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College Search Factors That Impact College Matriculation for African American Students: Implications for Policy and Praxis

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COLLEGE SEARCH FACTORS THAT IMPACT COLLEGE MATRICULATION FOR AFRICAN AMERICAN STUDENTS: IMPLICATIONS FOR POLICY AND PRAXIS

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Abstract

College access is a top educational priority in the United States as millions of federal and state dollars are funneled into programs to ensure college access for all students, minorities and low-income students in particular (U.S. Department of Education, 2009a; U.S. Department of Education, 2009b). Over 80% of high school students and their parents aspire to attain postsecondary education (Dounay, 2006; Institute for Higher Education Policy, 2007). Yet, minorities' and low-income students' ability to penetrate postsecondary doors remains relatively depressed in comparison to their non-minority high-income student peers (Freeman, 2005; Perna, 2007). Most of the research related to college access focuses on a student's predisposition to attend college (e.g., income, parental education levels and involvement, and academic achievement/rigor) or student college choice (Hossler, Schmit, & Vesper, 1999; Perna, 2005). Few researchers (Cabrera & LaNasa, 2000; Bell, Rowan-Kenyon, & Perna, 2009; De la Rosa, 2006) have investigated factors related to the stage in between college predisposition and college choice where students gather information regarding the college-going process, presenting a gap in the literature. For those recent studies that address how college knowledge impacts college entry, most of them place an emphasis on knowledge regarding financial aid and college tuition pricing (Bell, Rowan-Kenyon, & Perna, 2009; De la Rosa, 2006). To expand the higher education literature pertaining

to college access and choice, this study examines cross-sectional data from ELS:2002 using Hierarchical Generalized Linear Modeling (HGLM) to explain how obtaining college knowledge regarding the college-going process (i.e., participating in a college preparation program or obtaining information from a high school counselor regarding college attendance) impacts college matriculation for African Americans in comparison to their counterparts.

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Chapter One: Introduction

College Access

College access is a top educational priority in the United States as millions of federal and state dollars are funneled into programs to ensure college access for all students, minorities and low-income students in particular (U.S. Department of Education, 2009a; U.S. Department of Education, 2009b). Accordingly, access to postsecondary education has been listed as one of the top 10 state policy issues for higher education over the past several years by nationally recognized organizations such as the American Association of State Colleges and Universities (2008). The Montgomery GI Bill of 1944 (Thelin, 2004) and the Civil Rights movement of 1964 served as a main impetus for substantial increases in postsecondary access (Jackson, 2007), and more recently, over 80% of high school students and their parents aspire to attain postsecondary education (Dounay, 2006; Institute for Higher Education Policy, 2007). Yet, minorities' and low-income students' ability to penetrate postsecondary doors remains relatively depressed in comparison to their non-minority high-income student peers (Freeman, 2005; Perna, 2007). The aspiration/attainment dichotomy is indicative of an overarching college access issue within U.S. higher education in an era of declining affirmative action policies (Allen, 2005; Gandara, Horn, & Orfield, 2005; Teranishi & Briscoe, 2008). While significant strides have been made regarding college entry with college access and preparation programs present at the federal, state, and institutional

levels throughout the nation, college access and choice continue to be stratified along racial/ethnic and socioeconomic lines (Perna, 2006). The gap in college entry between African Americans and Caucasian Americans has widened over the past twenty years as African Americans continue to struggle to gain equal educational opportunity. For example, both Caucasian and African American 18- to 24-year-old postsecondary participation rates have grown from 1980 to 2007 from 27.3% to 42.6% and 19.4% to 33.1% respectively (National Center for Education Statistics [NCES], 2008a). Yet, the postsecondary entry rate gap between Caucasian and African Americans was larger in 2007 than it was in 1980, by 1.6 percentage points. In 2007, 40.1% of African American18-24 year-old high school completers enrolled in college while 47.8% of their Caucasian American counterparts enrolled (NCES, 2008a).

College entry disparities are exacerbated when income, race/ethnicity, or a combination thereof are taken into account (Perna, 2006). Current research indicates that students who lack economic, social, and cultural capital (Bourdieu, 1986; Coleman, 1988) enroll in college at lower rates, are relegated to community colleges and private for-profit institutions, and struggle more at navigating the educational pipeline in comparison to students with more forms of capital. For example, the Condition of Education report indicated that African Americans enrolled in two-year public institutions at higher rates than they enrolled in four-year public institutions in 2007, 13.7% and 12.4% respectively (NCES, 2008b). The gap was more pronounced in the private sector with 18.8% of African Americans enrolled in two-year private institutions versus 11.4% enrolled at four-year private institutions. At private for-profits institutions, African Americans enrolled at 25.8% compared to their 13% total enrollment in both

two-year and four-year postsecondary institutions. The disproportionate enrollment of African Americans in the two-year colleges and the private for-profit sector is problematic for two reasons: (a) community colleges tend to have lower graduation and retention rates than four-year institutions (Bragg, 2001) and (b) the private for-profit sector's educational quality is skeptical due to variation in accountability and accreditation structures at the state and national levels (Bailey, Badway, & Gumport, 2001).

Statement of the Problem

Researchers purport that several barriers impede the college entry of students of color and low socioeconomic status students. According to social scientists, postsecondary matriculation is influenced by numerous factors such as parental education levels and involvement (Charles, Roscigno, & Torres, 2007), socioeconomic status and ethnicity (Astin & Oseguera, 2004; Perna & Titus, 2005), student and parent educational expectations, gender (Hurtado, Inkelas, Briggs, & Rhee, 1997; Hossler & Stage, 1992; Hurtado, Inkelas, Briggs, & Rhee, 1997), K-12 academic and fiscal resources, residency (Yun & Moreno, 2006), and rigorous high school curriculum (Adelman, 1999). Furthermore, Hamrick and Stage (2004) cite inadequate fiscal and academic resources in inner-city schools as barriers that hinder adequate preparation of minority students for postsecondary entry.

Most of the research related to college access focuses on a student's predisposition to attend college (i.e., income, parental education levels and involvement, and academic achievement/rigor) or student college choice (Hossler, Schmit, & Vesper, 1999, Perna, 2005). Few researchers (Cabrera & LaNasa, 2000; Bell, Rowan-Kenyon, &

Perna, 2009; De la Rosa, 2006) have investigated college search factors, the stage in between college predisposition and college choice, where students gather information regarding the college-going process, presenting a gap in the literature. For those recent studies that address how knowledge about college impacts college entry, most of them place an emphasis on knowledge regarding financial aid and college tuition pricing (Bell, Rowan-Kenyon, & Perna, 2009; De la Rosa, 2006). Higher education literature denotes that minority and low-income students are misinformed about the kind of preparation necessary for college entry (Cabrera & LaNasa, 2001; Dounay, 2006; Institute for Higher Education Policy, 2007; Perna, 2005). Moreover, some students are uneducated about college entry course requirements and/or the impact of grades on college entry (Martinez & Klopott, 2006; Venezia, Kirst, & Antonio, 2003). Many low-income and minority students eligible for grant-based financial aid did not take the necessary steps to acquire these funds which is likely due to a lack of awareness of financial aid policies (American Council on Education, 2004; Journal of Blacks in Higher Education, 2009). Nonetheless, research findings on the impact of college entrance information on college enrollment are consistent in asserting that the more information and assistance a student has regarding the college-going process, the more likely that student is to enroll in college (Bell, Rowan-Kenyon, & Perna, 2009; De la Rosa, 2006).

Higher education literature on college access is replete with information regarding postsecondary access for low socioeconomic students, yet only a few authors such as Perna (2000) and Hurtado, Inkelas, Briggs, and Rhee (1997) have honed in on how issues and barriers to college entry impact African American youth. Researchers (Hamrick & Stage, 1998; Hurtado, Inkelas, Briggs, & Rhee, 1997; Paulsen & St. John, 2002; Perna,

2000; Perna & Titus, 2005; Qian & Blair, 1999) have asserted that it is important to differentiate between ethnic groups when examining the factors that affect college choice as their research has shown that the impact of certain factors related to college entry and related outcomes diverge when analyzed by racial and/or income subgroups. It is also clear from higher education research that African Americans have less cultural capital, in the form of college knowledge, and less social capital, in the form of social connections, to navigate through the educational pipeline, than their Caucasian American peers (Freeman, 1999; Perna, 2005; Yun & Moreno, 2006). To expand the higher education literature pertaining to the search phase of the college choice process, this study explains if and/or how obtaining college entrance information (i.e., participating in a college preparation program or obtaining information from a high school counselor regarding college attendance) impacts college matriculation for African Americans in comparison to their counterparts.

Purpose of the Study

The central purpose of this study was to determine if obtaining information related to the college-going process impacts college participation for African Americans in comparison to their peers. While the student served as the unit of analysis for the study, I sought to explicate the impact of school-level characteristics on student postsecondary entry as well. The research questions that served as the impetus for this study are as follows:

1. Do factors related to gaining college entrance information predict college entry for African American students in comparison to Caucasian American students?

2. Does a high school counselor-to-student ratio impact college entry for African American students in comparison to Caucasian American students?

More specifically, I assessed whether or not the following student-level variables predict college entry under the aforementioned conditions, (a) college entrance information was obtained from high school constituents (high school counselors, teachers, and/or athletic coaches), (b) college entrance information was obtained from a student's personal network (parents, siblings, friend, and/or relatives), (c) college entrance information was obtained from college or university constituents (publications, websites, representatives, and/or college search guides), and (d) a student participated in a college preparation program. At the school level, I determined whether or not a high school counselor-to-student ratio predicts college enrollment. Additionally, gender, race/ethnicity, income, parental education level, parental expectation level, parental involvement, and high school academic course offerings (e.g., the number of mathematics courses required for graduation) served as covariates in the model proposed in this study.

Significance of the Study

A study that focuses on understanding if and from where students gain information regarding the college-going process is imperative from a research and policy perspective for at least three reasons. First, current state and federal policies have yet to eliminate gaps between African Americans and Caucasian Americans in relation to college access across institutional types and sectors making college access a top priority for policy-makers and educational leaders (Perna, Rowan-Kenyon, Bell, Thomas, & Li, 2008). Second, there is a paucity of research that specifically and explicitly focuses on information and its impact on college participation. Finally, of the few studies that

examine the effects of information on college matriculation, only a handful of studies investigate how outcomes might differ by race/ethnicity.

In addition to the limited research that currently exists on college knowledge, there also exists a disconnect between current research and praxis as the overwhelming majority of state and federal programs fail to account for any of the factors deemed critically important to improving college access. For instance, a review of local, state, and federal college preparation programs demonstrates that while programs may focus on one, two, or even three factors that impact college entry, yet most programs fall short of implementing many essential factors pertinent to successful postsecondary entry, especially for African American students (Perna, 2008). Perna's study on college preparation programs indicated that 90% of state and federal programs were solely focused on financial aid. Similarly, Tierney and Jun (2001) asserted that parental involvement and cultural relevance was absent from most college preparation programs within their study. Yet, current research demonstrates that financial aid is one of many significant factors such as parental involvement, information access, rigorous K-12 curriculum (Cabrera & LaNasa, 2001; Hurtado, Inkelas, Briggs, & Rhee, 1997), and culturally relevant programming (Tierney & Jun, 2001) which all impact postsecondary enrollment for underrepresented students. Furthermore, persisting gaps in college entry between ethnic groups suggest that existing approaches fail to ameliorate barriers impeding college access for underrepresented youth (Perna, 2006). Consequently, it is imperative for policy-makers and educational leaders in the field of education to understand the factors that impact college entry for underrepresented groups in order to effectively change the landscape of higher education access in America.

Outline of the Study

The following chapter provides a review of the literature on college access with specific emphasis on African American students and provides the conceptual framework upon which this research study was grounded. The research questions, hypotheses and measures were selected based on the most salient factors affecting college matriculation for African Americans present in the extant literature. This study analyzed data from the Education Longitudinal Study of 2002 (ELS:2002), a national longitudinal study conducted by the National Center for Education Statistics (NCES). Data from 750 schools and over 15,000 students and their parents among other participants (i.e., teachers and administrators) was analyzed. The impact of several predictors related to 10th grade students gaining college entrance information on the dependent variable, postsecondary entry, was measured. Hierarchical Generalized Linear Modeling (HGLM) served as the analytic tool for this study as it provides more accurate statistical estimates for nested data structures, like those within the ELS:2002 dataset, than traditional methods like Ordinary Least Squares (OLS) regression models. Chapter three, outlines in detail the hypotheses, data source, sample, measures and the analytic tool utilized within the study.

Chapter Two: Literature Review

The purpose of this research study was to examine the impact of factors related to gaining college knowledge on college enrollment for African Americans. Furthermore, the extent to which a high school counselor-to-student ratio impacts college attendance for African American students was examined. Also, the extent to which these outcomes vary by race/ethnicity was explored. In order to develop and ground the study based upon previous research and theoretical and conceptual understandings of college choice, a literature review was conducted and is presented in this chapter. The chapter begins with a discussion of terminology and theoretical and conceptual frameworks related to college choice and how Perna's (2006) college choice model frames this study's design. The next section provides a review of the most salient factors that impact college matriculation for African American students. Understanding and considering these factors is pertinent to the conceptualization and design of the study as many of the factors reviewed served as covariates within the quantitative analysis. Lastly, one of the final sections details how obtaining information related to the college-going process impacts college entry for African American students.

Terminology

Within the literature related to the college-going process, the following terms emerge, (a) college access, (b) college choice, and (c) college entry/matriculation. Below I provide definitions for these terms as they are mentioned throughout this text. First,

college access can be defined in several ways. For instance, Adelman (2007) provides four definitions for college access (a) threshold access, (b) recurrent access, (c) convenient access, and (d) distributional access, two of which relate to the way in which college access is conceptualized within this study: threshold and distributional access. Threshold access occurs when a student enrolls in a college for the first time, regardless of institutional type. Distributional access occurs when a student enrolls into an institution of his or her choice or one that matches his or her qualifications for the first time (Adelman, 2007). Within this study, college access combines both threshold and distributional access because both college enrollment and institutional sector and type impact college access for African Americans in a unique way as most African American students are concentrated in the two-year and private for-profit sectors (NCES, 2008b). College choice refers to an individual's decision to enroll in college and is distinct from college matriculation. For example, a student might decide that he or she wants to attend college in the future but fails to enroll in postsecondary education. College access, choice, and matriculation are all interrelated within a broader college-going process.

Conceptual Framework

There are several theories and conceptual models that have been developed to explain the process of college choice for students. All of the college choice theories and models can be divided into three different realms: (a) economic models, (b) sociological models, and (c) combined models (Hossler, Schmit, & Vesper, 1999). Within the realm of economic models, theories such as rational choice theory and several variations therein have been utilized to explain college choice (DesJardins & Toutkoushian, 2005).

Rational choice theory denotes that students seek to maximize their individual utility in the form of satisfaction and/or preference and conduct a cost/benefit analysis when determining the amount of education to seek (Becker, 1976; Cohen, 1979; DesJardins & Toutkoushian, 2005). Some college choice literature based on rational behavior theories assert that students consider many factors that impact college choice but often place an emphasis on the impact of the market in the form of tuition pricing and discounting (Becker, 1962; Kane, 1994).

On the other hand, many scholars have instituted sociological models like status attainment to explain the college choice process. While there are several variations of status attainment theory that follow different theoretical paths, the Blau-Duncan (1967) and the Wisconsin status attainment models (Sewell, Haller, & Portes, 1969) represent the two main orientations that sociology scholars have followed. Haller and Portes (1973) defined status attainment processes derived from status attainment theory as "those set of events by which individuals come to occupy their positions in the social hierarchies of wealth, power, and prestige" (p. 54). Haller and Portes also directly connect occupational status to other dimensions such as education because education in American society is regarded as the primary determinant of occupational status and consequently income status. The impetus for the Blau-Duncan model (1967) was to determine the extent to which inherited status determines the social fate of individuals and the extent to which earlier positions in status hierarchies affect later levels of attainment. Blau and Duncan (1967) examined status attainment by analyzing a single cross-sectional sample of American adult males from the U.S. Census Bureau's Current

Population Survey. As a result of the analysis, Blau and Duncan (1967) determined that the primary influence on early and late occupational attainment was parental education. The Wisconsin model (Sewell, Haller, & Portes, 1969) supported the Blau-Duncan (1967) model while adding a few additional factors that influence occupational status. The Wisconsin-model researchers collected and analyzed data from a one-third random sample of Wisconsin's male high school seniors in 1957. Their subsequent findings indicated that educational attainment, level of occupational and educational aspiration, significant others' influence, academic performance, socioeconomic status, and mental ability significantly influence occupational attainment and status (Sewell, Haller, & Portes, 1969).

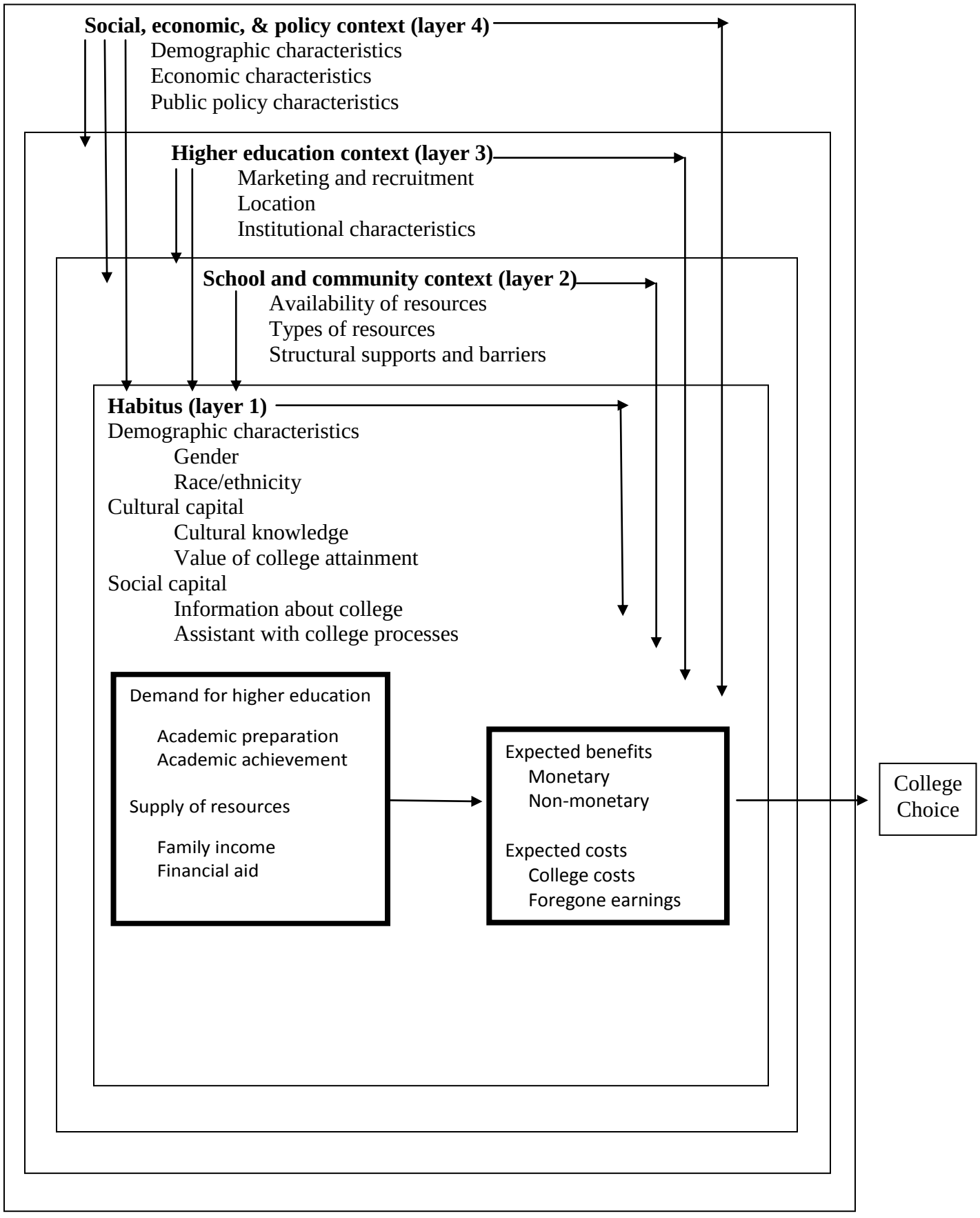
There are also models that combine both economic and sociological perspectives to provide a more holistic view of college choice. For instance, the Hossler and Gallagher (1987) model asserted that college choice occurs in three stages: (a) predisposition, (b) search, and (c) choice. The Hanson and Little (1982) model provided five stages and considered more variables explicitly than the Hossler-Gallagher model. Both of these models took into account economic and sociological variables. Perna's (2006) college choice model is the most recent and comprehensive of all of the college choice models as it combines many aspects found in economic, sociological, and combined models.

I utilized Perna's (2006) model of student college choice as a lens through which to determine and examine the factors that impact college matriculation for African American students. Perna's conceptual model is most appropriate and was selected for

this study because the model integrates both economic and sociological factors such as financial aid policy and social capital which interrelate in explaining college choice (Perna, 2006). Furthermore, Perna's model expands upon and extends previous combined models by Hossler and Gallagher (1987) and Hanson and Little (1982) by including more contextual effects represented in several different layers like the social, economic, and policy context while other models do not. While economic models such as those that reference financial aid certainly add to understandings of barriers to college access for African American students, research has shown that financial aid is merely one piece of the college access puzzle (Perna, 2000).

Perna's (2006) model provides four layers in which to contextualize factors that impact college choice. As seen in Figure 1 below, the first layer of the Perna model is categorized as habitus. Habitus is a system of outlooks, experiences, and beliefs about the social world (McDonough, 1997) and encompasses personal factors that relate directly to the student such as demographics, cultural, and social capital. The second layer embodies school and community related factors that involve resource availability and structural supports and barriers. The higher education context, layer three, is utilized to explain how college choice is influenced by postsecondary institutions through mechanisms such as marketing and recruitment, location, and institutional characteristics. Finally, the fourth layer denotes the social, economic, and political context of college choice. Perna's student college choice model provides a multilayered and integrated conceptual lens through which to examine a complicated and multifaceted problem, college access for African American youth.

Figure 1. Perna's (2006) Conceptual Model of Student College Choice



Review of Prior Research

The literature on factors that impact college matriculation for African American youth revealed a plethora of themes that are critically important for policy and program development to improve college access for African Americans. Within the following sections, each theme is categorized within one of the four layers illustrated by Perna's (2006) student college choice model.

Habitus.

The habitus layer encompasses critical factors such as demographics, cultural capital, social capital, demand for education, supply of resources, and expected costs and benefits of higher education. Demographics such as ethnicity, socioeconomic status (SES), and even family composition (Lillard & Gerner, 1999) impact college matriculation for minority and low-income students who often lack the social and cultural capital needed to successfully navigate through the educational pipeline.

Minority status.

African Americans' minority status has long plagued their ability to gain equal footing with Caucasian Americans in the American educational system (Jackson, 2007). African Americans have struggled to gain equal educational opportunities in America since the emancipation of slavery until the present day. African Americans struggled to maintain equal rights in all forms as represented in the *Dred Scott v. Sandford* of 1857 where Scott sought to purchase his freedom on the basis that he lived on free territory but was ultimately denied. In the *Dred Scott v. Sandford* case, the Supreme Court ruled that African Americans and their descendants (whether enslaved or free) were excluded from

possessing Constitutional rights and citizenship in the United States therefore having no legal rights. In 1896, the constitutionality of racial segregation was upheld under a "separate but equal" doctrine through the Supreme Court ruling in the *Plessy v. Ferguson* case. Schools were established separately for African Americans and Caucasian Americans, though history has shown that they were far from equal. The "separate but equal" doctrine remained standard in American law until its repudiation in the 1954 Supreme Court ruling in *Brown v. Board of Education of Topeka*. As racial tensions and unequal opportunities continued to stifle the African American community, President Lyndon B. Johnson signed the executive order 11246 supporting affirmative action policies based on the Civil Rights Act of 1964 (Jackson, 2007).

The enactment of the latter aforementioned court rulings improved education at the K-12 level and expanded postsecondary access for African American students in the U.S. Yet, in the year 2010, K-12 schools are almost just as segregated as they were prior to the Civil Rights Movement, with most African Americans concentrated in urban schools with limited resources (Yun & Moreno, 2006). While higher education participation for African Americans continues to rise, the gap of college entry between African Americans and Caucasian Americans has widened as African Americans continue to struggle for equal educational opportunity (Price & Wohlford, 2005; NCES, 2008a; NCES, 2008b). Race/ethnicity continues to be a factor in college access and success for African American students as race/ethnicity continues to explain disparities in educational access and attainment above and beyond other predictors such as income. For example, while income is positively correlated with SAT test scores for all students

combined, income levels do not explain the disparities in SAT scores between African American and Caucasian American students (Journal of Blacks in Higher Education, Winter 2008/2009). African Americans from families with incomes of more than $200,000 score lower on the SAT than Caucasian American students with incomes ranging from $20,000 and $40,000 (Journal of Blacks in Higher Education, Winter 2008/2009).

Financial resources.

Historically, African Americans have experienced higher poverty rates and have the lowest annual median income of all other races/ethnicities listed in the table below. According to the U.S. Census Bureau (2009b) data presented below in 2008 dollars, in 1988 the income of Caucasian American non-Hispanics and Asian/Pacific Islanders was more than double that of African American's income. The income disparities in 2008 are still large when comparing African Americans to other ethnic groups with African American's ranking last in median household income.

Table 1. Race and Hispanic Origin of Householder--Households by Median and Mean Income: 1967 to 2008

	2008 Income	1998 Income	1988 Income
African American	$34,218	$33,442	$28,694
Hispanic (of any race)	$37,913	$37,371	$35,606
Caucasian American (not Hispanic)	$55,530	$55,983	$51,722
Asian/Pacific Islander	$65,637	$61,521	$56,432

Financial resources can directly and indirectly impact a student's ability to access higher education. Attending private schools that serve as feeder schools to the nation's top colleges and universities, paying for tutoring and coaching services that increase chances of entering postsecondary education, purchasing a computer, and having access to the Internet are all examples of mechanisms that impact college matriculation requiring varying levels of financial resources (Schmidt, 2007). In the current information age, access to technology is instrumental to accessing information. Concerns about the "digital divide" are underlined by the assumption that people who use the Internet will gain greater access to goods and services and to enhanced life chances in the form of more education, better jobs, and higher income (DiMaggio & Hargittai, 2001). Key processes that help students navigate the educational pipeline such as applying for financial aid, accessing information regarding standardized test, and applying for admission to colleges and universities are all linked to the Internet, some with no alternative option (i.e., paper format). Access and the use of the Internet are widespread in the United States, however, access and usage of the Internet is stratified along socioeconomic and racial/ethnic lines (DiMaggio & Hargittai, 2001; U.S. Census Bureau, 2009c).

Research indicates that minorities and low-income students matriculate at lower rates than their Caucasian American counterparts and portends that in addition to minority status, low-income negatively correlates with college entry (Hamrick & Stage, 2004; Perna, 2007; Qian & Blair, 1999). The fact that African Americans' income is lower than their Caucasian American counterparts stifles their ability to buy "college

knowledge" (McDonough, 1994) in the forms of the college selection guidebooks, software, and coaching and counseling services widespread among the Caucasian American middle and upper classes. For instance, Schmidt (2007) asserted that Caucasian American parents commonly attempt to secure their children an edge on standardized tests like the ACT or SAT by paying for test-preparation services. In fact, as of 2006, private companies gained $690 million from SAT, PSAT, and ACT courses and tutoring. In addition to test preparation, affluent parents also purchase other services that assist their students such as editing or writing college application essays or paying consultants to track their preschoolers into prestigious preschools that are seen as ultimate feeders to the Ivy League schools (Schmidt, 2007). In 2008, Caucasian Americans were approximately 28 times more likely than African Americans to fall into the affluent group with a household income greater than $250,000 per year (U.S. Census, 2009a).

Gender.

Within society, African American males are overrepresented in categories related to negative behavioral outcomes by most quality-of-life indicators in such forms as having the highest homicides, as victims and perpetrators, incarceration rates, and poverty rates in the country (Noguera, 2003). Concomitantly, negative educational outcomes for African American males at the K-12 and postsecondary level are certainly no exception. At the K-12 level, being an African American male places one at risk for a plethora of negative educational outcomes such as low academic achievement, high dropout rates, special education assignment, suspensions, expulsions, and the like (Davis, 2003; Ferguson, 2000). Furthermore, African American males are more likely to be

labeled as suffering from a mental disability and more likely to be absent from honors and/or Advanced Placement (AP) courses in high school (Harry & Anderson, 1994; Milofsky, 1974; Noguera, 2003; Oakes, 1985). The educational outcomes at the K-12 level for African American males directly impact their ability to access and attain all levels of higher education. At the collegiate level, demographics such as gender do not significantly impact college matriculation for the general population (National Center for Education Statistics, 2008a). However, research indicates that African American females matriculate at much higher rates than their African American male counterparts (Choy, 2001; Noguera, 2003).

The rationales for explaining the disparities in educational outcomes between African American males and females in addition to other quality-of-life indicators are multifaceted and complex in nature. Rationales that can be classified as structural explanations of behavior typically focus on the impact of policy, economy, class structure, and social geography. Researchers (Davis, 2003; Fordham & Ogbu, 1986; Nogura, 2003) denote discrimination, stereotyping, tracking, curriculum, pedagogy, school climate, and low expectations as explanatory variables for African American males' low educational attainment rates in all levels of education.

Some cultural rationales that explain the disparities in educational outcomes between African American males and females and in some cases between African Americans and Caucasian Americans focus on moral codes, beliefs, values, norms, and socialization in lieu of structural or environmental explanations (Noguera, 2003). Within this cultural frame of reference, researchers point to cultural ecological structures

(Fordham & Ogbu, 1986; Gonzales, Cauce, Friedman, & Mason, 1996; Noguera, 2003) held by African Americans that manifest in the following facts: (a) African Americans' have traditionally been provided with substandard schooling that has been controlled by Caucasian Americans, (b) African Americans have faced a glass ceiling regardless of their educational attainment, and (c) African Americans have developed coping mechanisms to deal with the aforementioned facts. According to Fordham and Ogbu (1986) and Fordham (1991), African Americans develop an oppositional social identity that contains a set of norms that protect their identity and separate them from Caucasian Americans. Any violation of these norms results in being viewed in a negative light by members of the African American community. African Americans have long been excluded from equal educational and professional opportunities most often controlled by Caucasian Americans no matter their previous achievements (Allen, 2005). Therefore, their "oppositional identity and oppositional cultural frame of reference enter into the process of minority schooling through the minorities' perceptions and interpretations of schooling as learning the Caucasian American cultural frame of reference which they have come to assume to have adverse effects on their own cultural and identity integrity" (Fordham & Ogbu, 1986, p. 182). Therefore, learning school curriculum and learning to follow the standard academic practices of the school are often seen as "acting White" while negating their own identity (Gonzales, Cauce, Friedman, & Mason, 1996). Other cultural factors such as masculinity and a lack of African American male role models have been frequently cited as impacting educational outcomes for African American

males. For example, Noguera (2003) indicated that African American males perceive schooling activities as feminine and irrelevant to their masculine sense of self.

Family composition.

Research indicates that family composition impacts college-going indicators such as academic achievement, school attendance, dropout rates, and college entry. According to Astone and McLanahan (1994), children who grow up with both parents are more successful in school and more likely to graduate from high school, attend college, and graduate from college than children from single family homes. As demonstrated below, African American youth reside in single family homes at substantially higher rates than Caucasian Americans. Wu (2008) examined historical trends in the U.S. of non-marital fertility rates and provided cohort estimates of statistics on birth. Wu's research indicates that for all U.S. women born between 1965 and 1969, 1 out of 4 women had at least one birth outside of formal marriage, with roughly 1 out of 5 Caucasian American women, 3 out of 5 African American women, and 1 out of 3 Hispanic women having one or more non-marital births. Similarly, research by Lillard and Gerner (1999) demonstrated that family composition plays a role in college matriculation citing that students from disrupted families are less likely to apply to, be admitted to, or attend four-year universities.

African Americans also outpace other races/ethnicities in internment rates. For example, 1 in 40 Caucasian American children born in 1978 and 1 in 25 Caucasian American children born in 1990 had a parent imprisoned while 1 in 7 African American children and 1 in 4 African American, respectively, children had a parent imprisoned who

were born during the same years (Wildeman, 2009). Furthermore, African American males born between 1965 and 1969 were seven times more likely to have been imprisoned than Caucasian American men (Wildeman, 2009). The fact that parental imprisonment for African Americans is more pronounced is a problem that indirectly impacts indicators of college entry and is more common among single family households. In fact, for the African American community, the state of living in a married family household has declined since 1980-1984 from 41% of 16 year-olds living with married parents to 16% during the years 1990-1994 (Wildeman, 2009). African Americans are distinctly disadvantaged by these family composition factors as most of them come from single-family homes and are incarcerated at higher rates.

Cultural capital.

Perna (2006) indicated that a student's cultural capital in the forms of cultural knowledge and value of college attainment can impact postsecondary access. Perna asserted that students who possess knowledge of the dominant culture have access to the resources that promote college entry. The value of college attainment may be captured in parental encouragement and expectation which are both positively correlated with college entry for African American students (Cabrera & LaNasa, 2000). Furthermore, research indicates that African Americans possess similar levels of collegiate aspiration in comparison to their peers, which is a testament to their understanding of the costs and benefits associated with college attainment (Farmer-Hinton, 2008; Hossler & Stage, 1992; Hurtado, Inkelas, Briggs, & Rhee, 1997; Qian & Blair, 1999). Similarly, the parents of African American students also demonstrate high educational expectations

even when they lacked postsecondary educational attainment themselves (Farmer-Hinton, 2008; Freeman, 2005; Wimberly & Noeth, 2004). Despite their educational aspirations, African Americans are disadvantaged in other ways such as in the area of cultural knowledge. Most African American students are first-generation college attendees and lack the knowledge beneficial to understanding the process of gaining postsecondary entry (Cabrera & LaNasa, 2000; Choy, 2001).

Culture.

Research is extremely limited in addressing direct or indirect connections between African American culture, which can be defined as behaviors and values that are learned, shared, and exhibited by a group of people (Yosso, 2005), cultural awareness, and college choice. Only a few researchers have studied the impact of culture on postsecondary attendance (Freeman, 1997; Tierney & Jun, 2001), yet these researchers assert that culture has an effect on postsecondary entry. Tierney and Jun examined a college preparation program, the Neighborhood Academic Initiative (NAI), which incorporated cultural awareness and affirmation into its program along with academic rigor and support services and found increased college participation for the disadvantaged participants. Other researchers have discussed how culture impacts academic achievement and other educational outcomes at the K-12 level. Fordham and Ogbu (1986) provided understandings of how African American youth identity development and connection to their culture impacts their perceptions of schooling and ultimately educational outcomes. According to Fordham and Ogbu (1986)

> Subordinate minorities like African Americans develop a sense of collective identity or sense of peoplehood in opposition to the social identity of Caucasian

> Americans because of the way Caucasian Americans treat them in economic, political, social, and psychological domains, including Caucasian American exclusion of these groups from true assimilation…Along with the formation of an oppositional social identity, subordinate minorities also develop an oppositional cultural frame of reference which includes devices for protecting their identity and for maintaining boundaries between them and Caucasian Americans. Thus subordinate minorities regard certain forms of behavior and certain activities or events, symbols, and meanings as not appropriate for them because those behaviors, events, symbols, and meanings are characteristic of Caucasian Americans…To behave in a manner defined as falling within a Caucasian American cultural frame of reference is to "act White" and is negatively sanctioned. (p. 181)

Because some African American students view the academic environment and academic success as a Caucasian American person's prerogative and a space where their contributions to society are almost absent, some students who are academically able to excel choose not to put forth the necessary effort in their school work (Fordham & Ogbu, 1986; Freeman, 2005). It is important to denote that Ogbu's oppositional culture theory has been one of contentious debate among many authors (Foley, 2004) as scholars believe Ogbu's theory overemphasizes the deficits of African American youth and fails to account for the many success stories within the community among other criticism (Gibson, 1997; Valenzuela, 1999). Carter (2003) provided an alternate explanation of how African Americans' cultural differences might impact educational outcomes. Carter references African Americans' use of dominant cultural capital versus their use of non-dominant cultural capital. Carter's research provides a counterweight to Ogbu's oppositional culture theory. For example, Carter (2003) explained some of the differences between dominant and non-dominant cultural capital below.

> The acquisition of non-dominant cultural capital does not necessarily signify a rejection of commonly shared values regarding social, economic, and educational attainment. However, full reliance on non-dominant capital to maintain one's

> cultural status position does provide a challenge to socioeconomic mobility, since dominant cultural capital facilitates success within mainstream institutions and organizations. Nevertheless, some individuals employ both dominant and non-dominant cultural capital, negotiating strategically between their community, family, peer, and school spaces. (p. 139)

More research on the influence of culture and cultural awareness is necessary to truly understand its influence on postsecondary participation.

Social capital.

A significant amount of research demonstrates that social capital in the forms of access to information about college, assistance with college programs, parental education levels, parental encouragement, extended network of peers, familial and mentorship support, and parental involvement are significant indicators of college enrollment for minority students (Cabrera & LaNasa, 2000; Charles, Roscigno, & Torres, 2007; Farmer-Hinton, 2008; Qian & Blair, 1999). The low rates of postsecondary entry of African Americans in comparison to Caucasian Americans are attributed, in part, to their lack of social capital (Perna, 2005).

Parental education and involvement.

Perna and Titus (2005) and Choy (2001) concluded that parental education levels and involvement for African Americans and Hispanics were positively correlated with college enrollment regardless of the resources available to students. Perna and Titus found that African American students were unique in their response to specific types of parental involvement. Perna and Titus cited that African Americans matriculate at a much higher levels when their parents initiate school contact regarding academics than when parents simply discuss education related issues. Choy's research indicated that

only 59% of high school graduates whose parents did not have a college degree enrolled in some form of postsecondary education while 93% of students whose parents had at least a bachelor's degree entered college. Choy's sample included all races and ethnicities but the majority of the sample was comprised of minority and low-income students.

Peers and mentors.

The influence of peers and adult mentors can also impact postsecondary choice for African American students. Research regarding the role of peer influence on postsecondary entry is scarce at best. In addition to the scarcity of research on peer influence, its effect on college entry is difficult to ascertain because peer influence typically functions in tandem with other strategies such as mentoring or college preparation programming (Tierney & Colyar, 2005). Therefore, it is difficult to decipher whether outcomes are associated with peer influence alone (Thompson & Kelly-Vance, 2001). Similarly, current research on mentoring is also limited and imprecise in determining its effect on postsecondary entry. In an empirical evaluation of several mentoring programs, Jekielek, Moore, Hair, and Scarupa (2002) found that one mentoring program, Career Beginnings, demonstrated a slight increase in college entry for students participating in the program. Career Beginnings participants entered college at a rate of 53% compared to 49% for students in the control group. Thompson and Kelly-Vance (2001) found positive results in an evaluation of the mentoring program Big Brothers/Big Sisters' effect on academic achievement for at-risk students. The effects of Big Brothers/Big Sisters provide no direct connection to postsecondary entry yet its

positive effects on academic achievement indirectly influence college matriculation (Thompson & Kelly-Vance, 2001). Lastly, Levine and Nidiffer (1996) interviewed 24 low-income disadvantaged students who successfully accessed postsecondary education and found that almost every student referenced a mentor that played a significant role in assisting the student through the educational pipeline. Additional research is needed to gain better insight on direct linkages between mentorship and peer influence on college choice for African Americans.

Psychological factors.

The effects of psychological factors such as self-motivation and intimidation influence whether or not African American students enter college and the type of institutions these students select. Freeman's (1999) research on African American student college choice demonstrates that, unlike traditional predictors of college participation, African Americans were positively influenced by their family members who did not receive postsecondary education yet encouraged them to surpass the achievements of their family members. During Freeman's qualitative study (1999), African American students often mentioned themselves as motivators for college participation. The most prevalent finding from Freeman's research was the effect of intimidation on college choice whereby students attending predominately African American high schools were uncomfortable and intimidated by the predominantly Caucasian American college campuses they visited. Literature surrounding how psychological factors mediate college choice for African Americans is extremely dearth.

School and Community Context.

According to researchers, the K-12 environment with regard to fiscal and academic resources, curriculum, teachers, demographics, and geography have a deterministic effect on college access for high school students (Martin, Karabel, & Jaquez, 2005; Perna et al., 2008; Wolniak & Engberg, 2007; Yun & Moreno, 2006).

High school context.

Yun and Moreno (2006) conducted a study examining K-12 school related college access disadvantages disaggregated by ethnicity and found that schools with a high percentage of African American and Latino students in California tend to have higher poverty rates, lower teacher certification, and lower Advanced Placement course offerings than predominately Asian and Caucasian American schools. The factors analyzed by Yun and Moreno negatively correlate with postsecondary entrance and completion. Similarly, a study by Martin, Karabel, and Jaquez (2005) demonstrated that high school segregation, in the geographical sense, negatively affects college access in the state of California for minority students. Substantial inequalities related resources at every stage of the transition from high school to college (i.e., high school course selection, number of college applications submitted, academic preparation, etc.) by race/ethnicity were prominent in Martin, Karabel, and Jaquez's study and other researchers (Cabrera & La Nasa, 2001; Hurtado, Inkelas, Briggs, & Rhee, 1997; Perna, 2000) reported similar findings. Teacher quality is an important indicator of student success yet underrepresented students are more likely than their Caucasian American

counterparts to be taught by teachers with lower test scores and less academic preparation (Haycock, 1998).

Adelman (1999) contended that the impact of a rigorous high school curriculum on college enrollment is far more pronounced and positively correlated for African-American and Latino students than any other pre-college indicator such as parental education level or student collegiate aspiration. Adelman further asserted that many minority students, especially those who live in rural areas, do not have the opportunity to partake in such a rigorous curriculum. Similarly, members of the U.S. Department of Education (2001) examined the relationship between high school academic curricula and students' persistence paths through college approximately three years after first enrolling, drawing data from the 1995–96 Beginning Postsecondary Students (BPS) survey. The findings from the study indicate that the level of high school academic curriculum completed by beginning four-year college students was associated with their demographic and socioeconomic characteristics and also with the economic status of the student body in their high schools (U.S. Department of Education, 2001). More specifically, students from low socioeconomic families, students whose parents had no postsecondary education, and students who graduated from high schools in which 25% or more of them were eligible for free or reduced-price lunches were less likely than their more affluent peers to report completing rigorous high school curricula. Along racial lines, African American students were much less likely than Caucasian American and Asian/Pacific Islander students to complete a rigorous high school curriculum at 8% versus 20% and 31% respectively. The study also demonstrated that the level of college

students' high school curricula was strongly related to their persistence in postsecondary education. This was true both for maintaining enrollment at their initial institution and for transfer students staying on track toward a bachelor's degree. For example, 79% of students who had participated in rigorous high school academic curricula were continuously enrolled in their initial institution. Conversely, 55% of those in core curricula (also known as general education curricula) or lower were continuously enrolled in their initial institution (U.S. Department of Education, 2001). Even further, students participating in rigorous curricula also were less likely to transfer from their first institution than those who participated in less than rigorous curricula.

High school counseling.

Since the availability of information related to the college admissions process is critical to college enrollment for all students, the role of high school counselors for African American students is even more important considering their lack of social capital within the home (Lillard & Gerner, 1999; Perna, 2005; Wu, 2008). In addition to a rigorous college preparatory curriculum and a college-going culture within high schools, Corwin, Venegas, Oliverez, and Colyar (2004) cited appropriate counseling and resources committed to advising college-bound students as a reflection of factors critical to postsecondary entry. Low-income and minority students need guidance from teachers and high school counselors regarding the process of preparation for postsecondary education the most, yet budgetary constraints, alarmingly high counselor-to-student ratios (Corwin, Venegas, Oliverez, & Colyar, 2004; Lee & Ekstrom, 1987), and in some cases a

lack of caring/encouraging faculty and staff hinder their ability to successfully navigate through the postsecondary educational pipeline (Freeman, 2005).

Extracurricular activities.

Research on the impact of co-curricular and extracurricular activities is limited yet the existing literature indicates that co-curricular activity involvement for African Americans has both a direct and indirect effect on college entry. Hamrick and Stage (2004) asserted that school activity involvement is positively correlated with parental expectations which indirectly impacts college entry. Hearn and Holdsworth (2005) conducted a literature review of the effects of co-curricular activities and its connection to college entry and found that involvement in activities such as student government and school athletics can have positive impacts on college participation. Yet, Hearn and Holdsworth cautioned the reader that these effects tend to be modest and largely indirect, mediated by factors such as student attitudes and academic performance. Therefore, involvement in extracurricular activities alone will not significantly impact college enrollment.

Lack of diverse curriculum.

Little research exists examining the influence of high school curricula on college choice for African American students. Freeman (2005) made an indirect connection between the lack of African American cultural history within secondary school curriculum and college choice for African American students by stating that this lack of inclusion negatively affects students' perceptions of validation at all levels of schooling, sense of self-worth, and ultimately academic achievement.

Higher Education Context.

Perna's (2006) higher education context, layer three of Perna's (2006) model, provides a space for analyzing the impact of issues such as marketing and recruitment, location, and institutional characteristics on college entrance for African Americans. Higher education institutions' role in shaping postsecondary education access is significant as they control admission requirements, marketing and recruitment (McDonough, 1994), financial aid distribution, academic programs and community partnerships each impacting college choice (Chapman, 1981; Hossler, Braxton, & Coopersmith, 1989).

Recruiting students of color.

The role higher education institutions play in recruiting African American students is contingent upon their value system, mission, and ultimately the strategic plan for the institution (Bontrager, 2007). Most postsecondary institutions engage in targeted recruitment efforts for students of color in the forms of high school partnerships, mentoring programs, direct mail, alumni interviews, special events relevant to multicultural students, and multicultural advisory boards (Smith, 1998; Swail, 2000). Research assessing the effectiveness of college recruitment is dearth, mostly anecdotal, and mainly institution-specific (Gullatt & Jan, 2002). For example, Tierney and Jun (2001) examined the Neighborhood Academic Initiative (NAI), a partnership program between California schools and the University of Southern California (USC) aimed to increase postsecondary access for minority students at USC. The program was a success with 60% of those who started the program entering a four-year institution and 90%

pursuing some form of postsecondary education. However, Tierney cautions the reader in interpreting the impact of programs such as NAI on college access as they only impact a few within the disadvantaged student population, those selected to participate, and calls for a systemic approach. Not all college recruitment strategies like NAI promote college access for minorities. Some researchers (Avery, Fairbanks, & Zeckhauser, 2003; McDonough, 2004) have asserted that early admission programs, for example, favor Caucasian American affluent applicants from resource-rich high schools while hindering access for other students.

In the wake of diminishing affirmative action policies (Moses & Saenz, 2008), shrinking state budgets (Dadayan, 2010), and increasing tuition costs (College Board, 2009), increasing minority student enrollment is laden with challenges which make it even more imperative for higher education administrators to stay abreast of the factors that promote or hinder access for African American students (Van Horn & Prescott, 2010). Bontrager (2007) states that enrollment managers have been duplicitous in their efforts to commit to access and equity for minorities and low-income students while promoting prestige through college rankings and institutional profiles. Even further, Humphrey (2006) speaks of the push and pull of the enrollment manager in her study of prestigious public higher education institutions and the double-edged sword of increasing access while maintaining prestige. Despite the challenges that accompany increasing access at postsecondary institutions, researchers suggest that higher education institutions should capitalize on opportunities to help ensure that all students receive sufficient college counseling and establish recruiting relationships that promote access for all

students (Perna, Rowan-Kenyon, Thomas, Bell, Anderson, & Li, 2008; Wolniak & Engberg, 2007). Finally, McDonough (2004), Jun and Tierney (1999), and Gullat and Jan (2001) proposed the following recommendations for practitioners to adhere to when implementing outreach-based programs to increase access for underrepresented students:

- Set high standards for program students and staff.
- Incorporate identity affirmation.
- Provide personalized attention for students.
- Connect with the individual, school, and family.
- Provide adult role models and peer support.
- Collaborate with other institutions and school districts.
- Provide better information regarding the college entry process.
- Incorporate strategically timed interventions.
- Make long-term investments in students.
- Provide a school/society bridge for students.
- Incorporate scholarship assistance.
- Invest in evaluation designs that contribute to improved interventions.
- Consider cost effectiveness.
- Integrate flexibility in the approach.

Social, Economic, and Policy Context.

The research that is categorized by the fourth layer of Perna's (2006) student college choice model entitled social, economic, and policy context, covers how the following factors influence postsecondary access for African American students: (a)

financial aid (to include tuition costs and merit-based/need-based aid), (b) the alignment of K-12 and postsecondary policy (also known as P-16/P-20 initiatives), and (c) the role of local, federal, and state government in increasing college access. Each of the factors represented in layer four present pressing current issues debated within higher education today.

Tuition costs.

The literature is profuse with information regarding financial aid and tuition costs and their impact on college choice for students overall and specifically for African American students. Current research indicates that increases in college tuition rates have a negative correlation with college entrance for African American and low-income students (Heller, 1999; Long & Riley, 2007; Paulsen & St. John, 2002; St. John , Chung, Musoba, Simmons, Wooden, & Mendes, 2004; St. John, Paulsen, & Carter, 2005). For example, Heller (1999) sought to determine the extent to which divergent tuition levels and financial aid spending impact college undergraduate enrollment rates and if the effect differed by ethnic group. Heller found that tuition rate increases lead to declines in college enrollment at both two-year and four-year institutions for African Americans, Caucasian Americans, and Hispanics. Additionally, Heller determined that African Americans were slightly more sensitive to tuition increases than Caucasian Americans, but Hispanics were most sensitive of all. Similarly, Paulsen and St. John (2002) found that low-income and lower-middle-income students were far more responsive to college tuition prices than students from upper-middle-income and upper-income families. Paulsen and St. John further asserted that the current high-tuition, high-loan approach to

higher education finance does not appear to be working and that sufficient funding for access to postsecondary education is still lacking for poor and working-class students in our nation.

Merit-based versus need-based aid.

A panoramic view of the financial aid landscape in America reflects a continuous decline in the federal Pell grant until the year 2009 (Kittredge, 2009), which serves as the primary source of need-based aid, and the proliferation of state level merit-based financial aid such as the Georgia's Helping Outstanding Pupils Educationally (HOPE) scholarship program (Ehrenberg, Zhang, & Levin, 2006; Mumper, 2003). HOPE launched a national shift in financial aid funding then 14 other states and the federal government followed suit by adopting similar merit-based aid policies (Doyle, 2006). In fact, Doyle asserted that the shift to merit-based aid represented one of the most pronounced policy shifts in higher education in the last 20 years. Since the inception of the HOPE scholarship program, researchers have published articles analyzing the impact of merit-based aid on college enrollment and access for underrepresented groups. For instance, research by Doyle (2006) and Cornwell, Mustard and Sridhar (2003) show statistically significant increases in overall college enrollment as a result of the HOPE scholarship program. While Doyle (2006) did not disaggregate data by ethnicity, Cornwell, Mustard, and Sridhar (2003) found that African American student enrollment rates at four-year public and private colleges increased by 27% and 14% percent respectively because of HOPE. Cornwell, Mustard and Sridhar asserted that part of the explanation for such an increase for African American students is that "African

Americans have much lower enrollment rates to begin with; therefore, a relatively small increase in enrollment rates can account for a large percentage change" (p. 24).

While Cornwell, Mustard, and Sridhar's (2003) study appears to be one of the rare cases that points to benefits for African Americans due to merit-based aid programs like HOPE, several other authors (Long, 2004; Long & Riley, 2007; Ness & Tucker, 2008; St. John, Musoba, & Simmons, 2003) purport that merit-based aid programs disadvantage low-income and minority students. For example, Dynarski's (2000) research denoted that while Georgia's HOPE scholarship program increased middle-class and high-income student college attendance, it widened the gap in college attendance between African and Caucasian American students and between students from low-income and high-income families. Similarly, Heller (2004) cited how merit-based scholarships increased by 36% in 12 states while need-based aid only increased by 7%. Long (2004) and Heller assert that merit-based aid programs not only take away funding from low-income students but college tuition costs in predominately merit-based states have increased in response to scholarship programs such as HOPE, which negatively affects non-merit-based aid recipients. A literature analysis by Ness and Tucker (2008) revealed that merit-based scholarship programs in some states, specifically New Mexico, Michigan, and Florida, awarded merit-based scholarships to a disproportionately lower percentage of racial/ethnic minorities. Some of the merit-based scholarship programs take into account ACT/SAT scores on which ethnic minorities tend to score lower (Fleming & Garcia, 1998; Journal of Blacks in Higher Education, 2006) and have no income limits which provide more affluent students with an advantage.

P-20 initiatives.

Several states have P-20 (also known as P-16) initiatives either through some form of legislation or council formation in response to the disconnection between K-12 and postsecondary educational systems from a public policy, structural, and organizational perspective (The National Center for Public Policy and Higher Education, 2009). Each educational system has its own set of assessments, standards, and curriculum, which can disadvantage students attempting to navigate from one system to the next when there exists a discrepancy among such elements, particularly for students whose parents did not complete postsecondary education (Venezia & Kirst, 2005). Venezia and Kirst (2005) conducted a study to examine K-16 policies and practices and how they contribute to college access and success. The findings from their Stanford University Bridge Project demonstrate that access to college preparation information follow racial, ethnic, income, and curricular tracking lines. Because of the misalignment between the K-12 and postsecondary educational policy, requirements for graduation at the high school level, in many cases, is completely different than college entrance requirements. For example, Venezia and Kirst (2005) demonstrated that student knowledge of curricular requirements was sporadic and vague and that students were unclear about the different information and skills necessary for transition between K-12 and postsecondary education sectors. Students whose parents did not attend college or had limited resources of information (e.g., low-income and minority students) were at a distinct disadvantage when it came to navigating between two different educational systems (i.e., K-12 and higher education) (Choy, 2001; Perna & Titus, 2005; Venezia &

Kirst, 2005; Wimberly & Noeth, 2004). Stampen and Hansen (1999) called for K-12 education reform and hail the critical importance of a systematic approach to improving access to postsecondary education. The alignment curriculum, assessment, and data from the K-12 and higher education sectors along with effective implementation of the resulting policies and initiatives is critical to advancing postsecondary access for all students (The National Center for Public Policy and Higher Education, 2009). This is specifically important for African American students who typically do not have the social capital necessary to successfully navigate through the educational pipeline (Jackson, 2007).

Affirmative action.

The impetus for affirmative action policies in the U.S. from the 1964 Civil Rights Movement (Tierney, 1997) was to remedy the present effects of past discrimination, injustices, and unequal opportunities faced by racial/ethnic minorities and women. More recently, affirmative action policies have been challenged and in some states completely eliminated (Moses & Saenz, 2008). The elimination of affirmative action policies in the 1990s and 2000s have negatively impacted college enrollment for African Americans across the nation (Ternanishi & Briscoe, 2008). For example, Proposition 209, an amendment to California's state constitution that eliminated discriminatory practices in public institutions of higher education and beyond in 1996, had an immediate and significant effect on freshman enrollment for African American students. African American student enrollments decreased by 43% and 38% at the University of California,

Los Angeles and the University of California, Berkeley respectively (Ternanishi & Briscoe, 2008).

Local, state, and federal programs.

In addition to the collaboration between postsecondary education institutions and the K-12 educational system to improve access, the states play a critical role in facilitating a culture of equal access for all students (Perna & Titus, 2004). While all states have forms of need-based financial aid to provide access to low-income students, few state higher education boards have policy specifically designed to improve access for minority students. For instance, Welsh (2004) analyzed a study conducted by the State Higher Education Executive Officers (SHEEO) which sought to determine if state higher education boards within the United States had created policies specifically related to improving minority access and success in higher education. The findings from the study exhibited that only a small minority of state higher education boards had articulated policy objectives and implemented initiatives intended to improve minority student access and achievement in higher education. For the few state boards that had policy objectives in place, only a small number of them utilized their data systems to measure their own progress in creating equitable higher education systems in their states (Welsh, 2004).

To increase postsecondary matriculation for low-income and underrepresented students, many educational organizations are using college preparation programs as a mean to that end. Although there are literally thousands of early intervention programs in the U.S., empirical studies on their effectiveness are sparse (Gandara & Bial, 2001).

Gandara sought to demonstrate the range of college preparation program types, describe their features, identify programs with evaluation data to determine their effectiveness, and assess the extent to which existing programs address needs and problems identified within the literature. Gandara's study indicated that some of the most effective college preparation programs appear to be capable of at least doubling college-going rates. Yet, there are several program limitations that hinder these programs from collectively reaching their full potential (Gandara, 2001). These limitations appear in the following forms: (a) program attrition, (b) small number of students affected, (c) participant selection, (d) participation of males, (e) records on program contact, (f) sector approach, (g) academic achievement, (h) type of postsecondary institution attended, (i) long-term outcomes, and (j) program costs. Findings from the study revealed that the most effective programs had the following in common:

- provided a key person to monitor and guide students
- provided high-quality/rigorous course instruction
- made long-term investments in students
- paid attention to the cultural background of students
- provided a peer group
- provided financial assistance and incentives.

Similarly, to address the overabundance of federal and state level programs designed to increase college access, Perna, Rowan-Kenyon, Bell, Thomas and Li (2008) sought to create a typology of these programs in an effort to provide a better framework for policy-makers to understand why policies and programs are not effective at increasing

access for underrepresented students. Researchers purport that the strongest predictors of college enrollment for underrepresented students are parental involvement, academic rigor, access to information, and social support (Adelman, 1999; Cabrera & LaNasa, 2000; Choy, 2001; Perna & Titus, 2005). Yet, 90% of the 103 programs analyzed in Perna's et al. study only provide financial aid funding to students, while less than 6% focus on any combination of academic preparation or knowledge about college. Perna's et al. typology displays that both federal and state college access programs are saturated with financial support which is merely one of several factors that impact college entry for minority and low-income students.

College preparation programs such as the Advancement Via Individual Determination (AVID) program and the Gaining Early Awareness and Readiness for Undergraduate Programs (GEAR UP) were created to assist and support underrepresented students in achieving postsecondary education entry (Martinez & Klopott, 2005). Programs like AVID and GEAR UP have been deemed successful at increasing college preparedness with student participants but not all students participate in these programs. For example, many programs are available in specific states such as Project GRAD, while others such as AVID cover more states but students are selected to participate by their teachers (Martinez & Klopott, 2005; Tierney & Jun, 2001). While college preparation programs are vital to increasing access, not all of them take into account the most salient factors that researchers have shown to positively impact postsecondary entry for minority and low-income students. For instance, a detailed literature review conducted by Martinez and Klopott (2005) denoted that not a single

college preparation program encompassed all the major tenants researchers cited as essential to increasing college access. Although Project GRAD provides academic and social supports, aligns secondary and postsecondary sectors, and has a parental involvement component, it does not involve a rigorous high school curriculum which positively correlates with college entry (Adelman, 1999). Similarly, Tierney (2002) conducted research on the presence of parental and family components in college preparation programs and found that even for programs that boast of a parental involvement component, program staff's interaction with parents was typically minimal. Other researchers have pointed to how incorporating culture into college preparation programs is vitally important yet missing from most college preparation programs (Freeman, 1997; Tierney & Jun, 2001). While individuals leading college preparation programs are well intentioned and base their program structures on some research, in many cases a disconnection between research and practice still persists.

Obtaining College Entrance Information

Below is a list of the factors derived from the aforementioned literature on factors that impact postsecondary participation for African Americans in important ways:

Table 2. Factors that Impact College Matriculation for African American Students

Layer	Factors
Social, economic, and policy context (layer 4)	a. Financial aid policy b. P-20 initiatives c. Affirmative action d. Federal and state access programs
Higher education context (layer 3)	a. Postsecondary college preparation programs b. Marketing and recruiting efforts c. Institution financial aid policy d. High school/community partnerships
School and community	e. High school community partnerships

context (layer 2)	f. Administrator, teacher, counselor influence g. Rigorous K-12 curriculum, academic preparation and resources h. High school fiscal and personnel resources i. High school segregation by race/ethnicity j. High school curriculum
Habitus (layer 1)	a. Demographic characteristics i. Race/ethnicity ii. Gender iii. Residence iv. SES b. Cultural capital v. Cultural knowledge vi. Value of college attainment vii. Educational aspirations viii. Cultural history/customs c. Social capital ix. Information about college preparation/entry x. Resources/assistance with college preparation xi. Parental education levels xii. Parental involvement and encouragement xiii. Peer and familial influence xiv. Mentorship d. Demand for higher education/supply of resources e. Costs and benefits of higher education f. Psychological Factors i. Self-motivation ii. Resilience iii. Intimidation

The information factor, while directly connected to the student within the Habitus layer of the Perna (2006) model shown above, it also directly connects to all four layers of the model. Information can be obtained at the personal, high school, college, or on a larger level such as from state level leaders. Information at all four layers impacts college matriculation and is the main consideration of this study. For example, the impact of information obtained at the high school level (i.e., from high school teachers and

counselors) on college enrollment might have a greater impact than information obtained from a college recruiter. The aforementioned difference in impact could be attributed to the fact that high school counselors might provide college entrance information to students earlier than college recruiters who generally focus on seniors. Therefore, I examined the impact of a student obtaining information within each layer of the model for African American students.

As the previous review of the literature denotes, much is known about numerous factors that impact college entry for all students yet few studies focus on divergent outcomes by race and even fewer examine the impact of information explicitly (Perna, 2000; Bell, Rowan-Kenyon, & Perna, 2009). As a result, there is a paucity of literature on the impact of obtaining information related to the college-going process on college entry. Yet, the extant literature is consistent in confirming that the more information a student, regardless of race/ethnicity, has regarding the college-going process the better his/her chances for entering college (Bell, Rowan-Kenyon, & Perna, 2009). Bell, Rowan-Kenyon, and Perna (2009) drew upon data collected from descriptive case studies of 15 high schools to determine what 9th and 11th grade students knew about tuition prices, financial aid, academic requirements, and the amount of postsecondary education necessary to fulfill their specific career aspirations. Furthermore, they sought to understand how these students acquired their college knowledge and how it varied across high schools and states. Their findings indicated that all of the students in the study were aware of the general steps required to apply for college and that 11th graders had more detailed information than the 9th grade students. Moreover, they found that family

members were the primary source of information regarding college followed by the Internet and their high school constituents. Lastly, they found that the amount of college information that students acquired was influenced by their social, economic, and policy context (Bell, Rowan-Kenyon, & Perna, 2009). Similarly, in an attempt to determine how low-income students become cognizant of the college-going process and financial aid structures and the impact that information had on college opportunity, De La Rosa (2006) surveyed 11th and 12th graders within seven southern California low-income high schools. De La Rosa found that low-income students have some misperceptions about college opportunity and financial aid. Some students within the study perceived college to be too expensive and also perceived that college-related information was not for them.

The previously mentioned authors' findings are well supported within the extant literature which specifies that students, minority and low-income students especially, are misinformed about the kind of preparation necessary for college entry (Cabrera & LaNasa, 2001; Dounay, 2006; Institute for Higher Education Policy, 2007; Perna, 2005). Some students are uneducated about college-entry course requirements and/or the impact of grades on college entry for example (Martinez & Klopott, 2006; Venezia, Kirst, & Antonio, 2003). Furthermore, many low-income and minority students eligible for grant-based financial aid did not take the necessary steps to acquire these funds due to a lack of awareness of financial aid policies (American Council on Education, 2004). For example, according to a report by Dan Cohen-Vogel, assistant vice chancellor for the Florida State University System, (as cited in the Journal of Blacks in Higher Education, 2009) estimated that 22,000 needy Florida residents left $24 million in Pell grant money

untouched in 2005. African Americans made up 17% of all college students in Florida, and they made up a disproportionate share of students eligible for Pell grants. Potential rationales that explain why some students would leave funding untapped could be due to a lack of awareness of the available funds and of an understanding of the eligibility requirements, a poor communication stream between those who administer the funding and their target population, or a combination thereof. In the case of the Florida residents, Cohen-Vogel cited a lack of education regarding financial aid as the culprit. Other studies have demonstrated that students and their parents, low-income and minority students in particular, have missed opportunities due to a lack of information regarding the college-going process in the form of obtaining financial aid, estimating the cost of college and financial aid, and understanding the necessary steps and requirements necessary to enter an institution of higher education (Bell, Rowan-Kenyon, Perna, 2009; Horn, Chen, & Chapmen, 2003; King, 2004; Perna, 2005; Plank & Jordan, 2001).

A consistent theme woven throughout the literature is that information access plays a vital role in college preparation and postsecondary entry. Because information access is derived from social, cultural, and sometimes economic capital, African Americans are at a distinct disadvantage at accessing information advantageous for college entry. Information is vitally important to a seamless transfer from high school to postsecondary education for African American students.

Gaps in the Literature

As a result of this literature review on factors that impact postsecondary matriculation for African American students, several pertinent factors emerged. The

current body of research on factors that influence college matriculation for African Americans demonstrates major gaps in the literature and a lack of connection between theory and practice. The literature reviewed in this study inadequately addresses how college preparation programs, information regarding the college-going process, high school curriculum, African American culture, mentorship, peer influence, and psychological factors impact postsecondary participation for African American youth. Based on the gaps presented in the literature, the following questions served as a basis for further research for scholars in the field:

- Do college preparation programs sponsored by colleges and universities effectively impact African American college entry?
- Does information regarding the college-going process impact college entry for African American students?
- To what extent does high school curriculum impact African American viewpoints on education and postsecondary educational attainment?
- To what extent does the integration of cultural elements in college preparation programming enhance college entry rates for African American students?
- How can we expand our understandings of African American culture, their worldview, and how these elements might impact their educational experiences?
- What are the measured effects of mentoring on college entry for African American youth after controlling for all other factors?

- How might psychological factors such as resilience, self-motivation, or intimidation be supported or overcome to increase postsecondary entry for African Americans?

Because current systems and programs have yet to ameliorate gaps between college entry rates of Caucasian and African Americans (Perna, 2007), research addressing the aforementioned gaps in the literature may provide critical information necessary to improve current systems geared toward improving postsecondary access.

Conclusion

The findings from this literature review provide several mechanisms through which policy development and praxis might be enhanced. First, all of the findings demonstrate the importance of the consideration of race/ethnicity in data analysis and policy formation, development, and implementation. Some policies utilize proxies for race and ethnicity, such as income, yet the findings from the literature review indicate that such proxies do not always fully explain educational disparities while race/ethnicity sometimes provide better explanations of variance (i.e., standardized test scores like the SAT or ACT). Resultantly, this study analyzed the impact of information on college entry by race/ethnicity. Secondly, focusing on the most salient factors that impact college matriculation for African American students in policy and practice might lead to increased college entry and postsecondary attainment. Currently, many policies fail to ameliorate educational disparities between African Americans and their peers as many policies focus on one or only a few of the factors that impact college entry for this group. An abundance of programs focus solely on financial aid while others leave out critical

elements like parental involvement and academic intensity at the K-12 level. Moreover, further research and assessment is needed to address elements that are inadequately addressed within the extant literature. Consequently, the purpose of this study was to expand the higher education literature pertaining to information regarding the college-going process and its impact on college enrollment. This study took into account the factors, listed below, that impact college matriculation to understand the impact and interactions of these factors at both the student and school level.

The following section provides a general overview of the variables being examined within this study and their connections to Perna's (2006) college choice model. The independent variables that were measured are based upon Perna's (2006) model of student college choice and demonstrate the extent to which gaining information about college entry predicts college enrollment for African American students. Chapter three also provides a complete list of the variables which were selected based upon the findings from this literature review.

Table 3. List of Variables Examined and Their Relationship to Perna's (2006) College Choice Model

Layers with Perna's (2006) college choice model	**Independent variables**
Social, economic, and policy context (layer 4)	Whether or not a student participated in a college preparation program
Higher education context (layer 3)	Whether or not a student obtained college entrance information from college/university personnel (i.e., college recruiters or their marketing materials)
High school and community context (layer 2)	Whether or not a student obtained college entrance information from high school personnel (i.e., high school teachers, guidance counselors, or athletic coaches)
Habitus (layer 1)	Whether or not a student obtained college entrance information from individuals within their personal network (i.e., parents, relatives, or friends)

Chapter Three: Methods

This chapter focuses on the methods chosen for analyzing the data associated with the research questions and hypotheses presented below. Explicitly, this chapter covers the following sections: (a) the data source, (b) the sample, (c) the measures that were analyzed, (d) the statistical model and its associated procedures, and (e) the limitations of the study. Based upon the literature review, the research questions that served as the impetus for this study and their related hypotheses are as follows:

1. Do factors related to gaining college entrance information predict college entry for African American students in comparison to Caucasian American students?

- Hypothesis 1: Participation in a college preparation program will have a significant positive effect on college entry for African American students after controlling for race/ethnicity, gender, parental education, parental involvement, parental expectations, income, and high school academic course offerings.
- Hypothesis 2: Gaining information from high school constituents (teachers, guidance counselors, and/or athletic coaches) will have a significant positive effect on college entry for African American students after controlling for

race/ethnicity, gender, parental education, parental involvement, parental expectations, income, and high school academic course offerings.

- Hypothesis 3: Gaining information from members of a student's personal network (parents, siblings, relatives, and/or friends) will have a significant positive effect on college entry for African American students after controlling for race/ethnicity, gender, parental education, parental involvement, parental expectations, income, and high school academic course offerings.
- Hypothesis 4: Gaining information from college level personnel/resources (college recruiters, publications/websites, and/or college search guides) will have a significant positive effect on college entry for African American students after controlling for race/ethnicity, gender, parental education, parental involvement, parental expectations, income, and high school academic course offerings.

2. Does a high school counselor-to-student ratio impact college entry for African American students in comparison to Caucasian American students?

- Hypothesis 5: Schools with a high ratio of high school counselors to students will have a significant positive effect on college entry for African American students after controlling for race/ethnicity, gender, parental education, parental involvement, parental expectations, income, and high school academic course offerings.

Data Source

The data analyzed within this study were drawn from the Education Longitudinal Study of 2002 (ELS:2002), a national longitudinal dataset created from a study conducted by the National Center for Education Statistics (NCES). Data were collected from students, their parents, teachers, librarians, and administrators regarding the students' educational experiences and progression from 10th grade through postsecondary education through the workforce. The ELS:2002 study used a two-stage sample selection process (Ingels, Pratt, Wilson, Burns, Currivan, Rogers, & Hubbard-Bednasz, 2007). First, ELS:2002 staff contacted 1,221 public and private secondary schools from a population of approximately 27,000 schools containing sophomores. Of the selected schools, 752 agreed to participate in the study. Approximately 26 10^{th} grade students per school were randomly selected and Hispanics and Asians were oversampled which means that their representation in the ELS:2002 dataset is greater than their proportion in the population (Ingels et al., 2007). The ELS:2002 study consisted of three waves of data collection, (a) 2002 base year (BY), (b) 2004 first-follow up (F1), and (c) 2006 second follow-up (F2) (see Table 4 below). The spring 2002 sophomore base year (BY) student participants totaled 15,362. These same students were surveyed again in 2004 once they were seniors, representing the first follow-up (F1). The 2004 sample, comprised of 14,989 seniors, included students who were out of scope during the base year (BY) (i.e., students who were out of the country during the 10^{th} grade or who were homeschooled in the 10^{th} grade but not during the 12^{th} grade) (Ingels et al., 2007). The second and final

follow-up survey (F2) contained 16,400 student participants and followed those seniors surveyed in the first follow-up through to postsecondary education and the workforce.

Table 4. Three Waves of Data Collection in ELS:2002 Study (Ingels et al., 2007)

Base Year (BY): 10th Grade	**First Follow-Up, 2004 (F1): 12th Grade**	**Second Follow-Up, 2006 (F2): 2 Years Into Postsecondary Education**
• Completed the baseline survey of high school sophomores in spring term 2002. • Administered achievement tests in reading and mathematics. • Completed surveys of parents, English teachers, and mathematics teachers. • Collected school administrator questionnaires. • Included additional components for this study—a school facilities checklist and a media center (library) questionnaire. • Established sample sizes of 7,526 participating schools and 15,362 participating students. • Schools are the first-stage unit of selection, with sophomores randomly selected within schools. • Oversampled Asian and Hispanic students and private schools. • Designed linkages with PISA (reading in 2000 and math in 2003) and National Assessment of Educational Progress (NAEP 2005 math); scored reporting linkages to the prior longitudinal studies.	• Most sample members were seniors, but some were dropouts or in other grades (early graduates or retained in an earlier grade). • Student questionnaire (different versions for students who remained in the base-year school, transferred to a new school, completed high school early, or were homeschooled), dropout questionnaire, assessment in mathematics, and school administrator questionnaire were administered. • The survey returned to the same schools but separately followed transfer students and surveyed them outside of school. • The survey freshened for a spring-term 2004 senior cohort. • There was a high school transcript component in 2004–05 (course taking records at the student level for grades 9–12) and a course offerings component at the school level.	• Post-high-school follow-up with web-based instrument for self-administration, computer-assisted telephone interview (CATI), or computer-assisted personal interview (CAPI). • Survey 2 years after the cohorts' modal high school graduation captures six distinct groups: − high school late completers; − nonenrollers in higher education; − prompt postsecondary education enrollers; − delayed postsecondary education enrollers; − higher education leavers (versus persisters) and returnees; and − delayer-leavers. • Three distinct (and sometimes alternating or combined) transitions: − transition to the work force; − transition to postsecondary education; and − transition to adult roles.

Moreover, data from student transcripts that contained information related to course enrollment, credit hours, earned grades, etc., were collected in the F1 and F2 data collection waves. Additionally, two achievement tests, assessments in reading and

mathematics, were administered along with a school observation form during the base year (Ingels e. al., 2007). The majority of the survey content in ELS:2002 was an extension of previous NCES studies in the following forms: (a) the National Assessment of Educational Progress (NAEP), (b) the National Education Longitudinal Study of 1988 (NELS: 88), and (c) the Program for International Student Assessment (PISA) (Ingels et al., 2007).

Unlike the more widely used simple random sampling (SRS), the ELS:2002 used a complex probability sampling method which included the following elements: (a) stratification, (b) clustering, and (c) multistage sampling (Ingels, Pratt, Wilson, Burns, Currivan, Rogers, & Hubbard-Bednasz, 2007). ELS:2002 researchers selected schools and grouped them into small sub-groups they called strata. For example, they divided the United States into eight regions then pinpointed areas within those regions from which to select schools to include in the study based on locale (i.e., urban, suburban, or rural) and sector (i.e., public, catholic, or other private). Next, small geographical areas were constructed based upon counties, school districts, and schools then clusters of students were selected from those schools. Design effects were used to the multistage portion of the sampling design refers to the fact that ELS researchers surveyed multiple individuals at different stages. For example, ELS researchers selected a nationally representative sample of high schools, surveyed administrators within those high schools, and then interviewed students within those schools at one stage, the base year. Later students and their records were surveyed at different stages, F1 and F2 (Ingels et al., 2007).

The complex sampling design as a whole presents challenges for researchers to consider. First, the clustering portion of the sampling design violates assumptions of independence. Second, standard statistical software assumes that the probability sampling design is SRS. Third, as previously mentioned, some racial/ethnic groups, Asian Pacific Islanders and to a lesser degree Hispanics, and private schools students were oversampled in the study. Therefore, analytic weights must be applied to the data to account for this complex sampling design. Analytic weights are variables located within the data file that compensate for unequal probabilities of selection and also adjust for unit non-response (Ingels et al., 2007). More specifically, analytic weights are values that represent the number of people in the population of which a particular student in the sample represents. There are 11 different analytic weights for students and one school weight present in the ELS:2002 data file. Furthermore, these weights allow researchers to make generalizations to the national populations represented within the ELS in addition to ensuring that all individuals represent their proper proportions relative to the population. This sampling design permits accurate inferences to be made to three major groups or target populations: (a) spring 2002 high school sophomores, (b) spring 2004 high school seniors, and (c) spring 2002 10^{th} grade schools (Ingels et al., 2007). Finally, the structure of the ELS:2002 enables researchers to analyze the data from a longitudinal or cross-sectional perspective.

Sample

The data to be analyzed within this study were extracted from the aforementioned ELS:2002 dataset. Data from the 10^{th} grade base year (BY) student and school

administrator surveys was extracted. Additionally, data from both the first (F1) and second follow-up (F2) student and school administrator surveys, which captures information about these 10th grade students when they are in the 12th grade and at the postsecondary entry point respectively, was extracted. In order to generalize the findings obtained from this study to spring term 2002 10th graders in the U.S., I utilized the cross-sectional weight labeled F2QWT which captures 10th-grade students at the base year (BY) who responded to the second follow-up (F2) survey (Ingels et al., 2007). Students who did not participate in the 10th grade baseline survey but participated in the second follow-up survey (F2) are not a part of the sample for this study. The total sample size for the study is 9,450 10th grade students who participated in the base year and second follow-up surveys (Ingels et al., 2007). The sample size for African Americans in the study is 1,740 after deleting 280 cases with missing data on the dependent variable. The Caucasian Americans sample size is 7,710 after deleting 972 cases with missing data on the dependent variable.

Measures

Table 5 provides a list of all variables analyzed. The outcome variable of interest in this study is college entrance which is dichotomous in nature and derived from the second follow-up student survey (F2). The independent variables measured were analyzed at two levels within the study, the student level and the school level both interchangeably and respectively referred to as level-1 and level-2. Level-1 captured information regarding the individual student characteristics and educational outcomes

while level-2 provided data on school level measures (i.e., the number of teachers or guidance counselors employed in a high school).

At the student level, there are several independent variables which all directly relate to college aspirations or obtaining college entrance information and from whom, or where, this information is derived. The main independent variables of interest in the study conveyed whether or not students obtained college entrance information. The following four variables served as the main independent variables within the study and each have dichotomous outcomes, (a) college preparation program (prep), (b) high school information (hsinfo), (c) personal network information (persnet), and (d) college level information (univinfo). Three of these four variables, hsinfo, persnet, and univinfo, I constructed as composite variables. The college preparation variable (prep) was labeled BYS33L within the ELS dataset and illustrated whether or not a student was ever in a program to help him/her prepare for college. The prep variable does not include college test preparation and college entrance coaching that requires a monetary fee. Each of the composite variables I constructed was comprised of several variables (see Table 5) that indicated where a student received college entrance information (i.e., high school counselors or teachers). More specifically, the high school information variable (hsinfo) was a constructed composite that combined the responses of three different constructs, whether or not a 10th grade student went to a high school counselor, high school teacher, and/or high school athletic coach for college entrance information. Similarly, the personal network variable (persnet) combined four variables that indicated whether or not a student went to a parent, friend, sibling, and/or other relative for college entrance

information. Finally, the college level variable (univinfo) combined three different variables that specify whether or not a student acquired college entrance information from college publications/websites, a college representative, and/or college search guides. The four aforementioned variables of interest were constructed as composites in a manner that corresponds with the four layers embedded within Perna's (2006) college choice model (see Table 3) and the findings from the literature review in chapter 3. For example, the constructed hsinfo composite variable corresponds to the high school and community context layer of Perna's (2006) college choice model and was comprised of all data elements available within the ELS:2002 dataset related to gaining college entrance information from high school constituents.

As denoted in Table 5, several covariates were entered into the model, all of which were based on the findings from the literature review (see Chapter 3) which indicated those factors most likely to impact college enrollment for African American students specifically. The student level covariates included gender (gender), total family income in 2001 (income), parent education level (parented), parental education expectation level (parentexp), and parental involvement (parentinvolv). Each of the covariates was derived directly from the ELS:2002 dataset except for the parentinvolv variable. I constructed the parentinvolv variable as a composite variable that combined four variables that indicated how often a student discussed school courses, school activities, things studied in class, and grades with his/her parents.

At the school level, the main variable of interest was the ratio of full-time high school guidance counselors to students. This variable was constructed by calculating the

ratio of the number of full-time guidance counselors to the total student enrollment in each high school. The high school guidance counselor to student ratio variable was important for this analysis since high school counselors serve as the primary source for college entrance information for high school students (Johnson, Rochkind, Ott, & DuPont, 2010). Additionally, the high school academic course offerings variable served as a school level covariate as research (Adelman, 1999; U.S. Department of Education, 2001) has shown that high school academic rigor is one of the most salient pre-college indicators of postsecondary entry and completion, particularly for African American and Hispanic students. Currently, there is no set standard that defines high school academic intensity. Yet, some researchers refer to the number or percentage of high school course requirements such as higher level math and Advanced Placement (AP) courses or aggregate school achievement scores as indicators of high school academic rigor (Adelman, 1999). I specifically focused on the high school curriculum in the form of course offerings as a measure of high school academic rigor. Consequently, I constructed a composite variable based on the percentage of a school's student body enrolled in AP courses because it inherently accounts for school size and the number of years of mathematics and science coursework required to graduate.

Table 5. Variable Construction List

Variable Construction List Variables	Variable Name	Variable Description	Variable Scale
Outcome/Dependent Variable			
College entry	F2EVRATT	ELS composite: whether student ever attended college	Discrete
Independent Level-2 Variables			
Covariates			

High school academic course offerings (constructed composite (hscourse))	F1A22F	% of student body in Advanced Placement courses	Continuous
	F1A07B	Years of mathematics coursework required to graduate	Continuous
	F1A07C	Years of science coursework required to graduate	Continuous
Predictor Variable			
High school social capital: Ratio of counselors to students (constructed composite (counsratio))	BYA23K/ BYA01	Ratio of: # of full-time guidance counselors/total student enrollment as of Oct 2001	Continuous
Independent Level-1			
Control Variables			
Gender (gender)	BYSEX	Sex of student	Nominal
Parents education (parented)	BYPARED	Parents' highest level of education	Ordinal
Income (income)	BYINCOME	Total family income in 2001 from all sources	Ordinal
Parental educational expectations (parentexp)	BYPARASP	How far in school parent wants 10th grader to go	Ordinal
Parental involvement (constructed composite: (parentinvolv))	BYS86A	How often discussed school courses with parents	Ordinal
	BYS86B	How often discussed school activities with parents	Ordinal
	BYS86C	How often discussed things studied in class with parents	Ordinal
	BYS86D	How often discussed grades with parents	Ordinal
Predictor Variables			
College preparation program	BYS33L	Ever in program to help prepare for college	Discrete
High school information (constructed composite: hsinfo))	BYS59A	Has gone to counselor for college entrance information	Discrete
	BYS59B	Has gone to teacher for college entrance information	Discrete
	BYS59C	Has gone to coach for college entrance information	Discrete
Personal network information (constructed composite: (persnet))	BYS59D	Has gone to parent for college entrance information	Discrete
	BYS59E	Has gone to friend for college entrance information	Discrete

	BYS59F	Has gone to sibling for college entrance information	Discrete
	BYS59G	Has gone to other relative for college entrance information	Discrete
College level information (constructed composite: (univinfo))	BYS59H	Has gone to college publications/ websites for entrance information	Discrete
	BYS59I	- Has gone to college representatives for entrance information	Discrete
	BYS59J	- Has gone to college search guides for entrance information	Discrete

Data Analysis

I utilized Hierarchical Generalized Linear Modeling (HGLM), an advanced application of Hierarchical Linear Modeling (HLM), as the analytic tool for this study. The purpose of the model was to predict postsecondary entry from several factors related to the college-going process assessed at the 10th grade level. This section provides the following information: (a) a description of the analytic tool used within the study, (b) a synopsis of the procedures associated with exploring the data, handling missing data, and checking for violations of the model assumptions, (c) details regarding the model, (d) an evaluation of the model fit, and (e) limitations associated with the analysis.

Hierarchical Linear Modeling.

HLM was the most appropriate and effective analytic tool through which to test the aforementioned hypotheses in that it best accounts for the nested data structure of the ELS:2002 data, students nested within schools (Osborne, 2000). While other appropriate techniques such as logistic regression could have been utilized to determine the impact of predictors on a particular binary outcome, HLM offers at least three advantages to the other available options: (a) improved estimation of individual effects, (b) ability to model cross-level effects, and (c) partitioning variance-covariance components (Raudenbush &

Bryk, 2002). HLM also better accounts for data within hierarchical structures such as students nested within classrooms, schools, cities, or states than alternative techniques (Osborne, 2000). Accounting for a hierarchical data structure is important because nested data violate an assumption that underlies most analytic techniques like traditional linear and binary regression: independence of observations (Guo & Zhao, 2000; Raudenbush & Bryk, 2002). Independence of observations means that each unit of data is independent of the other. However, for nested data like students within classrooms, this assumption is violated because students within a classroom or school tend to have more in common with one another than students randomly sampled from a school district or from a national population of students. Typical ordinary least squares (OLS) methods ignore the effects of clustering therefore resulting in biased parameter estimates and underestimated standard errors (Guo & Zhao, 2000). Accurately estimating standard errors is vital because they can uphold or overturn important conclusions regarding the hypotheses of a study (Guo & Zhao, 2000). HLM, in contrast, corrects for the biases in parameter estimates that result from clustering. Furthermore, HLM allows for a systematic analysis of how covariates measured at various levels of a hierarchical structure impact the dependent variable and how interactions among these covariates affect the outcome variable (Guo & Zhao, 2000; Raudenbush & Bryk, 2002).

Conceptually, HLM is similar to OLS regression, however, it can account for clustered data. In a two-level HLM model, level-1 is modeled in the following manner (Raudenbush & Bryk, 2002):

$$Y_{ij}=\beta_{0j}+\beta_{1j}X_{1}+\ldots+\beta_{kj}X_{k}+r_{ij} \quad (1)$$

This equation represents the level-1 of a two-level model which represents student level data. Within the level-1 equation, Y_{ij} represents the predicted outcome value (college matriculation) of a student, denoted as *i*, in a particular school, denoted as *j*. β_{0j} represents the intercept of the school *j* and β_{1j} represents the slope of variable X_1, which continues through $\beta_{kj}X_k$ as more predictor variables are added to the model. The slope value represents the expected change in Y_{ij} given a unit increase in X_1 and the intercept term can be interpreted as the expected value of Y_{ij} when X_1 is zero (Hofmann & Gavin, 1998). Finally, r_{ij} represents the residual (or error term) for an individual student, *i*, in school *j*. The level-2 model which predicts the intercept and slope beta terms ($\beta_{0j,}$ $\beta_{1j\ldots}\beta_{kj}$) at level-1 is represented below (Raudenbush & Bryk, 2002):

$$\beta_{0j} = \gamma_{00} + \gamma_{01}W_{1\ \ldots} + \gamma_{0k}\ W_k + u_{0j}$$

$$\beta_{1j} = \gamma_{10} + \gamma_{11}W_{1\ \ldots} + \gamma_{1k}\ W_k + u_{1j} \qquad (2)$$

In this case, γ_{00} is the mean of the outcome variable for a school with all level-2 predictors (W) equal to zero, while γ_{01} is the outcome variable difference between schools with a one unit change in W. Furthermore, γ_{10} is the average slope for a school with all level-2 predictors (W) equal to zero, while γ_{11} is the average slope difference between schools with a one unit change in W. The level-2 equation continues as predictor variables (W) are added to the model just as it did at level-1. Finally, u_{0j} and u_{1j} represent the individual school residuals which represents the between school variation. An example of the combined two-level HLM model is represented below (with one level-1 predictor and one level-2 predictor for simplicity):

$$Y_{ij} = \gamma_{00} + \gamma_{10}\ X_{1j} + \gamma_{01}\ W_j + \gamma_{11}\ X_{ij}W_j + u_{1j}X_{ij} + r_{ij+}\ u_{0j} \qquad (3)$$

The aforementioned linear model of HLM assumes a continuous dependent variable, a normal distribution of level-1 (or individual student) errors, independence of error terms, and homogeneous variance in level-1 errors. The outcome variable for this study was dichotomous which violates the following three assumptions associated with the linear HLM model (Raudenbush & Bryk, 2002). First, the expected values for the outcomes within the proposed model will either be zero or one. This is problematic because expected values within the linear model can fall outside of the range [0, 1]. Secondly, the error terms associated with a binary dependent variable cannot be normally distributed because the errors can only take on the values zero or one. Finally, the level-1 error terms cannot have homogeneous variance because their variance depends on the predicted value of the outcome (Hox, 2002). Consequently, HGLM was implemented to account for the binary outcome variable in the model.

HGLM was used in this study to account for the effect of the dichotomous outcome variable. Hierarchical Generalized Linear Models offer a modeling framework for multilevel data with nonlinear structural models and nonnormally distributed errors (Raudenbush & Bryk, 2002). HGLM consists of three components: (a) a sampling model (also known as probability distribution), (b) a link function, and (c) a structural model (Raudenbush & Bryk, 2002). While a linear HLM assumes a normal sampling model and an identity link, the binary outcome model, HGLM, uses a binomial sampling model and a link function like the logit or probit link. The binomial sampling model accounts for the binary outcomes associated with the data and applies the appropriate error distribution and the logit or probit link transforms the outcome variable responses to reduce the

heteroscedasticity (Hox, 2002). Specifically, this study utilized a binomial distribution called the Bernoulli distribution. The Bernoulli distribution was appropriate for this study due to its ability to account for bounded sampling distributions, bounded distributions that are confined to lie between two determined values, 0 and 1 in this case (Van Hauwermeiren & Vose, 2009). The Bernoulli distribution is unlike the normal distribution which is unbounded with a distribution of values that extends from minus infinity to plus infinity (Van Hauwermeiren & Vose, 2009). Moreover, this study also incorporates the logit link which transforms the level-1 predicted values to ensure that the predictions are constrained to lie within the interval [0, 1] and is characterized by the equation below (Raudenbush & Bryk, 2002).

$$\eta_{ij} = \log(\varphi_{ij}/1-\varphi_{ij}) \quad (4)$$

In the model, η_{ij} represents the log of the odds of postsecondary entry for student *i* in school *j* and φ_{ij} represents the odds, the probability that a student would fall into one group versus another, of postsecondary entry. For the two-level HGLM model in this study, the level-1 equation is exactly the same at the aforementioned standard HLM level-1 equation except that η_{ij} now represents the predicted value, Y_{ij} and the level-1 error term is no longer necessary in the HGLM equation. The level-1 error term is absent from the equation because in a binomial error distribution the error variance is a function of the mean and cannot be estimated separately; representing the only structural difference in the HGLM model at level-1 compared to HLM (Hox, 2002). The HGLM level-2 equation has the same form as the HLM level-2 equation previously shown.

Finally, the full HGLM model proposed for this study is presented below (with one level-1 predictor and one level-2 predictor for simplicity).

Table 6. Full HGLM Model

	HGLM (binary outcome)
Level-1 Model	$\eta_{ij} = \beta_{0j} + \beta_{1j}X_{1} + \ldots + \beta_{kj}X_{k}$
Level-2 Model	$\beta_{0j} = \gamma_{00} + \gamma_{01}W_{1} \ldots + \gamma_{0k}\ W_{k} + u_{0j}$ $\beta_{1j} = \gamma_{10} + \gamma_{11}W_{1} \ldots + \gamma_{1k}\ W_{k} + u_{1j}$
Full Model	$\eta_{ij} = \gamma_{00} + \gamma_{10}\ X_{1j} + \gamma_{01}\ W_{j} + \gamma_{11}\ X_{ij}W_{j} + u_{1j}X_{ij} + u_{0j}$

Maximum likelihood estimation (MLE) is a statistical method used for fitting a statistical model to data and providing estimates for the model's parameters (Eliason, 1993). The parameters for HGLMs are estimated using maximum likelihood (ML) methods (Hox, 2002). Researchers using the method of maximum likelihood select values from a set of sample data that maximize the likelihood function in estimating model parameters (Eliason, 1993). The likelihood function allows researchers to estimate unknown parameters based on known outcomes. However, because of the multiple levels in HGLMs, estimating parameters using ML leads to complex models and estimation procedures (Hox, 2002). To simplify the model estimation procedures, the prevailing approach is to use a quasi-likelihood approach (predictive) quasi-likelihood (PQL) or Laplace estimation (Hox, 2002; Raudenbush, Bryk, Cheong, & Congdon, 2004).

Laplace estimation is used for Bernoulli models and provides an alternative method of estimation via PQL using a higher-order approximation to the likelihood based on a Laplace transform. Prior research indicates that the Laplace estimation method produces an accurate approximation to ML estimates (Raudenbush, Bryk, Cheong, & Congdon, 2004). In HLM6 software the HGLM model estimation choices are between PQL or Laplace (Raudenbush and Bryk, 2002). Raudenbush and Bryk asserted that if the level-2 variance components are small (i.e., the variance of the random intercept is about 0.5 or less), the answers using either PQL or ML will be very similar for a reasonably large dataset. However, for larger variance components, ML will provide better estimates than PQL but can be computationally intensive (Raudenbush & Bryk, 2002). Furthermore, the PQL estimation procedure is known to produce unreliable deviance statistics; statistics used to assess model fit, for HGLM models and is not provided in the output in HLM6 software. Laplace estimation, however, is reported to produce more reliable estimates than the PQL method and is currently the only option for obtaining a deviance statistic for HGLM models in HLM6 software (Raudenbush, Bryk, Cheong, & Congdon, 2004). Consequently, Laplace estimation was utilized within this study.

Data Exploration.

There were several stages involved within the data exploration process. To conduct the analysis, I began by organizing my data using SPSS software. First, I conducted an exploratory analysis of the data by running descriptive statistics to include but not limited to the mean, minimum, maximum, and the school level and student level sample sizes. Then I applied the F2QWT weight to the data to ensure that each student

within the study accurately represented that student's population. Next, I assessed the data for errors and missing observations. Furthermore, I assessed the data for missingness and violations of assumptions associated with HGLM models.

There are techniques available for handling missing data such as multiple imputation (MI) and the expectation-maximization (EM) algorithm among others (Allison, 2002). I assessed whether the data were missing completely at random (MCAR), missing at random (MAR), or missing not at random (MNAR). It is important to note that it is empirically impossible to accurately determine if data are MCAR. Researchers can only infer this pattern of missingness (Allison, 2002). Data that is MCAR means that the probability of missing data on Y (the actual values of the dependent variable) is unrelated to the value of Y or to the values of other variables within the proposed model (Allison, 2002). MAR means that the probability of missing data on Y is unrelated to the value of Y after controlling for other variables in the model. Finally, data that are not MCAR or MAR are considered to be MNAR and present a problem for analysis because a nonrandom pattern of missingness can produce biased estimates (Allison, 2002). I created dummy variables for each variable within the model to indicate whether or not there were missing cases. I used Little's (1987) test to ensure that the missing data items were not non-ignorable and used multiple imputation in handling the missing data for this study.

To assess the data for violations of model assumptions, I imported the data into HLM 6 software and began the HGLM analysis process. There are several assumptions associated with HLM models and they are as follows (Raudenbush & Bryk, 2002):

1. For each student within each school, r_{ij} is independent and normally distributed with a mean of 0 and variance of σ^2.
2. The student level predictors are independent of the student level random error terms r_{ij} (covariance of 0).
3. The school level random errors are multivariate normal with a mean of 0, each with variance of τ and covariance among the random elements. The school level random errors are independent among schools.
4. The school level predictors are independent of school level random errors.
5. Student level and school level random errors are independent.
6. Predictors at one level are not correlated with random errors at other levels. (Raudenbush & Bryk, 2002)

As previously mentioned, both the assumptions of homoscadasticity and normality are violated within the proposed model for this study. This violation was accounted for through the use of HGLM in lieu of the standard HLM. All other aforementioned assumptions were assessed for violation through an examination of the variables within residual files at level-1 and level-2.

The Proposed Model.

Hierarchical Generalized Linear Models are able to model both fixed effects and random effects for intercepts and slopes within the model. The 2-level fixed effects model assumes that any unexplained variance on the dependent variable is accounted for at the student level in differences between students. The 2-level random intercept model assumes that there is not only unexplained variance at the student level but also at the

school level (Snijders & Bosker, 1999). In some cases using probability models to represent the variability within and between groups is warranted. This concept is expressed statistically with random coefficients. Snijders and Bosker (1999) contended that determining whether to use a model with fixed effects or random effects is contingent upon the focus of the statistical inference, nature of the group units involved, and the population distribution involved. Snijders and Bosker stated that

> If groups are regarded as a sample from a (real or hypothetical) population and the researcher wishes to draw conclusions pertaining to this population, then the random coefficient model is appropriate…If the researcher wishes to test effects of group-level variables, the random coefficient model should be used. The reason is that the fixed effects model already "explains" all differences between groups by the fixed effects, and there I no unexplained between-group variability left that could be explained by group-level variables. 'Random effects' and 'unexplained variability' are two ways of saying the same thing. (Snijders & Bosker, 1999, .43)

The aforementioned criteria was met within this study as it pertains to the school level variables of interest, therefore, the random intercept models were used in this study and are discussed below.

I began the HGLM analysis with the fully unconditional model below. The fully unconditional model contains no independent variables at level-1 or level-2 (Snijders & Bosker, 1999). The fully unconditional model provides a baseline against which conditional models can be compared. The fully unconditional model provides information regarding the outcome variability at level-2 and enables researchers to gauge the magnitude of variation between level-2 units on the outcome variable (Raudenbush & Bryk, 2002). Within this model, the dependent variable, η_{ij}, is equal to the sum of the log odds of attaining postsecondary and, γ_{00}, the random effect at the school level, $U_{0j.}$

Level 1: $\eta_{ij} = \beta_{oj}$ (5)

Level 2: $\beta_{oj} = \gamma_{00} + U_{0j}$

Combined: $\eta_{ij} = \gamma_{00} + U_{0j}$

The following level-1 equation was utilized to predict the odds of college enrollment. Two separate models were analyzed in the study, one for African American students and one for Caucasian American students. The main goal of the study was to gain an understanding of factors that impact college enrollment for African American students. Therefore, the primary population of interest in the study was African Americans students. The Caucasian American student model was run for comparative purposes. Findings from the literature review in chapter 3 suggest that African Americans face different challenges than their peers when it comes to navigating the educational pipeline. Consequently, I analyzed the data separately for African American students in lieu of the prevailing approach, adding race/ethnicity as a variable of interest into the model. Following the level-1 equation is a matrix of the variables presented in the level-1 model:

$$\eta_{ij} = \beta_{0} + \beta_{1}(\text{gender*})_{ij} + \beta_{2}(\text{income*})_{ij} + \beta_{3}(\text{parented*})_{ij} + \beta_{4}(\text{parentexp*})_{ij} + \beta_{5}(\text{parentinvolv*})_{ij} + \beta_{6}(\text{prep})_{ij} + \beta_{7}(\text{hsinfo})_{ij} + \beta_{8}(\text{persnet})_{ij} + \beta_{9}(\text{univinfo}) \quad (6)$$

Table 7. Matrix of Model Variables for Level-1

Variable Label (* indicates a covariate)	**Variable Representation**
gender*	Gender: Whether or not a student is male or female
income*	Total family income
parented*	Parental education level
parentexp*	Parental education expectations
parentinvolv*	Parental involvement
Prep	Participation in a college preparation program
Hsinfo	High school acquired information
Persnet	Personal network acquired information

Univinfo	College level acquired information

The following level-2 equation was utilized to predict the beta terms in the level-l equation. Following the level-2 equation is a matrix of the variables presented in the level-2 model:

$\beta_{0j} = \gamma_{00} + \gamma_{01}(\text{hscourse*})_j + \gamma_{02}(\text{counsratio})_j + u_{0j}$
$\beta_{1} = \gamma_{10}$
$\beta_{2} = \gamma_{20}$
$\beta_{3} = \gamma_{30}$
$\beta_{4} = \gamma_{40}$
$\beta_{5} = \gamma_{50}$
$\beta_{6} = \gamma_{60}$
$\beta_{7} = \gamma_{70}$
$\beta_{8} = \gamma_{80}$
$\beta_{9} = \gamma_{90}$ (7)

Table 8. Matrix of Model Variables for Level-2

Variable Label (* indicates a control variable)	**Variable Representation**
hscourse*	High school academic course offerings
Counsratio	High school counselor/student ratio

The full HGLM model for the study is indicated below in equation 8:

$\eta_{ij} = \gamma_{00} + \gamma_{01}(\text{counsratio}) + \gamma_{02}(\text{hscourse}) + \gamma_{10}(\text{gender}) + \gamma_{20}(\text{parented}) + \gamma_{30}(\text{parentasp}) + \gamma_{40}(\text{income}) + \gamma_{50}(\text{prep}) + \gamma_{60}(\text{hsinfo}) + \gamma_{70}(\text{persnet}) + \gamma_{80}(\text{univinfo}) + \gamma_{90}(\text{parentinvolv}) + u_0$ (8)

Building the Model and Assessment of Model Fit.

When building a two-level HGLM, it is important to start building the level-1 equation prior to the second level (Raudenbush & Bryk, 2002). It is recommended to build the level-1 equation by using a "step up" approach where the model is built from univariate to bivariate to trivariate, etc. (Raudenbush & Bryk, 2002). Therefore, each predictor was entered one at a time in order of relevance as determined by the literature

review without any level-2 variables entered into the model. HLM models use a likelihood-ratio test to assess model fit by comparing the deviance statistic of an unconditional model with the deviance statistic of a conditional model (Raudenbush, Bryk, Cheong, & Congdon, 2004). The test is based on the difference between the deviance statistics of the two models, which has a chi-square distribution with degrees of freedom equal to the difference in the number of parameters estimated in the models being compared. After each variable was entered into the model, I assessed the deviance chi-squared statistic to determine which variables to include within the model. I moved to building the level-2 model in the same fashion.

Centering level-1 predictors is important in the interpretation the intercept and slope parameters in multilevel models (Enders & Tofighi, 2007). Furthermore, in addition to the implications of centering data on intercept interpretation, Bryk and Raudenbush (1992) mentioned that choices regarding the centering of level-1 predictors also have implications for the variance in the intercept term across groups and the covariance of the intercept term with other parameters. Hofmann and Gavin (1998) proposed three options for rescaling/centering data: (a) raw metric scaling where no centering occurs, and the level-1 predictors are used in their original metric, (b) grand mean centering where the grand mean of the level-1 predictor is subtracted from each level-1 case, or (c) group mean centering where the relevant group mean of the level-1 predictor is subtracted from each case. There is no statistically correct choice among grand mean centering, group mean centering, and uncentered data because they are all equally correct from a statistical point of view (Kreft, Leeuw, and Aiken, 1995). Kreft,

Leeuw, and Aiken asserted that the selection of a centering option is a function of the conceptual paradigm or research question(s) under investigation. However, depending on the type of research question, the selection of one centering can have an advantage over another. Enders and Tofighi (2007) provided guidelines for selecting a center option based upon the type of research questions. Those guidelines are listed below with CWC representing group mean centering and CGM representing grand mean centering.

> 1. CWC is appropriate if the Level 1 association between X and Y is of substantive interest,
> 2. CGM is appropriate when one is primarily interested in a Level 2 predictor and wants to control for Level 1 covariates,
> 3. Either CGM or CWC can be used to examine the differential influence of a variable at Level 1 and Level 2, and
> 4. CWC is preferable for examining cross-level interaction and interactions that involve a pair of Level variables, and CGM is appropriate for interaction between Level 2 variables. (Enders & Tofighi, 2007, p. 136)

The research questions in this study reflect an interest in the between unit effects or differences among all students, as opposed to assessing differences among schools or group differences. Furthermore, this study examined the influence of both level-1 predictors controlling for Level-2 and level-1 covariates and the influence of level-2 predictors controlling for level-1 and level-2 covariates. Therefore, grand-mean centering was the centering method chosen for this study.

Limitations

I anticipated that this analysis might be limited in several ways. The first is that missing data likely had an impact on the data analysis. Missing data is a common problem in quantitative research because nearly all standard statistical methods presume that every case has information on all the variables that are included in the analysis

(Allison, 2002). While there are several ways to handle missing data, none of the techniques is without drawbacks. Secondly, the composite variable that was constructed to measure high school academic intensity may be constructed in various ways. Currently, there is no uniform definition of high school rigor evident from the review of the literature. Researchers define high school rigor in divergent ways. The lack of a uniform definition is a limitation within itself. I defined high school rigor in a way that accounted for multiple factors that have a statistically significantly impact on college entry which represents one way to define high school rigor, yet other definitions exist or could be derived. Lastly, the nature of the categorical responses related to the covariate questions of interest is limited as well. Each of the questions related to where students received college entrance information supplies the reader with an indication of whether or not a student has gone to a particular source for this information. Contextual information is missing that details the nature of the information and type of correspondence that took place with each source. Also absent from the analysis is an understanding of why a student chose a particular source over another. This missing contextual information is a product of limitations to the survey instrumentation itself. Perhaps gaining such context is more appropriate within qualitative research given the scale of the ELS:2002 survey as a whole.

Chapter Four: Results

This chapter provides the results of the HGLM models analyzed in this study to determine if, and if so the extent to which, there exists a relationship between obtaining college entrance information and postsecondary enrollment for African American students in comparison to their Caucasian American peers. The results include findings from an exploratory analysis, fully unconditional models, conditional models, and information regarding the assessment of model fit.

Exploratory Analysis

Below are the weighted descriptive statistics for African American (Black) students and Caucasian American (White) students. All the variables included in the models are listed below along with the individual variables that were used to create the composite variables. The unweighted descriptive statistics are located in Appendix A and B.

Table 9. Weighted Means and Standard Deviation for Student Characteristics

Variables	Min	Max	Black Mean	Black Std. Dev	Min	Max	White Mean	White Std. Dev
Gender	1	2	1.50	.500	1	2	1.51	.500
Parented	1	8	4.16	1.950	1	8	4.66	1.978
Income	1	13	7.79	2.617	1	13	9.58	2.032
Parentexp	2	7	5.59	1.304	1	7	5.25	1.228
# full-time counselors	0	16	4.43	2.703	0	16	3.87	2.512
Total enrollment	48	4498	1442.99	721.787	20	4498	1236.68	748.187

Table 10. Weighted Means and Standard Deviations for Predictor Variables

Variables	Min	Max	Black Mean	Black Std. Dev	Min	Max	White Mean	White Std. Dev
Postsecondary Entry (Outcome)	0	1	.65	.478	0	1	.76	.427
College prep program	0	1	.32	.466	0	1	.19	.395
HS counselor	0	1	.44	.496	0	1	.44	.497
HS teacher	0	1	.37	.482	0	1	.30	.459
HS coach	0	1	.15	.355	0	1	.09	.288
Parent	0	1	.56	.497	0	1	.59	.491
Friend	0	1	.40	.490	0	1	.40	.490
Sibling	0	1	.25	.433	0	1	.25	.436
Relative	0	1	.34	.473	0	1	.25	.436
College pubs/websites	0	1	.33	.471	0	1	.37	.482
College rep	0	1	.20	.402	0	1	.12	.329
College search guides	0	1	.33	.469	0	1	.33	.471
Discussed courses w/ parents	1	3	2.11	.699	1	3	2.14	.674
Discussed school activities w/ parents	1	3	2.20	.704	1	3	2.22	.710
Discussed things studied w/ parents	1	3	2.09	.659	1	3	2.14	.656
Discussed grades w/ parents	1	3	2.41	.646	1	3	2.45	.606
hsinfo	.00	3.00	.9566	.93629	.00	3.00	.8345	.86307
persnet	.00	4.00	1.547	1.32920	.00	4.00	1.5045	1.27971
univinfo	.00	3.00	.8624	1.00440	.00	3.00	.8232	.97130
parentinvolv	4.0	12.00	8.819	2.16563	4.00	12.00	8.9525	2.10843
hscourse (level 2)	16	100.0	32.13	11.76337	14	102.0	33.29	13.16922
counsratio (level 2)	.00	330.6	34.92	33.69286	14.0 0	102.0 0	33.291	13.61922

Level-1 and level-2 residual files were analyzed to check for the aforementioned violations assumptions associated with HGLM models. Specifically, independence among the following groups of variables and error terms: (a) level-2 error terms, (b)

level-2 predictors and level-2 error terms, (c) level-1 and level-2 error terms, and (d) level-1 predictors and both level-2 and level-1 error terms was assessed. There was no violation of independence among any of the error terms and/or predictors.

There were 280 (16.1%) missing data cases on the outcome variable for African American students and 972 (12.6%) for Caucasian American students. In total, 1,252 cases were deleted from all data files due to missing data on the outcome variable. As a result 9,450 cases remained in the analysis, 1,740 and 7,710 cases for African American and Caucasian students, respectively. For independent variables considered in the analysis, African American students also had more missing cases ranging from 8% to 28.6% with an average of 21.7% of missing cases. Caucasian American students had missing cases on independent variables ranging from 5.4% to 15.1% with an average of 13.2%. Multiple imputation using MPlus software was used in handling the missing cases (Allison, 2002). The HGLM models below were based on 10 imputed data files for both African American student data and Caucasian American student data.

HGLM Models

Unconditional model

The fully unconditional model (see Equation 5) for African American students provides an intercept equal to the log odds of 0.82 (see Table 11). Therefore, an African American student attending an average school has an expected log odds of 0.82 of postsecondary entry. The log odds of 0.82 corresponds to a probability of $1/(1 + \exp\{0.82\}) = .69$ ($p < .001$) which is the average probability of postsecondary entry for

African American students. The confidence interval for the odds of postsecondary entry for African American students, which is 2.27, is between 2.011 and 2.557.

Table 11. Unconditional Model for African American Students Final Estimation of Fixes Effects (Laplace)

Fixed Effect	Coefficient	Standard Error	*t*-ratio	Approx. *d.f.*	*p*-value
For INTRCPT1, B0					
INTRCPT2, G00	0.818597	0.061258	13.363	433	0.000

Fixed Effect	Coefficient	Odds Ratio	Confidence Interval
For INTRCPT1, B0			
INTRCPT2, G00	0.818597	2.267316	(2.011, 2.557)

For Caucasian American students, their fully unconditional model denotes an intercept equal to the log odds of 1.52 (see Table 12). As a result, a Caucasian American student attending an average school has an expected log odds of 1.52 of postsecondary entry. The log odds of 1.52 corresponds to a probability of $1/(1 + \exp\{1.52\}) = .82$ ($p < .001$) representing the average probability of postsecondary entry for Caucasian American students. The confidence interval for the odds of postsecondary entry for Caucasian American students, which is 4.57, is between 4.15 and 5.04. Based upon these fully unconditional models, the average Caucasian American student is 2.3 times more likely to enroll in postsecondary education than African American students.

Table 12. Unconditional Model for Caucasian American Students Final Estimation of Fixed Effects (Laplace)

Fixed Effect	Coefficient	Standard Error	*t*-ratio	Approx. *d.f.*	*p*-value
For INTRCPT1, B0					
INTRCPT2, G00	1.519583	0.049371	30.779	675	0.000

Fixed Effect	Coefficient	Odds Ratio	Confidence Interval
For INTRCPT1, B0			
INTRCPT2, G00	1.519583	4.570317	(4.149, 5.035)

Conditional model

This section provides the results from the conditional model analyzing level-1 independent variables for African American students. When examining the independent variables and their impact on postsecondary enrollment, there are several statistically significant indicators (see Table 13). The odds of postsecondary enrollment for African American women are 1.5 times greater than for African American men holding all other independent variables in the model constant. For each increase in parental education attainment levels (i.e. moving from not attaining a secondary credential to attaining a high school diploma or GED), an African American student's odds of enrolling in postsecondary education increases by 1.1706 corresponding to the log odds of 0.16. For every $5,000 increase in total family income, the odds of postsecondary enrollment increase by 1.1 and by 1.3 for every unit change in parental educational aspirations (i.e.

moving from wanting their child to attend a two-year institution to a four-year institution).

The following two of the four non-control independent variables in the model were statistically significant predictors of postsecondary enrollment for African American students, participation in a college preparation program (prep) and obtaining college entrance information from a college representative, publication, and/or guide (univinfo). For African American students who participated in a college preparation program during the 10th grade, their odds of postsecondary enrollment increases by 1.4 ($p < .05$). Finally, African American students who obtained college entrance information from a college representative, publication, and/or guide are 1.2 times more likely to enroll in college than students who did not. Obtaining college entrance information from high school constituents (hsinfo) or members of a student's personal network (persnet) was not a statistically significant predictor of postsecondary enrollment for African American students. The next part of the analysis involved adding the following two variables at level-2, (a) high school counselor to student ratio (counsratio) and (b) high school academic course offerings (hscourse). Neither of these two variables has a statistically significant impact on postsecondary enrollment for African Americans students.

Table 13. Conditional Model Final Estimation of Fixed Effects for African American Students (Laplace)

Fixed Effect	Coefficient	Standard Error	*t*-ratio	Approx. *d.f.*	*p*-value
For INTRCPT1, B0					
INTRCPT2, G00	0.680126	0.086641	7.850	433	0.000

For BYSEX slope, B1					
INTRCPT2, G10	0.406453	0.119669	3.396	1730	0.001
For BYPARED slope, B2					
INTRCPT2, G20	0.157484	0.031898	4.937	1730	0.000
For BYINCOME slope, B3					
INTRCPT2, G30	0.112930	0.021935	5.148	1730	0.000
For BYPARASP slope, B4					
INTRCPT2, G40	0.239109	0.044493	5.374	1730	0.000
For BYS33L slope, B5					
INTRCPT2, G50	0.350765	0.148233	2.366	691	0.018
For HIGHSCHO slope, B6					
INTRCPT2, G60	-0.037780	0.083943	-0.450	120	0.653
For PERSONAL slope, B7					
INTRCPT2, G70	-0.001835	0.058446	-0.031	74	0.975
For COLLEGE slope, B8					
INTRCPT2, G80	0.169798	0.065281	2.601	249	0.010
For PARINVOL slope, B9					
INTRCPT2, G90	0.065831	0.030572	2.153	710	0.031

Fixed Effect	Coefficient	Odds Ratio	Confidence Interval
For NTRCPT1, B0			
INTRCPT2, G00	0.680126	1.974127	(1.666, 2.340)
For BYSEX slope, B1			
INTRCPT2, G10	0.406453	1.501483	(1.188, 1.898)
For BYPARED slope, B2			
INTRCPT2, G20	0.157484	1.170562	(1.100, 1.246)
For BYINCOME slope, B3			
INTRCPT2, G30	0.112930	1.119554	(1.072, 1.169)

For BYPARASP slope, B4			
INTRCPT2, G40	0.239109	1.270117	(1.164, 1.386)
For BYS33L slope, B5			
INTRCPT2, G50	0.350765	1.420153	(1.062, 1.899)
For HIGHSCHO slope, B6			
INTRCPT2, G60	-0.037780	0.962925	(0.816, 1.137)
For PERSONAL slope, B7			
INTRCPT2, G70	-0.001835	0.998167	(0.889, 1.121)
For COLLEGE slope, B8			
INTRCPT2, G80	0.169798	1.185065	(1.042, 1.347)
For PARINVOL slope, B9			
INTRCPT2, G90	0.065831	1.068047	(1.006, 1.134)

Similar to their African American counterparts, demographic/control variables within level-1 of the conditional model had a positive statistically significant effect on postsecondary enrollment for Caucasian American students (see Table 14 below). Female Caucasian American students were found to be 1.4 times more likely to enroll in postsecondary education than their male counterparts. Parental education levels also had a positive statistically significant impact on postsecondary enrollment, increasing the odds of enrollment by 1.3 for Caucasian American students. Income and parental educational aspirations were also positive statistically significant predictors of postsecondary enrollment for Caucasian American students with a one unit change resulting in a 1.2 and a 1.5 increase in the odds of postsecondary enrollment respectively. The odds of postsecondary enrollment increased by 1.5 as parental involvement increased by one unit for Caucasian American students. Of the four non-control variables in the model, one variable, obtaining college entrance information from a college

representative, publication, and/or guide (univinfo), had a positive statistically significant impact on postsecondary enrollment for Caucasian American students, increasing their odds by 1.1. When the two level-2 variables, counsratio and hscourse, were included in the model for Caucasian American students, both variables had a positive significant impact on postsecondary enrollment. The log odds associated with the high school counselor to student ratio was 0.005709 (p<.000) and 0.007206 (p<.000) was the log odds associated with high school academic offerings.

Table 14. Conditional Model Final Estimation of Fixed Effects for Caucasian American Students (Laplace)

Fixed Effect	Coefficient	Standard Error	*t*-ratio	Approx. *d.f.*	*p*-value
For INTRCPT1, B0					
INTRCPT2, G00	1.754127	0.043118	40.682	675	0.000
For BYSEX slope, B1					
INTRCPT2, G10	0.343255	0.069837	4.915	7700	0.000
For BYPARED slope, B2					
INTRCPT2, G20	0.244204	0.018517	13.188	7700	0.000
For BYINCOME slope, B3					
INTRCPT2, G30	0.204720	0.017341	11.806	7700	0.000
For BYPARASP slope, B4					
INTRCPT2, G40	0.399599	0.026701	14.965	7700	0.000
For BYS33L slope, B5					
INTRCPT2, G50	0.067808	0.084703	0.801	7700	0.424
For HIGHSCHO slope, B6					
INTRCPT2, G60	-0.019985	0.045951	-0.435	7700	0.663
For PERSONAL slope, B7					
INTRCPT2, G70	0.009103	0.026373	0.345	7700	0.730

For COLLEGE slope, B8					
INTRCPT2, G80	0.137334	0.038156	3.599	7700	0.001
For PARINVOL slope, B9					
INTRCPT2, G90	0.157020	0.017277	9.088	7700	0.000

Fixed Effect	Coefficient	Odds Ratio	Confidence Interval
For INTRCPT1, B0			
INTRCPT2, G00	1.754127	5.778402	(5.310, 6.288)
For BYSEX slope, B1			
INTRCPT2, G10	0.343255	1.409529	(1.229, 1.616)
For BYPARED slope, B2			
INTRCPT2, G20	0.244204	1.276605	(1.231, 1.324)
For BYINCOME slope, B3			
INTRCPT2, G30	0.204720	1.227181	(1.186, 1.270)
For BYPARASP slope, B4			
INTRCPT2, G40	0.399599	1.491226	(1.415, 1.571)
For BYS33L slope, B5			
INTRCPT2, G50	0.067808	1.070160	(0.906, 1.263)
For HIGHSCHO slope, B6			
INTRCPT2, G60	-0.019985	0.980213	(0.896, 1.073)
For PERSONAL slope, B7			
INTRCPT2, G70	0.009103	1.009145	(0.958, 1.063)
For COLLEGE slope, B8			
INTRCPT2, G80	0.137334	1.147211	(1.065, 1.236)
For PARINVOL slope, B9			
INTRCPT2, G90	0.157020	1.170019	(1.131, 1.210)

Below is a list of the probabilities of postsecondary enrollment for African American and Caucasian American students by independent variable. For African American students being female (.60), participating in a college preparation program (.59), and parental educational aspirations (.56) were the most probable indicators of postsecondary enrollment. Having high parental educational aspirations (.60), being female (.58), and having parents with high education levels were the strongest predictors of postsecondary enrollment for Caucasian American students.

Table 15. Probability of Postsecondary Enrollment for African American and Caucasian students

	African American	Caucasian American
Intercept	.66***	.85***
Sex	.60***	.58***
Parental Education	.54***	.56***
Income	.54***	.55***
Parental Educational Aspirations	.56***	.60***
College Preparation Program	.59**	.52
High School Network	.49(-)	.49(-)
Personal Network	.50(-)	.50
College Network	.54**	.53***
Parental Involvement	.52*	.54***

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

Assessment of Model Fit

I used a likelihood-ratio test through Laplace estimation to assess the model fit by comparing the deviance statistic of the unconditional models with the deviance statistic of the conditional models. The deviance statistic associated with the fully unconditional model for African American students was 5,357.23 with two parameters specified (see Table 16). The conditional model which included level-1 independent variables was the best fitted model in predicting postsecondary enrollment for African American students. On the other hand, the model that included level-2 variables, denoted (L2) below, did not serve as the best fitted model for predicting postsecondary education for African American students. Conversely, the model that included level-2 variables provided the best fit of the data for Caucasian American students.

Table 16. Summary of Model Fit Statistics for African American Students

	Deviance Statistic	Parameters	Chi-square	*d.f.*
Null Model	5357.23	2		
Unconditional Model (L1)	5166.78	11	190.42***	9
Unconditional Model (L2)	5164.80	13	1.97558	2

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

Table 17. Summary of Model Fit Statistics for Caucasian American Students

	Deviance Statistic	Parameters	Chi-square	*d.f.*
Null Model	21700.58	2		
Unconditional Model (L1)	20492.42	11	1208.08***	9
Unconditional Model (L2)	20472.91	13	19.50***	2

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

Chapter Five: Discussion

The central purpose of this study was to determine if there exists a relationship between obtaining college entrance information and postsecondary enrollment for African Americans in comparison to their Caucasian American peers. Consequently, I sought answers to the following research questions by conducting a Hierarchical Generalized Linear Model (HGLM) analysis:

1. Do factors related to gaining college entrance information predict college entry for African American students in comparison to Caucasian American students?
2. Does a high school counselor-to-student ratio impact college entry for African American students in comparison to Caucasian American students?

This chapter will summarize the results relative to each research question and provide potential implications of the findings for educational leaders.

Control Variables

Per the literature review in chapter 2, gender, parental education levels, parental involvement, parental educational expectations, income, and high school academic rigor are widely known predictors of college enrollment for African American students. Each of these variables was controlled for within the HGLM model.

Women have more recently begun to outpace men in postsecondary entry; this is especially true of African American women in comparison to African American men

(Snyder & Dillow, 2010). Consistent with the findings of previous research, female status served as a positive statistically significant predictor of postsecondary enrollment for African American students. Similarly, parental involvement, educational levels, and involvement all had a positive statistically significant impact on postsecondary enrollment for African American students. Overall, African American students had lower parental educational levels and family income than their Caucasian peers. However, African American parents experienced higher levels of educational aspirations for their children in comparison to Caucasian American parents. This is consistent with other research findings (Farmer-Hinton, 2008; Freeman, 2005; Wimberly & Noeth, 2004) that have shown higher parental educational aspirations for African American students in comparison to Caucasian students. Despite higher parental educational aspirations, this research study confirms the notion that African Americans enter postsecondary education at lower rates than Caucasian American students.

College Preparation Programs

I hypothesized that participation in a college preparation program would have a significant positive effect on college entry for African American students. This was the case for African American students; however there was no statistically significant impact on postsecondary enrollment for Caucasian American students. African American students who participated in college preparation programs were 1.4 times more likely to enroll in postsecondary education than students who did not participate in such programs. These phenomena can be explained by research that indicates that Caucasian American students have more social and cultural capital than African American students (Perna,

2005). Therefore Caucasian students have less of a need to participate in college preparation programs. Furthermore, college preparation programs are typically geared toward minority and low-income students and their needs (McDonough, 2005). The descriptive statistics from this study show that more African Americans participated in college preparation programs than their Caucasian peers.

To date, limited research has been conducted on college preparation programs. However, the existing research indicates that many college preparation programs are highly effective at increasing college enrollment for underrepresented students (Gandara & Bial, 2001; Swail & Perna, 2002). This study is one of the few quantitative studies to examine the impact of college preparation programs on college entry for African American students. The findings from this study support the notion reported in current research that college preparation programs have a positive statistically significant impact on postsecondary enrollment for African American students.

High School Constituents

Similar to the sparse research on college preparation programs, research on the impact of obtaining college entrance information from high school constituents (e.g., teachers, counselors, and/or athletic coaches) on postsecondary enrollment is also limited. However, the handful of studies that exist, cited below, demonstrate that quality high school counselors who are consistently and frequently able to provide direct services to students and parents can have a tremendous positive impact on student educational aspirations, achievement, and success (McDonough, 2005; Orfield & Paul, 1993; Plank & Jordan, 2001). Furthermore, research indicates that effective high school counselors

have a positive significant impact on college access for low-income, rural, urban, and minority students in particular (Gandara & Bial, 2001; McDonough, 2004; Rosenbaum, Miller, & Krei, 1996).

I hypothesized that gaining information from high school constituents (teachers, guidance counselors, and/or athletic coaches) would have a significant positive effect on college entry for African American students. The findings from this study indicate that obtaining college entrance information from these high school constituents did not have a positive statistically significant impact on postsecondary entry for African American nor Caucasian American students. The descriptive statistics also indicate that African American students sought college entrance information from high school constituents at higher rates than their Caucasian peers. This notion is consistent with findings in other studies which indicate that African Americans need more information from high school constituents regarding college entrance (Johnson, Rochkind, & Ott, 2010; Kirst, 2005). There exist several potential explanations for the statistically insignificant impact of obtaining college entrance information from high school constituents on postsecondary entry among African American and Caucasian American students. First, the quality of the high school counselor-student experience is an important consideration that drives its impact on college entry. High school counselors have many tasks and objectives (e.g., administrative duties, accountability duties, academic advising, and disciplinary duties), college counseling among them. Currently, there is no set standard for how much time high school counselors should dedicate to a particular task, so there is variation from school to school (McDonough, 2005). Therefore, some high school counselors dedicate

more time to college counseling than others. It has been found that high school counselors are generally overworked and underprepared when it comes to advising students for tasks beyond high school (Johnson, Rochkind, Ott, & DuPont, 2010). Some research indicates that high school counseling disparities follow racial/ethnic and socioeconomic lines with low-income, African American, and Latino students receiving inferior high school counseling. Upper income school counselors spend more time on college counseling than less affluent school counselors. Similarly, African American and Latino students are most likely to have high school counselors pulled away from college counseling to work on other counseling tasks and most likely to have underprepared high school counselors (McDonough, 2005; Paul, 2002). Contrarily, effective high school college counseling has been proven to have a positive impact on postsecondary enrollment (McDonough, 2005) in smaller quantitative studies. The discrepancy between African American students' high need for college counseling is reflected in their lack of social and cultural capital. Left unresolved from this study is the quality and nature of high school counseling by race/ethnicity which may explain its statistically insignificant effect on postsecondary enrollment for African American students in this study.

College Constituents

I anticipated that gaining information from college level personnel/resources (college recruiters, publications/websites, and/or college search guides) during the 10th grade would have a significant positive effect on college entry for African American students. Gaining information from these college level personnel and resources did have a positive statistically significant impact on college entry for African American students.

The odds of enrolling in postsecondary education increased by 1.4 for African American students who obtained college entrance information from college recruiters, publications/websites, and/or college search guides. The positive statistically significant impact of obtaining college entrance information from colleges and universities themselves was also present for Caucasian American students, increasing their odds of postsecondary entry by 1.1.

Students who gain information from colleges and universities early on in high school are better positioned to plan the necessary steps that ultimately lead to college enrollment. Gaining information regarding college from college constituents early on is particularly important for African Americans as high school graduation and college entrance requirements are typically disconnected (Kirst, 2005). For example, often state high school assessments stress knowledge and skills that differ from college entrance/placements exams. Furthermore, high school graduation requirements are not always in sync with a college or university's admissions requirements (Kirst & Venezia, 2004). Little research exists that examines the role of obtaining college entrance information directly from colleges and universities. Most of the research examines obtaining college entrance information from a variety of sources combined (high school constituents, college preparation program staff, or some combination thereof). Furthermore, research (Bell, Rowan-Kenyon, & Perna, 2009; Engberg & Wolniak, 2010; Kirst, 2005; Venezia, Kirst, & Antonio, 2003) has shown that obtaining college entrance information increases a student's odds of enrolling in postsecondary education which is consistent with the findings of this study.

Personal Network

I hypothesized that gaining information from members of a student's personal network (parents, siblings, relatives, and/or friends) would have a positive significant effect on college entry for African American students. Unlike the parental involvement variable however, there was no positive statistically significant impact on postsecondary enrollment for African American students. African American parents typically are unable to provide the necessary details and information related to the college-going process to their children. Many low-income and minority parents, siblings, and/or relatives lack experience and information concerning college preparation (Kirst, 2005). This might partially explain the lack of significance on this indicator. It could also be the case that other variables simply have more of an impact on predicting postsecondary entry for both African American and Caucasian American students. For instance, the parental involvement variable indicates whether or not and how often a parent discussed high school courses, activities, things studied in class, and grades with students. In the case of this study, parental involvement surrounding the aforementioned areas had a much greater impact on postsecondary entry for both African American and Caucasian American students. A limitation to the personal network variable is that it does not provide information regarding the nature of the communication and/or information regarding college entrance. If personal network constituents are not discussing important aspects of college entrance then the impact of this information on college entry is expected to be insignificant.

High School Counselor to Student Ratio and Academic Course Offerings

Giving the research and rhetoric surrounding the importance and substantial impact of high school college counselors and high school academic rigor on college entry, I expected that a school's high school counselor to student ratio and high school academic course offerings would have a significant positive effect on college entry for African American students. Neither of these claims held true for African Americans in this study, yet both a school's high school counselor to student ratio and high school academic course offerings increased the odds of college entry for Caucasian American students. Despite the fact that African American students and Caucasian American students have similar high school counselor to student ratios, research shows disparities in the quality of high school counseling between African American and Caucasian American students, which may be a better predictor of postsecondary enrollment than the high school counselor to student ratio.

Engberg and Wolniak (2010) also examined high school contexts on postsecondary enrollment using ELS:2002 data and found that the high school counselor to student ratio had no statistically significant impact on postsecondary enrollment. The Engberg and Wolniak study disaggregated postsecondary enrollment by sector and did not disaggregate their findings by race/ethnicity. Studies (Adelman, 1999; Engberg & Wolniak, 2010) have examined the level of math, science, and AP courses students took in high school to assess the impact of high school academic "rigor" on college enrollment. In the Engberg and Wolniak (2010) study, they examined the impact of the average level of math course-taking and the average number of AP courses taken on

college enrollment at two-year institutions and four-year institutions. Engberg and Wolniak found no statistically significant impact on enrollment at two-year institutions but found that the average level of math course-taking and the average number of AP courses taken had a positive impact on college enrollment at four-year institutions. In this study, there was no statistically significant impact of high school academic course offerings, which included math, science, and AP courses offered. Yet, it is widely known that high school academic rigor has a positive statistically significant impact on college enrollment for all students (Adelman, 1999; Kirst, 2004). Currently, there is no standard definition of high school academic rigor (Adelman, 1999). A possible explanation for the insignificant finding on the high school academic course offering variable for African Americans could be that courses taken might be a better predictor of college enrollment than courses offered for African American students.

Implications

The findings from this study present many implications for educational leaders at both the K-12 and higher education levels. The fact that college preparation programs increased the odds of postsecondary enrollment for African American students is an important finding that provides substantiation for funding and resource allocation in this area. However, college preparation programs along with other pre-collegiate outreach or intervention programs are designed to supplement schools with resources to assist students in preparing for postsecondary education (McDonough, 2005). These types of interventions are targeted at individuals rather than the structural environment of schools and school systems. If the purpose of American high schools is to prepare students for

opportunities beyond secondary education, adequate preparation for college for all students should be targeted at the structural level (e.g., individual high schools and districts) rather than targeted at specific students. Many students do not receive the benefits of participation in college preparation programs (McDonough, 2005). Therefore, college preparation and pre-collegiate outreach programs are inherently inequitable as they target only a small percentage of students and do not serve all students consistently.

Educational leaders might consider ways to cost effectively scale up relevant aspects of effective college preparation program models to the middle and high school level. Middle schools and high schools that historically do not adequately prepare students for entering college could benefit from scaling up college preparation programming to the school level as all students, not a select few, would be exposed to its benefits. Additionally, considering ways to increase the number of students affected by college preparation programs in their current forms is also warranted.

It is clear from this research study that colleges and universities play a vital role in impacting postsecondary entry for African American students. The African American students in this study who gained information from college-level constitutions were more likely than their peers to enroll in college. However, colleges and universities are generally not deemed as an integral player in the college preparation process. Additionally, colleges and universities tend to focus their recruiting efforts on students attending high school in the latter years. Since obtaining college entrance information from college/university constituents increased the odds of postsecondary enrollment for African American students colleges and universities should take advantage of connecting

with all students early on, during middle and high school, to assist students, particularly those with less social and cultural capital than others, in adequately preparing themselves for postsecondary enrollment. Colleges and universities could also take advantage of service learning opportunities that capitalize on college students reaching out to middle and high school students. Developing partnerships outside of K-12 environments in the community (e.g., churches and community centers) might serve colleges and universities in early outreach efforts. K-12 and higher education state departments collaborations that are more intentional, elaborate, and long-standing could also benefit students, African American students particularly, transitioning from one system to the other.

The differences in the factors that impact college matriculation for African American students in comparison to Caucasian American students demonstrate the importance of examining issues related to the college-going process, among others, by race and ethnicity. Traditionally, higher education scholarship shows that researchers generally examine issues in higher education collectively, considering all students regardless of race/ethnicity simultaneously. More recently, scholars have begun to analyze the impact of race/ethnicity as a variable among many others within a particular study. However, each of the aforementioned approaches is limited in that neither fully investigates the role of race/ethnicity. In this study I analyzed the impact of several variables separately for African American and Caucasian American students and found differences in which factors impacted college entry by race/ethnicity. These differences would not have been accounted for if I had analyzed the data considering race/ethnicity as one variable. Higher education scholarship might be enhanced if researchers isolate

the impact of race/ethnicity through analyzing interaction effects or racial/ethnic groups separately.

Overall, this study demonstrates that when 10th grade African American students participate in a college preparation program or gain college entrance information from college constituents, they are more likely to enroll in postsecondary education. There exist opportunity for expanding and scaling up college preparation programming as a means to increasing college enrollment for African American students. There is also an opportunity for colleges and universities to have more of an impact on students during the early stages of the college-going process. The findings from this study also demonstrate the importance of disaggregating data and examining higher education issues by race/ethnicity. Further research is needed to understand why gaining college entrance information from high school constituents or a student's personal network was statistically insignificant. Qualitative research in these areas would help the research community understand the nature and quality of information and communication in these areas which might explain their limited impact. More research on how educational leaders might expand and scale up current college preparation programs to the school level to reach more students would also add to the extant higher education literature.

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Appendix A

Table 18. Unweighted Student Characteristics

Variables	Min	Max	Black Mean	Black Std. Dev	Min	Max	White Mean	White Std. Dev
Gender	1	2	1.52	.500	1	2	1.52	.500
Parented	1	8	4.26	1.981	1	8	4.82	1.997
Income	1	13	7.88	2.657	1	13	9.71	2.042
Parentexp	2	7	5.64	1.288	1	7	5.31	1.207
# full-time counselors	0	16	3.98	2.560	0	16	3.28	2.342
Total enrollment	48	4498	1317.89	711.501	20	4498	1031.93	690.540

Appendix B

Table 19. Unweighted Means and Standard Deviations Predictor Variables for African American Sample

Variables	Min	Max	Black Mean	Black Std. Deviation	Min	Max	White Mean	White Std. Deviation
Postsecondary Entry (Outcome)	0	1	.68	.467	0	1	.79	.406
College prep program	0	1	.33	.469	0	1	.20	.397
HS counselor	0	1	.44	.497	0	1	.44	.497
HS teacher	0	1	.36	.481	0	1	.30	.456
HS coach	0	1	.14	.350	0	1	.09	.292
Parent	0	1	.56	.497	0	1	.61	.488
Friend	0	1	.40	.490	0	1	.40	.490
Sibling	0	1	.25	.435	0	1	.26	.439
Relative	0	1	.33	.471	0	1	.25	.434
College pubs/websites	0	1	.34	.474	0	1	.37	.483
College rep	0	1	.21	.404	0	1	.14	.343
College search guides	0	1	.35	.477	0	1	.34	.472
Discussed courses w/ parents	1	3	2.11	.702	1	3	2.15	.673
Discussed school activities w/ parents	1	3	2.22	.706	1	3	2.25	.697
Discussed things studied w/ parents	1	3	2.12	.650	1	3	2.16	.658
Discussed grades w/ parents	1	3	2.44	.640	1	3	2.45	.603
hsinfo	.00	3.00	.9496	.92111	.00	3.00	.8320	.86612
persnet	.00	4.00	1.5445	1.32895	.00	4.00	1.5224	1.27532
univinfo	.00	3.00	.8949	1.00940	.00	3.00	.8430	.97850
parentinvolv	4.0	12.00	8.9005	2.13860	4.00	12.00	9.0183	2.09037
hscourse (level 2)	16	100.0	32.372	12.34384	.00	.03	.0033	.00190
counsratio (level 2)	.00	330.6	34.663	30.20006	14.0	102.0	33.751	14.98586