school and student level characteristics. The framework combined Perna's (2006) layer one, student habitus and layer two, school and community context layer, of her four-layer college choice model using the "college-going culture" definition by Engberg & Glibert (2013). The college-going culture defined by Engberg & Gilbert (2013) focused on school resources, their type, their availability, and how these resources were structured within a school.

The sample for this study included students attending public high schools, where data on the school's college-going culture were available. Individual students' college-going behavior data also needed to be available for inclusion. Data from the High School Longitudinal Study 2009 (HSLS, 2009) were used to garner the effects of location and college-going culture on college choice decisions. Data were analyzed using hierarchical generalized linear regression (HGLM). The research questions asked were:

1. What are the effects of rural school location and college-going culture on public high school graduation?
2. What are the effects of rural school location and college-going culture on college enrollment?
3. For public high school graduates who enrolled in college, what are the effects of rural school location and college-going culture on the control structure of the college program enrolled?

4. For public high school graduates who enrolled in college, what are the effects of rural school location and college-going culture on type of college program enrolled (two-year vs. four-year)?
5. For public high school graduates who enrolled in college, what are the effects of rural school location and college-going culture on full-time vs. part-time enrollment?

The research conducted sought to demonstrate the importance of a rural location and a college-going culture on the choices students make from high school graduation, through college enrollment and the types of schools and programs a student chooses upon college enrollment. The findings illustrated that there were significant differences in students' college-going behavior based upon the high school they attended, even when holding for other variables that are known to influence college-going behavior. This chapter will first discuss the findings for each of the five research questions considered. Next implications for research, policy, and practice will be discussed.

The college-going process begins with high school graduation. Attending a rural school was not a significant factor in the high school graduation rate of my sample. However, the multi-level regression analysis showed that five school variables were significant predictors of high school graduation. Students attending schools where the primary goal of the counseling office was college going had a 79.9% increase in the odds of high school graduation than students who attended schools with counseling offices who did not have college enrollment as the counseling offices primary goal. Students who attended schools where counselors reported spending between 21-50% of their time on college related activities were 66% more likely in odds to attend college then those who attended schools with differing rates of college focus. The school's overall socio-economic status and overall GPA also increased the likelihood of a student graduating from high school by 2.35 times and 6.85 times respectively. The higher the economic status and grade point average, the more likely the graduation. These findings are consistent with other findings in the field that demonstrate the creation of a college-going culture and high college expectations for students results in higher educational attainment (Byun, et al, 2012b; Jarsky, et al., 2009; Roderick, Coca, & Nagaoka, 2011; Vela, Flamez, Sparrow, & Lerma, 2016; Wilcox, et al. 2014.)

Only a high rate of problems at a school, such as truancy and apathy resulted in a lower rate of high school graduation. Students were 19.2% less likely in odds to graduate from high school if they attended a high school with a high rate of problems. These findings support the findings of Jordan (2012), and Peguero, (2015, 2016) that students attending schools with more problems are more likely to drop out.

The results related to the second research question considering college enrollment indicated that location and a variety of other factors influenced students' choice to enroll in college. Students who attend high schools designated as rural school locations, had an 18.7% decrease in odds of enrolling in college than suburban students, holding all other factors constant. This matches the work of Korichich, (2014) and Hu, (2013) who also found that rural students were less likely to enroll in college. Students who attended schools with high AP enrollment had only a 1% increase in odds of enrolling in college but the difference was significant. However, attending schools with high mean GPA's increased the likelihood of college enrollment by 2.92 times, demonstrating that the academic strength of a given school is a strong predictor of college going. Students with high mean SES scores were 2.36 times more likely to enroll in college. Demonstrating a large advantage for all students who enroll in wealthy schools.

The remaining three variables were negatively related to college enrollment. Students who attend high poverty districts, or districts with high rates of Free and Reduced Lunch recipients were 5.8% less likely in odds to enroll in college than other students. This finding supports the findings of Grodsky and Riegle-Crumb, (2010) and Plardy, (2015). Similarly, to the findings on high school graduation, students who attended high problem schools had 13% lower odds of enrolling in college. This matches the findings of Engberg and Gilbert, (2014) using the same database. Finally, and most surprisingly, attending a majority White school was associated with a 4.8% decrease in the odds a student would attend college. Previous studies have indicated that an individual student's race had an impact on college enrollment. More specifically, Black students enrolled in college at a higher rate than White students (Belasco, 2013; Engberg & Wolniak, 2009; Grodsky & Riegle-Crumb, 2010; Koricich, 2011; Stephan & Rosenbaum, 2013). My study also found that Black students had a 40% increase in the odds likelihood they would attend college when compared to their peers. Studies considering schools racial composition and college enrollment are less clear. Irvin et. al., (2011) found that low income schools with higher percentages of Black students had higher future educational aspirations. However, Engberg and Wolniak (2010) and Engberg and Gilbert (2014), working with an earlier iteration of the data, found that school race did not influence college enrollment when using the administrator reported level of college enrollment at a given school, not the individual students reported enrollment behavior.

The results associated with the third research question, concerning college program control, showed three college preparation orientation variables affecting college program enrollment. A rural school location was not a significant factor in the college program control students chose. Students attending a high school with counselors spending little time on college

(5% or less) had a 51% decrease in the odds likelihood they would enroll in a not-for-profit institution. The variables associated with a counselor being assigned to college selection and a counselor being assigned to assist with college applications showed an interesting dichotomy. Students who attended schools with a professional assigned to college selection had a 76% lower odds rate of attending a not-for-profit institution. However, students attending a high school with an employee dedicated to college applications were 4.3 times more likely to attend a not-for-profit institution. These findings are important because prior national surveys have not asked specific questions about college counseling and assignments. There is very little literature on having specific college counseling roles and their effect on students' choices concerning college program control. By studying the affects the organization of high school's college counseling programs has on student's college program control choices researchers, policy makers, and practitioners can begin to review what organizational set up best serves students not just for college enrollment but in helping students enroll in programs that are the strongest and the most indicative for future success.

The multilevel analysis for the fourth research question that considered college program level did not find the addition of school level variables to be statistically significant. This demonstrates that for this sample, there were no between school differences in students choosing 2-year or 4-year programs. A rural high school location was also not a significant variable for 4-year college enrollment. However, other individual school variables were significant. Students attending schools with high hours of college counseling had a 28% increase in the odds of enrolling in a 4-year institution. Students in schools with high mean levels of SES were 3.15 times more likely to enroll in a 4-year college. A school with high mean levels of GPA increased the odds its students would attend a 4-year college by 66%.

The fifth and final question concerned the effects on college program time had three significant school level variables. Attending a school with a rural location was not a significant factor the college program time choices students made. The first significant factor demonstrated that students attending high schools with a higher proportion of White students were 10% more likely to enroll in a 4-year college program. A higher level of AP courses taken at a high school equated to a 22% increase in the odds likelihood that a student would enroll in a 4-year institution vs. a 2-year institution. This matches the findings of Engberg and Wolniak, (2010). Also, students attending a high school with a higher school mean GPA were 84% more likely in odds to attend a 4-year college.

Implications for Future Policy

The acknowledgement of my findings that differentiate rural students and schools from their urban and suburban counterparts should be a jolt to policy makers across the board. The data indicated the that experience of rural students in reference to college going behaviors is different than other students. Rural students have a 18.7% decrease in odds of enrolling in college and therefore policy changes are needed to create opportunities for rural students. The three implications the findings of my study have on future policy work are; (a) college counselor training, (b) availability of AP courses, and (c) an increased focus on rural students. National, state, and institutional policy makers need to recognize that the experience of rural students from rural schools differs from other students and therefore specific polices built with these experiences in mind are needed to create equal opportunities for rural students.

College Counselor Training

My study finds the structure of a school's counseling office did not have a significant effect on college enrollment. However, it did have an effect on high school graduation and the type of college a student chooses to enroll. The debate on the purpose of the high school counseling office has long hinged on the multiplicity of roles. Are guidance offices for students' personal health, in-school needs (i.e., course enrollment), or for the preparation for post-secondary endeavors. McDonough's (1997) earliest work indicated the need for a dedicated college counseling program. While the 2012 National Survey of School Counselors and Administrators, found that 92% believed their role was that all 12th graders should be ready for success in college and career, far fewer reported being educationally prepared to help students obtain this goal. Only 51% of the surveyed counselors expressed they had sufficient knowledge on the college and career admission process. Only 36% of high school counselors surveyed that their school counseling program adequately or extensively prepared them on the college and career admission process.

The role of the school counselor has changed, yet state policies and educational expectations for these positions have not. States need to create policies to improve college counseling within high schools. There are four distinct ways in which they can do this. First, mandate that all high schools have dedicated college counseling individual or office within the larger counseling structure. Secondly, mandate that the person within this position has been trained either through a college counseling focused counseling degree or by completing a certificate in college counseling. Next the state needs to encourage existing school counselors to take in-services concerning college admission, financial aid, and creating a college going culture. Finally, states need to mandate that accredited school counseling training programs provide either separate programs dedicated to training high school college counselors, or solid course work within existing school counseling programs to train school counselors on the fundamentals of college admissions and financial aid.

Availability of AP Courses

The availability of AP courses within a school curriculum slightly increased the likelihood a student would attend college. Having AP courses in high schools' matters, and half of rural high schools offer no AP courses (Gagnon & Mattingly, 2015). Roscigno, et al's (2006) work noted that rural schools were the most disadvantaged when it comes to the availability of AP courses, mostly as a result of lower per-capita student investment and larger class sizes. They also noted that having lower number of AP courses affected teacher encouragement and resulted in lower levels of teacher encouragement. The existence of AP courses dictates to students that the school is preparing them for college. AP courses are designed to create curriculum that mirrors that of college courses. The inclusion of AP courses within a school's curriculum feeds the notion that a given school has a college going culture and is interested and dedicated to enrolling its students in college. Stephan and Rosenbaum (2013) concluded AP course enrollment positively predicted college enrollment. The gap in AP course availability is largest for small and socio-economically challenged rural districts (Gagnon & Mattingly, 2015). My research demonstrates that having AP courses increases the odds a student will enroll in university, but that being a rural student decreases these odds. Knowing that the addition of AP courses to a school's curriculum increases teacher encouragement and college going behavior of students, the addition of AP courses either through on-line or course sharing programs is vital to helping rural students enroll in college. Districts and states must make increasing AP course availability a priority, especially for rural districts.

A Focus on Rural Schools

My study finds that rural students are disadvantaged in college enrollment, these findings make it clear that both researchers and states need more comprehensive research on the rural high school student. The focus on the urban student/school has left rural student/schools, which face many of the same challenges to the creation of a college going culture, without representation and support. Existing federal programs under the Trio umbrella, and state-initiated programs such as EOP/HEOP in New York, Cal-Soap in California, and Florida's Crop should do a review of their enrollment and if need be initiate programing that invest in the enrollment of rural students. In a conversation with a HEOP counselor (personal correspondence, January 11, 2018) the HEOP program has included geographical location as a data point for the first time in their annual review.

Rural areas are becoming increasingly poor according to Farrigan and Parker (2012). In Neale-McFall and Owen's, (2016) work in Pennsylvania, there were significant differences in the money allocated to students, the time spent by counselor's for college preparation, and the expectation of success by counselors at the detriment of rural students compared to their urban counterparts. The federal government and individual states must take the warning signs of lower college enrollment rates by rural students as a notice that rural students are not being reached. Using policy to encourage not only state and national level programs to increase their rural reach but also colleges and universities is vital in a comprehensive rural student college going initiative.

Implications for Practice

Changing the way high schools, colleges, and non-profits consider the college enrollment pipeline and encouraging them to explicitly include rural students in their educational and recruitment strategies will have a direct effect on rural student's college going behaviors.

Dedicated College Counseling Personnel

My study showed a statistical significance between dedicated college personnel and aspects of a school's college going culture, specifically high school graduation and college choices made beyond college enrollment. My study, and other studies focused on the relationship between the counseling office and students in reference to college, show that high schools with more comprehensive college counseling programs encourage higher high school graduation and college enrollment rates. Directors of high school counseling offices, along with district administrators, need to recognize the importance of dedicated college counselors and the creation of a school wide college going culture to improve college enrollment rates.

However, it is not enough to simply have someone within the counseling office appointed as the college contact. The employees in these positions need to be trained in college admissions and financial aid procedures. They need to be given the time and latitude to work with individual students and groups on college procedures and preparations. This is especially hard in rural districts if the student to counselor rate is high. By hiring additional staff, even staff members available virtually, and creating a curriculum with teachers that instills a college going culture throughout the academic and social fabric of the school, rural schools may be able to develop a more comprehensive college going cultures.

Rural Focused Admission Strategies

My study found that rural students are disadvantaged in college enrollment rates, therefore, colleges, universities, and professional admissions organizations should recognize the differences in students and schools in rural areas and alter their recruitment strategies accordingly. While the focus for many large universities has been to reach urban students by using non-profit connections, organizing bused campus visits, and attending local college fairs these strategies can be less effective in rural areas. First, few rural areas have the extensive college preparation non-profits, charter schools, and community organizations that focus on college enrollment and introduce colleges to interested students. Furthermore, students from rural areas are often geographically separated from institutions of higher learning. By only offering coordinated travel by high school or geographic locations, students in rural areas that face many of the transportation issues urban students face are left without the opportunity to visit and experience a college campus. Finally, findings have indicated that rural students are getting less comprehensive college counseling within their schools, therefore they are less knowledgeable about the college process and requirements (Neale-McFall & Owens, 2016). Individual school visits to rural schools may not reap high application numbers as a visit to a large urban school would. However, it may in fact endear strong students to institutions that make the time to visit individual rural schools.

If a college or university has a dedicated recruitment system for urban students, this program needs to be reviewed and encouraged to expand to include rural areas that face many of the same obstacles to college enrollment that urban students and schools do. Programs that encourage currently enrolled college students to visit their former high schools as ambassadors should not be limited to only urban high schools, but expanded to rural high schools as well.

Non-Profit Expansion

Existing non-profits are often urban centered. Large nationally known programs are based out of large urban centers. Small, specialized non-profits find funding and easy access to clientele in more populated areas. However, rural students are often low-income and first generation and would easily fit the criteria for college assistance from these organizations if they were living in urban areas. Both funding and the geographical distance between schools and students limit the creation of non-profits focused on rural college going. By better educating the larger population concerning the needs of rural youth, existing programs may be able to find additional funding, while new programs can identify new funding sources.

Community members can educate and encourage non-profits to consider their missions and whether they are reaching out to additional populations that are greatly in need of their help. With the encouragement of community members, researchers, and universities that work in conjunction with these programs, non-profits can be encouraged to expand or create programs specifically dedicated to rural students and college going. Those with financial means can be educated on the needs of rural students and directed to fund specific programs that are expanding their reach beyond the city limits.

There are existing models of programs that intersect, non-profits, local communities, and universities to encourage college attendance. The University of Virginia, champions a program called Virginia College Advising Corps. Where recent college graduates are sent to underrepresent school districts, both urban and rural, to work with existing programs and counselors to encourage college going. This became the basis for a national program called College Advising Corp. They in conjunction with schools and non-profits such as College Board and Bloomberg Philanthropies now offer services in 15 states. They also offer virtual one on one college advising from trained staff for free (College Advising Corps, 2017; Virginia College Advising Corps [VCAC], 2017). This example of intersectionality between existing non-profits, universities, and the local community is prime example of how under-represented students can be reached.

Implications for Research

This study furthers the understanding of location and a high schools' college going culture on students' college going behavior. However, the implications for further research are vast. Three implications that deserve continued consideration include examining the research questions through a qualitative lens, focusing on schools' socio-economic and racial composition, and extending this study by using the upcoming data on college graduation from the HSLS: 2009 study.

Using a Qualitative Lens

One implication for research is a qualitative follow up study to understand the lived experiences of students and their college going behaviors. A qualitative study focusing on schools without strong college preparatory environments, in rural areas, and at predominately White schools would flesh out additional reasons and underlying considerations in students' college going behavior.

The work by Chenoweth and Galliher (2004), considered the college aspirations of rural youth, but did not investigate the process or outcome of the students' college choice behavior. Strayhorn's (2009) also focused on educational aspirations across school locations, but is limited to Black males. The focus on aspirations is limiting. It speaks only to the possibilities and not to the realities of the full experience. Researchers speaking to students within the first semester of college and hearing their stories would further expand on the quantitative results we have garnered from this study. Researchers would be able to personalize the decision to attend college, and the type of program the student chose to enroll.

Schools' Racial Composition

A second implication for research would be to examine similar research questions based on a schools' socio-economic status and the racial composite of that school. My study indicated that there were differences in college going for students who attend majority White high schools. The current research available either indicates that school race has no effect on college enrollment as Engberg and Wolniak (2010) and Engberg and Gilbert (2014) find. Or the research shows that in high poverty rural communities the more diverse the student body the higher the projected education achievement (Irvin et al., 2011). Are low socio-economic majority White schools different than low socio-economic majority minority schools in students' college going behavior. Hamrick and Stage, (2004) reviewed the college predisposition of students by race at low-income schools but only focused on the race of students attending a majority minority high school. Fletcher and Tienda (2010) found when they considered the quality of schools, White students performed less well in terms of first semester college GPA. The research focus on minority majority high schools and urban high schools may have created a research vacuum in which the college going behavior differences of White students, particularly poor students in predominately White districts were overlooked.

College Graduation Rates

The third and final implication for research would be to continue this study and examine college graduation rates and consider the question *Are there differences in college graduation rates based upon rural school location and its college-going culture*? The HSLS:09 will continue to contribute data for the 2009 Freshman cohort. This data will include information on college graduation and postsecondary involvement. By adding work on the full college experience of these students, the research community can have a longitudinal view of the college going behavior of students. These data might help answer questions concerning location and the college-going culture of a high school and if they continue to affect the decisions students' make about their educational career.

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