AN EXAMINATION OF INVOLVEMENT BEHAVIORS AND MINORITY STUDENT RETENTION AT ACADEMIC MEDICAL INSTITUTIONS

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ABSTRACT

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The purpose of this correlational research study was to examine if student and institutional characteristics as well as involvement factors influence minority medical students’ intent to remain and which factors best predict the intent to remain at their academic medical institution (AMI). The online, 26-item Minority Medical Student Retention Questionnaire was administered to the Student National Medical Association (SNMA) students and assessed if the independent variables defined as student background characteristics and environment institutional characteristics (variables occurring between AMIs, variables occurring within AMIs, and intermediate educational outcomes) as well as student-to-faculty, student-to-student, and student-to-student group affiliation involvement factors predict intent to remain. Likert scales, time frame options, drop down options, and open-ended answer options were utilized. Of the 3,024 SNMA members solicited for a response, 317 individuals completed surveys and were utilized, demonstrating a response rate of 10.5%.

Astin’s involvement theory provided the study’s theoretical framework and Astin’s Input-Environment-Output corresponding model was used. Descriptive statistics and a stepwise multiple regression analysis were employed to determine the results of this study. Significant factors predicting intent to remain included the student characteristic of African American cultural background, the intermediate educational outcome of satisfaction with the overall AMI experience, and two combined variables of how often faculty provided medical program guidance and how often students sought a staff mentor. Further regression analysis revealed the
best predictor for the student’s intent to remain included the two combined variables of chances of satisfaction with the current overall satisfaction with overall AMI experience. Conclusions drawn from these findings lead to further questions concerning variable definitions. Surveying minority medical students throughout their medical school experience and allowing minority medical students to define their own satisfaction will help foster discussion and a positive medical school experience. By increasing satisfaction levels and the intent to remain of minority medical students, the number of minority physicians will increase ultimately positively affecting the health care of the Nation. The researcher provides further discussions and recommendations to the Association of American Medical Colleges, the SNMA, and AMI senior administrators, faculty, and staff.
To my loving husband Bobby L. Gore, Jr., daughter Shoshanah, and son Nathaniel who allowed me to explore a world of possibilities and follow my dream.
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CHAPTER I. INTRODUCTION

The recruitment and retention of a new generation of medical students that reflects the population they serve is a challenge for academic medical institution (AMI) leaders (Council of Graduate Medical Education [COGME], 2005; Smedley, Butler, & Bristow, 2004). These efforts are concentrated on advancing multicultural representation for future health care providers, especially from minority populations. A review of current health care policies that address socioeconomic, racial, and ethnic disparities by Fiscella, Franks, Gold, and Clancy (2000) states that “ethnic minorities report lower health care satisfaction and greater discrimination” no matter what their economic status (p. 2580). Fiscella et al. also conclude that linking the objective of improving health care quality and its availability to everyone will help close the gap in health care disparities.

Health care researchers explain that increased diversity is “valuable for increasing access to care in minority communities” (Smedley, Stith, Colburn, & Evans, 2001, p. 10) since minority patients are “more likely to have a minority physician as their regular doctor, with Latinos at 19 times the national average” of having a minority physician (King et al., 2004, p. 286). The Association of American Medical Colleges (AAMC) (2005) also cites the 2000 US Census Bureau, which states that the minority population is growing and a disproportionately lower number of minority physicians exist when compared to the entire physician population.

According to the Sullivan Commission on Diversity in the Healthcare Workforce (2004), a group made up of both private and public leaders to address health care racial inequities, diversity serves as “good business” that provides a “key competitive advantage” that will reach out to an ever-growing minority patient market (p. 25). In contrast, through their review of major studies, the Sullivan Commission found that “racial and ethnic disparities in care have been
documented across the three major health disciplines; medicine, nursing and dentistry” with “widespread treatment disparities across the full spectrum of disease categories and medical and surgical procedures” (p. 37). The Sullivan Commission expounds that training all students to be culturally competent will provide a service to the surrounding minority populations through cultural diversification of medical students in local clinics and residency physician programs.

One suggested way to accomplish cultural competency among health care providers is to increase the number of culturally-diverse physicians. The Sullivan Commission states that “increased diversity will improve the overall health of the nation” and will “strengthen cultural competence throughout the health system” (p. 3). When compared to the physician population, COGME (2005) states that underrepresented minorities (URMs) comprise, “Fewer than 10 percent of US physicians” (p. 11), and explains that a health care disparity gap already exists among individuals of different socioeconomic backgrounds (in which minorities are a disproportionate part of the lower socioeconomic level). Specifically for 2006, the AAMC reported:

28.8 percent of the U.S. population was black/African American, Hispanic/Latino, or Native American, yet these groups accounted for only 14.6 percent of medical school graduates. Nationwide, only 6 percent of practicing physicians are members of these groups. The AAMC has identified increasing diversity in medicine as one of its key strategic priorities. (AAMC, 2007)

Coupled with a national shortage of physicians, the AAMC set a mandate that medical schools increase their overall class size with an emphasis on increasing diversity as a separate goal (AAMC, 2007). The purpose of increasing diversity is the hope that this will alleviate health care disparity gaps between non-minorities and minorities by producing a population of physicians that reflect the patient population they treat.
Additionally, many reports not only suggest that minorities seek out physicians from their own ethnic background, but also that minority physicians serve minority populations. In their review of several studies concerning racial health care disparities, King, Dickinson, Dubose, et al. (2004) report that “many nonminority physicians will not work in underserved communities and are not willing to see patients from minority groups” and that a “high proportion of minority physicians choose to work in underserved communities” (p. 286). Komaromy, Drake, Vranizen, et al. (1996) found that even when controlling for cultural backgrounds of communities in which doctors stated they practiced, African American and Hispanic physicians were found to significantly care for patients from their own cultural backgrounds when compared to other physicians. Garland, Hojat, Christian, et al. (2003) also found in their empirical study of practicing physicians that African Americans are more likely than Whites to care for poor minority patients. Since these minority physicians have a higher likelihood of servicing minority populations who may be in economically-deprived populations, research is necessary to uncover factors that affect retention of minority medical students enabling them to successfully complete a medical curriculum allowing matriculation to residency and eventually to clinical practice.

There is also a misperception that the minority community makes up the majority of the socioeconomically poor, and that is why there is a disparity in their health care. This area of inquiry becomes more pivotal considering many researchers find that information gathered by US government agencies concerning the quality and quantity of medical care received by minorities compared to nonminorities has “systematic differences” even when “factored for income, insurance, and preference” (King et al., 2004, p. 284). These systematic differences are further confirmed by Smedley, Stith Butler, and Bristow (2004) who state that a “large body of research demonstrates that even when insured at the same levels as whites, minority patients
receive fewer clinical services” (pp. 32-33). Furthermore, the researchers conclude that systematic differences in clinical care between minorities and non-minorities may have to do with discriminatory practices and that the lack of culturally diverse representation in health care providers will maintain the health care disparity gaps. However, identifying who are considered to be underrepresented minorities is another challenge for those researching the health care disparity issue.

According to the academic medical colleges accrediting body, the AAMC, students from “racial and ethnic populations that are underrepresented in the medical profession relative to their number in the general population” are considered underrepresented minorities or URMs (as cited by COGME, 2005, p. 11). The definition of URM students or physicians, therefore, is determined by the population they represent and changes based on US location. The US Census Bureau estimates for 2000 that the number of minority individuals (African American, American Indian, Alaska Natives and Hispanics) are approximately a quarter of the US population (COGME, 2005). However by 2050, the US Census Bureau estimates that nearly one out of two US residents will be a minority with Hispanics being “the largest number of people to the Nation’s population of all racial or ethnic groups” and African Americans increasing to “just over 13 percent of the population” (COGME, 2005, p. 7). For the purposes of this study, in addressing the growing gap between physicians and the population they represent as estimated by the 2000 US Census Bureau, URM medical students will include only the two largest groups from Hispanic and African American cultural backgrounds.

Retention History

To examine retention challenges of URM medical students in academic medical institutions (AMIs), there needs to be an understanding of the current research to retain students
in higher education. According to Seidman’s (2005) meta-analysis, which includes a history of retention dating back to the early 1960s, he questions if there is too much focus on the first undergraduate year, but not enough resources devoted to understanding the factors that influence retention in subsequent years in higher education. In reviewing the literature and in support of Seidman’s (2005) observation, it is apparent that only a few studies currently exist that address retention in graduate studies, and only a handful include dissertations and commissioned study reports addressing minority student retention in medical school.

It is apparent that in the few existing studies, involvement of medical students among their peers and the faculty in the AMI environment seems to make a difference (Smedley, Butler, & Bristow, 2004). Additionally, Smedley, Butler, and Bristow note that involvement is part of student satisfaction and should be encouraged to enrich the learning environment for all students. However, this researcher uncovered no empirical study that addresses specific involvement factors for URM medical students.

To uncover the involvement factors that most influence the retention intentions of the URM medical student population, a research study involving a self-reporting survey from members the Student National Medical Association (SNMA), consisting of mainly African American and Latino medical students, would be the best to address retention of minority medical student research (Appendix A). This survey inquiry utilizes URM members of the SNMA to investigate the involvement factors they perceive most influence their intention to remain at their academic medical institutions. According to the SNMA Website, the organization is the “nation’s oldest and largest independent, student-run organization focused on the needs and concerns of medical students of color” (Student National Medical Association [SNMA], 2008, ¶ 1).
Rationale for Study

Research on where and from whom medical patient populations seek health care treatment suggests that increasing the number of minority physicians may reduce the health care disparity between whites and minorities through an increased supply of minority physicians (Gartland, Hojat, Christian, et al., 2003). To increase the number of minority physicians demands research on recruitment and retention of minority students into academic medical institutions. Currently, there are a number of studies investigating the retention of minorities in higher education but most focus on undergraduate student retention (see, e.g., Astin, 1984; Eimers & Pike, 1997; Flowers, 2004; Guiffrida, 2006; Opp, 2002; Pascarella, E., 1985; Tierney, 1992; Tinto, 1993). There are only a few quantitative studies that examine retention of minority medical students (Gartland, Hojat, Christian, Callahan, & Nasca, 2003; Grumbach, Coffman, Rosenoff, & Munoz, 2001; Pamies, Lawrence, Helm, & Strayhorn, 1994) and none have been found that explore the impact of involvement on the students’ intent to remain in medical school at their academic medical institution where they began their program. Since there is a need to recruit and retain students of color in higher education programs and a critical need of health care workers from culturally diverse backgrounds, this involvement study examining the retention of minority medical students is imperative, especially for leaders of academic medical institutions.

Purpose of the Study

The purpose of this survey research study is to examine if student and institutional characteristics as well as involvement factors influence a minority medical students’ intent to remain and which factors best predict the intent to remain at their academic medical institution.

Perceptions from currently enrolled minority medical students affiliated with the Student National Medical Association (SNMA) will be examined regarding several independent
variables and one dependent variable. The independent variables include student background characteristics, institutional characteristics, student-to-student interactions, student-to-faculty interactions, student-to-student peer group interactions, and one dependent variable of intent to remain in medical school.

Research Questions

The research questions explored in this study are:

1. Do background characteristics of minority medical students predict their intent to remain at their academic medical institution?
2. Do institutional characteristics predict the intent to remain for minority medical students at their academic medical institution?
3. Do student-to-faculty interactions predict minority medical students’ intent to remain at their academic medical institution?
4. Do student-to-student interactions predict minority medical students’ intent to remain at their academic medical institution?
5. Does the frequency of involvement in student groups predict a minority medical students’ intent to remain at the academic medical institution?
6. Which student background characteristics, institutional characteristics, or type of involvement from faculty and students best predict intent to remain at the academic medical institution?

Theoretical Framework

The conceptual framework for this descriptive study is based on Astin’s student involvement theory (Astin, 1984) and his resulting I-E-O Model (Astin, 1991). Student involvement is defined as “quantity and quality of the physical and psychological energy that
students invest in the college experience” (Astin, 1999, p. 528). Astin explains that this theory allows institutions the ability to measure and assess their own programs by evaluating involvement levels of students at their institution of choice.

Figure 1. Study Conceptual Framework with Variables based on the I-E-O Model (Astin, 1999).

Although Astin’s involvement theory primarily applies in studies examining undergraduate students, this framework will be applied in this study at the professional degree level, specifically with minority medical students (see Figure 1). The conceptual I-E-O model contains three components that are assigned aspects based upon the questions to be explored. According to Astin (1991), “input and outcome refer simply to the state of the person at two different time points, and environment refers to the intervening experiences” (p. 22). He explains that input contains the student background and refers to the personal attributes the student contributes initially to an educational setting that can affect the environment and outcome or output. The environment component includes all those variables external to the student, such as the student’s experiences in the educational setting. In the final component, he explains that outcome or output refers to the product of “talent” that is desired out of the educational setting.
For this study, *environment* will include institutional characteristics (between, within, and intermediate educational outcomes), student-to-faculty interaction, student-to-student interaction, and student-to-student group affiliation interaction while the *output* will be the intent to remain by the minority medical students.

According to the minority medical student organization Student National Medical Association (SNMA) website, the SNMA strives to become an intricate part of the academic medical institution’s recruitment and retention efforts for minority medical students. The student group also assists faculty and staff by creating a welcoming environment that retains students of color at their chosen medical institution. Due to a number of involvement initiatives among peers, faculty, staff, and community which are part of the SNMA’s mission, Astin’s I-E-O Model containing interactions among these variables with SNMA can be examined.

**Significance of the Study**

The present study will add to the scholarly research and literature in the field. The study results will address the lack of empirical literature on minorities in medical school. Findings may assist academic medical institutions in strengthening appropriate student program strategies and the retention of minority medical students, thus positively impacting the critical shortage of minority physicians nationally. By identifying those variables that impact a minority medical student’s intent to remain, institutional policy can be created that will help retain minority medical students.

**Definitions of Terms**

*Academic Medical Institutions (AMIs)* include the 129 medical colleges accredited by the Association of American Medical Colleges (AAMC) or have medical colleges or programs associated with their universities. Osteopathic medical programs are included in this definition.
*Block* is a term utilized to describe the grouping of variables based on a temporal sequence or progression of time when variables impact a student. For example, student background characteristic variables including demographic information occur before environmental variables of interactions with faculty at academic medical institutions.

*Environment between institutions* is a phrase utilized to describe those environment independent variables that vary between AMIs but not within AMIs. An example of these factors would be medical school tuition rates.

*Environment within institutions* is a phrase utilized to describe those environment independent variables that vary from student to student within an AMI. An illustration of these factors includes the perceived challenges students feel about the availability of retention programs within the institution’s environment.

*Historically Black Colleges and University (HBCUs)* are those institutions founded to provide African Americans with higher educational opportunities after being denied access based on race to predominately white institutions.

*I-E-O Model* stands for the Input, Environment, and Output conceptual model created by Astin in 1991.

*Institutional Characteristics* are defined by the National Center for Educational Statistics (NCES) Integrated Post-secondary Education Data System (IPEDS) and include institutional control (private or public institutions) and institutional race (historically and predominately Black colleges or predominately White institutions).

*Institutional Retention* occurs when students remain at their chosen college or university from one period of time to the next.
Intermediate Educational Outcomes are those environment measures that may have been influenced by other environment factors and are considered part of the institutional characteristics.

Involvement Theory a theoretical framework developed by Astin in 1984 asserting that an institution’s educational assessment should be based on student involvement.

Minority is a racial classification representing those from African American, Hispanic/Latino, and Native American backgrounds.

Non-Minority is a racial classification representing Caucasian students.

Predominately White Institutions is a higher education college or university that is comprised of enrolled, mostly Caucasian (non-minority) students.

Student-to-Faculty Interaction is part of a student’s social integration into the institution and is concentrated on those relationships between currently employed faculty and students.

Student-to-Student Interaction is part of a student’s integration into relationships with other medical students on both academic and social levels.

Student-to-Student Peer Group Interaction is part of a student’s social integration and includes participation in the Student National Medical Association and other medical student organizations as well as the quality of experience within those organizations.

Student National Medical Association (SNMA) is an organization comprised mainly of African American, Hispanic/Latino, and Native American medical students.

Underrepresented Minority (URM) is a classification representing those races identified as disproportionately lower in number within the medical field when compared to the general public. Those URM groups may change based on regional differences but for the sake of this study, URM will represent those from African American and Hispanic/Latino descent.
Delimitations and Limitations

**Delimitations**

Cresswell (2003) defines delimitations as a way to narrow the scope of the study. First, this study utilizes a quantitative survey research design. Second, the research only includes active members of the Student National Medical Association (SNMA). Lastly, the data will be collected utilizing an online, web-based survey.

**Limitations**

Limitations are defined by Cresswell (2003) as potential weaknesses in the study. There are four main limitations to this study as a result of the delimitations placed on the study. First, due to the nature of the quantitative survey instrument, students will have a limited opportunity to expound upon their answer choices. According to Fraenkel and Wallen (2006), this disadvantage also includes limiting the breadth of the participants’ responses. Future research involving a qualitative study would allow participants to expound upon types of student-to-student and student-to-faculty interactions.

Second, any generalizability to all minority medical students is decreased since participation in the SNMA organization is not required of all minority medical students. However, Fraenkel and Wallen (2006) state that if the “sample is representative of the intended population on at least some relevant variables,” then generalizability is plausible (p. 104). The SNMA is made up of two of the three targeted populations of African American and Hispanic/Latino descent.

Thirdly, results are only based upon students who are members of SNMA that provided updated email addresses to the SNMA national headquarters and have online access.
Finally, this study asks the participants to focus only on interactions that occur in the on-campus environment. Since this is a national survey, this study will not examine the external off-campus variables that could possibly affect the student and environment and ultimately the output of student retention.

Organization of the Remaining Chapters

The organization of the remainder part of this dissertation includes a literature review in chapter 2, methodology in chapter 3, study results in chapter 4, and discussion in chapter 5.
CHAPTER II. LITERATURE REVIEW

This chapter presents a summary of the retention literature related to students in higher education and explores the input variables (e.g. student characteristics – gender, ethnicity, age, ability, program year completed, and socio-economic level) and the environmental variables (e.g. institutional characteristics, student-to-student, student-to-faculty, and student-to-student peer group interactions) that influences a minority medical student’s intent to remain with the academic medical institution.

Retention of Students in Higher Education

Research studies that focus on student retention in higher education are numerous and date back as a topic of interest since the early 1970s. Educational researchers in higher education have even created well documented and supported theories of retention. Tinto’s (1975, 1993) interactionist theory and model of departure and Astin’s (1993, 1999) involvement theory and I-E-O model (1991) are two of the most cited in educational literature both linking environmental climates to student success. However, most of these retention studies concentrate on the retention of undergraduate students from first to the second year (Seidman, 2005) and the definition of what “retention” means varies across different higher educational settings.

Defining Retention

According to Seidman’s (2005) meta analysis of retention research, there are four basic definitions for retention that include a student: (1) remaining in a specific course, (2) remaining in a specific program, (3) remaining at one institution over time, or (4) remaining in the education systems as a whole. However, Seidman’s third definition referring to remaining at one institution over time by describing “the ability of a particular college or university to successfully graduate the students that initially enroll at that institution” is consistent with Astin’s (1991) I-E-
In his own perspective of retention literature, Hagadorn (2005) states that the word persistence is sometimes used in place of the word retention and suggests caution in Seidman’s (2005) retention analysis noting that the two concepts are independent from one another with the differentiating point that “institutions retain and students persist” (p. 92). Through this explanation, it is clear that a student has the power of persistence and can affect the retention rate of the institution, since institutions cannot force a student to remain.

However, persistence can be an independent variable or a dependent variable. As a dependent variable, a number of factors are noted for affecting student persistence. Tierney (1980) makes one of the earliest observations that funding not only influences if a student will pursue college, but also how long they go and where they attend, ultimately affecting the level of persistence. However, Tinto (1993) states that students who claim financial woes as motives for ending their educational careers may have a number of other more influential reasons. He further explains that satisfied students who believe that education is worthwhile will take on the burden of loans and persist through degree completion.

Although administrators at colleges and universities may believe that high retention rates reflect student satisfaction and is a powerful learning assessment variable, retention is only a part of what higher education institutions should emphasize. As Tinto (1993) reflects,

Retention should not be the ultimate goal of institutional action…institutions and students would be better served if a concern for the education of students, their social and intellectual growth, were the guiding principles of institutional action. (p. 4)

Tinto further explains that successful retention is entrenched in the “nature of educational commitment” both on the part of the institution and student, with clear obligations on both
parties (p. 6). What those obligations are differ between institutions and programs, and may change as goals for students from different cultural backgrounds.

In summary, retention of students in higher education is a well-studied area of interest among educational researchers. Scholars Tinto and Astin are the two most cited investigators of retention and have created theories explaining why students persist in college. Most of the research conducted on retention focuses on the first and second years of the undergraduate experience and persistence is sometimes mistakenly utilized synonymously with retention. For the purposes of this investigation, retention will refer to a medical student’s intent to remain at their academic medical institution. Academic institutions that uncover factors that affect the student’s desire to remain, understand the cultural differences of their students, and create programs that take these variables into account will be successful.

Retention of Minority Students

The majority of studies concerning retention of students utilize nonminority student populations. Guiffrida (2006) explains in his meta analysis of retention theories and their applications with minority students that there are limitations to many of the retention studies and theories based on the lack of cultural diversity in the research studies. For example, he asserts that Tinto’s (1993) theory states that students have to disassociate from their past associations to be able to be drawn into an institution’s academic and social environments to successfully remain at their institution. In his review of the studies with minority student participants, Guiffrida argues there are a number of authors who have concluded that minority students “greatly benefit from the support of families, friends, and other members of their home communities” (p. 457) and that disconnection from their culture and past associations do not benefit minority student populations. He also suggests that further research should be conducted
with minority populations, and that the goal of administrators should not be to *integrate* but to *connect* students, with a focus upon relationship creation and maintenance between the minority students and all those that interact with them. The present research study will enhance the knowledge base of how minority students in medical schools interact with their academic medical institution environments including peers, faculty, staff, and their peer groups.

*Four-year Institutions*

A majority of the research on minority student retention is in a four-year undergraduate setting. In a study of 799 freshmen (97 minority and 702 nonminorities) at a Midwest university, Eimers and Pike (1997) find that the intent to persist at an institution is not different between minority (Hispanic, African American, Asian American, and Native American) and nonminority students (Caucasian). However, the *factors* that affect the intent to persist are different between groups. Those factors that are significantly different between minority and nonminority students are that minority students had lower levels of entering academic ability, encouragement, social and academic integration, perceived quality of education, overall commitment to the institution, and higher levels of faculty and student interactions. However, the higher levels of faculty and student interactions did not translate to better relations since Eimers and Pike found that minority students also had higher amounts of perceived discrimination than nonminority students. The researchers explain that in identifying “campus-related factors that influence the student’s voluntary decision to stay or leave, intention to persist may have been more appropriate measure than actual retention” (p. 91). They also suggest that further research should include students at different institutions as most retention studies, including their own studies, are conducted at one institution.
Flowers (2004) states through his examination of self-reports from 7,923 African American students between 1990 and 2000 that involvement experiences with faculty, and specifically career planning and counseling services, are most beneficial to students. He reaffirms Astin’s (1984) involvement theory by noting that student affairs personnel incorporate “more educationally relevant activities and have fewer experiences that detract from student development or only contribute in trivial ways” (p. 651). While Flowers explains that involvement will enhance educational results for African American students and that further research should be conducted on student involvement and institutional types (i.e., historically Black colleges and universities versus predominately White institutions and private versus public institutions), he did not find that all types of involvement experiences benefited students. Unlike Astin, Flowers cautions that minority involvement experiences need to be carefully examined such as attending social gatherings in the student union, serving on committees, and participating in extra curricular activities which are shown to “negatively effect on gains in thinking and writing skills” (pp. 649-650). Flowers explains that non-academic and non-career-focused activities may be distracting students from more developmental activities.

In another well cited retention study of minority students, Tierney (1992) explains that students remaining in college has its advantages:

The successful retention of students offers at least three benefits: the student will be able to reap the rewards that a college degree affords, the college or university will be able to maintain the income that derives from the student’s attendance, and society will be able to utilize the skills of students in becoming more productive. (p. 604)

Tierney also maintains that retention theories like that of Tinto’s (1993) that correlate student social and academic integration to successfully remaining at that institution are not the best solutions for minority students. After review of retention theoretical frameworks and their potential use with minority students, Tierney recommends that higher education school
administrators “need to consider how institutionally sponsored interventions function within the
variety of different contexts” (p. 616). Therefore, Tierney encourages retention research in
different settings to effectively address the needs of minority students. Those different contexts
can include community college, graduate school or medical school.

Two-year Institutions

Concerning the community college setting, there are only a few studies that focus on
retention of minority students (Opp, 2002), despite the fact that minorities are more likely to
enroll in a two-year institution than a four-year institution (Horn, Peter, & Rooney, 2002).
Pascarella, Edison, Nora, Hagedorn, and Terenzini (1998) also find that minority students who
enter two-year institutions have lower educational aspirations than students who attend a four-
year institution.

In Opp’s (2002) multi-institutional community college study, he finds that 643 chief
student affairs officers (CSAO) believe that their amount of involvement with minority students
is significant in their college retention. He utilizes Astin’s (1984, 1991, 1993) involvement
theory as a framework to determine if the CSAO retention practices and the information reported
on the National Center for Education Statistics (NCES) Integrated Postsecondary Education Data
System (IPEDS) on institutional characteristics significantly influences degree completion rates.
Opp establishes that “The quantity and the quality of the interactions between minority students
and faculty influence the retention process” (p. 150) and the presence of peer tutor programs for
students of color will “enhance the talent development process” (p. 158). Policy and practice that
promotes interactions among students with other students, staff, and faculty also have positive
influences on completion rates. Opp concludes that hiring faculty and administrative staff of
color and having minority institutional board members who promote retention programming also makes a difference in college completion rates.

In another study focusing on gender and retention of minority students in a two-year institutional setting, Flowers (2006) examines 467 African American males and their attendance at community college. He utilizes Tinto’s (1993) retention theory of academic and social integration and finds that African American males have significantly higher amounts of interactions at four-year institutions than two-year colleges. Flowers refers to Tinto’s work that integration substantially influences a student’s decision to remain at his or her institution. Flowers also suggests that further research to measure retention programs be conducted.

Graduate Education and Medicine

Some retention studies concentrate on minority students pursuing graduate education. In one of the first studies about retention of minority students in graduate and professional schools, Blackwell (1983) finds that sustained communication and support in the areas of financial, academic, and social systems assists students to build ties to the local community. These bonds make the difference in retention and are created through formal and informal interactions like mentoring programs. In their research about the trends in underrepresented minorities enrolling in health profession schools, Grumbach, Coffman, Rosenoff, and Munoz (2001) reveal that a possible gap and lack of studies on retention is due to information-gathering problems. Grumbach et al. state that they “did not examine retention rates in health professions schools because data on progression of students from matriculation through graduation were not available for most professions” (p. 183).

In a like manner, few studies look exclusively at the retention of minority medical students. In a case study involving seven third-year, fourth-year, and graduated African
Americans medical minority students, Bennett (1991) finds that a number of variables contribute to the retention of students in their medical programs. In her qualitative study, Bennett states that several factors make the difference for students to persist in medical school, including exposure to the medical field, personal characteristics (i.e., high degrees of motivation, perseverance, and ability to withstand racism), support systems (i.e., peer support, mentorship programs, and minority affairs office), financial resources, specially designed medical school programs, and non-traditional approaches utilized by medical school admission committees. Blackwell (as cited by Bennett, 1991) uncovers in his 1983 study that, on average, African American medical students have a 10 percent less chance of completing medical school than their white peer group classmates with the “retention rate for Mexican Americans and Natives Americans only slightly better” at eight to nine percent less (p. 55). Bennett concludes that more interactions between students and faculty of color be encouraged, including mentoring programs and that the establishment of minority affairs offices be fully supported to attract and retain minority medical students.

In a retention study by Gore (2007) that includes 11 students attending a Midwest academic medical institution, factors of social integration, interaction, perception of care, perception of justice, and academic support system are examined. The lack of financial resources and culturally diverse faculty and peers are the most stressed concerns. Gore finds that a majority of the students feel that they are being treated well but make insightful observations about fellow classmates:

The majority of my classmates are Caucasian. I have encountered many attitudes that can best be described as having an ‘air of entitlement’ when interacting with myself, and in some instances with ‘minority’ patients. Unfortunately, I do not feel that this behavior can be changed with a cultural course or lecture. Instead, I feel/hope it is something that will improve over time with increased interaction with non-Caucasian persons. (p. 10)
Study results suggest that creating and maintaining positive impressions of the medical school environment with minority medical students were necessary to retain students, not only at that institution but in the local area after graduation (Gore, 2007).

To investigate if there are differences between a minority and nonminority medical student’s quality of life, burnout levels, and symptoms of depression, 538 students from three medical schools in Minnesota offer insights about their medical school experience (Dyrbye, Thomas, Huschka, Lawson, Novotny, Sloan, Shanafelt, 2006). This study finds that minority students have “a lower sense of personal accomplishment…more likely to report experiencing major personal illness and are more likely to have children than nonminority students” resulting in challenges with finding appropriate childcare (p. 1439). The researchers conclude that defining what negatively impacts a minority medical student’s performance and focusing on ways to improve their mental well-being may affect attrition rates.

*Value of Student Organizations*

In another minority medical student study by Pamies, Lawrence, Helm, and Strayhorn (1994), academic medical institutions that are members of the southern region Group on Student Affairs-Minority Affairs Section provide information about their student and institutional characteristics so that minority medical student retention and their preferences for medical specialty areas can be explored. The responses from 18 southern medical schools (including three from Puerto Rico) explore if the existence of a Student National Medical (SNMA) chapter or the existence or amount of power provided by the Minority Affairs Office affect selection of specialty choice. Other parts of the study include uncovering differences between minorities and non-minorities with indebtedness and final specialty choice. Unfortunately, due to the inconsistency of the existence of SNMA chapters and Minority Affairs Offices, the researchers
do not compare between institutions on these variables. However, Pamies et al. draw conclusions based on the lack of interactions between staff of color and students. “The most disappointing finding is the lack of influence by minority affairs offices…the purpose of the minority affairs office is to aid and guide minority students through any problems that might arise, from racism to study habits, as a result of being, in fact, a minority” (p. 139). Wadenya, Schwartz, Lopez, and Fonseca (2003) also state the need for Minority Affairs staff (along with the offices of Admissions, Student Affairs, International Relations, and Academic Affairs) to interact with underrepresented minority medical students as an effective recruitment and retention strategy. Their study focuses on minority students in dental medicine and endorses the active support of senior leadership, financial support, and “institutional commitment to ensure the creation of an inclusive environment – all of which complement each other” (p. 1039).

Although minority medical students differ from undergraduate minority students by being older and by having a higher educational level, there are a number of common characteristics. Similar to undergraduate students, minority medical students face “finding one’s niche within the institution” in order to increase their persistence in medical college (Tinto, 1993, p. 59). Tinto clarifies that “niche” means a subculture within the institutional environment and expounds that students from culturally diverse backgrounds to be one of those commonly understood subcultures. Since the majority of the 129 academic medical institutions in North America have a predominately White student population (AAMC, 2005), minority medical students may be also inclined to finding their own niche by seeking support systems within their own cultural communities. Seeking support from a specific group challenges Tinto’s need to be part of the entire community. Similarly to their undergraduate careers, minority medical student’s social integration may still relate to persistence and correlates with their satisfaction with the institution
(Gartland, Hojat, Christian, Callahan, & Nasca, 2003). As Gartland et al. explain in their conclusion of a medical college survey that focuses on professional careers and research activities of African American and White physicians, minority medical students who remain in school and are dissatisfied with the medical school environment tend to still have a sense of disappointment well into their professional careers. Well established theories of retention attempt to address this question of what retention is for students and the Gartland study points to need to look beyond graduation day.

In review, most retention studies focus on non-minority students and do not account for cultural differences. Programs based on retention studies concentrate on integration of minority students instead of connecting students of color with non-minority students. Two-year, four-year, and graduate school environments are part of retention studies but few studies exclusively involve minority students in medical school. There are a number of similarities between minority students in undergraduate programs and medical school but scholars are still calling for additional studies.

Retention Theory

There are a number of theories and a few models that address retention in terms of the interaction between the student and those individuals, institutions, and groups around them. However, the two most known and cited education retention researchers who focus on interactions and involvement are Astin and Tinto.

Tinto (1993) supports the position of involvement in his interactionist model that includes the importance of integrating a students’ academic and social life into the formal college setting and the informal external environment. Although Tinto’s model recognizes that different groups, such as minority groups, and different types of college settings need retention programs and
policies suited specifically to meeting the needs of students, Astin (1984) formulates his ideas of what involvement means by concentrating on the behaviors or activities that take place instead of what an individual would believe should happen with these groups. As a result, Astin (1991) has created the input-environment-outcome (I-E-O) model that he believes to be a “conceptual guide for assessment activities in higher education” that is simple but can deal with “most complex and sophisticated issues” (p. 16).

Involvement

Astin (1999) first formulated involvement theory in 1984 out of his frustration “at the tendency of many academicians to treat the student as a kind of ‘black box’ ” with policy and programs on one side and academic measures on the other (p. 519). He defines involvement as “the amount of physical and psychological energy that the student devotes to the academic experience” (Astin, 1999, p. 518) and explains that students who invest considerable time or energy in their academics and both faculty and peer social interactions including individuals and groups are examples of involved students.

During his review of existing theory, Astin (1999) makes observations that his previous research frameworks may not be the most conducive in student learning development since they are not driven by practicality and are seldom “tested” in the field. While creating his own involvement theory, he briefly identifies the three other main compartmentalized theories of Subject-Matter/Content, Resource, and Individualized. According to Astin (1999), the Subject-Matter theory or Content theory focuses on providing students content that was highly specialized with faculty relaying information to the student, Resource theory facilitates a resource-rich environment that focuses on student-faculty ratio and recruitment of high-achieving students, and Individualized or Eclectic theory encourages students to take program
electives, work on independent study, and create a learning environment that centers on the
individual student. Astin states the positives and negatives of each concept, ultimately causing
him to create the involvement theory.

The I-E-O Model

The modified input-environment-outcome (I-E-O) model (see Figure 1 in chapter 1) concentrates on the assessment of outcomes with a number of dependent variables that are affected by a number of inputs and the overall environment that include a number of independent variables. Astin (1991) explains that his model is valid in a number of environments but that most of his research focuses on that of the educational setting. He states that student outcomes refer to “aspects of the student’s development that the institution does influence or attempts to influence through its educational programs and practices” (p. 38).

![Figure 2. The I-E-O Model (Astin, 1991, p. 18).](image)

As the model demonstrates, inputs affect outputs but the environment also has a relationship with inputs that can affect outputs. The environment, or in this research study the academic medical institution, would be affecting the output; the intent of the student to remain at that institution.

According to Astin (1991), those outputs are “aims, goal, or objectives” (p. 38). For this study, that outcome will be the student’s intent or goal to remain at their academic medical institution (AMI) and those factors affecting the outcome will be the environment – student-to-
student interactions, student-to-faculty interactions, characteristics of the AMI – as well as the input of the student’s own demographic background will be examined.

Input Variables

Identified by Astin (1991), the student input characteristics that have “potential interaction effects with environmental variables are the student’s gender, ethnicity, age, ability, and socio-economic level” (p. 67). There are a number of reasons for assessing input variables. Astin states that one of the reasons is to determine if there are interactions between the student’s background and the environment ultimately affecting the output. Flowers (2004) finds that minority students, specifically from African American cultural backgrounds, tend to have lower levels of involvement with their environment but are positively impacted in their educational incomes by being engaged by faculty and student groups.

Student background characteristics. Student demographics and academic standing also seem to relate with the likelihood to remain at a higher education institution. In Astin and Oseguera’s (2005) report based on longitudinal retention data gathered from 262 institutions involving more than 56,000 students, a number of demographic characteristics like ethnicity, religious affiliations, age, grade point averages (GPAs) and socioeconomic backgrounds show to correlate with likelihood to complete a program. Allen (1999) utilized the results of the Noel Levitz’s College Student Inventory (CSI) that surveys freshmen for academic risk and student need assessment and states that precollege academic performance does play a significant part in college academic performance and indirectly affects a student’s persistence to remain in college.

In academic graduate medical education, these student demographics may still be factors in the likelihood that students remain; however, medical students have already demonstrated the ability to complete a degree program. This is a distinct and important difference since the
student’s personal attributes are now not the most influential reason to remain, but the academic medical institutional climate or environment variables may be the most influential reasons (Wadenya, Schwartz, Lopez, & Fonseca, 2003). Also, the current year of medical school completion may affect the desire to seek out interactions among peers and faculty since medical students tend to get less involved during their clinical rotations occurring in the third year of study (Gore, 2007).

*Environment Variables*

The characteristics including the *type* of higher educational institution also play a pivotal role in the retention of students at that institution. According to Pascarella and Terenzini (1983) in their empirical retention study, they demonstrate that “what happens to a student after arrival on campus may have greater impact on persistence than either the background characteristics or personal commitments to the institution and the goal of graduation brought to college” (p. 219). They further explain that both academic and social integration effects a student’s institutional commitment even more that a student’s commitment to achieve an educational goal but note in another study that that institutional type does not affect student learning alone (Pascarella & Terenzini, 1991). However, there are limited amounts of studies that measure environmental variables. Astin (1991) points to the lack of consistency in measuring environmental factors as the reason why assessment is still a mostly unexplored research area. In academic medical institutions this could be defined in a number of ways. For this study, environmental factors are institutional characteristics (including variables between, within, and intermediate educational outcomes), student-to-student interaction, student-to-faculty interaction, and student-to-student group interaction.
Institutional characteristics. According to Tinto (1993), colleges are communities in which “student learning moves beyond the simplistic notion that students are alone responsible for their own effort” and that “institutions also influence the quality of student effort via their capacity to involve students with other members of the institution in the learning process” (p. 132). Many research studies conducted in undergraduate college settings demonstrate that institutional characteristics do affect student experiences. However, the size and type of campus affects the way the environment is measured. Astin (1991) points out that the levels and types of environmental measures are probably “much greater in the larger and more complex institutions than in the smaller and more homogeneous ones” (p. 82). Concerning minority student learning and retention, only a few studies address the impact of institutional type with research solely based on the African American experience and with no definitive answers on what characteristics have the strongest impact (Seifert, Drummond, & Pascarella, 2006) and none that explores the Hispanic experience with institutional type.

Seifert, Drummond, and Pascarella (2006) cite a number of studies with conflicting results when institutional types are defined as being historically Black (African American) colleges versus predominately White (Caucasian) institutions. Seifert et al. state that some studies reveal that African American students “gain significantly more in cognitive and personal development from attending a historically Black college (HBC) rather than a predominantly White institution (PWI)” (p. 187). One study uncovers that African American students’ intent to pursue a graduate degree and who attend HBCs, and ultimately remain in school, are “12.5 times those of similar African American students attending non HBCUs” (Pascarella, Wolniak, Pierson, & Flowers, 2004, p. 311). However, other researchers like Kim (2002) who focuses on HBCUs and historically White colleges and universities (HWCUs) find “no significant
difference existed between HBCUs and HWCUs in their ability to influence overall academic ability, writing ability, and math ability” when controlling for institutional factors such as mean pretest of students at the institution, selectivity, average family income, and singe-sex college status (p. 403).

Concerning private versus public institutions, Astin (1991) explains in his research study section of input-environment correlations that “the data indicate that students from well-to-do families are much more likely than are students from poorer families to attend selective institutions and, in particular, private universities” while students from lower socioeconomic backgrounds are “substantially more likely to attend predominately black colleges” (p. 77). Astin elaborates that African American students and those students with poorer grades are more likely to attend black colleges and universities in the Southeast US. In their second volume of research on how college affects students, Pascarella and Terenzini (2005) examine the between-college effects and find that “public institutions also appeared to have a negative, indirect effect on students’ social self-concepts by inhibiting social interaction with faculty members and peers” (p. 231).

As for medical education and institutional types, Astin (1993) finds that attending an historically black college or a private institution has an overall positive influence on an undergraduate senior’s intent to become a physician. Bennett (1991) explains in an extensive literature review that includes a history of black public and private colleges that medical education was originally limited to only a few colleges and that recommendations early in the 20th century encouraged the limitation of blacks and women into the medical profession. Bennett expounds that the 1896 doctrine of “separate but equal” had “effectively created a segregated
society hence closing the doors of white medical schools to blacks” and that Howard and Meharry medical colleges were the most attended and influential (p. 37).

According to Astin (1991), intermediate educational outcomes are “self-produced” by the student but are still part of the institutional environment. Variables that create this measure are those that may have been influenced by other environment factors. Astin states that intermediate educational outcomes are hard to assess since students can “choose and form their own environmental experiences” (p. 83) and these variables can sometimes be considered part of the input or the outcome of the I-E-O Model. An example of an intermediate educational outcome is student satisfaction levels. Astin explains that if researchers examine low student retention rates and state that low satisfaction levels caused the student retention rate to drop, that same argument could be reversed to state that poor retention led to poor satisfaction levels. Since this study focuses on current students and the student’s intent to remain, intermediate educational outcomes are part of the institutional environment. Astin recommends that due to some level of ambiguity of when exactly these variables impact students, factors measuring intermediate educational outcomes should be placed in the last block before the output. Therefore, institution environment variables will be placed in the order of variables occurring between institutions, within institutions, and intermediate educational outcomes.

**Student-to-student interaction.** Another variable found by researchers to influence retention of college students is student-to-student interaction or oftentimes referred to as “social integration”. From the beginning of retention research, social integration involving peer-to-peer contact is been in the forefront of attrition theories. The term “social integration” is utilized in a number of research studies and reports. For example, in a sponsored ACT (formerly known as Academic College Testing) 2004 report concerning retention practices that includes more than
1,000 participating colleges, McClanahan (Habley, 2004) indicates in the retention literature review that the first “widely recognized model for college student dropout” is that of Spady in 1970 that includes five variables of academic potential, normative congruence, grade performance, intellectual development, and friendship support that “contribute directly to social integration” (p. 2). Astin (1993) later supports the concept of integration by stating that student peer involvement is essential for effective retention. He postulates that institutions need to commit to “rethink traditional ways of structuring collegiate learning environments and find new ways of actively involving students” into the retention of other students (p. 212).

Tinto (1993) also utilizes the term of social integration concerning retention and defines it as meaning both the social and academic integration of the student. “The greater the contact among students, the more likely individuals are to establish social and intellectual membership in social communities of the college and therefore the more likely they are to remain in college” (Tinto, 1993, p. 118). He expands this further by addressing specific needs of different groups and how the socialization may be more difficult to accomplish than with others:

Since it has been demonstrated that individuals from disadvantaged and/or minority origins are much more likely to be found in public schools generally and in the lower quality public schools in particular, it follows that they will be less well prepared for college. As a result, they will also be more likely to experience academic difficulty, in college regardless of measured ability, and more likely, therefore, to leave because of academic failure. Of course, this is partially explained by the differential social experiences of disadvantaged youth and thus the difficulty they encounter in attempting to successfully act out the largely middle-class role of ‘college student’. (Tinto, p. 50)

Although Tinto asserts that certain students are exposed to substandard schools that may explain higher attrition rates in these groups, he does state that among the undergraduate levels, only a quarter of departures are linked to academic failure. However, so as to not exclude this variable, Tinto explains academic integration as that the “degree to which those experiences serve to integrate individuals in the social and intellectual life of the institution…the more
satisfying those experiences are felt to be, the more likely are individuals to persist until degree completion” (p. 50). He asserts that the level of integration is dependent upon the level of incongruence and isolation. Tinto defines *incongruence* as the “state where individuals perceive themselves as being substantially at odds with the institution” and *isolation* as “the absence of sufficient interactions whereby integration may be achieved” (p. 50). However, Astin’s (1993) involvement theory is not focused on perceptions but actual motivations and the resulting behaviors from that student who interacts with other students.

For medical school interactions, social and academic integration are noted as important factors for student retention. However Tinto (1993) explains about undergraduate student departure that the level of integration may play a more pivotal role among minority or disadvantaged students. Therefore, student-to-student contact, even in the medical school environment, may still be effect the intent to remain at the medical institution.

*Student-to-faculty interaction.* There are a number of studies that focus on interactions between faculty and students but only a few that include tested models that explain student departure from college or universities prior to graduation. Tinto’s (1993) interactionist model of departure focuses on the sociological reasons for departure as it relates to leaving an institution and examines it as longitudinal process. The model “highlights the critical importance of student engagement or involvement in the learning communities of the college” (Tinto, p. 132). Pascarella and Terenzini (1983) validates the model with undergraduate students and finds gender differences concerning the intent to remain at that institution. Tinto (1993) also explains that the absence of faculty and student interaction or “unrewarding interactions outside the classroom may lead to academic boredom and thus to voluntary withdrawal or to lower levels of academic performance which may in turn lead to dismissal” (Tinto, p. 118).
Astin (1999) also agrees with the lack of participation may be linked to unfulfilled interactions in Tinto’s model but further ties in student satisfaction with the amount of faculty interaction through his involvement theory. “Frequent interaction with faculty is more strongly related to satisfaction with college than any other type of involvement or, indeed, any other student or institutional characteristic” (Astin, 1999, p. 525). Pascarella and Terenzini (1983) support both Astin and Tinto through their study on predicting the likelihood of withdrawal by explaining that the “classroom teaching quality and frequency of interactions with faculty focusing on academic or intellectual matters” directly influences institutional commitment from the student (p. 221). However, their study only validates Tinto’s (1993) model that utilizes scales with grouped questions and does not address specific behaviors that the students identify as being the most effective. Astin’s (1999) I-E-O model approach to identifying the desired behaviors of medical college faculty to encourage institutional retention to minority medical students is selected because it allows for the researcher to identify the most influential behaviors.

In a longitudinal study involving a data set of 941 African American undergraduate students from the Cooperative Institutional Research Program (CIRP), Kim and Conrad (2006) find that involvement with faculty is significant. Even though African American students are at different institutional types of predominately white and predominately black, “student involvement in professors’ research projects and senior seminar curriculum status were positively associated with the outcome—degree completion” (Kim & Conrad, p. 418). The researchers conclude that despite the lack of resources, institutional characteristics, the student-to-faculty interactions are the strongest factor for student degree completion.

In Blackwell’s (1983) well-known study on mentoring and role model effects on minority student retention in graduate and professional schools, there is evidence that the faculty and
student interactions make a difference with remaining at the institution. More specifically concerning minority faculty, Blackwell (as cited in Brown, 1992) notes that “visible black role models provide several benefits for students: (a) as role models for success for both black and white students; (b) by reducing demeaning stereotypes about the intellectual ability and scholarship of black professionals; and (c) by changing the graduate experience of black students” (p. 145).

Concerning medical school experiences, studies show minority and non-minority students have different experiences with faculty and staff. According to a survey of African Americans and Whites at an Eastern US medical school, African Americans report a lack of satisfaction with their interactions with faculty and administrators and are less likely to recommend the medical college than their white counterparts (Gartland, Hojat, Christian, Callahan, & Nasca, 2003). The researchers find that African Americans are less likely to give to annual alumni giving campaigns and are more likely to practice medicine among the minority poor and overall economically depressed environments. This report concludes that it is “necessary, but not sufficient, to merely increase numbers of minority medical students. It is imperative that the social environment and its informal curriculum welcome diversity” (p. 111). This social environment also can include another less studied area – interactions between students and their peer group organizations.

Student-to-student group interactions. Astin (1991) states that a number of variables linked to “organizations and other co-curricular activities in which the student participates, as well as any special program to which the student is exposed” are important factors in assessing the institutional environment (p. 81). He explains the difficulty of attempting to measure the involvement in organizations and other co-curricular activities due to the enormity of attempting
to keep a general definition that can be used across institutions. Astin also labels participation as self-produced and that participation like seeking out peer group interactions can also be considered as an input variable. However, he expounds that gathering information directly from students is the “richest source of data on the students’ environmental experiences” (Astin, 1991, p. 85) and still considered group interactions environmental.

For medical colleges, there are a numerous student peer group organizations and special programs that students choose to be involved in, especially for recruitment and retention purposes. However, there are only a few quantitative studies that examine retention of minority medical students through their student organization (Oyewole, 2001). According to the American Medical Association (AMA) website, the 155 year old AMA student section has the highest membership at nearly 50,000 and boasts as the “largest and most influential organization of medical students in the country” (AMA, 2007, ¶ 1). However, the AMA student section does not specifically address health care disparities and retention among minority medical students. There are a few culturally diverse-oriented student medical organizations such as the Latino Medical Student Association and the Association of Native American Medical Students that do seek to assist specific populations. However, the Student National Medical Association (SNMA) is the only student organization that has the goal of eliminating health care disparities and increasing recruitment and retention of Latino, Native Americans, and African American medical students (SNMA, 2007). SNMA has existed for 40 years and has its roots from Howard University School of Medicine and Meharry Medical College. SNMA is made up of 10 chapters that are governed solely by medical students and includes a pre-medical section called the Minority Association of Pre-Medical Students (MAPS).
As researchers pointed out, SNMA participation with medical school administrators can make a difference in recruitment and retention initiatives (Rumala & Cason, 2007) and student involvement with student peer groups will boost satisfaction with the medical school environment and even encourage exploring medical specialty areas that may not have been considered (Pamies, Lawrence, Helm, & Strayhorn, 1994).

There are a number of commonly used practices to help build student success. Some of the practices are through mentoring programs and social gatherings that involve both medical and non-medical personnel (Bennett, 1991). Social gatherings are sometimes arranged by the student body leadership like that of the Student National Medical Association (SNMA) with financial support from administration. However, training sessions for mentors are suggested to help facilitate interactions that can benefit all parties. For example, the John Hopkins University Department of Medicine’s *Mentoring 101* is offered to faculty to provide an opportunity to ask questions and prepare to become a mentor for students of color. An external mentoring program can help support activities and provide recreational activities away from campus. For example, The University of Toledo College of Medicine financially supports quarterly dinners that are coordinated by SNMA student leaders that encourage student involvement through the encouragement of faculty interaction and social integration with both peers and supportive external community members (Rumala & Cason, 2007). These meetings may also provide exposure to more minority professionals if the institution’s staff is also predominately non-minority. Participating community leadership that desire to mentor can be physicians, but also can be religious leaders, financial advisors, and minority-centered organizational officers to name a few possibilities.
Summary

While most studies examine retention of undergraduate students and some focus on retention of minority undergraduate students, few studies attempt to examine the factors that affect the retention of minority medical students. Those studies identified the student’s background, the institutional characteristics, academic and social integrations, faculty interactions, and student group participations as factors that effect minority student retention. However, these factors are not limited to undergraduate students but applicable to students of color in medical programs. Concerning concepts that best encompass interactions and incorporate environmental variables, Astin’s (1999) involvement theory and I-E-O Model complements studies on minority medical student retention. However, further exploration of minority student retention in different environmental situations, like that of medical school, still needs to be explored.
CHAPTER III. METHODOLOGY

This chapter provides the research methodology used in the study. The following sections are included: research design, participants, instrumentation, data collection procedures, and data analysis procedures.

Research Design

The goal for this study was to find the optimal set of independent variables to predict the dependent variable of a minority medical student’s intent to remain at his or her medical school. A correlational design was utilized and since more than one independent variable was involved in this study, a multivariate analysis was conducted. According to Mertler and Vannatta (2005), a multiple regression analysis is selected when more than one independent variable is involved when predicting a single dependent variable. The researcher employed the multiple regression analysis to uncover relationships and the best predictable variables for intent to remain in medical school.

Concerning data collection, the researcher employed the survey method to efficiently gather data from a large sample. Fraenkel and Wallen (2006) suggest utilizing a survey method when an examination of the relationship among responses to one question or another is performed. Data collection procedures with participants included an electronic self-administrated, on-line survey constructed by the researcher. Selection of a Web-based survey over that of hard copy questionnaire and phone survey has benefits both to the researcher and the participants. According to Dillman (2000), Web-based surveys nearly completely eliminates paper, postage, mailout, and data entry costs and provides the researcher an opportunity through cost savings to survey entire populations instead of samples of populations. For the participants, Dillman further explains that any international boundaries can be overcome through software
that can translate the questions into different languages. However, Dillman cautions that utilizing a Web-based survey only benefits “certain populations” that have Internet addresses and access such as “members of some professional organizations” (p. 356). Since the Student National Medical Association requires all members to provide current email addresses and medical students are expected to be familiar and in some cases experts with research through the Internet, the Web-based questionnaire for this study allows the survey of the entire population.

Participants

The target population for this study was all minority medical students at academic medical institutions in the United States. However, the accessible population for this study included members of the Student National Medical Association (SNMA) who have an email address. All SNMA medical student members with email were asked to participate in this voluntary survey study. Targeting SNMA membership for this study is due to three main reasons: the SNMA population cultural background characteristics, number of members in the accessible population, and desire from the SNMA organization to participate in this research. The SNMA membership consists of 85 percent medical students and includes other members who are pre-medical students, residents and physicians all of whom are from predominately minority backgrounds of African American and Hispanic descent. The SNMA has more than 135 medical chapters and 120 premedical chapters nationwide with 10 regions spanning the US and Caribbean.

According to Fraenkel and Wallen (2006), researchers should prefer to “study the entire population of interest” (p. 92) or at least strive for a generalizability based on a large enough sample size. To determine how many participants are needed for generalizability of the entire SNMA student medical membership, there is a two-step process to determine sample size. First,
Tabachnick and Fidell (1996, 2001) recommend review of two possible formulas in which the researcher utilizes the one that produces the highest n for an optimal sample size. The formula of 
\[ n > 104 + k \] fulfills that requirement for this study by producing an n of 109 when the five variables (k) are utilized.

Secondly, Mertler and Vannatta (2005) state that to have generalizability of the regression equation and to demonstrate the stability of using this sample, a cross-validation method will also be required. According to Mertler and Vannatta (2005), cross-validation is a method in which a regression equation, which is based on a sample from the population, is tested to ensure that the same regression equation can be utilized with any other sample from that population.

Two approaches to accomplish the cross-validation are provided by Mertler and Vannatta. One involves applying the regression equation to another sample at a later date and the second is to randomly split the original sample into two groups and compare the regression equation produced by them. According to Tabachnick and Fidell (2001), the random split of samples should be “80% for statistical regression analysis and the remaining 20% as the cross-validation sample” (p. 135). Since it may not be feasible to incorporate a waiting period into the study, the splitting of the original sample is recommended. Therefore, this would require the sample to double the n from the noted formula 
\[ n > 104 + k \] resulting in 109 (Tabachnick & Fidell, 1996, 2001) and requiring a minimum of 218 participants.

**Instrumentation**

The Minority Medical Student Retention Questionnaire (MMSRQ) (Appendix A) was used for this study. The MMSRQ instrument is a result of the researcher modifying and integrating questions from two existing surveys as well including questions that pertain to the
academic medical institution environment. The two instruments are from the Higher Education Research Institute (HERI) and are called the *Cooperative Institutional Research Program (CIRP) Freshman Survey* and the *College Senior Survey* (CSS). The *CIRP Freshman Survey* is designed to be administered to high school students entering college and asks how they believe their experiences during their freshmen year will influence their success in college. The *College Senior Survey* is designed to capture the student’s academic and campus life undergraduate experiences and “helps institutions respond to the need for assessment and accountability data by providing information on a broad range of student outcomes” (HERI, 2007, ¶ 1). Since the original two instruments are designed to capture undergraduate student perceptions, this researcher sought and received permission from HERI to adapt questions suitable to the graduate medical audience.

*Reliability of the CIRP and CSS*

In support of involvement theory and the I-E-O model, Astin and his colleagues at the Higher Education Research Institute developed a number of surveys that have been empirically supported and tested by numerous higher education institutions through the utilization of the *Cooperative Institutional Research Program (CIRP) Freshman Survey*. According to the *CIRP Freshmen Survey* developers at the Higher Education Research Institute (HERI) website, CIRP has been administered to more than 11 million students. This instrument includes measuring the intent of students to be involved in campus life with academics, faculty, and student peer groups (McClanahan, 2004).

According to the HERI website, the *College Senior Survey* (CSS) explores the impact of a number of higher education practices including faculty mentoring, service-learning, leadership development among college seniors. The CSS concentrates on college outcomes and post-college
goals. The researcher sought reliability coefficients from the original creators of the CSS, the Higher Education Research Institute (HERI), but none were provided. A total of five questions (Q17, Q18, Q19, Q22, and Q24) were taken from CSS.

According to Fraenkel and Wallen (2006), correlation coefficients are produced when variables have relationships between them. Fraenkel and Wallen also explain that the reliability of scores should be at least .67 or higher for any instrument used in research. When the MMSRQ was administered to medical school students, cronbach alphas were found for each of the three scales that dealt with student interactions with others around them. This included a cronbach alpha of .898 for student-to-faculty scale, a .822 for student-to-student group affiliation scale, and a .700 for the student-to-student scale.

In a similar study utilizing Astin’s theoretical framework, The Missouri University Freshman Survey had a reliability coefficient of at least .73 (as cited in the Eimers and Pike, 1997) when questions are grouped together to explore concepts relating to this study. Eimers and Pike note these groupings include the student’s entering ability and academic achievement as well scales that measured external encouragement (.73), perceptions of discrimination (.91), affinity of values (.67), faculty-student interaction (.74), academic integration (.73), social integration (.79), perceived quality/satisfaction (.83), perceptions of learning and development (.94), institutional commitment (.83), goal commitment (.72), and intent to persist that only includes one question. This study concentrated on four of the 10 measurable concepts of faculty-student interaction, social integration, goal commitment, and institutional commitment.

Validity of the MMSRQ

As outlined in the previous pages, this researcher developed the MMSRQ by combining selected questions from the CSS and the CIRP Freshman Survey. Validity was established for
the MMSRQ instrument through consultation with content experts and survey structure experts. Fraenkel and Wallen (2006) define validity as “the appropriateness, correctness, meaningfulness, and usefulness of the specific inferences researchers make based on the data they collect” (p. 151). They describe the three main types of validity as content-related evidence of validity, criterion-related evidence of validity, and construct-related evidence of validity. According to Babbie (1983), face validity is the “quality of an indicator that makes it seem a reasonable measure of some variable” (p. 555) and content validity is “the degree to which a measure covers the range of meanings included within the concept” (p. 113). To check for face and content validity, three content experts knowledgeable in the area of retention reviewed the instrument. The first individual was a retention content expert involved in the study of assessing retention among minority students in higher education, the second was a practicing physician and an admissions dean for a Midwestern US academic medical institution, and the third was a medical faculty member who serves as an advisor for one of the 135 existing Student National Medical Association (SNMA) chapters and was assistant dean of student diversity, recruitment and retention in an academic medical institution.

Two of the three content experts were also experts in survey structure. The survey experts were knowledgeable about the development and appropriateness of the survey instrument format. The minority student retention expert who served as a content expert also was an educational leadership faculty researcher who worked with Astin and the HERI organization with gathering data for the CIRP and CSS instruments. The SNMA faculty advisor who served as a content expert also had created survey instruments involving medical field language.

Revisions to the MMSRQ were in accordance with language clarity and content appropriateness. A pilot study was conducted to gather content-related evidence which was
utilized to ensure questions were recognizable to students in the medical school environment. The pilot group consisted of SNMA members on the University of Toledo (UT) Health Science Campus and was approved by the Chair of Biomedical Institutional Review Board in the UT Department of Human Research Protections (Appendix B). SNMA members were sent the online pilot survey link on April 7, 2008 with a communicated completion need deadline at the end of three weeks. Names and email addresses were received from the UT Health Science Registrar’s Office and the SNMA faculty advisor verified membership. Although 33 SNMA members were sent the survey, 21 SNMA members responded who were actually in the UT College of Medicine, and 16 of those 21 members were from the target ethnicity groups of African American or Latino cultural descent. Based upon the pilot results and comments from the participants, revisions where made to the MMSRQ in preparation for study with the national accessible population of SNMA.

Variables and Questions

The MMSRQ survey instrument included 26 questions with 84 total items. A series of Likert scales, time frame options, drop down options, and fill ins were utilized for answer options. For example of the Likert scales, participants had a choice of “strongly agree”, “agree”, “neutral”, “disagree”, and “strongly disagree” when asked if they agree with statements concerning their involvement with the SNMA. An instance for the time frame options were none, less than one hour, 1-4 hours, 5-9 hours, 10-15 hours, 16-20 hours, and more than 20 hours for the amount of estimated interactions. Illustrations of drop down options included medical school names and yes/no/don’t know for confirmation of membership in the SNMA. An example of fill ins were age and current GPA. Concerning the dependent variable (Q23), participant’s intent to remain at their academic medical institution, a scale from 0 to 10 was utilized.
Input Variables

Input variables included student background characteristics. Tinto (1975) states that student characteristics possessed before or entering college influence the decision to leave an institution. Q1 verified if the participants were current members of the Student National Medical Association (SNMA), Q2 confirmed if they were pursuing a medical degree, Q3 focused on their year of medical education, Q4 was what medical institution the participant attended through a drop down of known academic medical institutions (AMIs). For Q5 from the CIRP survey and Q6, academic experiences at the institution were explored since Tinto (1975) states that academic integration will influence a higher likelihood to remain at the institution. According to Allen (1999), the “precollege academic ability” of students is found to “play a significant role on their academic performance in college and an indirect effect on persistence” (p. 466) and Q7 and Q8 inquired about scores on the Medical College Admissions Test (MCAT) and undergraduate GPA. Q10 and Q11 were from the CIRP survey and inquired about the parent’s education level since Astin and Oseguera’s (2005) and Bean (2005) state that there is a correlation between the amount of education obtained by parents and the likelihood for students to complete a degree.

Q12 was from the CIRP instrument and included statements that address influences to attend medical school. These statements included parents wanting to attend medical school (Q12a), always wanting to be a physician (Q12b), wanting to help others (Q12c), wanting to help others that look like themselves (Q12d), encouragement by mentor/role model to attend (Q12e), wanting to make more money (Q12f), influenced by elementary school program (Q12g), influenced by a high school program (Q12h), and influenced by an undergraduate program (Q12i).
Two of the demographic questions were from the CIRP survey including Q13 (cultural descent) and Q14 (gender), and a third, Q15, requested the participant’s age and provided further student background characteristics.

*Environment Variables*

There are a number of questions that were factored in as environment questions. Environment included institutional characteristics (variables that occur between institutions, within institutions, and variables that are intermediate educational outcomes), student-to-faculty interaction, student-to-student interaction, and student-to-student group interaction. For example of those characteristics that occur *between* institutions, percentages of African American enrollment were included. An illustration of variables that occur *within* institutions were the challenges students felt at their AMI. An example of intermediate educational outcomes included student satisfaction levels.

*Institutional characteristics.* To investigate variables that occur *between* institutions, Integrated Post-secondary Education Data System (IPEDS) data was utilized. IPEDS data is collected by the National Center for Education Statistics (NCES) and includes US postsecondary education data relative to enrollments, graduation rates, institutional tuition, program completions, and demographic information. For this study, IPEDS data included institutional control types (private, religious, Tribal School status, and HBCU), medical tuition, and student enrollment percentages including percentages of Whites, Hispanics, African Americans, Native Americans, and women.

*Within* institution variables refer to those factors that vary from student to student within an AMI. Four questions with 16 segments were selected to measure those variables occurring within the institution. Q3 asked about current medical school year and what were the chances of
being satisfied with the academic medical institution (Q16e). Q16 inquired on the possibility that extra time may be needed for completion of degree requirements (Q16a) and asked about residency program opportunities (Q16b) and residency program location chances to remain in the local area (Q16f). Pamies, Lawrence, Helm, and Strayhorn (1994) state that opportunities to select the residency programs reflect a student who is confident and is likely to be doing well academically since many residency programs demand levels of academic achievement to be accepted. Q18 inquired about time spent in labs (Q18k) and classes or watched/heard lectures (Q18l) and reflected how involved students are in their academic work. The final question was concerning challenges toward degree completion and was from the Gore (2007) study that found these statements reflected the concerns of minority medical students. These questions included academic preparedness (Q25a), financial resources (Q25b), social connectedness to other students (Q25c), cultural diversity among peers (Q25d), cultural diversity among faculty (Q25e), cultural diversity among staff (Q25f), social support by community members (Q25g), availability of retention programming (Q25h), and access to tutoring services (Q25i).

There were three questions including nine segments concerning intermediate educational outcomes. As described earlier, intermediate educational outcomes are those environment measures that may have been influenced by other environment factors. Those questions included current GPA (Q9) and those concerning current satisfaction. As stated earlier, Q24 was from the CSS instrument and inquired about satisfaction which is linked to intent to remain at an institution (Gartland, Hojat, Christian, Callahan, & Nasca, 2003) and included segments concerning satisfaction with amount of contact with faculty (Q24a), class size (Q24b), interaction with other students (Q24c), instruction quality (Q24d), sense of community among students (Q24e), availability of campus social activities (Q24f), and overall academic medical
institution experience (Q24g). Q22 was also from the CSS instrument and asked if the currently attended academic medical institution would still be the student’s first choice.

*Student-to-faculty involvement.* Astin (1993), Bennett (1991), Flowers (2004), Opp (2002), and Tinto (1993) state that the quantity and quality of faculty and staff interactions with students are related to the retention of students. There were four questions including Q16, Q17, Q18, and Q19 with a total of 18 segments within those questions that pertained to the faculty/staff to student involvement variable. Q16c was from the *CIRP Freshman Survey* and asked the chances of communicating regularly with professors. Q17a and Q17b were from the *College Senior Survey (CSS)* and inquired about the amount of hours spent with professors during a typical week discussing curriculum and non-curriculum matters.

Q18 and Q19 were from the CSS instrument and contained a number of statements on how often interactions occur with faculty and staff. Q18a addressed faculty interactions outside of class, Q18e asked about faculty interactions inside of class, and Q18b focused on counseling about career plans. Concerning Q18c and Q18d, the amount of mentoring among faculty and staff were included. As Wadenya, Schwartz, Lopez, and Fonseca (2003) explain about successful dental school programs aimed at minority student recruitment and retention, mentoring serves as a support mechanism for students to remain in school and their programs. Concerning amounts of support from faculty concerning overall well being, Q19a was encouragement to complete a medical degree, Q19h was intellectual challenge and stimulation, Q19j was help in achieving professional goals, and Q19d was emotional support and encouragement. Concerning faculty support to students for the program, Q19c concerned advice and guidance about the medical program, Q19b asked about opportunities to work on research projects, Q19e addressed letters of recommendation, Q19f focused on help with improving study skills, Q19g concerned feedback
on academic work outside of grades, and Q19i addressed opportunities to discuss coursework outside of class. A factor analysis was created for student-to-faculty involvement by converting individual responses to a Z-score and then a T-score which has a mean of 50 and a standard deviation of 10. The factor score has a reliability of .861.

**Student-to-student involvement.** According to Astin (1999) and Tinto (1993), the amount of time students interact with each other is related to the retention of those students. For student to student involvement, question 17 included six parts to measure this variable. Q17 was from the CSS and asked how many hours in a typical week the students spend socializing with friends (Q17c), discussed course content with students outside of class (Q17e), studied with other students (Q17f), tutored another classmate (Q17g), and been tutored by other students (Q17h). A factor analysis was created for student-to-student involvement by converting individual responses to a Z-score and then a T-score which has a mean of 50 and a standard deviation of 10. The factor score has a reliability of .468.

**Student-to-student group affiliation.** Pascarella (1985) suggests that formal group affiliations influence minority students more so than white students with their social integration at higher educational institutions. Tinto (1993) also states that persistence may be aided by the community within the college. Q16d was from the CIRP survey and asked the anticipation with the amount of participation with student groups and Q17d was from the CSS instrument and inquired about the number of hours spent with student groups in a typical week. Q18 was from the CSS instrument and inquired about how often students interact with student groups besides SNMA (Q18f), interacted with student organizations (Q18g), served as an officer or other leadership position in a student organization not including SNMA (Q18h), served as an officer or other leadership position within SNMA (Q18i), and studied or did homework within student
groups (Q18j). To address interactions specifically with the SNMA organization, Q20 addressed if there was participation with an SNMA-affiliated undergraduate Medical Association of Premedical Students (MAPS) chapter and Q21 asked how perception about membership helped academically (Q21a), with mentorship (Q21b), with socializing with students (Q21c), socializing with the community outside of campus (Q21d), and with an overall sense of belonging (Q21e). A factor analysis was created for student-to-student group affiliation involvement by converting individual responses to a Z-score and then a T-score which has a mean of 50 and a standard deviation of 10. The factor score has a reliability of .769.

Output Variable

The output or dependent variable for the study and all research questions is the intent to remain at an academic medical institution. The dependent variable was measured by one question (Q23) and asked respondents how likely they would remain and complete a medical degree on a scale from 0 to 10.

Data Collection Procedures

Before conducting the study, the researcher submitted an application for permission from the Bowling Green State University (BGSU) Human Subjects Review Board (HSRB) (Appendix C). Since the pilot study involved students on the University of Toledo campus, the researcher also pursued permission for the pilot study from the University of Toledo (UT) Social, Behavioral & Educational Institutional Review Board.

The researcher contacted the Student National Medical Association (SNMA) Executive Director via phone in August of 2007 to discuss the study objective, timeline, and obtain permission to pursue this study with the SNMA organization. The survey was approved and the
researcher worked with the SNMA Executive Director for a formal email communication alerting SNMA members of the survey.

The Pilot Study

As stated earlier, a pilot study involved a survey with UT SNMA members in April 2008. The survey was an online, web-based instrument that utilized the Vovici survey software. Vovici is a survey company under contract with UT with the ability to host Web surveys, securely house data collected from participants preserving their confidentiality, and provide a capacity of downloading data back to an authorized UT user such as this researcher. Access and retrieval of any collected data was done through a password authentication process by the authorized UT user. A link to the survey was placed in an email explaining the study objective and an invitation for SNMA students to voluntarily participate. Three weeks were provided to complete the questionnaire. Data was collected, analyzed, and utilized to determine if any clarity modifications would need to be made to the MMSRQ instrument.

Conducting the Study

To distribute the survey, the researcher created an email explaining the importance of conducting research that enhances the learning environment and assists with student retention initiatives which also included a voluntarily request to SNMA members to complete MMSRQ online survey (Appendix D). Within the email, a link to the online survey instrument hosted on the Vovici Website was included. The email with the imbedded link to the online instrument was sent to the SNMA Executive Director at the Washington DC national headquarters for the Student National Medical Association (SNMA). The researcher requested that SNMA Executive Director distribute the email to all of their 3,024 SNMA medical student members.
Online Survey Development

The survey was posted for 12 weeks from June 17, 2008 to September 11, 2008. The SNMA Executive Director spoke with each of the 12 region SNMA executive officers to encourage participation as well as verbally endorsing the survey at the Student National Medical Association (SNMA) National Leadership Institute and Board of Directors meeting. During the last two weeks of the survey posting, the director also sent one email reminder to complete the survey. The online survey required participants to complete the 26 questions during one logon session and no time limits were placed on the survey. A confidentiality statement was also included stating that the provided information would not be shared with any external companies or individuals not associated with the research. In case of inquiries, the name of the primary researcher, academic advisor, academic institution of research origin, and the researcher’s office phone number were provided in the email. Participants were also offered an opportunity to obtain a summary of the results.

Data Analysis Procedures

A number of statistical procedures were utilized to analyze the data obtained from this research study including the Statistical Program for Social Sciences (SPSS) software program. Responses were downloaded and transferred into this software package. The researcher reviewed and screened the data to ensure it met assumptions previously explained for multiple regressions and identified any outliers which can “adversely affect the interpretation of regression analysis results” (Mertler & Vannatta, 2005, p. 171) through boxplots and Mahalanobis distance testing. Outliers can affect data analysis because they can skew results by excessively weighting results in one direction or another. Mertler and Vannatta (2005) state that Mahalanobis distance testing is a “statistical measure of an outlier” and determines how far the outlier is from the means of the
all the other variables (p. 342). However, outliers identified through Mahalanobis distance
testing for this study were included since excluding the 6 of the 20 cases identified would have
impacted the variability of the dependent variable. To compensate for missing data and
maximize the utilized sample, pairwise was selected in SPSS to only eliminate those missing
responses for variable for the analysis. Pairwise eliminates missing responses by utilizing cases
or responses with complete data.

To address the research questions concerning institutional and individual characteristics,
descriptive statistics were utilized. Fraenkel and Wallen (2006) state that descriptive statistics
allow for identification of the overall population by enabling the researcher to “describe the
information contain in many, many scores with just a few incise, such as the mean” (p. 189). For
this study, the description of a typical SNMA minority medical student respondent was
conducted. To determine the factors that best predict if minority medical students will remain at
their academic medical institution and answer the research questions, a multiple regression
analysis was applied. According to Babbie (1983), “social researchers find that a given
dependent variable is affected simultaneously by several independent variables” (p. 429). Babbie
explains that multiple regression analysis provides the best opportunity to explore these
situations.

Since the study theoretical framework was Astin’s (1984) involvement theory and
resulting Input-Environment-Output (I-E-O) model (Astin, 1991), the researcher entered
predicting variables in a specific order. To uncover the smallest set of predictors for retention,
the stepwise method was utilized for the SPSS package. According to Brace, Kemp, and Snelgar
(2006), stepwise regression analysis allows for each variable to be entered and value assessed.
Brace, Kemp, and Snelgar explain that the stepwise procedure continues to add variables but
evaluates each time to determine the significance with their contribution. If significance is not found, then the variable is removed.

This research was an exploratory study and had one dependent variable – a minority medical student’s level of intent to remain at their medical institution – and independent variables including student characteristics, institutional characteristics, amount of student-to-student interactions, amount of faculty/staff-to-student interactions, and amount of student-to-student group affiliations. To better uncover if particular areas within each of the constructs significantly contributed to the dependent variable, the multiple regression was conducted for each question with grouped variables, with all variables placed in seven blocks, and again with variables involving three scales for student-to-faculty, student-to-student, and student-to-student group affiliation.

Research Questions and Blocks

For clarity of the constructs explored in this study and to enter the information appropriately into SPSS software when utilizing Astin’s I-E-O model, data collected from questions that are related were placed in seven blocks. As previously defined, the term block refers to the grouping of variables based on a temporal sequence or progression of time when variables are thought to impact a student. Astin (1991) explains that when placing variables in blocks, most “proximate environmental variables be controlled first and the most distal ones controlled last” (p. 304).

In order to examine each construct for this study, the researcher manually grouped variables in sections of student-to-faculty interaction, student-to-student interaction, student group affiliation, and characteristics of the student and institution environment. The researcher then placed the variables into SPSS software. Block one addressed the Input segment of the
Astin’s I-E-O model which includes student background characteristics and blocks two through seven addressed the Environment segment of the model which include variables occurring between institutions, within institutions, student-to-faculty interaction, student-to-student interaction, student-to-student group affiliation, and intermediate educational outcomes. To determine which variable or scale best predicts intent to remain for the final research question, two multiple regressions were conducted, one with scales and another without. As stated before, the dependent variable of intent to remain at the current academic medical institution was considered the Output of the I-E-O model and used in all analyses.

To address research question one, variables were group together to analyze the background of the minority medical student with the dependent variable of intent to remain. This block included ethnicity, age, gender, family educational history, self-identification of influences to go to medical school, and prior history of attendance and possible graduation from an undergraduate program at the current institution.

For research question two, a group of independent variables concerning general institutional characteristics that could be found between academic medical institutions (AMIs), within AMIs, and those intermediate educational outcomes resulting from the AMI experience that may predict intent to remain were grouped together. The variables for between AMIs included institutional control (private vs. public), if there was a religious affiliation, medical tuition amounts, total enrollment amounts, designation of historically black college or predominately white institution, percentage of female students, and percentages of students of color (African American born in the US, African American born outside the US, Hispanic and Latinos, Asian, and Pacific Islander). The variables from within AMIs were medical school year and perceived challenges with finances, academic preparedness, cultural diversity among peers,
cultural diversity among faculty, cultural diversity among staff, availability of retention programs, tutoring services, social connectedness to student, student’s attendance habits and perceptions of satisfaction with their academic medical institution. The final variables were those grouped as intermediate educational outcomes and may have been influenced by the other environment variables already discussed. The variables included satisfaction with contact, class size, student interaction, quality of instruction, communication among students, and overall satisfaction with academic medical institutional (AMI) experience. Current GPA (if noted or utilized by the academic medical institution) and if the student would select the AMI again if provided a choice were included as well.

To address research question three, independent variables containing student-to-faculty questions were grouped together. The student-to-faculty variables included how often students met with advisors, sought mentoring, engaged with professors in and out of the classroom, received advice, felt emotional support and encouragement. Also included with student-to-faculty variables were chances that a student received recommendation letter assistance, help with study skills, feedback on academic work, challenges intellectually, opportunity to discuss coursework outside of class, and help to get to their professional goals. Questions also consisted of the number of hours discussing both personal and academic issues with faculty.

For research question four, student-to-student questions were placed together. These variables included number of hours students engaged socially with friends, discussed academic issues with other students, tutored peer students, and were tutored by peer students.

Concerning the research question five, student-to-student organization questions were grouped. These variables were the students’ amount of engagement with SNMA including possible leadership participation and perceptions of assistance with academics, mentoring, social
contact with others, outreach to the community, and overall sense of belonging. Also, questions concerning participation with non-SNMA organized groups or clubs were included in this group.

To address research question six concerning which variables best predicts the intent to remain, two multiple regressions were conducted. For the first multiple regression, all variables in research questions one through five were placed in seven blocks mentioned above and were analyzed against the dependent variable intent to remain. The order the blocks were placed in the stepwise analysis was determined by the timing of when students may be affected by these variables or constructs. For the second multiple regression, the variables in blocks four, five, and six were made into scales including created for student-to-faculty (cronbach alpha of .898), student-to-student (cronbach alpha of .700), and student-to-student group (cronbach alpha of .822). each question or variable was used that consisted of the scale derived from the above mention. Block four addressed research question three.

Summary

In summary, this chapter provided the research design for the study, a description of the participants, the instrument developed to investigate the research questions, the procedures of collecting the data, and the data analysis procedures. The study utilized an Internet-based, self-administered survey to collect data from minority medical students involved in the SNMA organization. The questionnaire was called the Minority Medical Student Retention Questionnaire (MMSRQ) and drew mainly from two preexisting surveys based in undergraduate populations. Descriptive analysis was utilized to provide an overview of what typical medical school institutions and typical SNMA minority medical students that participated in the study. All collected data was entered into the SPSS software package. After participants were confirmed as being SNMA members pursuing a medical degree, independent variables of student
and institutional characteristics and interactions between students and faculty, other students, and peer groups were grouped together and a multiple regression was conducted. To uncover what variables best predict a medical student’s intent to remain, two multiple regression analyses were conducted with one examining the correlations between all variables and the other utilizing three scales derived from grouping questions in the constructs of student-to-faculty, student-to-student, and student-to-student organization affiliation involvement. In the next chapter, the researcher provides the results of the study.
CHAPTER IV. RESULTS

Introduction

A correlational design was used to examine minority medical students’ perceptions of their intent to remain at their academic medical institutions. Since more than one independent variable was involved in this study, a multivariate analysis was utilized. Among the different types of analyses, the researcher employed a multiple regression analysis to uncover relationships and the best predictable variables for intent to remain in medical school. Babbie (1986) states that the multiple regression “works well with two, three, or more independent variables...to find the best linear fit among several independent or explanatory variables and a single dependent variable” (p. 542).

To conduct the research study, a survey method was utilized. According to Cresswell (2003), a survey method was appropriate because the independent variables of perceptions were measured and according to Cresswell (2003), “a survey design provides a quantitative or numeric description of trends, attitudes, or opinions of a population by studying a sample of that population” (p. 153). Fraenkel and Wallen (2006) suggest utilizing a survey method when an examination of the relationship among responses to one question or another is performed.

The Minority Medical Student Retention Questionnaire (MMSRQ) (Appendix A) was used for this study. To create this instrument, the researcher modified and integrated two existing surveys: the Cooperative Institutional Research Program (CIRP) Freshman Survey developed by Astin and the College Senior Survey developed by the Higher Education Research Institute (HERI). The 2006 CIRP Freshman Survey was designed to measure how high school students entering college believe their experiences during their freshmen year influence their success in college. The College Senior Survey “helps institutions respond to the need for assessment and
accountability data by providing information on a broad range of student outcomes” (HERI, 2007, ¶ 1). Since the original two instruments were designed to capture undergraduate student perceptions, this researcher sought and received permission from HERI to adapt these instruments to be suitable for the graduate medical audience.

The resulting instrument, the MMSRQ, included 26 questions with 84 total items. Measurement was conducted with a series of nominal scales and Likert scales. Nominal scales were used to measure student background characteristics and institutional characteristics. Likert scales were used to measure the amount of interactions with student-to-student, student-to-faculty, and student-to-student peer group contacts. The question responses were suited so that a higher score on the Likert scale indicated a higher level on the dependent variables. For example, when respondents were asked how often they had been a guest in a professor’s home, “almost always” was considered the highest level and provided a five score, versus “not at all” with a one score. Two questions elicited open-ended responses to provide an opportunity for the participants to explain their answer selections. For example, participants responded on a scale concerning how likely they would remain at their academic medical institution, but were then afforded an opportunity to expound upon why they chose to remain or stay. These open-ended comments were not measured but analyzed using categories that will be discussed in Chapter 5.

Descriptive Results

The participants for this research study were student members of the Student National Medical Association (SNMA) who were studying to be physicians. An email with the link to the MMSRQ was sent electronically to the entire SNMA population of 3,024 students with 333 respondents (11.0%). Sixteen of the respondent surveys were not included in the analysis because of incomplete information. Due to the need for complete responses including the
identification of the AMI to address the institutional characteristics research question and a reply on the dependent variable intent to remain 317 respondents, representing 10.5% of the total population, were utilized for the study. The 317 students represented 103 academic medical institutions including 89 of the 129 total AAMC accredited medical schools in the United States.

Of the 317 respondents, 241 or 76.3% were females and 75 respondents males (23.7%) with only 1 missing data. Participants self reported an age range between 19 and 37 with an average of 25 years of age. In Table 1, demographic data on ethnicity backgrounds displays that the majority of respondents were African American born in the US \( (n=213, 68.7\%) \) and African Americans born outside the US \( (n=46, 14.8\%) \). Respondents who identified African American born in and outside the US constituted 83.5% of the participant responses. Of the 317 respondents, 7 did not identify their ethnicity.

Table 1

<table>
<thead>
<tr>
<th>Demographic Information on Ethnicity</th>
<th>( f )</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>African American/Black (Born in the US)</td>
<td>213</td>
<td>68.7</td>
</tr>
<tr>
<td>African American/Black (Born outside the US)</td>
<td>46</td>
<td>14.8</td>
</tr>
<tr>
<td>Latino/Mexican American</td>
<td>12</td>
<td>3.9</td>
</tr>
<tr>
<td>Other Latino</td>
<td>12</td>
<td>3.9</td>
</tr>
<tr>
<td>White/Caucasian</td>
<td>11</td>
<td>3.5</td>
</tr>
<tr>
<td>Asian-American</td>
<td>7</td>
<td>2.3</td>
</tr>
<tr>
<td>Pacific Islander</td>
<td>4</td>
<td>1.3</td>
</tr>
<tr>
<td>Puerto Rican</td>
<td>4</td>
<td>1.3</td>
</tr>
<tr>
<td>Native American</td>
<td>1</td>
<td>0.3</td>
</tr>
<tr>
<td>Total</td>
<td>310</td>
<td>100%</td>
</tr>
</tbody>
</table>

* Only 81 participants provided a current GPA

Concerning the respondent’s educational status in medical school, Table 2 provides the mean and standard deviations of these open-ended questions. The average MCAT score for respondents was a 26.68 out of a possible 45 and their average undergraduate GPA was 3.21.
Current GPA averages were 3.19 but were only reported by 81 of the 317 students, since many respondents stated that they were on a pass/fail grade system.

Table 2

Descriptive Statistics for Respondent’s MCAT Scores and GPAs

<table>
<thead>
<tr>
<th>Item #</th>
<th>Item Description</th>
<th>Scale</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>MCAT Score</td>
<td>Open</td>
<td>26.68</td>
<td>6.14</td>
</tr>
<tr>
<td>8</td>
<td>Undergraduate GPA</td>
<td>Open</td>
<td>3.21</td>
<td>0.42</td>
</tr>
<tr>
<td>9</td>
<td>Current GPA</td>
<td>Open</td>
<td>3.19</td>
<td>1.04</td>
</tr>
</tbody>
</table>

For the respondent’s parent education, a scale included 1 = grammar school or less, 2 = some high school, 3 = postsecondary school other than college, 4 = some college, 5 = 2-year degree, 6 = 4-year degree, 7 = some graduate school, and 8 = graduate degree other than a medical degree. The mean for Q10 for father’s educational level was 5.36, with a standard deviation of 2.36 and Q11 for mother’s educational level was a mean of 5.10 and a standard deviation of 2.88. For the regression, dichotomous variables of 1 = no and 2 = yes were created to capture if a respondent’s parent had obtained a medical degree. The mean for if the father was a doctor was 1.40 with a standard deviation of .49 and the mean for if the mother was a doctor was 1.28 with a standard deviation of .45.

Concerning Q12 listed in Table 3, respondents were asked to state how important they felt certain motivating reasons to attend medical school were to them. The scale, mode, median, mean, and standard deviation are presented.
Table 3

Descriptive Statistics for Most Important Reasons to Pursue Medicine

<table>
<thead>
<tr>
<th>Item #</th>
<th>Item Description</th>
<th>0 Not Important</th>
<th>1 Somewhat Important</th>
<th>2 Very Important</th>
<th>Mode</th>
<th>Median</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>f</td>
<td>%</td>
<td>f</td>
<td>%</td>
<td>f</td>
<td>%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12a</td>
<td>Parents wanted me to go to medical school</td>
<td>201 64.4</td>
<td>96 30.8</td>
<td>15 4.8</td>
<td>0</td>
<td>0</td>
<td>.40</td>
<td>.58</td>
</tr>
<tr>
<td>12b</td>
<td>Always wanted to go to medical school</td>
<td>26 8.3</td>
<td>65 20.7</td>
<td>223 71.0</td>
<td>2</td>
<td>2.00</td>
<td>1.63</td>
<td>.63</td>
</tr>
<tr>
<td>12c</td>
<td>Wanted to help others</td>
<td>3 1.0</td>
<td>33 10.5</td>
<td>278 88.5</td>
<td>2</td>
<td>2.00</td>
<td>1.88</td>
<td>.36</td>
</tr>
<tr>
<td>12d</td>
<td>Wanted to help others that look like me</td>
<td>45 14.4</td>
<td>87 27.8</td>
<td>181 57.8</td>
<td>2</td>
<td>2.00</td>
<td>1.43</td>
<td>.73</td>
</tr>
<tr>
<td>12e</td>
<td>Was encouraged by a mentor/role model</td>
<td>124 39.6</td>
<td>122 39.0</td>
<td>67 21.4</td>
<td>0</td>
<td>1.00</td>
<td>.82</td>
<td>.76</td>
</tr>
<tr>
<td>12f</td>
<td>Wanted to make more money</td>
<td>122 38.9</td>
<td>150 47.8</td>
<td>42 13.4</td>
<td>1</td>
<td>1.00</td>
<td>.75</td>
<td>.68</td>
</tr>
<tr>
<td>12g</td>
<td>Was influenced by an elementary school program</td>
<td>262 84.2</td>
<td>40 12.9</td>
<td>9 2.9</td>
<td>0</td>
<td>0</td>
<td>.19</td>
<td>.46</td>
</tr>
<tr>
<td>12h</td>
<td>Was influenced by high school program</td>
<td>183 58.7</td>
<td>71 22.8</td>
<td>58 18.6</td>
<td>0</td>
<td>0</td>
<td>.60</td>
<td>.78</td>
</tr>
<tr>
<td>12i</td>
<td>Was influenced by an undergraduate program</td>
<td>126 40.4</td>
<td>96 30.8</td>
<td>90 28.8</td>
<td>0</td>
<td>1.00</td>
<td>.88</td>
<td>.83</td>
</tr>
</tbody>
</table>

For Q12 concerning motivations to become a physician, the strongest noted reasons of being very important included wanting to help others ($n = 278, 88.5\%$) and that they had always wanted to be a doctor ($n = 223, 71.0\%)$. The weakest noted motivations of not important were influences from an elementary school program ($n = 262, 84.2\%$), parents wanted me to go ($n = 201, 64.4\%$), and the influence of a high school program ($n = 183, 58.7\%)$. 
In reference to Astin’s Input-Environment-Output (I-E-O) model utilized for this study, there were a number of questions that addressed the environment segment. The independent variables associated with the environment were placed into blocks based upon when the student would be exposed to that variable. Tables 4, 5, 6, 7, 8, 9, and 10 provide descriptive analysis on those questions including their means and standard deviations.

Table 4

*Descriptive Statistics for Predictions of Academic Medical Institution Experiences*

<table>
<thead>
<tr>
<th>Item #</th>
<th>Item Description</th>
<th>1 No Chance</th>
<th>2 Very Little Chance</th>
<th>3 Some Chance</th>
<th>4 Very Good Chance</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>f</td>
<td>%</td>
<td>f</td>
<td>%</td>
<td>f</td>
<td>%</td>
<td>f</td>
</tr>
<tr>
<td>16a</td>
<td>Need extra time to complete degree</td>
<td>160</td>
<td>50.8</td>
<td>89</td>
<td>28.3</td>
<td>22</td>
<td>7.0</td>
</tr>
<tr>
<td>16b</td>
<td>Be admitted to residency of choice</td>
<td>0</td>
<td>0</td>
<td>12</td>
<td>3.8</td>
<td>114</td>
<td>36.3</td>
</tr>
<tr>
<td>16c</td>
<td>Communicate regularly with professors</td>
<td>5</td>
<td>1.6</td>
<td>60</td>
<td>19.2</td>
<td>126</td>
<td>40.3</td>
</tr>
<tr>
<td>16d</td>
<td>Participate in student clubs/groups besides SNMA</td>
<td>3</td>
<td>1.0</td>
<td>18</td>
<td>5.8</td>
<td>66</td>
<td>21.1</td>
</tr>
<tr>
<td>16e</td>
<td>Be satisfied with experiences at the AMI</td>
<td>5</td>
<td>1.6</td>
<td>22</td>
<td>7.0</td>
<td>118</td>
<td>37.6</td>
</tr>
<tr>
<td>16f</td>
<td>Desire a residency program close to current AMI</td>
<td>41</td>
<td>13.1</td>
<td>84</td>
<td>26.8</td>
<td>131</td>
<td>41.9</td>
</tr>
</tbody>
</table>

For Q16 concerning predictions of academic medical institution (AMI) experiences, the strongest noted responses of *very good chance* were that respondents would be admitted to residency of their choice \( n = 188, 59.9\% \), would be satisfied with their experiences at the AMI \( n = 169, 53.8\% \) and participate in student clubs/groups besides SNMA \( n = 226, 52.2\% \). Also,
79.1% of respondents believed that they would either not need more time to complete a degree \((n = 160, 50.8\%)\) or very little chance of needing more time to complete degree \((n = 89, 28.3\%)\).

As demonstrated in Table 5, concerning Q17 inquiring about the number of hours respondents believed they interacted faculty and peers in a week, there were a few noted response preferences. Q17a revealed that 67.7\% spent less than one hour \((n = 154, 49.4\%)\) or no hours \((n = 57, 18.3\%)\) discussing course content with the faculty with Q17b demonstrating limited interactions discussing personal issues of no hours \((n = 99, 31.8\%)\) or less than one hour \((n = 144, 46.3\%)\). When reviewing where respondents grouped together, nearly half selected 1-4 hours when inquiring about friends and peer interactions. Those questions included Q17d participation in student clubs \((n = 160, 51.8\%)\), Q17e discussion of course content with peers outside of class \((n = 147, 47.3\%)\), and Q17c socializing with friends \((n = 147, 47.0\%)\). However when referencing tutoring with peers, respondents stated that they spent no hours tutored by peers \((n = 174, 56.1\%)\) or no time tutoring another peer \((n = 171, 54.8\%)\).
Table 5

*Descriptive Statistics for Estimated Hours with Interactions*

<table>
<thead>
<tr>
<th>Item #</th>
<th>Item Description</th>
<th>0 No hours</th>
<th>1 Less than 1 hour</th>
<th>2 1-4 hours</th>
<th>3 5-9 hours</th>
<th>4 10-15 hours</th>
<th>5 16-20 hours</th>
<th>6 20+ hours</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>17a</td>
<td>Talk with faculty about course content</td>
<td>f 18.3</td>
<td>f 49.4</td>
<td>f 27.6</td>
<td>f 3.5</td>
<td>f 1</td>
<td>f 0</td>
<td>f 1</td>
<td>1.21</td>
<td>.85</td>
</tr>
<tr>
<td>17b</td>
<td>Talk with faculty about personal issues</td>
<td>f 31.8</td>
<td>f 46.3</td>
<td>f 19.6</td>
<td>f 1.6</td>
<td>f 0.6</td>
<td>f 0</td>
<td>f 0</td>
<td>.93</td>
<td>.80</td>
</tr>
<tr>
<td>17c</td>
<td>Socialize with friends</td>
<td>f 0.6</td>
<td>f 4.5</td>
<td>f 47.0</td>
<td>f 27.5</td>
<td>f 13.4</td>
<td>f 5.1</td>
<td>f 1.9</td>
<td>2.72</td>
<td>1.07</td>
</tr>
<tr>
<td>17d</td>
<td>Participate in student clubs</td>
<td>f 2.9</td>
<td>f 17.8</td>
<td>f 51.8</td>
<td>f 18.8</td>
<td>f 22</td>
<td>f 7.1</td>
<td>f 1.3</td>
<td>2.15</td>
<td>.96</td>
</tr>
<tr>
<td>17e</td>
<td>Discuss course content with peers outside of class</td>
<td>f 2.3</td>
<td>f 16.1</td>
<td>f 47.3</td>
<td>f 19.6</td>
<td>f 35</td>
<td>f 1.9</td>
<td>f 5.1</td>
<td>2.34</td>
<td>1.10</td>
</tr>
<tr>
<td>17f</td>
<td>Study with other peers</td>
<td>f 14.6</td>
<td>f 22.3</td>
<td>f 30.4</td>
<td>f 16.5</td>
<td>f 24</td>
<td>f 7.8</td>
<td>f 15</td>
<td>4.9</td>
<td>1.51</td>
</tr>
<tr>
<td>17g</td>
<td>Tutor another peer</td>
<td>f 54.8</td>
<td>f 70.2</td>
<td>f 22.4</td>
<td>f 18.9</td>
<td>f 8</td>
<td>f 2.6</td>
<td>f 1.0</td>
<td>0.3</td>
<td>0</td>
</tr>
<tr>
<td>17h</td>
<td>Are tutored by peers</td>
<td>f 56.1</td>
<td>f 67.2</td>
<td>f 21.6</td>
<td>f 18.4</td>
<td>f 10</td>
<td>f 3.2</td>
<td>f 0</td>
<td>2 0.6</td>
<td>0</td>
</tr>
</tbody>
</table>
In Table 6 concerning Q18 perceptions with the types of interactions, 42.9% of respondents rarely \( n = 68, 21.9\% \) or do not meet \( n = 65, 21\% \) with an advisor concerning medical school with only 4.8% almost always meeting with an advisor. However, respondents claimed higher interactions with student groups. Q18g noted 64.4% had often \( n = 113, 36.6\% \) or almost always \( n = 86, 27.8\% \) interacted with student groups, Q18i revealed 59.3% had often \( n = 75, 24.3\% \) or almost always \( n = 108, 35\% \) been an officer within the Student National Medical Association (SNMA), and Q18h demonstrated that 48.9% had often \( n = 73, 23.8\% \) or almost always \( n = 77, 25.1\% \) served as an officer of a student organization other than SNMA. As for academics, 214 (70.2%) of the respondents almost always attended classes or watched/heard lectures and 190 (61.5%) almost always attended labs.
Table 6

*Descriptive Statistics for Perceptions with Types of Interactions*

<table>
<thead>
<tr>
<th>Item #</th>
<th>Item Description</th>
<th>1 Not at All</th>
<th>2 Rarely</th>
<th>3 Sometimes</th>
<th>4 Often</th>
<th>5 Almost Always</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>18a</td>
<td>Been in professor’s home</td>
<td>119</td>
<td>38.3</td>
<td>73</td>
<td>23.5</td>
<td>86</td>
<td>28</td>
<td>9.0</td>
</tr>
<tr>
<td>18b</td>
<td>Met with advisor</td>
<td>65</td>
<td>21.0</td>
<td>68</td>
<td>21.9</td>
<td>117</td>
<td>45</td>
<td>14.5</td>
</tr>
<tr>
<td>18c</td>
<td>Sought faculty mentor</td>
<td>66</td>
<td>21.3</td>
<td>56</td>
<td>18.1</td>
<td>105</td>
<td>62</td>
<td>20.0</td>
</tr>
<tr>
<td>18d</td>
<td>Sought staff mentor</td>
<td>109</td>
<td>35.5</td>
<td>73</td>
<td>23.8</td>
<td>63</td>
<td>44</td>
<td>14.3</td>
</tr>
<tr>
<td>18e</td>
<td>Engaged faculty during class</td>
<td>28</td>
<td>9.1</td>
<td>92</td>
<td>29.8</td>
<td>113</td>
<td>56</td>
<td>18.1</td>
</tr>
<tr>
<td>18f</td>
<td>Interacted with groups besides SNMA</td>
<td>4</td>
<td>1.3</td>
<td>31</td>
<td>10.1</td>
<td>112</td>
<td>404</td>
<td>13.8</td>
</tr>
<tr>
<td>18g</td>
<td>Interacted with student groups</td>
<td>6</td>
<td>1.9</td>
<td>20</td>
<td>6.5</td>
<td>84</td>
<td>113</td>
<td>36.6</td>
</tr>
<tr>
<td>18h</td>
<td>Was officer in non-SNMA student groups</td>
<td>78</td>
<td>25.4</td>
<td>32</td>
<td>10.4</td>
<td>47</td>
<td>153</td>
<td>23.8</td>
</tr>
<tr>
<td>18i</td>
<td>Was officer within SNMA</td>
<td>79</td>
<td>25.6</td>
<td>11</td>
<td>3.6</td>
<td>36</td>
<td>175</td>
<td>24.3</td>
</tr>
<tr>
<td>18j</td>
<td>Studied within student groups</td>
<td>58</td>
<td>18.8</td>
<td>77</td>
<td>24.9</td>
<td>83</td>
<td>26.9</td>
<td>67</td>
</tr>
<tr>
<td>18k</td>
<td>Attended labs</td>
<td>8</td>
<td>2.6</td>
<td>9</td>
<td>2.9</td>
<td>32</td>
<td>10.4</td>
<td>70</td>
</tr>
<tr>
<td>18l</td>
<td>Attended classes/lectures</td>
<td>2</td>
<td>0.7</td>
<td>11</td>
<td>3.6</td>
<td>18</td>
<td>5.9</td>
<td>60</td>
</tr>
</tbody>
</table>
In Table 7, Q19 concerning perceptions of faculty interactions revealed that all parts of the question had a majority of respondents selecting sometimes, often or almost always when asked about how often they interacted with faculty. However, there were items that had a majority marked as often or almost always. This included 57.6% of respondents for Q19a that felt encouraged to finish by faculty often (n = 89, 28.8%) or almost always (n = 89, 28.8%). Respondents revealed for Q19h that 58.3% were intellectually challenged often (n = 72, 23.3%) or almost always (n = 108, 35%) and 52.4% believed for Q19i that they were provided an opportunity to discuss course work outside of class often (n = 77, 24.9%) or almost always (n = 85, 27.5%). On the other hand, 43.8% of respondents revealed that they rarely (n = 70, 22.7%) or have not received feedback (n = 65, 21.1%) from faculty on their academic work (Q19g) and 42.2% of the respondents rarely (n = 76, 24.7%) or have not received help (n = 54, 17.5%) with their study skills from faculty (Q19f).
<table>
<thead>
<tr>
<th>Item #</th>
<th>Item Description</th>
<th>1 Not at All</th>
<th>2 Rarely</th>
<th>3 Sometimes</th>
<th>4 Often</th>
<th>5 Almost Always</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>f</td>
<td>%</td>
<td>f</td>
<td>%</td>
<td>f</td>
<td>f</td>
<td>%</td>
</tr>
<tr>
<td>19a</td>
<td>Encouragement to finish</td>
<td>24</td>
<td>7.8</td>
<td>47</td>
<td>15.2</td>
<td>60</td>
<td>19.4</td>
<td>89</td>
</tr>
<tr>
<td>19b</td>
<td>Opportunity to work on research</td>
<td>42</td>
<td>13.5</td>
<td>60</td>
<td>19.4</td>
<td>85</td>
<td>27.4</td>
<td>54</td>
</tr>
<tr>
<td>19c</td>
<td>Advice about medical program</td>
<td>26</td>
<td>8.4</td>
<td>49</td>
<td>15.8</td>
<td>108</td>
<td>34.8</td>
<td>58</td>
</tr>
<tr>
<td>19d</td>
<td>Emotional support</td>
<td>30</td>
<td>9.7</td>
<td>60</td>
<td>19.4</td>
<td>95</td>
<td>30.6</td>
<td>61</td>
</tr>
<tr>
<td>19e</td>
<td>Recommendation letter</td>
<td>81</td>
<td>26.5</td>
<td>31</td>
<td>10.1</td>
<td>64</td>
<td>20.9</td>
<td>57</td>
</tr>
<tr>
<td>19f</td>
<td>Help with study skills</td>
<td>54</td>
<td>17.5</td>
<td>76</td>
<td>24.7</td>
<td>90</td>
<td>29.2</td>
<td>26</td>
</tr>
<tr>
<td>19g</td>
<td>Feedback on academic work</td>
<td>65</td>
<td>21.1</td>
<td>70</td>
<td>22.7</td>
<td>84</td>
<td>27.3</td>
<td>31</td>
</tr>
<tr>
<td>19h</td>
<td>Intellectual challenge</td>
<td>16</td>
<td>5.2</td>
<td>34</td>
<td>11.0</td>
<td>79</td>
<td>25.6</td>
<td>72</td>
</tr>
<tr>
<td>19i</td>
<td>Opportunity to discuss coursework</td>
<td>25</td>
<td>8.1</td>
<td>46</td>
<td>14.9</td>
<td>76</td>
<td>24.6</td>
<td>77</td>
</tr>
<tr>
<td></td>
<td>outside of class</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19j</td>
<td>Help obtain professional goals</td>
<td>31</td>
<td>10.0</td>
<td>56</td>
<td>18.1</td>
<td>86</td>
<td>27.8</td>
<td>54</td>
</tr>
</tbody>
</table>
Q21 listed in Table 8 focused on the perceptions of interactions respondents have with the Student National Medical Association (SNMA). Respondents felt that SNMA assisted the strongest in two of the five areas including 80.4% in Q21c agreeing ($n = 136, \, 43.9\%$) or strongly agreeing ($n = 113, \, 36.5\%$) that SNMA helped with socializing with students and 65.6% in Q21e agreeing ($n = 102, \, 32.8\%$) or strongly agreeing ($n = 102, \, 32.8\%$) that SNMA provided them with a sense of belonging. For the lowest ranked among the segments, 25.7% of respondents for Q21a disagreed ($n = 53, \, 17\%$) or strongly disagreed ($n = 27, \, 8.7\%$) that SNMA helps with academics (Q21a).
<table>
<thead>
<tr>
<th>Item #</th>
<th>Item Description</th>
<th>1 Strongly Disagree</th>
<th>2 Disagree</th>
<th>3 Neutral</th>
<th>4 Agree</th>
<th>5 Strongly Agree</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>f</td>
<td>%</td>
<td>f</td>
<td>%</td>
<td>f</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>SNMA Assistance with Involvement</td>
<td>21</td>
<td>8.7</td>
<td>53</td>
<td>17.0</td>
<td>128</td>
<td>41.2</td>
<td>78</td>
</tr>
<tr>
<td>a</td>
<td>Academically</td>
<td>27</td>
<td>8.7</td>
<td>53</td>
<td>17.0</td>
<td>128</td>
<td>41.2</td>
<td>78</td>
</tr>
<tr>
<td>b</td>
<td>Mentorship</td>
<td>23</td>
<td>7.4</td>
<td>24</td>
<td>7.7</td>
<td>74</td>
<td>23.9</td>
<td>117</td>
</tr>
<tr>
<td>c</td>
<td>Socializing with Students</td>
<td>14</td>
<td>4.5</td>
<td>4</td>
<td>1.3</td>
<td>43</td>
<td>13.9</td>
<td>136</td>
</tr>
<tr>
<td>d</td>
<td>Socializing with outside community</td>
<td>15</td>
<td>4.8</td>
<td>20</td>
<td>6.4</td>
<td>73</td>
<td>23.5</td>
<td>116</td>
</tr>
<tr>
<td>e</td>
<td>Sense of belonging</td>
<td>18</td>
<td>5.8</td>
<td>14</td>
<td>4.5</td>
<td>75</td>
<td>24.1</td>
<td>102</td>
</tr>
</tbody>
</table>
Table 9 for Q25 included the respondent’s perceived challenges to their medical degree. The most noted perceived challenges for degree completion were Q25e concerning cultural diversity among faculty with nearly 50% of respondents agreeing ($n = 96, 31.4\%$) or strongly agreeing ($n = 55, 18\%$) and Q25b financial resources with 38.2% of respondents agreeing ($n = 62, 20.4\%$) or strongly agreeing ($n = 54, 17.8\%$). The least perceived challenges for degree completion were Q25c social connectedness to peers with 56.2% stating that they disagree ($n = 102, 33.3\%$) or strongly disagree ($n = 70, 22.9\%$) and Q25i tutoring access with 54.3% disagreeing ($n = 91, 30.3\%$) or strongly disagreeing ($n = 72, 24\%$).
Table 9

Descriptive Statistics for Perceived Degree Challenges

<table>
<thead>
<tr>
<th>Item #</th>
<th>Item Description</th>
<th>1 Strongly Disagree</th>
<th>2 Disagree</th>
<th>3 Neutral</th>
<th>4 Agree</th>
<th>5 Strongly Agree</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>f</td>
<td>%</td>
<td>f</td>
<td>%</td>
<td>f</td>
<td>%</td>
<td>f</td>
</tr>
<tr>
<td>25</td>
<td>Challenge toward degree completion</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a</td>
<td>Academic preparedness</td>
<td>64</td>
<td>21.3</td>
<td>84</td>
<td>27.9</td>
<td>49</td>
<td>16.3</td>
<td>76</td>
</tr>
<tr>
<td>b</td>
<td>Financial resources</td>
<td>62</td>
<td>20.4</td>
<td>79</td>
<td>26.0</td>
<td>47</td>
<td>15.5</td>
<td>62</td>
</tr>
<tr>
<td>c</td>
<td>Social connectedness to peers</td>
<td>70</td>
<td>22.9</td>
<td>102</td>
<td>33.3</td>
<td>60</td>
<td>19.6</td>
<td>50</td>
</tr>
<tr>
<td>d</td>
<td>Peer cultural diversity</td>
<td>54</td>
<td>17.7</td>
<td>82</td>
<td>26.9</td>
<td>63</td>
<td>20.7</td>
<td>64</td>
</tr>
<tr>
<td>e</td>
<td>Faculty cultural diversity</td>
<td>38</td>
<td>12.4</td>
<td>63</td>
<td>20.6</td>
<td>54</td>
<td>17.6</td>
<td>96</td>
</tr>
<tr>
<td>f</td>
<td>Staff cultural diversity</td>
<td>44</td>
<td>14.5</td>
<td>81</td>
<td>26.6</td>
<td>70</td>
<td>23.0</td>
<td>68</td>
</tr>
<tr>
<td>g</td>
<td>Community member social support</td>
<td>58</td>
<td>19.1</td>
<td>87</td>
<td>28.7</td>
<td>93</td>
<td>30.7</td>
<td>42</td>
</tr>
<tr>
<td>h</td>
<td>Retention program availability</td>
<td>59</td>
<td>19.3</td>
<td>82</td>
<td>26.9</td>
<td>85</td>
<td>27.9</td>
<td>44</td>
</tr>
<tr>
<td>i</td>
<td>Tutoring access</td>
<td>72</td>
<td>24.0</td>
<td>91</td>
<td>30.3</td>
<td>63</td>
<td>21.0</td>
<td>49</td>
</tr>
</tbody>
</table>
Q24 noted in Table 10 included the current satisfaction of respondents with their academic medical institution (AMI). This question revealed that most respondents were currently satisfied with their medical schools with at least 70.6% stating that they either were very satisfied or somewhat satisfied in all seven provided categories. However, the two strongest areas of satisfaction included Q24c student interaction yielding 81.7% either somewhat satisfied \((n = 99, 32.5\%)\) or very satisfied \((n = 150, 49.2\%)\) and Q24g overall AMI experience demonstrating 81.1% of respondents either somewhat satisfied \((n = 134, 43.6\%)\) or very satisfied \((n = 115, 37.5\%)\). The least amount of satisfaction was noted in Q24f campus social activity availability with 15.1% either somewhat dissatisfied \((n = 32, 10.5\%)\) or very dissatisfied \((n = 14, 4.6\%)\).
Table 10

*Descriptive Statistics for Satisfaction Rate with Academic Medical Institution*

<table>
<thead>
<tr>
<th>Item #</th>
<th>Item Description</th>
<th>1 Very Dissatisfied</th>
<th>2 Somewhat Dissatisfied</th>
<th>3 Neither Satisfied nor Dissatisfied</th>
<th>4 Somewhat Satisfied</th>
<th>5 Very Satisfied</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>f</td>
<td>%</td>
<td>f</td>
<td>%</td>
<td>f</td>
<td>%</td>
<td>f</td>
</tr>
<tr>
<td>24a</td>
<td>Amount of faculty contact</td>
<td>6</td>
<td>2</td>
<td>26</td>
<td>8.5</td>
<td>38</td>
<td>12.4</td>
<td>122</td>
</tr>
<tr>
<td>24b</td>
<td>Class size</td>
<td>8</td>
<td>2.6</td>
<td>17</td>
<td>5.5</td>
<td>51</td>
<td>16.6</td>
<td>94</td>
</tr>
<tr>
<td>24c</td>
<td>Student interaction</td>
<td>9</td>
<td>3.0</td>
<td>18</td>
<td>5.9</td>
<td>29</td>
<td>9.5</td>
<td>99</td>
</tr>
<tr>
<td>24d</td>
<td>Overall instruction quality</td>
<td>11</td>
<td>3.6</td>
<td>31</td>
<td>10.2</td>
<td>23</td>
<td>7.5</td>
<td>155</td>
</tr>
<tr>
<td>24e</td>
<td>Overall sense of community</td>
<td>22</td>
<td>7.2</td>
<td>39</td>
<td>12.7</td>
<td>29</td>
<td>9.5</td>
<td>100</td>
</tr>
<tr>
<td>24f</td>
<td>Campus social activity availability</td>
<td>14</td>
<td>4.6</td>
<td>32</td>
<td>10.5</td>
<td>45</td>
<td>14.7</td>
<td>112</td>
</tr>
<tr>
<td>24g</td>
<td>Overall academic medical institution experience</td>
<td>14</td>
<td>4.6</td>
<td>21</td>
<td>6.8</td>
<td>23</td>
<td>7.5</td>
<td>134</td>
</tr>
</tbody>
</table>
Q22 asked respondents if they would still choose to enroll at their current institution if they could make their medical school choice over. Answer options included 4 = definitely yes, 3 = probably yes, 2 = probably no, and 1 = definitely no. In line with the noted 70.6% positive satisfaction rate with their campus experiences, only 16% of respondents answered that they would not enroll in their academic medical institution if provided a choice to select the school again. The mode was 4, median 3.0, mean 3.19, and standard deviation was .861.

The dependent variable measuring the student’s intent to remain at their academic medical institution (Q23) addressed the output segment of Astin’s Input-Environment-Output (I-E-O) model and utilized a scale ranging from “0” being “No Chance of Staying” to “10” being “Highest Likely Chance of Staying”. Eighty-four percent of respondents selected “10” revealing that they believed that they were at the highest level of chance to remain. The mode was 10, the median was 10.00, the mean was 9.39, and the standard deviation was 1.951.

Research Question One

Do background characteristics of minority medical students predict their intent to remain at their academic medical institution?

Respondents were asked for information about their ethnicity, gender, age, their educational experience prior to medical school, the educational level of their parents, and what were their important motivating factors attend into medical school. Outlined in earlier chapters, student background questions were considered the input portion of Astin’s Input-Environment-Output (I-E-O) model and the dependent variable of the student’s intent to remain is considered the output portion of the model.

Concerning the student background variable questions, Q14 revealed that more than three quarters of the respondents were female and Q13 demonstrated that nearly 84 % of all
respondents were African American. For the regression analysis, the two participating groups of African Americans born in the US (68%) and the 46 born outside the US (14.8%) were entered separately as well as a combined variable of 259 participants (83.5%). To incorporate Latino descent into the multiple regression, the Latino/Mexican Americans \((n = 12, 3.9\%)\), the Puerto Rican \((n = 4, 1.3\%)\), and Other Latino \((n = 12, 3.9\%)\) categories were combined \((n = 28, 9.1\%)\) for the regression analysis. Whites \((n = 11, 3.5\%)\), Asians \((n = 7, 2.3\%)\), and Pacific Islanders \((n = 4, 1.3\%)\) were also included. Since only one participant identified as Native American, this group was not appropriately represented and was not included in the multiple regression analysis.

Prior course experience at the institution and whether a degree was obtained by the student was part of the student background characteristics. Two hundred and sixty-three participants (83%) had no prior course experience at their institution before entering their medical program and 29 participants (14%) had obtained a degree from their institution.

Table 11 includes the mean and standard deviation for the remaining variables that were considered background characteristics. Q7 MCAT Scores and Q8 Undergraduate GPA were structured to receive open numeric responses. As stated before, the scale for Q10 and Q11 concerning the respondent’s parental educational level included 1 = grammar school or less, 2 = some high school, 3 = postsecondary school other than college, 4 = some college, 5 = 2-year degree, 6 = 4-year degree, 7 = some graduate school, and 8 = graduate degree other than a medical degree. A dichotomous variable of 1 = no and 2 = yes was recreated for the question if a parent had obtained a medical degree. The scale for Q12 concerning most important reasons to attend medical school included 0 = not important, 1 = somewhat important, and 2 = very important.
Table 11

**Student Characteristics Variable Block**

<table>
<thead>
<tr>
<th>Item #</th>
<th>Item Description</th>
<th>Scale</th>
<th>$M$</th>
<th>$SD$</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>MCAT Score</td>
<td>Open</td>
<td>26.68</td>
<td>6.14</td>
</tr>
<tr>
<td>8</td>
<td>Undergraduate GPA</td>
<td>Open</td>
<td>3.21</td>
<td>.412</td>
</tr>
<tr>
<td>10</td>
<td>Father’s highest educational level</td>
<td>1-8</td>
<td>5.36</td>
<td>2.36</td>
</tr>
<tr>
<td>10</td>
<td>Father is a medical doctor</td>
<td>1-2</td>
<td>1.40</td>
<td>.49</td>
</tr>
<tr>
<td>11</td>
<td>Mother’s highest educational level</td>
<td>1-8</td>
<td>5.10</td>
<td>2.88</td>
</tr>
<tr>
<td>11</td>
<td>Mother is a medical doctor</td>
<td>1-2</td>
<td>1.28</td>
<td>.45</td>
</tr>
<tr>
<td>12a</td>
<td>Parents wanted me to go to medical school</td>
<td>0-2</td>
<td>.40</td>
<td>.58</td>
</tr>
<tr>
<td>12b</td>
<td>Always wanted to go to medical school</td>
<td>0-2</td>
<td>1.63</td>
<td>.63</td>
</tr>
<tr>
<td>12c</td>
<td>Wanted to help others</td>
<td>0-2</td>
<td>1.88</td>
<td>.36</td>
</tr>
<tr>
<td>12d</td>
<td>Wanted to help others that look like me</td>
<td>0-2</td>
<td>1.43</td>
<td>.73</td>
</tr>
<tr>
<td>12e</td>
<td>Was encouraged by a mentor/role model</td>
<td>0-2</td>
<td>.82</td>
<td>.76</td>
</tr>
<tr>
<td>12f</td>
<td>Wanted to make more money</td>
<td>0-2</td>
<td>.75</td>
<td>.68</td>
</tr>
<tr>
<td>12g</td>
<td>Was influenced by elementary school program</td>
<td>0-2</td>
<td>.19</td>
<td>.46</td>
</tr>
<tr>
<td>12h</td>
<td>Was influenced by high school program</td>
<td>0-2</td>
<td>.60</td>
<td>.78</td>
</tr>
<tr>
<td>12i</td>
<td>Was influenced by an undergraduate program</td>
<td>0-2</td>
<td>.88</td>
<td>.83</td>
</tr>
</tbody>
</table>

A stepwise multiple regression was conducted to determine which independent variables (MCAT score, undergraduate GPA, gender, age, prior course experience at the institution, if institutional degree attainment, parents educational level, ethnicity and motivating reasons to attend medical school) predicted a student’s intent to remain at the academic medical institution. For the regression, a dichotomous variable of $1 = no$ and $2 = yes$ was created for each of the ethnicity options. Regression results indicate one variable (Q13 African American ethnicity, both born in and outside the US) significantly predicts intent to remain; $R = .177$, $R^2 = .031$, $R^2_{adj} = .026$, $F(1, 180) = 5.814$, $p < .017$. This model accounted for 3.1% of variance in intent to remain. The unstandardized coefficient ($B$) is .891 and the standardized coefficient (beta or $\beta$) is .177. In summary, respondents who are African American descent born in or outside the US were found to be more likely to remain in medical school. This ethnicity-related predictor was the only statistically significant factor out of the total 26 student background variables.
Research Question Two

Do institutional characteristics predict the intent to remain for minority medical students at their academic medical institution?

For block two concerning institutional characteristics, predictors included those that occur between institutions (IPEDS database of institutional control, historically black, tribal school, religious affiliation, medical tuition, total enrollment, and percentages of African American, Hispanic, Women, White, and Native American), those variables within AMIs (perceived challenges with finances, academic preparedness, cultural diversity among peers, cultural diversity among faculty, cultural diversity among staff, availability of retention programs, tutoring services, social connectedness among students, student’s attendance habits and current perceptions of satisfaction with their academic medical institution), and intermediate educational outcomes (satisfaction with contact, class size, student interaction, quality of instruction, communication among students, overall academic medical institutional (AMI) experience, current GPA, and if the student would select the AMI again if provided a choice).

Descriptive analysis including the mean and standard deviation for each of the 36 variables occurring between institutions, within institutions, and intermediate educational outcomes utilized for this research question can be found in Table 12. For variables between institutions, an open numeric response format was utilized for the current GPA and the latest Integrated Post-secondary Education Data System (IPEDS) information collected by the National Center for Educational Statistics (NCES) Education Statistics including medical tuition costs and percentages of student ethnicity characteristics. For IPEDS variables that identified the type of institution (historically black, private institution, religiously affiliated, tribal institution), a scale of $1 = no, 2 = yes$ was utilized.
For variables within institutions, Q3 concerning the respondent’s year of medical school, the scale was comprised of 1 = first year, 2 = second year, 3 = third year, 4 = fourth year, 5 = fifth year, 6 = sixth year, and 7 = residency and intern status. For Q16 inquiring what the best chances the respondent would have a series of interactions utilized a scale range from 1 = no chance to 4 = very good chance. Q18 asked how often the respondent has different types of interactions with a scale range from 1 = not at all to 5 = almost always. For the last variable within institutions, respondents ranked how strongly they felt certain factors challenged their medical degree completion and selection options ranged from 1 = strongly disagree to 5 = strongly agree.

Concerning intermediate educational outcomes, respondents were provided an open-ended question format for Q9 Current GPA. For Q22 about if the respondent would select the institution again, the scale comprised of 1 = definitely no, 2 = probably no, 3 = probably yes, and 4 = definitely yes. Q24 contained inquiries about satisfaction with campus life and utilized a scale range from 1 = very dissatisfied to 5 = very satisfied.
Table 12

*Environment Institutional Characteristics Variable Blocks*

<table>
<thead>
<tr>
<th>Blocks</th>
<th>Item #</th>
<th>Item Description</th>
<th>Scale</th>
<th>$M$</th>
<th>$SD$</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Between</em></td>
<td>IPEDS Control Type of Private</td>
<td>1-2</td>
<td>1.50</td>
<td>.50</td>
<td></td>
</tr>
<tr>
<td>IPEDS Historically Black Institution</td>
<td>1-2</td>
<td>1.10</td>
<td>.30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IPEDS Tribal (Native American) Institution</td>
<td>1-2</td>
<td>1.00</td>
<td>.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IPEDS Religious Affiliation</td>
<td>1-2</td>
<td>1.09</td>
<td>.28</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IPEDS Medical Tuition 2006</td>
<td>Open</td>
<td>$27,192$</td>
<td>$9,293$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IPEDS Total Enrollment 2006</td>
<td>Open</td>
<td>15,064</td>
<td>12,546</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IPEDS Female Percent 2006</td>
<td>Open</td>
<td>55.94%</td>
<td>6.78%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IPEDS African American Percent 2006</td>
<td>Open</td>
<td>14.93%</td>
<td>21.16%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IPEDS Hispanic Percent 2006</td>
<td>Open</td>
<td>5.4%</td>
<td>8.43%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IPEDS Caucasian Percent 2006</td>
<td>Open</td>
<td>55.08%</td>
<td>21.40%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IPEDS Native American Percent 2006</td>
<td>Open</td>
<td>.34%</td>
<td>.50%</td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Within</em></td>
<td>3</td>
<td>Medical School Year</td>
<td>1-7</td>
<td>2.92</td>
<td>1.45</td>
</tr>
<tr>
<td>16a</td>
<td>Chances for needed extra time</td>
<td>1-4</td>
<td>1.84</td>
<td>1.06</td>
<td></td>
</tr>
<tr>
<td>16b</td>
<td>Chances for choice of residency</td>
<td>1-4</td>
<td>3.56</td>
<td>.57</td>
<td></td>
</tr>
<tr>
<td>16e</td>
<td>Chances to be satisfied with AMI</td>
<td>1-4</td>
<td>3.44</td>
<td>.70</td>
<td></td>
</tr>
<tr>
<td>16f</td>
<td>Chances for residency close to AMI</td>
<td>1-4</td>
<td>2.65</td>
<td>.93</td>
<td></td>
</tr>
<tr>
<td>18k</td>
<td>Often Attended Labs</td>
<td>1-5</td>
<td>4.38</td>
<td>.96</td>
<td></td>
</tr>
<tr>
<td>18l</td>
<td>Often Attended Class/Heard Lecture</td>
<td>1-5</td>
<td>4.55</td>
<td>.81</td>
<td></td>
</tr>
<tr>
<td>25a</td>
<td>Academic preparedness challenge</td>
<td>1-5</td>
<td>2.73</td>
<td>1.30</td>
<td></td>
</tr>
<tr>
<td>25b</td>
<td>Financial resource challenge</td>
<td>1-5</td>
<td>2.89</td>
<td>1.41</td>
<td></td>
</tr>
<tr>
<td>25c</td>
<td>Connectedness to peers challenge</td>
<td>1-5</td>
<td>2.53</td>
<td>1.22</td>
<td></td>
</tr>
<tr>
<td>25d</td>
<td>Peer cultural diversity challenge</td>
<td>1-5</td>
<td>2.86</td>
<td>1.31</td>
<td></td>
</tr>
<tr>
<td>25e</td>
<td>Faculty cultural diversity challenge</td>
<td>1-5</td>
<td>3.22</td>
<td>1.30</td>
<td></td>
</tr>
<tr>
<td>25f</td>
<td>Staff cultural diversity challenge</td>
<td>1-5</td>
<td>2.94</td>
<td>1.27</td>
<td></td>
</tr>
<tr>
<td>25g</td>
<td>Community social support challenge</td>
<td>1-5</td>
<td>2.62</td>
<td>1.16</td>
<td></td>
</tr>
<tr>
<td>25h</td>
<td>Retention programming challenge</td>
<td>1-5</td>
<td>2.72</td>
<td>1.25</td>
<td></td>
</tr>
<tr>
<td>25i</td>
<td>Tutoring access challenge</td>
<td>1-5</td>
<td>2.55</td>
<td>1.25</td>
<td></td>
</tr>
<tr>
<td><em>Intermediate Outcome</em></td>
<td>9</td>
<td>Current GPA</td>
<td>Open</td>
<td>3.19</td>
<td>1.04</td>
</tr>
<tr>
<td>22</td>
<td>Select institution first again</td>
<td>1-4</td>
<td>3.19</td>
<td>.86</td>
<td></td>
</tr>
<tr>
<td>24a</td>
<td>Satisfied amount of faculty contact</td>
<td>1-5</td>
<td>4.02</td>
<td>1.01</td>
<td></td>
</tr>
<tr>
<td>24b</td>
<td>Class size satisfaction</td>
<td>1-5</td>
<td>4.09</td>
<td>1.03</td>
<td></td>
</tr>
<tr>
<td>24c</td>
<td>Student interaction satisfaction</td>
<td>1-5</td>
<td>4.19</td>
<td>1.03</td>
<td></td>
</tr>
<tr>
<td>24d</td>
<td>Current instruction quality satisfaction</td>
<td>1-5</td>
<td>3.89</td>
<td>1.04</td>
<td></td>
</tr>
<tr>
<td>24e</td>
<td>Current sense of community satisfied</td>
<td>1-5</td>
<td>3.81</td>
<td>1.27</td>
<td></td>
</tr>
<tr>
<td>24f</td>
<td>Campus social availability satisfaction</td>
<td>1-5</td>
<td>3.84</td>
<td>1.14</td>
<td></td>
</tr>
<tr>
<td>24g</td>
<td>Current overall institution experience satisfaction</td>
<td>1-5</td>
<td>4.03</td>
<td>1.07</td>
<td></td>
</tr>
</tbody>
</table>
A stepwise multiple regression was conducted to determine which independent variables noted in Table 13 predicted a student’s intent to remain at the academic medical institution. Regression results indicate one variable (Q24g Satisfaction with overall academic medical institution experience) significantly predicts intent to remain; $R = .478$, $R^2 = .229$, $R^2_{adj} = .218$, $F(1,76) = 22.511$, $p < .000$. This variable accounted for 22.9% of variance in intent to remain. The unstandardized coefficient ($B$) is .875 and the standardized coefficient (beta or $\beta$) is .478.

Among the 36 variables including predictors between institutions, within institutions and intermediate educational outcomes, only the level of student satisfaction with the medical school experience significantly predicted the intent to remain at that medical institution.

Research Question Three

Do student-to-faculty interactions predict minority medical students’ intent to remain at their academic medical institution?

Independent variables for student-to-faculty were how often students met with advisors, sought mentoring, engaged with professors in and out of the classroom, received advice, felt emotional support and encouragement, and the number of hours discussing both personal and academic issues with faculty. Table 13 contains descriptive analysis for student-to-faculty predictors. The scale for question 16 regarding if respondents regularly communicated with professors included the scale of $1 = no \ chance$, $2 = very \ little \ chance$, $3 = some \ chance$, and $4 = very \ good \ chance$. For question 17 concerning the amount of time respondents talked with faculty about course content or personal issues, the scale was $0 = none$, $1 = less \ than \ 1 \ hour$, $2 = 1-4 \ hours$, $3 = 5-9 \ hours$, $4 = 10-15 \ hours$, $5 = 16-20 \ hours$, and $6 = more \ than \ 20 \ hours$. For question 18 and question 19 concerning different types of faculty interactions, the scale was comprised of $1 = not \ at \ all$, $2 = rarely$, $3 = sometimes$, $4 = often$, and $5 = almost \ always$. 
Table 13

**Student-to-Faculty Variable Block**

<table>
<thead>
<tr>
<th>Item #</th>
<th>Item Description</th>
<th>Scale</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>16c</td>
<td>Communicate regularly with professors</td>
<td>1-4</td>
<td>3.17</td>
<td>.79</td>
</tr>
<tr>
<td>17a</td>
<td>Talk with faculty about course content</td>
<td>0-6</td>
<td>1.21</td>
<td>.85</td>
</tr>
<tr>
<td>17b</td>
<td>Talk with faculty about personal issues</td>
<td>0-6</td>
<td>.93</td>
<td>.80</td>
</tr>
<tr>
<td>18a</td>
<td>Been in professor’s home</td>
<td>1-5</td>
<td>1.28</td>
<td>.45</td>
</tr>
<tr>
<td>18b</td>
<td>Met with advisor</td>
<td>1-5</td>
<td>2.12</td>
<td>1.07</td>
</tr>
<tr>
<td>18c</td>
<td>Sought faculty mentor</td>
<td>1-5</td>
<td>2.60</td>
<td>1.12</td>
</tr>
<tr>
<td>18d</td>
<td>Sought staff mentor</td>
<td>1-5</td>
<td>2.73</td>
<td>1.20</td>
</tr>
<tr>
<td>18e</td>
<td>Engaged faculty during class</td>
<td>1-5</td>
<td>2.31</td>
<td>1.25</td>
</tr>
<tr>
<td>19a</td>
<td>Encouragement to finish</td>
<td>1-5</td>
<td>3.56</td>
<td>1.26</td>
</tr>
<tr>
<td>19b</td>
<td>Opportunity to work on research</td>
<td>1-5</td>
<td>3.15</td>
<td>1.34</td>
</tr>
<tr>
<td>19c</td>
<td>Advice about medical program</td>
<td>1-5</td>
<td>3.31</td>
<td>1.22</td>
</tr>
<tr>
<td>19d</td>
<td>Emotional support</td>
<td>1-5</td>
<td>3.22</td>
<td>1.25</td>
</tr>
<tr>
<td>19e</td>
<td>Recommendation letter</td>
<td>1-5</td>
<td>3.03</td>
<td>1.52</td>
</tr>
<tr>
<td>19f</td>
<td>Help with study skills</td>
<td>1-5</td>
<td>2.89</td>
<td>1.35</td>
</tr>
<tr>
<td>19g</td>
<td>Feedback on academic work</td>
<td>1-5</td>
<td>2.83</td>
<td>1.38</td>
</tr>
<tr>
<td>19h</td>
<td>Intellectual challenge</td>
<td>1-5</td>
<td>3.72</td>
<td>1.20</td>
</tr>
<tr>
<td>19i</td>
<td>Opportunity to discuss course-work outside of class</td>
<td>1-5</td>
<td>3.49</td>
<td>1.26</td>
</tr>
<tr>
<td>19j</td>
<td>Help obtain professional goals</td>
<td>1-5</td>
<td>3.32</td>
<td>1.31</td>
</tr>
</tbody>
</table>

A stepwise multiple regression was conducted to determine which independent variables (how often students met with advisors, sought mentoring, engaged with professors in and out of the classroom, received advice, felt emotional support and encouragement, and the number of hours discussing both personal and academic issues with faculty) predicted a student’s intent to remain at the academic medical institution. Regression results indicate two variables (Q19c How often faculty provided guidance about the medical program and Q18d How often students sought a staff mentor) when placed together in a model significantly predicts intent to remain; $R^2 = .084$, $R^2_{adj} = .078$, $F(2,297) = 13.636, p < .000$. This model accounts for 8.4% of variance with the dependent variable intent to remain. A summary of the regression model is presented in Table
14. In addition, unstandardized \((B)\) and standardized coefficients (beta or \(\beta\)) are presented in Table 15. In summary, the data indicated that the higher amount of interaction with faculty providing medical career combined with how often respondents sought out staff for mentoring opportunities significantly predicted the respondent’s intent to remain at that medical institution.

Table 14

*Model Summary for Research Question 3*

<table>
<thead>
<tr>
<th>Step</th>
<th>(R)</th>
<th>(R^2)</th>
<th>(R^2_{adj})</th>
<th>(\Delta R^2)</th>
<th>(F_{chg})</th>
<th>(p)</th>
<th>(df_1)</th>
<th>(df_2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.27</td>
<td>.07</td>
<td>.07</td>
<td>.07</td>
<td>22.51</td>
<td>.00</td>
<td>1</td>
<td>298</td>
</tr>
<tr>
<td>2</td>
<td>.29</td>
<td>.08</td>
<td>.08</td>
<td>.01</td>
<td>4.50</td>
<td>.04</td>
<td>1</td>
<td>297</td>
</tr>
</tbody>
</table>

Table 15

*Coefficients for Research Question 3*

<table>
<thead>
<tr>
<th></th>
<th>(B)</th>
<th>(\beta)</th>
<th>(T)</th>
</tr>
</thead>
<tbody>
<tr>
<td>How often faculty</td>
<td>.71</td>
<td>.29</td>
<td>5.14**</td>
</tr>
<tr>
<td>provided medical</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>program advice</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How often student</td>
<td>-.19</td>
<td>-.12</td>
<td>-2.12*</td>
</tr>
<tr>
<td>sought staff mentor</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: ** indicates significance at \(p < .001\), * indicates significance at \(p < .05\)

Research Question Four

Do student-to-student interactions predict minority medical students’ intent to remain at their academic medical institution?

Student-to-student variables include the number of hours students engaged socially with friends, discussed academic issues with other students, studied with other students, tutored peer students, and were tutored by peer students as predictors. Table 16 contains descriptive analysis for student-to-student predictors. The scale for Q17 inquiring about the amount of time students
interacted with their peers was comprised of 0 = *none*, 1 = *less than 1 hour*, 2 = *1-4 hours*, 3 = *5-9 hours*, 4 = *10-15 hours*, 5 = *16-20 hours*, and 6 = *more than 20 hours*.

Table 16

**Student-to-Student Variable Block**

<table>
<thead>
<tr>
<th>Item #</th>
<th>Item Description</th>
<th>Scale</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>17c</td>
<td>Socialize with friends</td>
<td>0-6</td>
<td>2.72</td>
<td>1.07</td>
</tr>
<tr>
<td>17e</td>
<td>Discuss course content with peers outside of class</td>
<td>0-6</td>
<td>2.34</td>
<td>1.10</td>
</tr>
<tr>
<td>17f</td>
<td>Study with other peers</td>
<td>0-6</td>
<td>2.09</td>
<td>1.51</td>
</tr>
<tr>
<td>17g</td>
<td>Tutor another peer</td>
<td>0-6</td>
<td>.73</td>
<td>.95</td>
</tr>
<tr>
<td>17h</td>
<td>Are tutored by peers</td>
<td>0-6</td>
<td>.71</td>
<td>.95</td>
</tr>
</tbody>
</table>

A stepwise multiple regression was conducted; however, a significant model was not generated among the five student-to-student variables in predicting the student’s intent to remain.

**Research Question Five**

Does the frequency of involvement in student groups predict a minority medical students’ intent to remain at the academic medical institution?

Student-to-student group affiliation variables (students’ amount of engagement with SNMA including possible leadership participation and perceptions of assistance with academics, mentoring, social contact with others, outreach to the community, overall sense of belonging, participation with non-SNMA organized groups or clubs) were considered predictors. Table 17 contains descriptive analysis including the mean and standard deviation for student-to-student group affiliation variables. The scale for Q16 about if respondents regularly participated in student clubs/groups besides SNMA was comprised 1 = *no chance*, 2 = *very little chance*, 3 = *some chance*, and 4 = *very good chance*. For Q17 concerning the amount of time respondents participated in student clubs, the scale was 0 = *none*, 1 = *less than 1 hour*, 2 = *1-4 hours*, 3 = *5-9 hours*, 4 = *10-15 hours*, 5 = *16-20 hours*, and 6 = *more than 20 hours*. For Q18 about the types of
interactions with different student organizations, the included scale range was 1 = not at all to 5 = almost always. Q20 addressing if the respondents currently assisted with the Medical Association of Premedical Students (MAPS) provided the options of 1 = no and 2 = yes. The scale for Q21 concerning statements about the respondent’s involvement with SNMA included the scale range from 1 = strongly disagree to 5 = strongly agree.

Table 17

**Student-to-Student Group Affiliation Variable Block**

<table>
<thead>
<tr>
<th>Item #</th>
<th>Item Description</th>
<th>Scale</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>16d</td>
<td>Participate in student clubs/groups besides SNMA</td>
<td>1-4</td>
<td>3.65</td>
<td>.64</td>
</tr>
<tr>
<td>17d</td>
<td>Participate in student clubs</td>
<td>0-6</td>
<td>2.15</td>
<td>.96</td>
</tr>
<tr>
<td>18f</td>
<td>Interacted with groups besides SNMA</td>
<td>1-5</td>
<td>3.58</td>
<td>.95</td>
</tr>
<tr>
<td>18g</td>
<td>Interacted with student groups</td>
<td>1-5</td>
<td>3.82</td>
<td>.98</td>
</tr>
<tr>
<td>18h</td>
<td>Was officer in non SNMA student groups</td>
<td>1-5</td>
<td>3.13</td>
<td>1.53</td>
</tr>
<tr>
<td>18i</td>
<td>Was officer within SNMA</td>
<td>1-5</td>
<td>3.39</td>
<td>1.60</td>
</tr>
<tr>
<td>18j</td>
<td>Studied within student groups</td>
<td>1-5</td>
<td>2.75</td>
<td>1.21</td>
</tr>
<tr>
<td>20</td>
<td>Involved with MAPS Chapter</td>
<td>1-2</td>
<td>1.35</td>
<td>.48</td>
</tr>
<tr>
<td>21a</td>
<td>SNMA assists academically</td>
<td>1-5</td>
<td>3.07</td>
<td>1.04</td>
</tr>
<tr>
<td>21b</td>
<td>SNMA assists with mentorship</td>
<td>1-5</td>
<td>3.62</td>
<td>1.14</td>
</tr>
<tr>
<td>21c</td>
<td>SNMA assists with socializing with Students</td>
<td>1-5</td>
<td>4.06</td>
<td>.98</td>
</tr>
<tr>
<td>21d</td>
<td>SNMA assists with socializing with outside community</td>
<td>1-5</td>
<td>3.77</td>
<td>1.08</td>
</tr>
<tr>
<td>21e</td>
<td>SNMA assists with a sense of belonging</td>
<td>1-5</td>
<td>3.82</td>
<td>1.12</td>
</tr>
</tbody>
</table>

A stepwise multiple regression was conducted; however, a significant model was not generated among the 13 student-to-student group affiliation variables in predicting the student’s intent to remain.
Research Question Six

Which student background characteristics, institutional characteristics, or type of involvement from faculty and students best predict intent to remain at the academic medical institution?

To address research question six, two stepwise multiple regressions were conducted. The first regression analysis entered all 98 predictors from the previous five questions that had been placed in seven blocks and calculated in a multiple regression with the dependent variable of intent to remain. As stated previously, variables were placed in blocks based on Astin’s (1991) recommendation to group them and place them order of when those factors may impact a student. The blocks were input of student characteristics, environment institutional characteristics between academic medical institutions, environment institutional characteristics within an academic medical institution, student-to-faculty involvement, student-to-student involvement, student-to-student group involvement, and intermediate educational outcomes.

The second regression analysis involved three sub-scale scores created for student-to-faculty, student-to-student, student-to-student group affiliation. To accurately create the sub-scale scores from variables that had a variety of measurements, item responses were converted to z-scores and then T-scores. The mean of respective sub-scale items was calculated to generate sub-scale scores: student-to-faculty (items Q16c, Q17a, Q17b, Q18a, Q18b, Q18c, Q18d, Q18e, Q19a, Q19b, Q19c, Q19d, Q19e, Q19f, Q19g, Q19h, Q19i, Q19j), student-to-student (items Q17c, Q17e, Q17f, Q17g, Q17h), and student-to-student group affiliation (items Q16d, Q17d, Q18f, Q18g, Q18h, Q18i, Q18j, Q20, Q21a, Q21b, Q21c, Q21d, Q21e).

For both stepwise multiple regressions, similar results were produced. Regression results indicate two variables (Q16e Estimated chance of satisfaction at the academic medical institution
and Q24g Current satisfaction with overall AMI experience) combined in a model significantly predict intent to remain; $R^2 = .233$, $R^2_{adj} = .204$, $F(2,53) = 8.060$, $p < .01$. This model accounted for 23.3% of variance in intent to remain. A summary of the regression model is presented in Table 18. In addition, unstandardized ($B$) and standardized coefficients (beta or $\beta$) are presented in Table 19. Out of all 98 variables utilized in this study, respondents that stated that they would have a higher chance of satisfaction with experiences at their academic medical institutions as well as noting having a higher chance of satisfaction with experiences at their academic medical institutions combined with a higher amount of current satisfaction with experiences at their academic medical institution were the best predictors for intent to remain.

Table 18

*Model Summary for Research Question 6*

<table>
<thead>
<tr>
<th>Step</th>
<th>$R$</th>
<th>$R^2$</th>
<th>$R^2_{adj}$</th>
<th>$\Delta R^2$</th>
<th>$F_{chg}$</th>
<th>$p$</th>
<th>$df_1$</th>
<th>$df_2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.39</td>
<td>.16</td>
<td>.14</td>
<td>.16</td>
<td>9.91</td>
<td>.00</td>
<td>1</td>
<td>54</td>
</tr>
<tr>
<td>2</td>
<td>.48</td>
<td>.23</td>
<td>.20</td>
<td>.08</td>
<td>5.40</td>
<td>.02</td>
<td>1</td>
<td>53</td>
</tr>
</tbody>
</table>

Table 19

*Coefficients for Research Question 6*

<table>
<thead>
<tr>
<th></th>
<th>$B$</th>
<th>$\beta$</th>
<th>$T$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chances that will be satisfied with experiences at academic medical institution</td>
<td>.28</td>
<td>.10</td>
<td>.57**</td>
</tr>
<tr>
<td>Currently satisfied with the overall academic medical institution experience</td>
<td>.74</td>
<td>.41</td>
<td>2.33*</td>
</tr>
</tbody>
</table>

Note: ** indicates significance at $p < .01$, * indicates significance at $p < .05$
Summary

This chapter presented the characteristics of the sample including frequencies and percentages of the demographics, the descriptive statistics for each question grouped in blocks, the results of factor analyses, stepwise multiple regressions for each of the six research questions, and tables of model summaries and coefficients for those variables found to be significant predictors of an SNMA student’s intent to remain.

The stepwise multiple regression revealed significant variables and models for four of the six questions. The findings for research question one included that the student characteristic of being from an African American cultural descent born either in or outside the US best predicts intent to remain \((p < .05)\). This means that out of the 26 student background characteristics, students from African American descent tended to be more likely to remain in medical school.

For research question two, institutional characteristics with intermediate educational outcomes predicted intent to remain through satisfaction with overall academic medical institution experience \((p < .001)\). Therefore, current satisfaction with the medical school experience is the factor out of the 36 measured variables that predicted the respondent’s retention.

Research question three student-to-faculty interactions predicted intent to remain with two variables out of 18 factors combining to generate a significant model that predicts intent to remain: Q19c how often faculty provided medical program advice and Q18d how often a student sought a staff as a mentor.

Concerning research question four, student-to-student interaction did not predict intent to remain. There were five measured variables comprised of the amount of hours students interacted with their peers.
For research question five involving student-to-student group affiliation interaction, 13 variables inquiring about the amount students were involved in student groups were measured and none were found to significantly predict intent to remain.

Research question six that sought to identify which variables best predict intent to remain generated a model consisting of two items among all 98 variables: Q16e chances student will be satisfied with experiences at academic medical institution and Q24g student’s current satisfaction with overall academic medical institution experience.

In the next chapter, the researcher will provide the discussions, conclusions, and recommendations for further study.
CHAPTER V. DISCUSSIONS, CONCLUSIONS, AND RECOMMENDATIONS

Introduction

Chapter 5 discusses the research results from this study. The purpose of this research study was to examine if student and institutional characteristics as well as involvement factors influence a minority medical students’ intent to remain and which factors best predict the intent to remain at their academic medical institution (AMI).

This chapter is organized in three parts. Section one provides a review of the study and discussion of each research question results as well as observations of the open-ended answer responses. The second part includes the conclusions concerning the study results and involvement at academic medical institutions. The final section discusses recommendations for the US medical colleges’ accrediting body the Association of American Medical Colleges (AAMC), academic medical institution (AMI) senior administrators, AMI faculty and staff, student groups such as SNMA, and future researchers that study student involvement, diversity in medicine, and leadership in higher education.

Discussions

This section contains a review of the study, description of the study instrument, and discussion of each of the six research questions. The section provides discussion of the significant factors predicting intent to remain, the open-ended answer responses associated with the motivating factors to enter medical school and reasons for remaining at the current AMI, and the theoretical framework utilized to examine the intent to remain of minority medical students.

Review of the Study

There is a current shortage of physicians in the health care field and a prediction that the shortfall will grow, especially in some specialty areas (Council of Graduate Medical Education
Compounded by the shortage, recruiting and retaining medical students from culturally diverse backgrounds is a challenge to AMI leaders (COGME, 2005; Smedley, Butler, & Bristow, 2004). The AAMC recognizes the challenge among the AMI leaders and fully-funds advertising and public relations campaigns which includes the AspiringDoc.org Website to support medical colleges and encourage undergraduate minority students to enter the field of medicine. Explanation by the AAMC on the AspiringDoc.org Website for the need to have diversity among medical providers states that “while racial and ethnic minorities make up 25 percent of the United States population, only 12 percent of students graduated from our nation’s medical schools are from these groups” (Association of American Medical Colleges [AAMC], 2008a, ¶ 1).

Furthermore, the AAMC comments that support “extends to increasing the number of minority physicians available to serve the nation’s growing minority population…raising the general cultural competence of all physicians” ultimately advancing “health care equity in the United States” (AAMC, 2008b, ¶ 1). The goal to create the noted “health care equity” is connected to increasing access to health care in minority communities and according to researchers, minority patients are “more likely to have a minority physician as their regular doctor” (King et al., 2004, p. 286). Other researchers reveal that minority patients report greater discrimination and lower health care satisfaction than their non-minority counterparts (Fiscella, Franks, Gold, and Clancy, 2000). By increasing the number of culturally competent physicians and retaining minority medical students in medical programs, AMI leaders are reaching for parity of minorities in medicine. This parity of increased minority medical physicians with the general population they statistically have a tendency to serve which will provide a perception of
greater access, increase minority patient satisfaction, and help eliminate the lack of health care equity and between minority and non-minority patients.

To examine the retention of minority medical students, this research addressed if student background characteristics, institutional characteristics, student-to-student interactions, student-to-faculty interactions, and student-to-student peer group interactions predicted intent to remain among 317 Student National Medical Association (SNMA) minority medical students. The sample of 317 represented 10.5% of the entire SNMA population of 3,024 students. The average age of the respondents was 25 years of age with a range from 19 through 37 years. Respondents were 65% were in their second year (36.9%) or third year of their medical program (28.4%). The majority of participants (83.5%) were African Americans with most born in the US (n =213, 68.7%) and others born outside the US (n =46, 14.8%). Also, 241 of the respondents were females (76.3%) and 75 males (23.7%) with only one participant not completing the question.

The Minority Medical Student Retention Questionnaire (MMSRQ) survey was used to survey if the independent variables of student background characteristics, institutional characteristics, student-to-student interactions, student-to-faculty interactions, and student-to-student peer group interactions significantly influenced the dependent variable of intent to remain in medical school. Each of the independent variables are discussed in the following sections.

Discussion of Student Characteristic Predictors

The first research question asked if student characteristics (ethnicity, gender, age, educational experience prior to medical school, parent educational levels, and what were important motivating factors to go into medical school) predicted a minority medical student’s intent to remain. Being of African American descent born in or outside the US was the only
variable out of 26 found to be a significant factor ($p < .05$). This means that out of the 26 student background characteristics, students from African American descent tended to be more likely to remain in medical school. Ethnicity as a significant factor has also been found in studies involving underrepresented (URM) minority premed undergraduate students.

According to Barr, Gonzalez, and Wanat (2008), there are significant differences between URM (African American, Latino, and Native American) students and non-URM (White or Caucasian) pre-med students concerning remaining in a pre-med program. The study, based on pre-med students at Stanford University, demonstrated that a “larger decline in interest” was found in URMs than non-URMs when a negative academic experience occurred, even when controlling for the same academic qualifications. This researcher concludes that perhaps URM undergraduate students that push through negative experiences and go on to successfully matriculate into medical school have become less sensitive to negative impacts and are now more likely remain due to a number of factors. Some of those factors would be found by looking holistically at the URM student’s experiences. For example in this study, intent to remain was found significantly impacted perhaps because the URM respondents felt they had more at stake than non-URMs due to those past negative undergraduate experiences and had planned to remain no matter the circumstances.

On a national comparison in Table 20, there were some student background characteristics from the SNMA population that were of interest to this study. For example, respondents tended to have slightly lower scores on the standardized MCAT test and fell below the national average for undergraduate GPAs. Astin (1991) explains that studies reveal that minority students (specifically African American and Hispanics) tend to perform lower on standardized tests than non-minority students but that this does not reflect on their ability to
complete their programs. The researcher believes that since 65% of the respondents are in their second and third years of medical school, these students demonstrated that they were not only successful in entering medical school but with remaining in their medical programs despite having lower than average scores in their undergraduate programs or the required MCAT.

Table 20

*Student National Medical Association National Comparison*

<table>
<thead>
<tr>
<th>Stats</th>
<th>SNMA</th>
<th>All Medical Students 2007*</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCATS</td>
<td>26.68</td>
<td>30.8</td>
</tr>
<tr>
<td>Undergrad GPAs</td>
<td>3.21</td>
<td>3.73</td>
</tr>
<tr>
<td>Gender</td>
<td>Female: 76.3% (n = 241)</td>
<td>Female: 48.6% (n = 34,099)</td>
</tr>
<tr>
<td></td>
<td>Ethnicity</td>
<td></td>
</tr>
<tr>
<td></td>
<td>African American: 83.5% (n = 259)</td>
<td>Total Enrolled: 70,225</td>
</tr>
<tr>
<td></td>
<td>Hispanic: 9% (n = 28)</td>
<td>African Americans: 7.2% (n = 5,056)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hispanics: 7.6% (n = 5,364)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>White: 62.6% (n = 43,971)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Asian: 21.1% (n = 14,848)</td>
</tr>
</tbody>
</table>

Note: National statistics are from the Association of American Medical Colleges (2008c).

Another national comparison point of interest in Table 20 was the number of African American females in medical school. For this study, 83.5% of the respondents were African American and 76.3% were female. When reviewing the national statistics, the skewing toward more African American females (63%) than African American males (37%) pursuing medicine was also demonstrated. A report generated by the AAMC (2008c) reflects that African American
Americans were the only ethnicity that had the most gap between males and females attending medical school. According to researchers, this statistic is supported by the fact that more black women attend college than black men (Cuyjet 1997, 2006; Roach, 2001; Ross, 1998).

Concerning African Americans in professional degree programs, Cuyjet (1997) cites the National Center for Education Statistics that demonstrates that African American males are “the only ethnic group in which men do not outnumber women” (p. 6). He further explains that since 2002 African American men are outnumbered by women “by almost two to one” with “no indication that this trend has changed” (Cuyjet, 2006, p. 7). For undergraduate programs, Cuyjet explains that African American men are less represented on college campuses for a number of explanations but that these reasons can be categorized into either being prevented from ever getting to college or an under-preparedness that leads to a higher attrition rate. The researcher believes that although much of the research on minority student retention is in undergraduate programs, those studies along with the statistics demonstrating a lower amount of African American males entering and remaining in college are early indicators of the lack of African American males to be potential medical students. Further studies focusing on the experiences of African American males in science and pre-med programs should be conducted to help develop strategies to grow this population.

Other student characteristics of note included the reasons why respondents pursued medicine. Although not significant toward the intent to remain, these few variables were motivators toward wanting to pursue medicine. For example, the desire to help others (88.5%), the respondent’s own desires of always wanting to be a doctor (71.0%), and the desire to help others that look like them (57.8%) were not significant with influencing intent to remain but were ranked the strongest among very important reasons to pursue medicine among the
responses. The factor of wanting to help others resulting in high responses is not surprising since the Hippocratic Oath recited by medical students is based upon a responsibility and expectation by the future physician to assist the health and healing of one’s fellow man. Furthermore, the long-term desire to want to be a physician could be considered an indication of determination by the respondent to conquer odds throughout their educational career to make obtaining a medical degree a goal. Studies that demonstrate minority physicians were more likely to serve minority patients than non-minority physicians (Garland, Hojat, Christian, et al, 2003; King, Dickinson, Dubose, et al., 2004; Komaromy, Drake, Vranizen, et al., 1996) are also supported here in part by the desire to help others that look like them since the majority of the minority medical students selected very important and somewhat important on what are the most important reasons to pursue medicine.

There were other variables that were surprisingly not as strong as expected. For those variables that would have supported some current reports that pipeline or programs aimed at young generations of potential doctors may be influential and that it is important to reach them as young as kindergarten (Anderson, 2003), 84.2% of respondents ranked influenced by an elementary school program as not important. Unfortunately, the question did not clarify if the respondent had ever been exposed to an elementary school program. Also, the student background characteristic included the mother’s educational level with 76.2% having some college or more and the father’s educational level with 73.7% having some college or more. This reveals that most of the respondents were not first generation college graduates from their families. However, the AAMC’s Diversity in Medical Education Facts & Figures 2008 report stated that parental influences were ranked the highest among 30.2% of the matriculating African Americans and 28% of matriculating Hispanic or Latino populations which is in opposition of
this study found that only 4.8% ranked parents wanting the respondent to go to school as very important and 30.8% as somewhat important. This researcher contributes this difference between studies concerning the influence of parents as a reflection that those participating in the AAMC study were primarily in their first year of medical school and that respondents for this study were predominately in years two and three (65.3%). Since the students are one to two years removed from parental influence (involving living proximity or other factors of maturity), perhaps the perception of parental influence changed over that year or two of participating in the medical program.

Discussion of Environment Institutional Characteristic Predictors

Research question two inquired if institutional characteristics (variables found between institutions, within institutions, and intermediate education outcomes) influenced a student’s intent to remain in their academic medical institutions (AMI).

Predictors between AMIs. Variables that occur between institutions included Integrated Post-secondary Education Data System (IPEDS) database of institutional control of public or private, historically black, tribal school, religious affiliation, medical tuition, total enrollment, and percentages of African American, Hispanic, Women, White, and Native American. Unfortunately, there was not much variance among the types of institutions. A majority of respondents were from predominately white (89.9%), non-religious affiliated (91.5%) institutions with no tribal school present. However, there were 32 students from historically black colleges (10%) to conduct an analysis and determine if this variable significantly influenced the respondent’s intent to remain.

There are studies that suggest African American students do better academically and remain at historically black colleges (HBCs) in higher numbers than those who attend
predominately white institutions (Pascarella, Wolniak, Pierson, & Flowers, 2004). Astin (1993) supports this conclusion in part by stating that undergraduates attending an HBCU institutional type have a positive influence to a senior’s intent to become a physician. However, there are other studies that demonstrate no significant differences exist between HBCs and predominately White institutions (Kim, 2002). The findings for this study reveal that there are no significant differences with the intent to remain between those attending HBCUs and predominately White institutions or any of the other predictors outlined above that occur between AMIs.

The researcher believes wide representation of medical students across states in different types of communities may have contributed to the lack of any significant differences between the respondents and their institutional types. For example, there were 103 AMIs represented in this study and only 10% of respondents reported attending HBCUs including Moorehouse, Howard, and Meharry. Of the HBCUs, Howard and Meharry have been documented as the most attended and influential when producing US minority medical physicians (Bennett, 1991). Perhaps if there were more parity with the number of minority physicians graduating from HBCUs and predominately White institutions, a clearer picture of how the institutional type impacts the student could be examined.

*Predictors within AMIs.* The variables within institutions were medical school year, attendance habits and chances that a student will need extra time to complete the degree requirements, be admitted to the residency of choice, be satisfied with their experiences at the AMI, and desire a residency program close to their current AMI. Also included among variables within AMIs were the perceived challenges with finances, academic preparedness, cultural diversity among peers, cultural diversity among faculty, cultural diversity among staff, availability of retention programs, tutoring services, social connectedness to student, social
support from community members, and student’s attendance habits. There were no significant predictors found within AMIs. However, there were a number of identified variables of interest concerning retention.

The most noted degree challenges were concerning cultural diversity among faculty at nearly 50% of respondents agreeing or strongly agreeing and financial resources at 38.2% of respondents agreeing or strongly agreeing. The selection of financial resources as a high ranking challenge for minority medical students is consistent with other recent reports and studies (AAMC, 2008c; Smedley, Butler, Bristow, 2004). By having respondents note challenges with the cultural diversity among faculty, this study demonstrates a partial argument that if minority medical students do not retain and eventually graduate the availability of future medical faculty will be affected. If AMIs provide minority medical students with consistent financial counseling and assistance along with accessibility to culturally diverse faculty, this approach will greatly impact the perceptions of the institution as one of support and caring.

The least perceived challenges for degree completion were social connectedness to peers at 56.2%. This finding was also supported since the respondents were members of the organized student organization SNMA that regularly meets and encourages members to support each other. Unfortunately, respondents stated that SNMA had the strongest impact in this area of social connectedness and this is not a variable that respondents noted as a concern.

Unlike medical questionnaires that are administered to matriculates during the summer, i.e., the Matriculating Student Questionnaire (AAMC, 2008c), the MMSRQ survey was administered to all students that were in different years of their medical program, with 207 (65.3%) from years two and three. The strongest noted responses of very good chance included 59.9% of respondents selecting be admitted to residency of their choice, 53.8% satisfied with
their experiences at the AMI and 52.2% participating in student clubs/groups besides SNMA. Also, 79.1% of respondents believed that they would either not need more time to complete a degree (50.8%) or very little chance of needing more time to complete degree (28.3%). This researcher believes that the pursuit of peer group interaction and confidence with completing the degree on time and getting a residency of choice may contribute to retention and a level of satisfaction. Satisfaction questions were identified by the researcher to be intermediate educational outcomes of the AMI environment.

**Predictors of intermediate educational outcomes.** For intermediate educational outcomes, variables included satisfaction with faculty contact, class size, student interaction, quality of instruction, sense of community among students, availability of campus social activities, overall satisfaction with academic medical institutional (AMI) experience, current GPA, and if the student would select the AMI again if provided a choice. Of the 36 variables in each of the blocks of predictors between, within or as intermediate outcomes of the AMI environment, it was an intermediate educational outcome that yielded the only significant predictor. This significant variable was satisfaction with current overall academic medical institution experience significantly predicted the intent to remain ($p < .001$).

According to Astin (1993), satisfaction with college is a short-term outcome that will eventually lead to job satisfaction in a student’s chosen field. (Gartland, Hojat, Christian, Callahan, & Nasca, 2003) further explain that satisfaction with college, at least among minority medical students, also affects if they will financially contribute as alumni. This researcher believes that the respondents view each variable of the Q24 satisfaction question as contributing to a general definition of overall current satisfaction and positive responses with all other institutional characteristics would contribute to a positive current overall satisfaction with the
AMI. To determine if satisfaction within the AMI environment significantly impacts intent to remain, then the other environment variables of student-to-faculty, student-to-student, and student-to-student group affiliation need to be examined as well.

**Discussion of Student-to-Faculty Involvement Predictors**

Research question three involved if student-to-faculty interactions predicted the minority medical students’ intent to remain. Student-to-faculty variable categories included how often students met with advisors, sought mentoring, engaged with professors in and out of the classroom, received advice, felt emotional support and encouragement, and the number of hours discussing both personal and academic issues with faculty. Of the 18 total variables measured, two items were combined to generate a significant model that predicts the intent to remain: Q19c how often faculty provided medical program advice and Q18d how often a student sought a staff as a mentor.

This finding supports a study by Pascarella and Terenzini (1983) that states that the amount of faculty interaction directly affects a student’s commitment to the institution. Also, research from Astin (1999) and Tinto (1993) reveal that frequent contact with faculty is the most strongly related to satisfaction. Specifically for minority students, Kim and Conrad (2006) explain that even when controlling for predominately white or black institutions, another environment variable and institutional characteristic, student-to-faculty interaction positively contributed to degree obtainment. Concerning seeking mentors, a study by Blackwell (1983) notes that mentoring and role model effects on minority student retention in graduate and professional schools contributes to remaining at the institution. The researcher believes that respondents view faculty as experts in medicine and since letters of recommendation are tied in
part to the amount and quality of those interactions, it is important that minority medical students pursue interacting with faculty whenever possible.

There were variables that were not significant but could have been considered a hindrance to a student’s intent to remain in medical school. For the question if the respondents ever met with advisors, responses were 42.9% total revealing not at all (21.0%) and rarely (21.9%) with only 15 (4.8%) noted as almost always demonstrating a lack of interaction. One explanation for this result could be the variety of definitions of what an “advisor” represents at different medical institutions. Another discouraging result was that 43.8% of respondents felt they had not received (21.1%) or rarely (22.7%) received feedback from faculty about their academic work. The researcher believes that this lack of interaction may affect retention but the lack of feedback and a perception that faculty may not want to interact with them will affect satisfaction and perhaps the level of commitment once the student graduates.

A promising response of interaction was concerning how often faculty encouraged students to finish with more than 56% of respondents selecting often (28.8%) and almost always (28.8%). Also, a note of interest was that although respondents believed they were provided opportunities to discuss course-work outside of class on an often (24.9%) and almost always (27.5%) occasion. However, 18.3% of respondents revealed that they spent no time talking with faculty about course content and that 49.4% spent less than an hour. The researcher believes that a lack of faculty of color and possible shortage of mentors contribute to students not pursuing current opportunities to meet with faculty.

Discussion of Student-to-Student Involvement Predictors

Concerning research question four, student-to-student interactions were examined with predicting intent to remain. Student-to-student variables included number of hours students
engaged socially with friends, discussed academic issues with other students, studied with other students, tutored peer students, and tutored by peer students as predictors. Respondents revealed that a majority did not tutor a peer (54.8%) or were not tutored by a peer (56.1%) but only 14.6 spent no time studying with one another. This demonstrated a lack of one-on-one interaction concerning coursework but a possible academic support system when in groups. However among the five variables, none were found that significantly predict the intent to remain.

This finding refutes Astin’s (1993) statement that student peer involvement is essential for effective retention. The result also does not support Tinto’s (1993) explanation that the amount of integration with other students affects student retention among minority students. Since Astin and Tinto focused their findings on undergraduate populations, the researcher believes that the minority medical students have different expectations from their institutional experiences than undergraduate students. For example, many of the medical school respondents are in competition with each other within their respective AMIs to obtain scholarships and choice residency program awards.

Discussion of Student-to-Student Group Affiliation Predictors

Research question five included if student-to-student group affiliation interactions predicted intent to remain. Student-to-student group affiliation interactions were students’ amount of engagement with SNMA including possible leadership participation and perceptions of assistance with academics, mentoring, social contact with others, outreach to the community, overall sense of belonging, participation with non-SNMA organized groups or clubs. The respondents revealed that 64.4% interacted with student groups often (36.6%) and almost always (27.8%) interacted with student groups. Since the survey population was the membership of student group SNMA, high interactions with student groups including leadership roles was to be
expected. However among the 13 variables measuring student-to-student group affiliation, none were found to significantly predict intent to remain.

For the medical school environment, researchers found that student involvement with student peer groups elevates the satisfaction with the AMI experience and will even encourage exploring medical specialty areas (Pamies, Lawrence, Helm, & Strayhorn, 1994). The researcher finds that since respondents are involved with SNMA and many of them hold leadership roles both within and outside of SNMA, their interaction with the AMI environment and student group is perhaps more involved than other minority medical students at their institutions. Furthermore, although there were not significant variables found among the student group questions that influenced the intent to remain, membership with SNMA does affect satisfaction and according to results with the institutional characteristics question, satisfaction does significantly influence intent to remain. However, the researcher wanted to uncover what were the best predictors of intent to remain from all the variables in the study.

Discussion of Multiple Regressions of All Predictors

Research question six asked which student background characteristics, institutional characteristics, or type of involvement from faculty and students best predict intent to remain. To uncover the significant variable or model, two multiple regressions were conducted. The first regression was conducted by treating each of the 98 variables separately and grouping them in seven blocks based on the progression of time. For example, student characteristics were placed in first since this is the first set of variables students would bring with them to medical school and the intermediate educational outcomes were the last block since those questions dealt with the satisfaction of the student while at school. For the second regression, faculty, student, and student group affiliation variables were made into scales and were utilized in place of the
variables associated. To accurately create scales from variables that had a different measurements, responses were converted into z-scores and then to T-scores to create a composite factor score. Scales were reliable with Cronbach alphas of student-to-faculty (.898), student-to-student (.700), and student-to-student group affiliation (.822). However, no scales were found to significantly influence the intent to remain.

Of the 98 variables, the same results were produced for both multiple regressions in which a significant model was produced to predict intent to remain. This model consists of two items: (Q16e) chances that students will be satisfied with experiences at academic medical institutions and (Q24g) current satisfaction with experiences at academic medical institutions. As with the prior results that demonstrated that satisfaction was a significant predictor of intent to remain among the institutional characteristic variables, the student’s satisfaction is the most influential among all factors. The results demonstrate that an optimistic outlook on the academic medical institution as well as a current view of satisfaction has a profound effect on the student’s intent to remain at their current medical institution.

Astin (1991) explains that satisfaction is an outcome generated indirectly and is a “measurement of psychological traits” that are internal to the student based upon a series of answers to questions (p. 44). Other identified outcomes like satisfaction include the student’s beliefs, attitudes, values, and self-concept. The researcher believes that satisfaction is defined in a number of different ways and factors like satisfaction with class size and the amount of interactions in the AMI environment all contribute to the student’s perception of their chances to be satisfied as well as their current level of satisfaction. Therefore, the satisfaction factor could be linked to the other variables or perhaps depend upon them. However to fully understand the satisfaction variable’s influence on the dependent variable of intent to remain, exploring the
reasons why respondent’s selected their level of intent to remain at their AMI needs to be conducted. Fortunately, respondents did provide comments for the intent to remain scale as well as their motivation for pursuing a career in medicine.

Discussion of Open-Ended Answer Responses

There were two questions that provided respondents an opportunity to further explain their answer selections. These open-ended inquiries were Q12 concerning naming what were the most important reasons the respondent pursued a medical degree and Q23 providing an additional comment opportunity to explain why they were likely or not likely to remain at their current medical school. To better understand the comments and summarize the findings of these questions, the researcher utilized the method of analytical induction. Analytical induction involves “abstracting out of empirical data and generating categorizations which are then tested against subsequently collected data” (Bond & Bond, 1994, p. 236). The researcher reviewed all comments and created categories based on how often the comment appeared. Fraenkel and Wallen (2006) explain that categorizing responses “help to organize and make sense out of large amounts of descriptive information” and to “investigate possible relationships or to test ideas” (p. 485).

For Q12 inquiring about their most important reason to pursue medicine, 23 comments were given by the respondents representing 7.3% of the total 317 respondents. Of those 23 comments, 6 (26.09%) were general comments and did not provide further explanations on what was the motivation for attending a medical program. Using analytical induction, the other 17 comments were grouped into five categories and percentages were calculated based on the total of 23 responses. The results of those categories that shaped the student’s decision to attend medical school included overall life experiences (n = 5, 21.74%), early educational programs (n
= 4, 17.4%), religious beliefs (n = 3, 13.04%), future positive outcome possibilities (n = 3, 13.04%), and love of science/field (n = 2, 8.69%). According to the AAMC (2008c) and their survey of medical students who matriculated in 2007, the top five reasons influencing factors on decision to becoming a physician were health-related work experience, science course, a parent, a physician, and competitiveness/challenge of medicine. The researcher believes that if the AAMC survey were modified to explore the level of exposure of early educational programs coupled with science course experiences, the insight gained may assist with pipeline programs. Ultimately, any discoveries will assist with recruitment objectives as well as retention.

As described in Chapter 4, the dependent variable measuring the student’s intent to remain at their academic medical institution was measured on a scale ranging from “0” being “No Chance of Staying” to “10” being “Highest Likely Chance of Staying”. However, respondents were also provided the opportunity to expound on question 23 by completing the comment area. Eighty-three respondents (26.18%) of the total 317 completed this section. Utilizing analytical induction on the provided comments, responses produced 10 categories including totally satisfied (n = 31, 37.35%), financially obligated (n = 9, 10.84%), degree nearly completed (n = 8, 9.64%), unhappy with no way out (n = 7, 8.43%), desires a transfer (n = 6, 7.22%), family (n = 3, 3.62%), indifferent (n = 3, 3.62%), academic difficulties but still attending (n = 2, 2.41%), and other reasons (n = 3, 3.62%). The other reasons from the respondents included that the diversity office was not supportive, considering another degree, and residency program decision challenges.

Although 84 % of respondents selected the highest level on the scale for chances of staying, the comments section reveals that was not only total satisfaction but because the respondent felt obligated to complete the degree and was in a few undesirable circumstances.
Words that were used over again were “unhappy” and “can’t get out” with those who provided answers like “don’t care either way” could also be viewed as negative responses instead of indifferent. Since satisfaction has been identified as the best predictor for intent to remain in this study, a continued focus by academic medical institution administrators on student satisfaction levels would be positive for retention levels.

The researcher believes that by reaching beyond a scale or drop down answer option will provide AMI leaders valuable insights about how the student interacts with their medical experience. The ability for students to provide explanations about their experiences may help them feel less “trapped”, change possible negative attitudes toward their AMI to positive ones, and allow them to become more involved with their AMI environment. Based on the findings about student engagement, the researcher recommends that the study theoretical framework of involvement theory along with the accompanying I-E-O Model be utilized to explain the findings.

Discussion of Involvement Theory Relating to this Study

Unlike other theories that center on policy programs and academic measures to assess how well the student is doing at an academic institution (Astin, 1999), Astin’s (1984) involvement theory focuses on the student and how that student invests time and energy into academics and social interactions with faculty, staff, and other students. To better understand and allow institutional administrators the ability to measure a student’s level of involvement and assess their programming, Astin (1991) created the Input-Environment-Output (I-E-O) Model. He explains that input contains the student background and personal attributes, environment includes all external variables to the student, and output is the desired “talent” produced from the educational setting.
As explained in earlier chapters, the researcher modified the I-E-O Model to shape this study and explore the research questions concerning if a student’s background characteristics as well as external interactions with institutional characteristics, faculty, students, and student groups predict their intent to remain (See Figure 3).

![Diagram of Study Conceptual Framework with Variables based on the I-E-O Model (Astin, 1999).]

**Figure 3.** Study Conceptual Framework with Variables based on the I-E-O Model (Astin, 1999).

However, due to the results of the study, the researcher has created a new suggested model incorporating satisfaction as the identified best predictor model for intent to remain of minority medical students when all variables are analyzed (See Figure 4).
As discussed in Chapter 4, the institutional characteristics block included overall current satisfaction as an intermediate educational outcome of the environment experienced by the respondent. The chances the respondent would be satisfied with their AMI experience was also in the institutional characteristic block and was considered an environment variable occurring within a medical school. The distinction between variables found in the block within versus intermediate educational outcomes is the sequential timing of when the predictors take place to the respondent. Current satisfaction is based upon the feelings, attitudes, and perceptions that students have of the variables based on the environment (Astin, 1991); therefore, predictors occurring within the medical school environment (i.e., chances of satisfaction) affect the outcome variables.

The significance of student-to-faculty interaction predicting intent to remain among SNMA members is also supportive of Astin’s involvement theory and I-E-O Model. The two items of how often faculty provide medical program advice and how often students sought a staff mentor is what Astin refers to as part of the environment ultimately affecting the student’s
outcome. Astin’s (1984) definition of student involvement is how the student engages their environment through their academics or cognitive abilities and interactions with those individuals and elements around them.

Astin (1991) explains that student outcomes are traditionally separated by educational researchers into two categories of *cognitive* having to do with knowledge and use of reasoning and *affective* that “have to do with the student’s feelings, attitudes, values, beliefs, self-concept, aspirations, and social and interpersonal relationships” (p. 43) and that academic institutions tend to limit assessment to cognitive outcomes. Astin states that limiting assessments to cognitive results such as academic achievement is in many cases in conflict with the goals of higher education to positively affect the student’s qualities such as social responsibility and character. Although he applies this to undergraduate students, the researcher believes the utilization of affective outcomes is also relevant to the graduate academic medical institution environment since the responsibility of becoming a physician requires the student to be a leader in the area of professional behavior, to work in the best interest of a patient’s health, and understand the overall obligation to positively impact the human condition.

Astin (1991) reveals that satisfaction with academic institution is one of the types of affective outcomes. This study’s finding of satisfaction with the AMI being the best predictor model for intent to remain supports Astin’s involvement theory and a continuous focus on affective outcomes. The researcher finds that cognitive outcomes through testing are necessary but cannot provide any AMI administrator or faculty member the whole view of how their interactions affect the intent to remain for the medical student.
Conclusions

From the findings of this study, a number of conclusions can be drawn. As stated before, the findings concerning SNMA members include (1) African American cultural descent predicts intent to remain as opposed to any of other student background characteristics; (2) institutional characteristics reflected in intermediate education outcomes of a student’s satisfaction with overall academic medical institution experience does predict intent to remain; (3) two variables of student-to-faculty interaction combined to predict intent to remain: how often faculty provide medical program advice combined with how often students seek a staff mentor; (4) student-to-student interaction does not predict intent to remain among SNMA members; (5) student-to-student group affiliation interaction does not predict intent to remain among SNMA members; and (6) the model consisting of two items – chances that the student will be satisfied with experiences at the academic medical institution and satisfaction with the overall academic medical institution experience – is the best predictor of intent to remain among all variables. Each of the conclusions from these findings will be further discussed.

Although the student characteristic variable of African American ethnicity was found to be a significant predictor in the student’s intent to remain in medical school, the results and conclusions drawn from this predictor are multifaceted. There are studies that explore differences between minority and nonminority students concerning intent to remain and find no differences (Eimers & Pike, 1997) and others that find significant differences with retention rates (Barr, Gonzalez, & Wanat, 2008). However, most of the research studies focus on undergraduate students and there are only a few that examine minority medical student retention (Blackwell, 1983; Bennett, 1991; Gore, 2007). The present supports those studies that find that ethnicity is a significant predictor of retention. The researcher concludes that since there are a number of
studies examining differences between ethnic groups, the factors that affect retention within ethnic groups should be a priority of study with a focus on those groups from underrepresented backgrounds. Additionally, those studies should also collect information from the students’ experiences as a whole. Furthermore, results that demonstrate that those from African American backgrounds do have a high level of intent to remain do not necessarily translate to a higher graduation rate. Bennett (1987) explains that African American medical students have a 10 percent less chance of completing medical school than their Caucasian classmates. Understanding the backgrounds of African American students and the challenges facing students from minority backgrounds, especially students in high pressure educational programs like medicine, can help shape the types of support programs and policies at academic medical institutions.

Another conclusion is that institutional characteristics reflected in intermediate education outcomes of a student’s satisfaction with overall academic medical institution experience does predict intent to remain. Pascarella and Terenzini (1983) supports this finding by stating that what occurs to students on campus has a greater impact on their persistence than almost any other variable including background characteristics. They do explain that institutional types in isolation do not affect the student’s learning alone and that other variables have to be factored into understand the student’s institutional commitment. This researcher believes that since the students research and apply to medical programs in hopes of being admitted, expectations and initial satisfaction levels with the institution would probably be high with either major setbacks or events transforming that opinion. It would be best to continuously survey the AMI environment not only in the first year but in subsequent years to see if and when a shift in satisfaction may take place.
The third conclusion is that student-to-faculty interaction does predict intent to remain among minority medical students. The two items of how often faculty provide medical program advice and how often students sought a staff mentor combined to generate a significant model that predicts intent to remain. A number of studies support this finding that involvement between medical students and faculty positively impact retention (Wadenya, Schwartz, Lopez, & Fonseca, 2003; Smedley, Butler, & Bristow, 2004; Flowers, 2004). Flowers (2004) further explains that African American students may have lower levels of involvement but are positively affected in their academics by being engaged by faculty. The researcher surmises that the amount of student-to-faculty interaction not only impacts students of color but all medical students. However, the study of minority student and faculty relations should remain separate from those studies focusing on nonminority student and faculty relations since there are a number of factors leading to a lack of minority representation first as students, then as physicians, and finally as tenure-track faculty or empowered administrative staff members. The researcher considers that the amount of time is not as important as the quality of time that a faculty member can devote to the student. Staff, even if nonminority, can positively impact minority medical students and it will be imperative that suggestions and valuable insights these individuals bring to administrators be heard and considered when planning programs like those involving mentors.

The fourth conclusion from this study is that student-to-student interaction does not predict intent to remain among minority medical students. The results do not support existing research that proposes that the higher amounts of interaction among fellow peers improve the retention of students (Astin, 1993; Tinto, 1993). Furthermore, Tinto (1993) explains that peer interaction is an even more important factor on persistence for students in a doctoral program since social integration is “linked not only to one’s intellectual development, but also to the
development of important skills required for doctoral completion” (p. 232). However, the researcher believes that the level of education and type of program affects the desire by the student to seek interaction with other students. For example, unlike undergraduate programs where many of the minority students may be first-generation college attendees, the majority of minority medical students who participated in this study were not first generation students, had already experienced undergraduate education, and were participating in a highly competitive medical program that typically sends medical students out in year three to hospital rounds or outpatient clinic experience. Although student-to-student involvement is not a significant predictor perhaps for these reasons, the researcher still encourages support for these interactions since the amount of hours SNMA members spent socializing with peers was the highest amount noted among all time variables. With 47.9% spending at least 5 hours or more a week with other students socializing and 34.4% spending at least 5 hours or more a week discussing course content with peers, there is still a need for students to connect with other students.

Similar to the lack of significance found with student-to-student interaction and intent to remain, conclusion five is that student-to-student group affiliation interaction does not predict intent to remain among minority medical students. There are only a few studies that focus on the importance of organized student groups on retention of medical students (Oyewole, 2001) including one that specifically states that SNMA makes a difference in recruitment and retention (Rumala & Cason, 2007). Pamies, Lawrence, Helm, and Strayhorn (1994) explain that student involvement with peer groups positively effects satisfaction and assistance for students to explore medical specialty areas. Due to the fact the population for this study is the student group SNMA, this researcher believes that the variable to be explored should not be just how much a student participates but the type of involvement with the student organization. The results
demonstrate that there are various levels of participation (i.e. leadership, officer posts) from the respondents both within SNMA and with other student groups. The researcher believes that the results demonstrate that the amount of student-to-student group affiliation exclusively cannot significantly impact retention but how that student interacts with the student group as well as how that student group interacts within their academic medical institutions can make a difference with retention rates.

The final conclusion is drawn from the last research question that explores what are the best predictors from all available variables in the study. The model that combined the two variables of chances that the student will be satisfied with experiences at the academic medical institution and the student’s current satisfaction with the overall academic medical institution experience was found to be the best predictor among the 98 variables analyzed. These results support theorists who study undergraduate populations (Astin, 1991) as well as those in medical school settings (Gartland, Hojat, Christian, Callahan, & Nasca, 2003) and believe that satisfaction is related to a student’s persistence to remain with the institution. Additionally, Gartland et al. state that dissatisfaction with the AMI during the student’s time attending classes can carry through passed their graduations and into their professional careers affecting if these alumni will financially contribute to the institution. The researcher considers a minority student’s satisfaction level as a complex variable that demands time, patience, and resources to explore. Since respondents provided explanations why they remained at their AMI beyond the survey’s 0-10 scale, research that includes both qualitative and quantitative methods within minority groups will help decode how satisfaction is defined by the students. Furthermore as seen in the modified model displayed earlier in the chapter (Figure 4), there needs to be an understanding that involvement between the student and the environment will ultimately affect the satisfaction
outcome and that current and forecasted perceptions about satisfaction levels will significantly affect a minority medical student’s intent to remain at their academic medical institution.

Recommendations

Although the majority of studies conducted with students of color are with those in undergraduate programs and Astin’s I-E-O model is based upon longitudinal studies of undergraduate retention and attrition, the results of this study both support and refute current research concerning the retention of students of color in a graduate environment. Since the researcher could not find studies specifically exploring what involvement variables, institutional characteristics, and student background characteristics best predict the intent to remain of minority medical students at their AMI, this study provides pivotal first steps toward providing valuable insights and exploration of how minority medical students are affected and what AMIs can do to positively impact students. Since there were variables and models found that significantly affect intent to remain in the usage of Astin’s involvement theory and I-E-O model, further examination of the student’s input and the environment affects upon the student should be conducted.

The following recommendations are for practice geared toward those that interact, create programming, or set policy for or about minority medical students. This includes primarily the accrediting body of the AAMC leadership, AMI senior administrators, AMI faculty and staff, SNMA, and future researchers in the area of leadership and diversity in higher education.

Recommendations for the Association of American Medical Colleges

There are five major recommendations for the AAMC. The first is an expansion of the current Aspiringdocs.org marketing campaign. Aspiringdocs.org is the AAMC campaign to increase diversity in medicine primarily targeting undergraduate students. The researcher
suggests that Aspiringdocs.org be divided into a section continuing support for undergraduate recruitment and another section for the retention of current minority medical students. For example, surveys focused directly on the retention of minority medical students like the Minority Medical Student Retention Questionnaire (MMSRQ) could be administered through the site and include students from all years of medical study.

The second recommendation is an incorporation of pertinent MMSRQ questions into preexisting surveys. Currently in the AAMC’s *Diversity in Medical Education Facts & Figures 2008* report, the 2007 Matriculating Student Questionnaire provides the top influencing factors that students pursue medicine but lacks the definition of what participating students mean by a positive interaction with a physician or parent. For example, if students respond that a physician had a “very positive influence” on them, would that interaction or experience be the same between Caucasian students and minority students? Perhaps the Caucasian students were exposed to a physician who was a family friend while an African American student was invited to participate in an office tour. The researcher surmises that information on the type of contact should be collected as well as the amount of interaction made with that contact. Those responses that note a positive influence should then be communicated to AMIs for possible discussion about encouraging program creators and policy setters to duplicate those efforts.

Thirdly, the AAMC should survey minority medical alumni regarding their level of satisfaction with their AMI. This reaches beyond the current Medical School Graduation Questionnaire that surveys graduating medical students. A new survey would require the AAMC leadership to conduct the survey or require AMIs to conduct satisfaction surveys with alumni instead of just graduating students. In an environment where “student-centeredness” may be part of the mission, it is essential that graduates feel they can provide this needed feedback to their
respective AMIs. By allowing former students a voice about their medical education, perhaps any accumulated dissatisfaction with the AMI can be vented and the healing process can begin. Another positive result would be that these alumni have already graduated and are not exposed to any possible reprisals from their comments.

The fourth consideration is to conduct in-depth interviews with those minority students who have not remained at their academic medical institutions. This includes both those that transferred to other AMIs or may have dropped out of medical programs. A request to AMIs for the contact information for students who are not participating in their medical program for more than six months should be done to investigate why students are no longer in the program. Although individual AMIs may conduct student exit interviews for use within their own schools, permitting the AAMC to gather the data allows for a central depository of information. Therefore, any feedback will benefit both the AAMC and the AMI with understanding why these students do not remain.

Lastly, the researcher suggests that the AAMC work more closely with organized student groups like that of SNMA to help educate and support current and potential students. Organized student groups like the SNMA are trusted by and are run primarily by students to meet the needs of fellow students. By partnering with the SNMA, the AAMC will gain valuable insight about the backgrounds and needs of minority medicals students beyond any quantitative survey tool.

**Recommendations for AMI Senior Administrators**

Concerning academic medical institution senior administrators, there are three suggestions for creating a more supportive environment. First, create and fully fund a department that supports the needs of students of color. If the department already exists, a thorough review of the department’s achievements and student satisfaction levels with the department should be
periodically conducted. The researcher suggests that due to comments provided by respondents in this study revealing that some AMI diversity departments are “not supportive”, AMI senior administrators whom uncover a lack of support to students should consider a review of allocated resources, restructuring and/or possibly removal of department leadership before diversity programming is adversely affected. If the diversity department does not exist, there are a number of benefits associated with a dedicated department. Primary reasons include utilization of the department as a positive recruitment tool for the best and brightest potential minority applicants since dedicated staff will have the time to actively build relationships. For retention, students can seek out support from this department when they feel they need guidance or have a concern about their environment and are too worried about possible reprisals from faculty or staff. To achieve credibility both internally and externally, diversity department leadership should be an AMI senior administrator that has studied diversity, has experience with diversity-oriented programming, and possesses a substantial track-record in fostering a diversity-friendly atmosphere. If the department has strong leadership and can also serve as the focal point for community outreach as well as for student groups that concentrate their efforts on supporting cultural diversity in medicine, minority student satisfaction and community support for the AMI will be increased.

The second consideration would be to build a network of contacts through the SNMA to attract future faculty of color. Since this study demonstrates that satisfaction is a significant factor to the SNMA minority medical student’s intent remain and many of the students are leaders within the SNMA organization, the researcher believes that relationships built on satisfied students will lead to satisfied alumni. Furthermore, senior administrators could
encourage SNMA members to remain in communication with the institution after the students graduate and consider employment to teach a new generation of medical students.

Thirdly and similarly to undergraduate programs involving minority students, a strong mentoring program should be implemented. The researcher suggests that a mentoring program occur internally in the AMI between students and faculty/staff, but that external relationships be created as well between students and external physicians and leaders from the local communities. These new possible bonds will help foster positive relations, create a sense of satisfaction among the students that the local community cares about them, and ultimately may encourage students to consider seeking a local residency and remaining to serve that community. This type of mentoring program needs to be lead by senior administrators and communicated to appropriate staff and faculty for implementation. If not, this program may begin with good intentions but falter if proper funding and release time cannot be secured for staff to foster and guide those relationships.

Recommendations for AMI Faculty and Staff

There are five suggestions for AMI faculty and staff. The first is to create a longitudinal study for each medical cohort based on existing questionnaire information. Those questionnaires include the Matriculating Student Questionnaire and Medical School Graduation Questionnaire. For example, this would entail review of the Matriculating Student Questionnaire responses for students in 2009 and then reviewing their Medical School Graduation Questionnaire responses in 2013. However, since this study involves the Minority Medical Student Retention Questionnaire (MMSRQ) and found that current and projected satisfaction with the medical school experience are significant predictors for intent to remain, the researcher also suggests that the question
involving the *chances* the student will be satisfied should be incorporated into the current Matriculating Student Questionnaire.

A second thought would be to utilize a modified MMSRQ to gauge all student’s perceptions and opinions in years two and three within an AMI. Since the AAMC already surveys students in year one and their last year, the researcher believes that the MMSRQ could be modified and administered to all students to gauge the amount of interactions experienced within the AMI. If desired, comparisons between ethnic groups can be done and if significant differences are found, further study including student focus groups to discuss those differences could be conducted.

Thirdly, the researcher suggests adoption of other theoretical models that encourage both formal and informal contact between faculty and staff with students. This will provide additional thoughts about why minority medical students do not interface as much as may be needed to affect their satisfaction levels and ultimately their intent to remain.

The fourth recommendation is to not rely on students to mentor other students exclusively. Considering this study demonstrates that student interaction does not significantly influence intent to remain, initiatives that rely on students to mentor peers may work in some environments but would be difficult to sustain over time. This structure also places a burden of responsibility on the shoulders of students that are seeking an education and not attending medical school to mentor others or lead programming. Instead, due to clinical rounds beginning in year three and a significant predictor was found to be with student-to-faculty involvement, encouraging students to be mentored by physicians and working with faculty would be of greater benefit to their medical experience.
Finally, encourage staff to mentor students and faculty to provide medical career advice whenever possible. The researcher expects that faculty and staff should and will provide guidance on the positive and negatives in certain specialties and discuss career paths based upon personal experiences and solid information. Faculty and staff should also encourage students to seek out multiple opinions from other faculty and staff as well as mentors including AMI alumni.

**Recommendations for the SNMA**

For the Student National Medical Association leadership, the researcher suggests five ways to improve the intent to remain for minority medical students. The first proposal is to communicate how SNMA can academically benefit students. This study demonstrated that students believe SNMA is highly supportive with helping them socialize with other students. However, 41% felt neutral or less than able to agree that SNMA assists them academically. The researcher recommends SNMA concentrates on creating academic support groups and begin to promote itself as another resource that students can turn to for academic support. The benefits for SNMA include building additional credibility among the students as well as AMI administrators. For support, SNMA could enlist the help of the AAMC to help promote the academic support groups to AMIs and gain assistance through the National Medical Association (NMA) consisting of minority medical physicians.

The second recommendation is to promote collaboration with other student organizations. The study reveals that students are involved in a number of other organizations. The researcher suggests that SNMA identify those student organizations with similar purpose and seek out projects and initiatives in which to work collaboratively.

Thirdly, the researcher suggests the SNMA encourage students not currently in leadership roles to lead. This requires that current SNMA leadership begin to identify members within their
different AMIs that they could mentor into leadership and officer positions. To identify those members who are not as active, SNMA leaders should survey their own membership within the AMI to see why some students are not as engaged and to understand the perception students have of SNMA.

Fourthly, the SNMA should work in collaboration with the AAMC. There are a number of benefits about working with AAMC including leveraging financial support to develop and increase initiatives targeting students of color in medicine. As the AAMC benefits from the accessibility the SNMA organization provides, the SNMA can gain accessibility to the AAMC policy makers and obtain knowledge on how they impact students. Another benefit would be SNMA assisting with the Aspiringdocs.org site to reach current minority medical students as well as help promote SNMA’s MAPS chapters that focuses on increasing and supporting minority students in premed undergraduate programs.

Finally, the researcher suggests that the SNMA create an online database of programs and resources for minority medical students at all AMIs. This could be done by requesting AMIs to provide links to their web pages that contain valuable information in the areas not limited to but specifically related to retention programs, scholarships, and diversity contacts for that particular AMI. This could serve as an additional resource to any current AAMC resource materials directed at AMIs.

*Recommendations for Future Researchers*

There a number of suggestions for future researchers. The first is to consider utilizing involvement theory and the I-E-O Model in other environment settings. Since the amount of involvement was shown to be significant between students and faculty/staff in medical education, the researcher suggests the model application in a number of other settings that have
an element of involvement between individuals. For example, settings like K-12 with the amount of interfacing elementary school students have with teachers could affect the output of student grades or their desire to complete school.

Secondly, the researcher recommends asking respondents to define satisfaction. Although minority students are a consistent element among the number of studies examining retention, satisfaction can be defined by students in different ways. The researcher believes that the I-E-O Model explains the definition of satisfaction can change for different students by incorporating the variable of environment. For example, a medical student may feel satisfied when their expectation for faculty interaction is met but an undergraduate student may feel satisfied when they feel integrated into campus life.

The third consideration is to explore effective leadership in diversity. Successful diversity programs and positive environments for diversity are led by strong leaders. The researcher considers that those AMIs with high satisfaction and student-to-faculty interaction for students of color probably have leaders that celebrate cultural diversity and have made valuing diversity part of the institution’s mission. Future researchers could investigate the characteristics of these leaders, report their results, and ultimately provide a set of desirable traits that AMIs or other higher-learning institutions can look for when hiring individuals to fulfill this role.

Researchers should also consider the delimitations of the study. One of these delimitations included the fact that the study only includes active members of SNMA. As described before, the researcher would suggest that the MMSRQ be administered to all minority medical students as well as being modified and utilized as a tool within individual institutions to be administered to all students.
Another study delimitation was that the MMSRQ survey only allowed two opportunities to explain answer selections through comments sections. The researcher recommends that mixed methods including focus groups and/or interviews be conducted along with the quantitative survey. This would also allow data to be collected beyond the current Web-based survey format.

Considering limitations, this study only has 10% of the SNMA population. Again, the researcher suggests that the MMSRQ be expanded beyond the SNMA to capture more minority medical school students.

Another limitation of this research was the lack of variability in the dependent variable scale of intent to remain (84% marked 10 out of 10 for highest intent to remain). Since most of the outliers contained the variability, they were included in this research limiting the study’s generalizability. The retention rate and the amount of influence environmental variables have on undergraduate minority students may be different from minority students in professional programs but this study demonstrates that there are still significant predictors, especially in medical school. The researcher believes that by allowing students an opportunity to explain why they made their selections on a retention scale, the responses will benefit all those interested in understanding why minority medical students remain or leave medical school.

An additional limitation is that Astin’s I-E-O Model was developed and meant to be utilized as a longitudinal instrument and not for cross-sectional use as it was in this research study. The researcher suggests that perhaps the I-E-O Model could be further modified to adapt to cross-sectional use if more researchers adopted it for their environments.

In conclusion, there is a definite need to continue research on ways to retain students of color in medicine. Despite small gains made in the number of minority medical students attending AMIs (AAMC, 2008c), there are still projected shortfalls with producing minority
physicians when examining the estimated population growth (AAMC, 2007; COGME, 2005;
Smedley, Stith, Colburn, & Evans, 2001). AMI leaders cannot ignore that even with cultural
competency training of nonminority medical students, minority patients still tend to seek out
minority physicians and minority physicians tend to serve minority populations (Garland, Hojat,
Christian, et al., 2003; King, Dickinson, Dubose, et al., 2004; Komaromy, Drake, Vranizen, et
al., 1996). By understanding that student cultural background, amount of involvement with
faculty and staff, and current and perceived future satisfaction with the AMI significantly
impacting a student’s intent to remain, those that work with minority medical students will be
able to create appropriate programming and support students beyond graduation ultimately
positively affecting the health of our nation.
REFERENCES


APPENDIX A

Minority Medical Student Retention Questionnaire

This survey measures the perceptions of interactions held by minority medical students involved in the Student National Medical Association (SNMA) during their medical school careers. By completing this questionnaire, you are providing consent to participate in this study with no more than minimum risk associated with participation in the study with the understanding that the names of participants and their academic medical institutions (AMIs) will not be revealed in any publications or presentations that disseminate the results of this study. This survey also provides you an opportunity to voice your opinions and provide valuable insights to help the SNMA and academic medical administrators understand your needs for support assistance including possible retention programs.

For each item, you will be asked to provide responses and information that describes your academic medical experiences and personal background. **Approximate time to complete the survey is 10 to 12 minutes.** *(BGSU HSRB Approval for Use, ID# H08D283GX2, effective 4-23-08 expires 4-7-09)*

1) **Are you a current member of the Student National Medical Association (SNMA)?**
   - Yes
   - No
   - Don't Know

2) **Are you studying to be a physician?**
   - Yes
   - No

3) **Which of the following describes where you are in your medical education?**
   - First Year
   - Second Year
   - Third Year
   - Fourth Year
   - Fifth Year
   - Sixth Year
   - Residency
   - Intern Status
   - Not applicable
4) **What academic medical institution do you attend?**

*Please scroll carefully down the following list considering the possible different names of your academic medical institution.*

- Albany Medical College
- Albert Einstein College of Medicine of Yeshiva University
- Baylor College of Medicine
- Boston University School of Medicine
- Brody School of Medicine at East Carolina University
- Case Western Reserve University School of Medicine
- Chicago Medical School at Rosalind Franklin U-Med & Sci
- Columbia University College of Physicians and Surgeons
- Creighton University School of Medicine
- Dalhousie University Faculty of Medicine
- Dartmouth Medical School
- Drexel University College of Medicine
- Duke University School of Medicine
- East Tennessee State University James H. Quillen College of Medicine
- Eastern Virginia Medical School
- Emory University School of Medicine
- Florida State University College of Medicine
- George Washington University School of Medicine and Health Sciences
- Georgetown University School of Medicine
- Harvard Medical School
- Howard University College of Medicine
- Indiana University School of Medicine
- Jefferson Medical College of Thomas Jefferson University
- Joan C. Edwards School of Medicine at Marshall University
- Johns Hopkins University School of Medicine
- Keck School of Medicine of the University of Southern California
- Laval University Faculty of Medicine
- Loma Linda University School of Medicine
- Louisiana State University School of Medicine in New Orleans
- Louisiana State University School of Medicine in Shreveport
- Loyola University Chicago Stritch School of Medicine
- Mayo Medical School
- McGill University Faculty of Medicine
- Medical College of Georgia School of Medicine
- Medical College of Wisconsin
- Medical University of South Carolina College of Medicine
- Meharry Medical College
- Memorial University of Newfoundland Faculty of Medicine
- Mercer University School of Medicine
- Michael G. DeGroote School of Medicine
- Michigan State University College of Human Medicine
- Morehouse School of Medicine
- Mount Sinai School of Medicine of New York University
- New York Medical College
- New York University School of Medicine
- Northeastern Ohio Universities College of Medicine
- Northern Ontario School of Medicine
Northwestern University The Feinberg School of Medicine
Ohio State University College of Medicine
Oregon Health & Science University School of Medicine
Pennsylvania State University College of Medicine
Ponce School of Medicine
Queen's University Faculty of Health Sciences
Rush Medical College of Rush University Medical Center
Saint Louis University School of Medicine
San Juan Bautista School of Medicine
Sanford School of Medicine of the University of South Dakota
Southern Illinois University School of Medicine
Stanford University School of Medicine
State University of New York Downstate Medical Center College of Medicine
State University of New York Upstate Medical University
Stony Brook University Health Sciences Center School of Medicine
Temple University School of Medicine
Texas A&M Health Science Center College of Medicine
Texas Tech University Health Sciences Center School of Medicine
The University of Western Ontario - Schulich School of Medicine & Dentistry
The Warren Alpert Medical School of Brown University
Tufts University School of Medicine
Tulane University School of Medicine
Uniformed Services University of the Health Sciences F. Edward Hebert School of Medicine
Universidad Central del Caribe School of Medicine
Université de Montréal Faculty of Medicine
Université de Sherbrooke Faculty of Medicine
University at Buffalo State University of New York School of Medicine & Biomedical Sciences
University of Alabama School of Medicine
University of Alberta Faculty of Medicine and Dentistry
University of Arizona College of Medicine
University of Arkansas for Medical Sciences College of Medicine
University of British Columbia Faculty of Medicine
University of Calgary Faculty of Medicine
University of California Los Angeles David Geffen SOM
University of California San Diego School of Medicine
University of California, Davis, School of Medicine
University of California, Irvine, College of Medicine
University of California, San Francisco, School of Medicine
University of Chicago Division of the Biological Sciences The Pritzker School of Medicine
University of Cincinnati College of Medicine
University of Colorado School of Medicine
University of Connecticut School of Medicine
University of Florida College of Medicine
University of Hawaii John A. Burns School of Medicine
University of Illinois College of Medicine
University of Iowa Roy J. and Lucille A. Carver College of Medicine
University of Kansas School of Medicine
University of Kentucky College of Medicine
University of Louisville School of Medicine
University of Manitoba Faculty of Medicine
University of Maryland School of Medicine
University of Massachusetts Medical School
University of Medicine and Dentistry of New Jersey-New Jersey Medical School
Please select your school or training program:

- University of Medicine and Dentistry of New Jersey-Robert Wood Johnson Medical School
- University of Miami Leonard M. Miller School of Medicine
- University of Michigan Medical School
- University of Minnesota Medical School
- University of Mississippi School of Medicine
- University of Missouri-Columbia School of Medicine
- University of Missouri-Kansas City School of Medicine
- University of Nebraska College of Medicine
- University of Nevada School of Medicine
- University of New Mexico School of Medicine
- University of North Carolina at Chapel Hill School of Medicine
- University of North Dakota School of Medicine and Health Sciences
- University of Oklahoma College of Medicine
- University of Ontario Institute of Technology
- University of Ottawa Faculty of Medicine
- University of Pennsylvania School of Medicine
- University of Pittsburgh School of Medicine
- University of Puerto Rico School of Medicine
- University of Rochester School of Medicine and Dentistry
- University of Saskatchewan College of Medicine
- University of South Alabama College of Medicine
- University of South Carolina School of Medicine
- University of South Florida College of Medicine
- University of Tennessee Health Science Center College of Medicine
- University of Texas Medical Branch School of Medicine
- University of Texas Medical School at Houston
- University of Texas School of Medicine at San Antonio
- University of Texas Southwestern Medical Center at Dallas Southwestern Medical School
- University of Toledo College of Medicine
- University of Toronto Faculty of Medicine
- University of Utah School of Medicine
- University of Vermont College of Medicine
- University of Virginia School of Medicine
- University of Washington School of Medicine
- University of Wisconsin School of Medicine and Public Health
- Vanderbilt University School of Medicine
- Virginia Commonwealth University School of Medicine
- Wake Forest University School of Medicine
- Washington University in St. Louis School of Medicine
- Wayne State University SOM
- Cornell Weill Medical College
- West Virginia University School of Medicine
- Wright State University Boonshoft School of Medicine
- Yale University School of Medicine
- Other (please specify)

If you selected other, please specify
________________________________________________________________________________________________________________________________________
5) Prior to your academic medical experience, have you ever taken courses for credit at this institution?

- Yes
- No

6) If you did take courses at this institution prior to entering medical school, did you obtain a degree?

- Yes
- No

7) What was your score on the MCAT?

__________________________________________________________________________

8) What was your undergraduate GPA?

__________________________________________________________________________

9) What is your current GPA?

__________________________________________________________________________

10) What is the highest level of formal education obtained by your father?

- Grammar school or less
- Some high school
- Postsecondary school other than college
- Some college
- 2-year Degree
- 4-year Degree
- Some graduate school
- Graduate degree other than a medical degree
- Medical graduate degree

11) What is the highest level of formal education obtained by your mother?

- Grammar school or less
- Some high school
- Postsecondary school other than college
- Some college
- 2-year Degree
- 4-year Degree
- Some graduate school
- Graduate degree other than a medical degree
- Medical graduate degree
12) In deciding to go to an academic medical institution, which of the following was most important in your decision to go into medicine?

<table>
<thead>
<tr>
<th></th>
<th>Very Important</th>
<th>Somewhat Important</th>
<th>Not Important</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. My parents wanted me to go.</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>b. I've always wanted to be a physician.</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>c. I wanted to help others.</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>d. I wanted to help others that look like me.</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>e. I was encouraged by a mentor/role model to go.</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>f. I wanted to make more money.</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>g. I was influenced by an elementary school program.</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>h. I was influenced by a high school program.</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>i. I was influenced by an undergraduate program.</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>

13) What is your ethnic/racial background?

- African-American/ Black (Born in the U.S.)
- African-American/Black (Born outside the U.S.)
- Latino/ Mexican American
- White/ Caucasian
- Asian-American/ Asian
- Pacific Islander
- Puerto Rican
- Native American
- Other Latino

14) Your gender is:

- Male
- Female

15) What is your age?

-----------------------------------------------

16) What is your best guess as to the chances that you will:

<table>
<thead>
<tr>
<th></th>
<th>Very Good Chance</th>
<th>Some Chance</th>
<th>Very Little Chance</th>
<th>No Chance</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Need extra time to complete your degree requirements?</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>b. Be admitted to the residency program of your choice?</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>c. Communicate regularly with your professors?</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>d. Participate in student clubs/groups besides SNMA?</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>e. Be satisfied with your experiences at your academic medical institution?</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>f. Desire a residency program close to your current academic medical institution area?</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>
17) Think about a typical week in school. Try to estimate about how many hours in a typical week you...

<table>
<thead>
<tr>
<th>Activity</th>
<th>None</th>
<th>Less than 1 hour</th>
<th>1-4 hours</th>
<th>5-9 hours</th>
<th>10-15 hours</th>
<th>16-20 hours</th>
<th>More than 20 hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Talk with faculty regarding academic, course content or curriculum issues</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>b. Talk with faculty concerning non-curriculum or personal issues</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>c. Socialize with friends</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>d. Participate in student clubs/groups</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>e. Discuss course content with students outside of class</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>f. Study with other students</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>g. Tutor another classmate</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>h. Are tutored by other students</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

18) Since entering your medical program, how often have you:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Almost Always</th>
<th>Often</th>
<th>Sometimes</th>
<th>Rarely</th>
<th>Not at All</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Been a guest in a professor's home</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>b. Met with an advisor/counselor about your career plans</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>c. Sought out a mentor who was a faculty member</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>d. Sought out a mentor who was a staff member</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>e. Engaged with professors during class</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>f. Interacted with medical organizations besides SNMA</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>g. Interacted with student organizations</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>h. Served as an officer or another leadership position in a student organization (not in SNMA)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>i. Served as an officer or other leadership position within SNMA</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>j. Studied or did homework within student groups</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>k. Attended labs</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>l. Attended classes or watched/heard lecture</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

19) How often has faculty provided you with:
<table>
<thead>
<tr>
<th></th>
<th>a. Encouragement to complete your medical degree</th>
<th>b. An opportunity to work on a research project</th>
<th>c. Advice and guidance about your medical program</th>
<th>d. Emotional support and encouragement</th>
<th>e. A letter of recommendation</th>
<th>f. Help to improve your study skills</th>
<th>g. Feedback on your academic work (outside of grades)</th>
<th>h. Intellectual challenge and stimulation</th>
<th>i. An opportunity to discuss coursework outside of class</th>
<th>j. Help in achieving your professional goals</th>
</tr>
</thead>
</table>

20) The Medical Association of Premedical Students (MAPS) is an undergraduate student organization affiliated with SNMA.

Are you currently assisting with a MAPS chapter?

- ☐ Yes
- ☐ No

21) How likely do you agree with the following statements:

<table>
<thead>
<tr>
<th></th>
<th>a. My involvement with SNMA helps me academically.</th>
<th>b. My involvement with SNMA helps me with mentorship.</th>
<th>c. My involvement with SNMA helps me with socializing with students.</th>
<th>d. My involvement with SNMA helps me with socializing with the community outside of campus.</th>
<th>e. My involvement with SNMA helps me with a sense of belonging.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>![ ]</td>
<td>![ ]</td>
<td>![ ]</td>
<td>![ ]</td>
<td>![ ]</td>
</tr>
</tbody>
</table>

22) If you could make your medical school choice over, would you still choose to enroll at your current academic medical institution?

- ☐ Definitely Yes
- ☐ Probably Yes
- ☐ Probably No
- ☐ Definitely No
23) How likely are you to stay and complete your medical degree at this institution? Please select on a scale of 0 to 10 with “0” being “No Chance of Staying” to “10” being “Highest Likely Chance of Staying”. Please further explain your selection under “Additional Comments”.

- 0
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10

Additional Comments: ___________________________________________

24) Please rate your satisfaction with this institution on each of the aspects of campus life listed below.

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Very satisfied</th>
<th>Somewhat satisfied</th>
<th>Neither satisfied nor dissatisfied</th>
<th>Somewhat dissatisfied</th>
<th>Very dissatisfied</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Amount of contact with faculty</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. Class size</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. Interaction with other students</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. Overall quality of instruction</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. Overall sense of community among students</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>f. Availability of campus social activities</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>g. Overall academic medical institution experience</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
25) What do you believe to be your challenge(s) toward degree completion?

<table>
<thead>
<tr>
<th>Challenge</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Academic preparedness for program</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. Financial resources</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. Social connectedness to other students</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. Cultural diversity among peers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. Cultural diversity among faculty</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>f. Cultural diversity among staff</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>g. Social support by community members</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>h. Availability of retention programming</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>i. Access to tutoring services</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

26) If you are interested in receiving a summary of the study results, your email address will only be kept on a password protected computer and deleted once the results are provided. Please provide your email address:

________________________________________________________________________

Please note that you should clear browser cache and page history following submission of the completed survey in order to protect confidentiality and some institutions and employers use software that tracks websites visited and keystrokes made, so you may wish to complete the survey on a public or home computer.

*Please be sure to select the “Submit Survey” button. Thank you again for your participation!*
APPENDIX B

TO: Patricia Hogue, Ph.D. – Principal Investigator/Faculty Advisor  
UT Department of Physician Assistant Studies  
Shanda Gore, M.A. – Student Investigator  
Director of Diversity, Recruitment and Retention

FROM: Roland Skeel, M.D., Chair  
Deepak Malhotra, M.D. Vice Chair  
Gregory Siegel, R.Ph., J.D., Chair Designee  
UT Biomedical Institutional Review Board

SIGNED: ______________________ DATE: 4/7/08

SUBJECT: IRB # 106016  
Title: An Examination of Involvement Behaviors and Minority Medical Student Retention

The above research was reviewed and approved by the Chair of the Biomedical Institutional Review Board as an Exempt review (category #2b). The requirement to obtain a signed consent/authorization for use and disclosure of protected health information form has been waived as this research is determined to be minimal risk and a signed consent/authorization document would be the only record linking the subject to the data. It was determined that this waiver for signed consent/authorization for use and disclosure of protected health information form will not adversely affect the rights and welfare of the participants. This action will be reported to the committee at its meeting on 04/17/2008.

Items Reviewed:
- IRB Claim of Exempt Research Application  
- Data Collection Tool – Minority Medical Student Retention Questionnaire (MMSRO)(assigned version date 04/07/2008)

DESIGNATED as EXEMPT RESEARCH on: 04/07/2008

Please read the following attachment detailing Principal Investigator responsibilities.
May 16, 2008

TO:    Shanda Gore
EALS

FROM:  Richard Rowlands
HSRB Administrator

RE:     HSRB Project #: H08D283GX2

TITLE:  An Examination of Involvement Behaviors and Minority Student Retention at Academic Medical Institutions

The Human Subjects Review Board (HSRB) has reviewed the requested modifications you submitted for your project involving human subjects. Effective May 15, 2008 the following modifications have been approved:

Expand measurement dimensions for selected survey questions and add additional comments option to one survey question.

You may proceed with approved project activities as you wish. If you seek to make any additional changes in your project activities, complete the Request for Modifications/Addendum application and submit it to the HSRB via this office. Please notify me in writing upon completion of your project (fax: 419-372-6916 or email: hsrp@bgsu.edu).

Good luck with your work. Let me know if this office or the HSRB can be of assistance as your project proceeds.

COMMENTS:

C: Dr. Judy Jackson May
APPENDIX D

You're receiving this email because of your relationship with Student National Medical Association. Please confirm your continued interest in receiving email from us.

You may unsubscribe if you no longer wish to receive our emails.

Student National Medical Association

June 09, 2008

Dear First Name Last Name,

In an ongoing effort to reach our SNMA members and gauge the needs of our student population, we are participating in a project involving a survey and need your input. The 10-12 minute online survey, called the Minority Medical Student Retention Questionnaire (MMSRQ), contains a total of 26 questions. If you cannot go directly to the link, please copy and paste the link into an URL line https://vovici.com/wsb.dll/s/15b20g33fc0. This survey provides you an opportunity to voice your opinions and provide valuable insights to help the SNMA and academic medical administrators understand your needs for support assistance including possible retention programs.

Your participation is strictly voluntary and confidential; and, you can refrain from answering any questions without penalty or explanation. By completing the survey and clicking the "submit" button, you are indicating your consent to participate in the project and will have no more than minimum risk associated with participation with the survey. If you participate and request a copy of the survey results, your email address will only be kept on a password protected computer and deleted once the results are provided. Please note that you should clear browser cache and page history following submission of the completed survey in order to protect confidentiality and some institutions and employers use software that tracks websites visited and keystrokes made, so you may wish to complete the survey on a public or home computer. If you elect not to participate, your choice will not affect your relationship with the SNMA. The objective is to explore if minority medical student involvement with faculty, peers, and student organizations like the SNMA coupled with the institutional and student background characteristics may influence a student's intent to remain in medical school. An executive report will be generated from the responses and it is hoped that the survey results will help facilitate future retention programming at medical schools across the United States.

The survey is being administered by Ms. Shanda Gore, a Bowling Green State University doctoral student and primary investigator, and any inquiries about the survey can be directed to Ms. Gore (sgore@bgsu.edu, 419-383-6538) or Dr. Judy Jackson May, her project advisor (judyjac@bgsnet.bgsu.edu, 419-372-7373). If you have any questions about the conduct of this project or about your rights as a research participant, you may contact the Chair of Bowling Green State University's Human Subjects Review Board at 419-372-7716 (hsrb@bgsu.edu). Thank you again for your input and willingness to participate.

Dr. Wallace Davenport II,  SNMA Executive Director
Shanda Gore,  Primary Investigator

BGSU HSRB - Approved for Use ID#H08D283GX2 Effective 4-23-08 Expires 4-7-09