

**Reconstructing Research: Exploring the Intersections of Race, Gender and
Socioeconomic Status in Medical Education**

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Dedication

This dissertation is dedicated to the memory of those whose lives ended well before their time due to the unjust and preventable burden of disease, Jeanmarie (Aunt Missy) Belton, Ernestine (Grandma B) Belton and Hilary Leroy (Pops) Hardeman Sr.

I also dedicate this work to those who are deep in the struggle to change our world, knock down walls and eliminate barriers that keep us from living in a just and equitable society.

This dissertation is just one small contribution to La Lucha.

Abstract

Introduction

This dissertation is based on the notion that understanding the early years of medical training is vital to gaining perspective on the socialization of future physicians. The medical school socialization process is a complex and multidimensional one. Studies of this socialization process over the years have failed to explicate how the role of diverse social positions fits into the process. It is the premise of this dissertation that the medical school socialization process is likely one in which certain students (e.g. White, male, upper-middle class) will thrive while its effect on non-whites, women and lower income groups may be less beneficial. This, combined with the fact that members of marginalized social positions may begin their medical training with different resources and vulnerabilities than their counterparts who are part of the majority suggests that medical school socialization processes has the potential to be harmful to certain groups.

Methods

In this dissertation, I use social position (race, gender, SES) to explore and understand three aspects of the medical school socialization process—psychological well-being, identity and attitudes towards patient-centered care. I believe that these are three important elements that can have a profound impact on the experience of medical trainees and ultimately the type of physicians they will become. All analyses come from the Medical Student CHANGES Study. The first manuscript assesses whether there are race and gender disparities in mental and physical health in a national sample of first-year medical students; if there are race and gender differences in factors known to increase

resiliency to stress (e.g. coping, mastery, social support, self esteem); and how race and gender intersect to impact symptoms of depression and anxiety. The second manuscript examines if racial identity is a protective factor for depressive symptoms and anxiety among African American first year medical students. It also explores the interaction between gender and racial identity and SES and racial identity and their impact on depressive and anxiety symptoms. The third manuscript explores the relationship between socio-demographic characteristics (gender, race and SES) and attitudes towards patient-centered care among African American and White first year medical students.

Results

In manuscript one, African American and female medical students were found to be at greater risk for depressive symptoms and anxiety. African American students were also at greater risk of lacking psychosocial resources such as social support. In manuscript two, findings suggested that a high racial identity is not protective of depressive symptoms and anxiety. Instead, I found that students with high racial identity were at greater risk for depression and anxiety. In manuscript three, I found that female gender and SES (low-middle income) were significant predictors of positive attitudes towards patient-centered care.

Conclusions

This dissertation provides insight into the potential impact of the medical socialization process on students from marginalized social positions, more specifically; how the process impacts their psychological well-being, identity and attitudes towards

patient care of students. The findings of this dissertation have practical implications for medical education, clinical care and health disparities.

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Chapter 1

INTRODUCTION

This dissertation is based on the notion that understanding the early years of medical training is vital to gaining perspective on the socialization of future physicians. Sociological studies of medical education and of the socialization of health care providers and providers in training occupy a prominent position in the medical sociological literature. Classic studies include *The Student Physician* by Merton, Reader and Kendall¹ and *Boys in White* by Becker, Geer, Hughes, and Strauss.² Most of these studies are based on the belief that medical school socialization is best studied in the patient-centered years of clinical training (e.g. years 3 and 4 and/or residency).^{3,4} Indeed, researchers tend to focus on the clinical rather than the preclinical years of medical training. The outcome is a relative neglect of earlier but formatively important stages in the socialization process.^{5,6}

Studying students in the first year of medical school may be especially important for students from marginalized and/or minority groups (e.g. African Americans, women and individuals with low socioeconomic standing) since they begin medical school socialized into prescriptions and expectations of their social position that are quite different than the prescriptions and expectations of their White and higher socioeconomic status (SES) counterparts. Furthermore, they may have had drastically different experiences prior to medical school and may be struggling with greater allostatic load than their White, male and higher SES counterparts. Indeed, students who experience prior socialization based on their race, gender or socioeconomic standing likely bring

with them varied psychosocial resources and different personality assets into the medical school context.⁷ These sources of differential vulnerability may encompass earlier familial socialization experiences that are strongly influenced by race, gender and SES.⁷ The fundamental proposition of my dissertation is that members of marginalized social positions start medical school with different resources and vulnerabilities than their counterparts who are part of the majority; and as a result, experience medical school socialization in a fundamentally different way.

Medical School Socialization: An Overview

Merton and colleagues use the concept of socialization to explain how medical students acquire the beliefs, values, and norms of medical culture.^{1(pp287-290)} They suggest that the medical school functions as a social environment where the medical professional culture is “transmitted to novices through distinctive social and psychological processes”.^{1(pvii)} Becker on the other hand suggests that the socialization of medical school results from the medical students’ culture and group perspectives within the larger system of the medical school institution.² He explains that the students interact with each other, with faculty, and with staff based on the institutional roles that they occupy, which are the socially defined positions of students within the organization.^{2(p34)} Simpson incorporates both perspectives, explaining that the medical socialization process is multidimensional and is therefore comprised of both the social environment and the culture and group perspectives within the larger system.^{8(pp225-226)} In this dissertation, I rely upon Simpson’s suggestion that both Becker and Merton’s conceptualizations of the medical school socialization are relevant, particularly the fact that it is a

multidimensional process by which people acquire the values and attitudes, the interests, skills, knowledge and the culture of medicine.

Medical students' socialization process requires active participation and emotional involvement through a process known as the "moral career" of medical education.⁹

According to Light's model of professional socialization, early stages of this process involve moral ambiguity stemming from feeling different and the fear of being discredited by their instructors and patients. This period of confusion, numbness, and exhaustion is often stress inducing. It is followed by a resocialization process that ultimately culminates in the growing sense of mastery and self-affirmation, as students assimilate the values and attitudes of their chosen profession.⁴ The resocialization process involves the elimination of former behaviors and the acceptance of new ones as part of the transition to a person's new life, in this case, learning to take on the roles and behaviors of the medical profession.⁴ Hafferty's research expanded Light's findings by demonstrating that the process of medical socialization is not a simple matter of substituting one value system with another when a student begins medical school.¹⁰ Instead, for a period of time, lay values overlap medical values and create tension. Long held lay values and attitudes first become suspect, then dysfunctional, and finally are deemed inferior. At the same time, medical values and attitudes become thought of as increasingly desirable, then functional, and eventually are considered superior and internalized.^{10(pp241-242)} Hafferty also suggests that the process of professional socialization is fundamentally social in nature.^{10(p242)} While the formal curriculum of medical school is designed to train students in the skills and knowledge of their particular

field, there is a “hidden curriculum” or informal curriculum, where the expected cultural values and norms of medicine as modeled and enforced by the faculty and staff are transmitted to the students.¹¹

Indeed, Hafferty (2000) suggests that conventional medical education is a multidimensional process that includes both a formal and an informal curriculum.¹⁰ The formal curriculum is the stated, intended coursework. The informal curriculum consists of the unscripted and interpersonal teaching and learning that happens through faculty-student contact outside of the classroom. But, Hafferty insists that there is more to medical education than only the formal and informal educational processes.¹⁰ He argues that there also is also a “hidden curriculum” (p. 243).^{10(p243)} This hidden curriculum helps to teach medical students the dominant values of conventional medicine. These lessons are taught through the culture and organizational structure of conventional medical schools. For example, Hafferty suggests that the organizational value placed on scientific research is conveyed through the hidden curriculum.¹⁰ When emphasis and overt rewards are attached to medical research, students effectively learn to place high value on research. Jaye, Egan, and Parker (2006) find that medical students are very aware of the socialization process that underpins their formal curriculum studies and teaches them the professional norms, values, and beliefs.¹² I mention the concept of the hidden curriculum in this dissertation because it is useful for understanding how the culture and social structure of medical school contributes to the internalization of core values. This notion is particularly salient for understanding how the socialization process impacts various attitudes towards patient-care. Very little work has been done to understand if the

socialization process operates differently or creates different results for students from marginalized social positions (e.g. African Americans, women and individuals with low socioeconomic standing).

The medical socialization process combined with medical school demands create high burden on medical students. As a result, there has been an emphasis on research that seeks to understand the psychosocial well-being of medical students. However little is known about how the burden and stress of the socialization process impact the psychological well-being of these students. While medical students enter into medical school with a set of values and norms, they also enter with a pre-established identity. Identity represents an individual's psychological relationship to social category systems (e.g. race, gender and SES).¹³ Students not only have to learn how their current identity fits within their new social structure and environment but they are also simultaneously developing a professional identity through the socialization process. For students whose identity prior to medical school aligns closely with their newly developed professional identity there will be less stress as they reconcile the two. On the other hand, students whose identities do not easily align may experience greater identity dissonance. This may be more likely to occur in certain students; further detail on this is outlined below.

In the next sections of this chapter I will describe these ideas in further detail, outlining how the medical school socialization process can affect psychological well-being, identity and attitudes towards patient care. I will also discuss how and why the socialization process interacts with and affects social position. I will conclude the chapter with a description of the three papers that comprise this dissertation, along with their

research questions, hypotheses and conceptual model.

Medical School Socialization: Stress and Psychological Well-being

The process of socialization into medical school is often filled with tension and anxiety.^{1,2,14,15} Multiple aspects of medical school can be stressful, including heavy workloads, academic pressures and a competitive environment, limitations on time and loss of leisure activities, and financial burden.¹⁶ These stressors may take their toll on the functioning, socialization and ultimately the well-being of medical students. As a result, over the course of 4 years of medical school, students experience poor physical health, increased depression, lowered self-esteem, more negative mood, and less positive mood than their non medical student peers.¹⁷ A myriad of studies over the past decade have documented the prevalence of psychological distress (e.g. depression, anxiety, burnout) among the medical students.¹⁸

While there are strain-inducing problems that are applicable to all medical students, some appear to be unique to certain groups.¹⁵ The medical socialization process is different for various individuals based on their prior social position. For example, prior studies have found that for African American medical students, the major areas of stress in medical school are related to the insensitivity of the medical school environment to African American culture, financial problems, lack of African American role models who understand their needs, negative faculty attitudes toward African American students, and poor academic preparation for medical school.¹⁵ Dyrbye and colleagues found that minority medical students were more likely than non-minority students to report that their race had adversely affected their medical school experience.¹⁹ She goes on to suggest that

racial discrimination (e.g., unfair treatment based on race); racial prejudice (e.g., an unfavorable preformed opinion based on race); feelings of isolation; and interpersonal and communication differences owing to cultural upbringing (e.g. consequences of differences in socialization such as cultural norms, expectations, and upbringing) all contribute to psychological distress for these students.^{19,20} As a result, these students are likely to experience the socialization process of medical school differently. For example, they will have greater challenges in gaining a sense of belonging and acceptance in school. These students may also be more likely to experience powerful emotional disruptions that include uncertainty about their own values, ambitions, abilities, affinities, and their self-worth and develop haphazard coping mechanisms. Coping mechanisms may include the outright rejection of the professional role, displaying aspects of identity that conflict with the professional role, and avoiding professional school-setting interactions whenever possible, and when not possible, ‘role playing’ in professional situations.²¹

The medical school socialization process may also affect women differently than men. Although most U.S. medical schools have achieved gender equity in terms of the number of women entering medical training²², the daily experiences of female medical students continue to be affected by issues of gender.²³⁻²⁶ Female medical students negotiate a broad range of gender-based experiences that impact their psychosocial well-being.²⁷ Perhaps as a result, women in medical school experience more psychological distress than men.^{22,27,28} Existing research on gender in medical education suggests that sexual harassment and gender discrimination substantially influence the medical school

experience for women and may be some of the reason for worse mental health among women.²²

Medical School Socialization: Development of Identity

Identity represents an individual's psychological relationship to social category systems (e.g. race, gender and SES).¹³ The medical school socialization process affects identity and identity development.²¹ It is the premise of this dissertation that identity is an important aspect of the medical socialization process for medical students with marginalized social status. An individual enters medical school with a particular identity or identities (e.g. African American female or White, male, upper-middle class). This identity then interacts with the medical school socialization process in a systematic way. These identities will also be confronted by the professional identity that is being developed through the socialization process.

Identities in some cases may be protective but in other ways might be harmful during the socialization process. For example, for medical students who identify as White, male and from upper-middle or upper SES backgrounds the socialization process of medical school will be less foreign to them^{29,30} because they are more likely to have experienced aspects of the socialization process of medical education long before they became medical students. A higher percentage of their parents are professionals of some type including physicians,³⁰ and they have likely had access to many resources to prepare them for medical school. The socialization process on the other hand, might be more difficult for African American students who are being socialized into values, beliefs, norms and behaviors that may be in conflict with what they have previously known. For

example, studies have found that African American students with a strong racial identity may suffer from social isolation and greater stress in school (the concept of racial identity will be developed and discussed further in chapter 4).^{15,31} Additionally, Costello (2005) found that women, members of lower socio-economic groups and non-Whites underperform at professional schools and suffer from poor mental health. One of the reasons for this is that they suffer from identity dissonance—integrating a new identity as a medical student and future physician is an easy process for people whose personal identities are consonant with their new professional role, but traumatic for those whose personal identities are dissonant with it.²¹

While studies have separately explored the experience of being an African American medical student¹⁹ and a female medical student,^{22,27} to date, very little has been done to understand the complexity at the intersection of both (or other) identities. Even less has been done to explore this specifically within the context of the medical school socialization process. Nevertheless, the ways in which individuals conceptualize and manage their multiple identities have profound implications for the education of future physicians.³² Monrouxe (2010) suggests that there are several ways in which a medical student might structure his/her multiple identities; the best way to illustrate this is with Maria's story:

Maria has developed multiple identities as Black, female and doctor. One way Maria can understand her identities is to focus on the intersection between them. In doing so, Maria will represent herself in the single unique identity of a 'Black female doctor'. Those who do not share this identity (e.g. White male doctors, Black female nurses) will be considered to belong to out-groups.

A second way in which Maria can consider her multiple identities is to construct a hierarchy of identities, in which one takes precedence over the others. So, Maria might place her identity as a doctor over that as a woman and over that of being Black. People who are also members of this dominant identity (i.e. other doctors) are considered in-groups. However, because the representation is hierarchical, Maria will feel closer to other doctors who are female or Black. People outside her dominant identity will be considered out-group members.

A third way in which Maria might represent her multiple identities is through a process of differentiation and isolation, resulting in compartmentalization. Identities are then activated within different contexts and situations. So, while at work Maria will identify with other doctors and will consider everyone else as out-group members. In other contexts her gender or her race might dictate who she identifies with. The ability to hold a complex representation of identities will lead Maria to develop a merged in-group identity that is highly inclusive and divergent. Here, Maria's social identity 'transcends single categorical divisions between people.'^{33(p43)}

To date, there has been little research that has considered how medical students construct relationships between their different identities. Monrouxe (2010) suggests that within the framework of identity construction lies a fruitful area of research for medical education; understanding the factors that facilitate or inhibit the development of merged identities will have profound implications for both the education of doctors and for patient care.

The Medical School Socialization Process: Attitudes towards patient care

The medical school socialization process also impacts how individuals think about, will interact with and communicate with their patients. Some scholars suggest that this is directly related to the socialization process that creates a professional identity for medical trainees.^{1,10,21,34} Indeed, medical training has been found to influence physician

professional identity development in ways that ultimately affect doctors' relationships with patients.^{35,36} The occupational identity physicians develop during their medical training has important implications for their future interactions with patients and strongly influences their values and attitudes around the type of care they deliver.³⁷ For example, Mishler (1984) suggests that what students learn in medical school is not synonymous with what is happening in the real world, stating that: "the 'voice of medicine' taught in medical school and residency clashes with 'voice of the life world' experienced by patients..."(pp.127).^{38(p127)} This can yield problematic outcomes for physician-patient communication and building a physician-patient relationship.³⁸ Ultimately, the socialization process may be socializing medical students into a discourse in which the medical ideology is based on values such as objectivity and authority used to maintain traditional hierarchical social orders and legitimate the biomedical model, marginalizing alternative perspectives.³⁹⁻⁴¹ The development of these values and norms often is derived by what Hafferty refers to as the "hidden curriculum" of medicine as described above.¹⁴ During this time, students learn the organizational value that is placed on things like patient-centered care or shared decision-making. Students also internalize subtle rules about the social hierarchy of a physician and how to think about, conceptualize and operationalize the physician-patient relationship.⁶

It is unclear if and how the medical socialization process interacts with prior social position to affect professional and personalized identity. It is also unclear if and how the medical school socialization process interacts with their social position to influence their attitudes and beliefs regarding interpersonal processes of care. The literature that

documents greater satisfaction for African American patients who have an African American physician suggests that social position is an important aspect of the physician-patient relationship. Additionally, several studies suggest that gender can play an important role in the physician-patient relationship, concluding that women physicians tend to be more patient-centered in their communication.⁴²⁻⁴⁵ It has also been documented that physicians from lower SES backgrounds may be better equipped to care for patients who come from similar backgrounds.²⁹ It is quite possible that those from marginalized social positions have different values based on their social position and as a result, may have a stronger impact on their values and beliefs towards patient-centered care than those learned from the “hidden curriculum” Individuals’ awareness of their group memberships can have important implications for how they practice medicine and communicate with their patients.⁴⁶ Individuals who construct their identities as complex, like “Maria” might demonstrate different communicative patterns such as communicating in a way that manifests less social distance and demonstrates greater acceptance and trust.⁴⁷ On the other hand, it is quite possible that the medical socialization process that develops professional identity may do harm to the notion of physician-patient relationship and patient-centered care for students of color, women and/or low SES students. It is quite possible that their new professional identity might take precedence and drive their thoughts around patient care rather than their previous notions based on their social position. This scenario is supported by Berger who suggests that historically; physicians tend to under recognize the influence of their own demographically based predispositions in medical practice. He goes on to suggest that there is a presumption in

medicine that clinicians are neutral operators governed by objective science and are unaffected by personal variables.⁴⁸

Conclusion and Description of Three Papers

In conclusion, there has been little prior investigation of how the role of diverse social positions fits into the complex and multidimensional pre-clinical medical school socialization process. It is the premise of this dissertation that the medical school socialization process is likely very manageable for certain students (e.g. White, male, upper SES) while causing considerable strain for non-whites, women and lower SES groups. This, combined with the fact that members of marginalized social positions may begin their medical training with different resources and vulnerabilities than their counterparts who are part of the majority suggests that medical school socialization processes has the potential to be detrimental for women, non-white and low SES students.

In this dissertation I use social position (race, gender, SES) to explore and understand three aspects of the medical school socialization process—psychological well-being, identity and attitudes towards patient care. I believe that these are three important aspects of the socialization process that can have a profound impact on the experience of medical trainees and ultimately the type of physicians they will become. The three papers that will explore these ideas are as follows:

Paper 1: *Depression, anxiety, health status and resiliency in first year medical students:
A comparison of the effects of race and gender*

There is a growing literature on the health and well-being of medical students in general, yet few studies have had a large enough sample size to make comparisons based on socio-demographic characteristics such as race and gender.²³ Limited findings suggest that race is profoundly related to distress for minority medical students who report frequent experiences of discrimination, isolation and/or prejudice.¹⁹ Female medical students have been found to manifest higher levels of psychiatric symptomatology,^{49,50} and a greater number of general health and psychological identity problems⁵¹ in contrast to male medical students. While there is some evidence to suggest that African American and female medical students may suffer from higher levels of distress in medical school, there is no work that we know of that also investigates the intersection of these socio-demographic characteristics (e.g. African American female).

Research Questions:

Q1. Are there race and gender disparities in mental and physical health in a national sample of first-year medical students?

H1. I hypothesized that African American and female medical students begin medical school at greater risk of depression, anxiety with worse self-rated health compared to their White and male counterparts.

Q2. Are there race and gender differences in factors known to increase resiliency to stress (e.g. coping, mastery, social support, self esteem)?

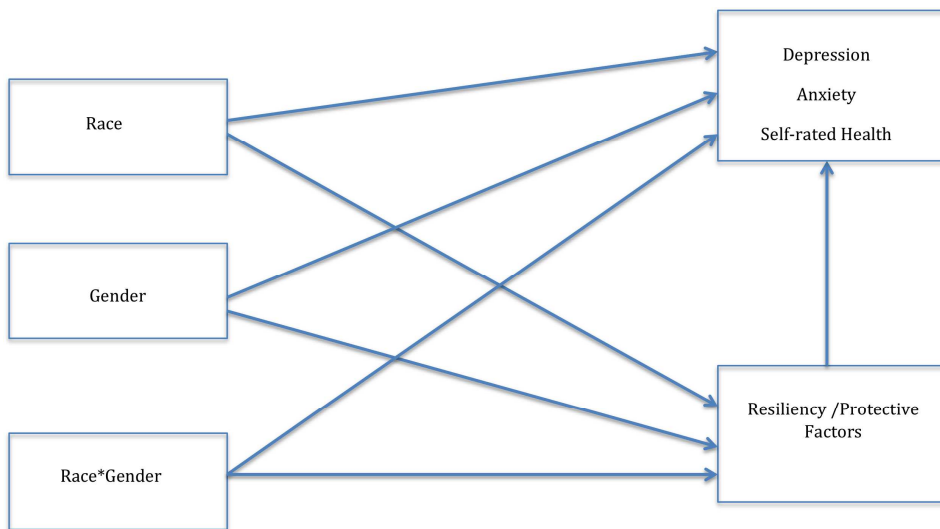
H2. I hypothesized that African American and female medical students begin medical

school with fewer resources to cope with or protect themselves from the effects of stress, including practice with active coping techniques, social support, self-esteem and mastery.

Q3. How do race and gender intersect to impact depression and anxiety?

H3. I also hypothesize that when examining the interaction of race and gender, African American female medical students will have worse self-rated health, fewer psychosocial resources and be at greater risk for depression and anxiety than their white male counterparts.

Figure 1: Conceptual Model



Paper 2: *Is Racial Identity Protective? Depression and Anxiety Among A National Sample of African American First Year Medical Students*

Given what we know about the salience of psychological distress for medical students and African American students in particular, the importance of identity both professional and otherwise in the medical education process, it is important that medical education literature fully explores the role of identity for African American students.

Racial identity has potential to impact psychological well-being (depression and anxiety) which is found to be of particular importance given the emotional socialization that happens during medical school.⁵² Some scholars suggest that racial identity can potentially be a protective factor for poor psychological well-being among African Americans. In addition to understanding the relationship between racial identity and depression/anxiety, this study presents an opportunity to explore racial identity and its relationship to socioeconomic status and gender.

Research Questions:

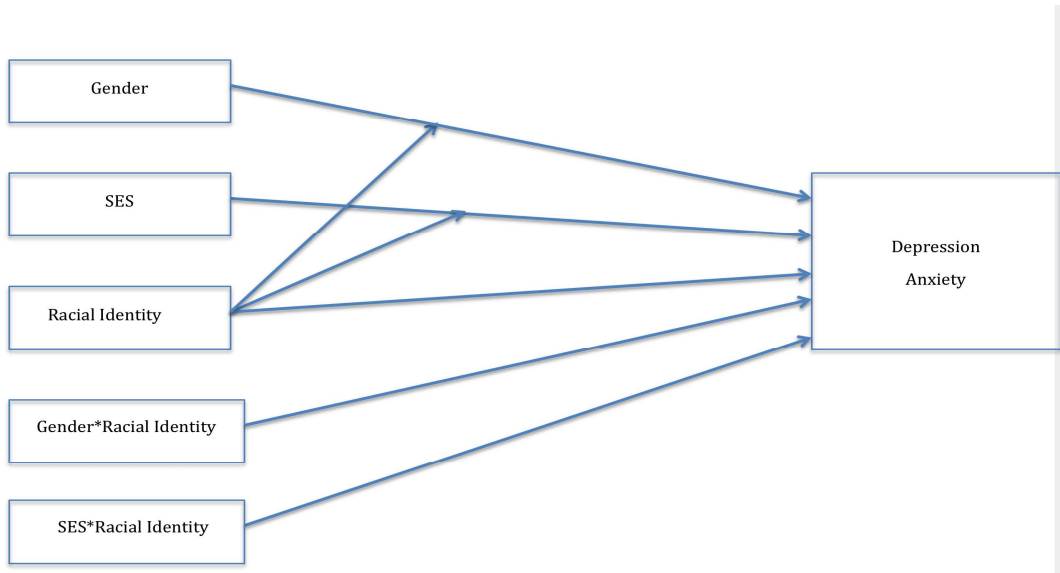
Q1. How does racial identity impact depression and anxiety for African American first year medical students?

H1. I hypothesize that African American medical students with a higher or more positive racial identity score will experience less depression and lower levels of anxiety.

Q2. Given the potential role that gender and SES might also play in the African American medical school experience, we also aim to explore the interaction between gender and racial identity and SES and racial identity and their impact on depressive and anxiety symptoms.

H2. I hypothesize that being an African American female and having a low racial identity centrality score will result in greater depressive and anxiety symptoms and that being of low or low-middle SES standing and having a low racial identity centrality score will result in greater depressive and anxiety symptoms.

Figure 2: Conceptual Model



Paper 3: *Medical student socio-demographic characteristics and attitudes towards patient-centered care: Do race, socioeconomic status and gender matter?*

Individuals' awareness of their group memberships can have important implications for how they practice medicine and communicate with their patients. Individuals who construct their identities as complex might demonstrate different communicative patterns within interprofessional teams, such as communicating in a way that manifests less social distance and demonstrates greater acceptance and trust of lower status team members.⁴⁷ Furthermore, the ability to represent complexity within our multiple identities can have implications for patient care. Thus, understanding physicians attitudes toward patient-centered interacting with patients and how their identities (race based, gender based or socioeconomically based) impact those attitudes is relevant to the exploration of the underlying mechanisms that contribute to disparities in health care. There is a paucity of research that explores the relationship between the socio-

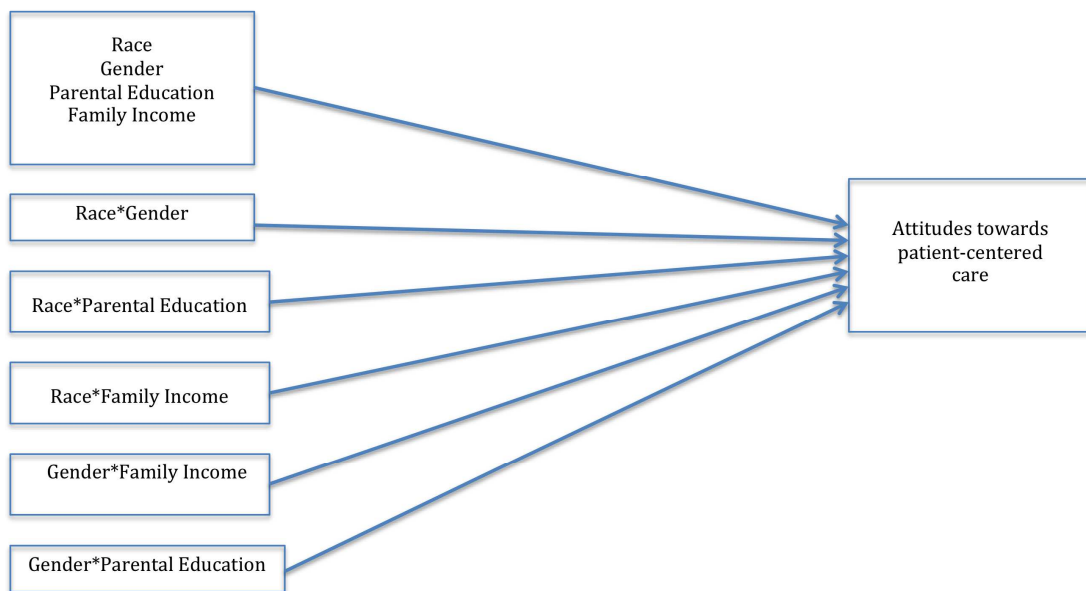
demographic characteristics medical students and their attitude towards patient-centered care. While medical curricula have begun to focus on teaching students strategies for patient-centered care, some of the attitudes that may influence uptake of these behaviors may be intrinsic to the social background the physician/future physician.

Research Question:

Q1. What is the relationship between socio-demographic characteristics (gender, race and SES) and attitudes towards patient-centered care among African American and White first year medical students?

H1. Students who are African American, female and/or from a low-middle SES background will have more positive attitudes towards patient-centered care.

Figure 3: Conceptual Model



CHAPTER 2

METHODOLOGY

Description of Overall Study

The Medical Student Cognitive Habits and Growth Evaluation Study (CHANGES) Study is a study developed by a Research team, lead by Principal Investigator Dr. Michelle van Ryn (Division of Health Care Policy and Research, Mayo Clinic) and Co-PI Dr. John F. Dovidio (Department of Psychology, Yale University). CHANGES is a longitudinal cohort study of medical students that is intended to examine the independent and combined effects of student and school factors on implicit racial bias and in the inappropriate effect of patient race on clinical judgments and decisions. The study also collected data on changes in medical students' quality of life, social relationships, attitudes, and beliefs over the course of medical school.

In Fall of 2010, the CHANGES research team collected extensive survey data and Implicit Association Test (IAT) scores from 4,764 medical students starting their first year of medical school. The CHANGES study will administer the same measures as well as clinical vignettes at the end this cohort's 4th year (2014). In Spring of 2013, data was also collected on a wide variety of medical school environment and curricula factors.

Study Sample

This research study was approved by the IRBs of Mayo Clinic, the University of Minnesota, and Yale University. We randomly selected 50 medical schools from strata of public/private schools and 12 regions of the country using a sample proportional to strata

size methodology.⁵³ One sampled school (military school) had highly unique characteristics, including acceptance policies, curriculum structure, timing and student characteristics. Due to concerns for the generalizability of our study findings, this school was excluded from analysis (n=32).

Since there are no accurate and comprehensive lists of first year medical students available early-mid fall of their first year, we used the following methods to ascertain as many of the 8,594 first year medical students attending the 49 schools as possible (see Figure 4): (1) we obtained emails of students interested in participating in the study through a question included as part of the Association of American Medical Colleges (AAMC) Matriculating Student Questionnaire (MSQ), a voluntary annual survey sent to all students entering medical school (n=3310); (2) a list of first year medical students (incomplete) purchased from an American Medical Association (AMA) licensed vendor (n=525); and (3) referral (i.e. snowball) sampling through recruited survey respondents (n=1988).

Between October 2010 and January of 2011, a total of 4,764 first year medical students completed the baseline survey, representing 81% of the 5,873 students invited to participate in the study, and 54% of all 8,763 first year students enrolled at the 50 sampled schools. Our survey response rate is comparable to other published studies of medical students.⁵⁴ The demographic characteristics of students in our sample were similar to the demographics of all students who enrolled in a medical school in 2010, as reported by the AAMC (See Table 1).

Data Collection and Integrity

Students identified as first year medical students in any of the sampled schools were sent an email or letter with a link to the informed consent page. Those who consented were linked to an online questionnaire that they advanced through by answering questions placed on consecutive screens (can be thought of as pages). Time spent on each screen (page) and total time to completion was recorded. On average, it took 33 minutes to complete the survey. If participants attempted to move to the next screen (page) with an unanswered question on the current screen, a warning popped up and they were directed back to the unanswered question. If they chose not to answer that question, they had to click on a button to indicate their desire to skip the question. This protected participants' right to skip questions while eliminating any timesaving incentives for doing so. After students completed the entire questionnaire they completed two Implicit Associations Tests (IATs). All participants were given the Race IAT and 50% were randomly assigned to the Anti-fat or a homonegativity IAT each. Upon completing the IAT's participants were direct to a separate secure server where they provided their name and address so we could send them their \$50.00 cash incentive. This allowed us to identify and eliminate duplicates. It also allowed us to confirm that our snowball sampled respondents were first year medical students at the school they identified. While many medical schools carefully protect the list of and/or contact information for their first year class, in most cases it is possible to find the student and their matriculation year in school online directories if one already has their name and/or email address. Last, responses were examined for indications of systematic response bias (e.g. clicking the same

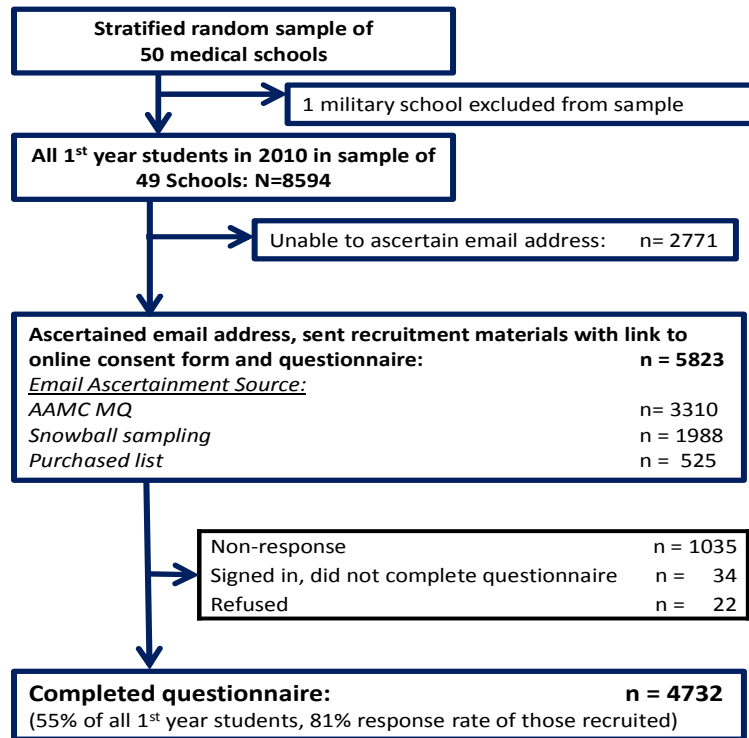
response option to move rapidly through the questionnaire). Invalid or incomplete questionnaires were omitted (n=32).

All eligible students who responded and completed our survey received an incentive of fifty dollars for their participation along with an email and thank you letter. We have maintained contact with respondents through study updates and newsletters.

Table 1. CHANGES participant demographic characteristics in comparison to all US medical school matriculants in 2010

	CHANGES Medical School Student Survey (n = 4764) 50 Schools	Matriculating Student Questionnaire 2010* (n = 14,638) 131 Schools
Sex		
Male Sex	50.2%	51.9%
Race		
African American	6.3%	6.8%
Alaska Native, American Indian, Pacific Islander	2.3%	1.9%
Asian	24.4%	24.0%
White	68.6	70.7
Hispanic/Latino	6.3%	8.1%
Unknown	2.0%	3.2%
SES		
Less than \$10,000	2.4%	2.6%
\$10,000 - \$19,999	2.5%	2.4%
\$20,000 - \$29,999	3.4%	3.4%
\$30,000 - \$39,999	3.8%	4.5%
\$40,000 - \$49,999	4.3%	4.2%
\$50,000 - \$74,999	12.0%	12.8%
\$75,000 - \$99,999	11.7%	11.3%
\$100,000 - \$249,999	40.5%	42.8%
\$250,000 - \$499,999	14.3%	13.1%
\$500,000 or more	5.2%	3.0%
Median income of parents of those providing figures:	\$110,000	\$110,00

Figure 4. CHANGES Sampling Strategy



Measures and Psychometric Evaluation

The CHANGES survey consists of 358 items (questions) and employs a wide range of measures (see Appendix F for full review of the survey). The CHANGES research team selected all scale items and based decisions on recommendations from the scale’s developer whenever possible. Scales and subscales were identified by using principal component analysis (PCA) and computed as the mean of all scale items, requiring that at least 50 percent of the scales questions were answered to compute a score. Below is a description of each of the measures I used for this dissertation.

Socio-demographic characteristics and Other Dependent Variables

Race was collected through self-report. Students identified their race from the following choices: American Indian/Alaskan Native, East Asian, South Asian, African American, Native Hawaiian/Pacific Islander, White or Multiracial. Respondents who identified with multiple racial/ethnic groups were categorized into just one of those groups in the following order: African American, South Asian, East Asian, and White. For example, all participants who marked “African American” (n=58) were categorized as African American. This dissertation focuses on medical students who identified as White (n=2,913) or African American (n=301).

Gender was assigned based on self-report. Those who indicated “other” for their gender (n=5) were excluded from analyses.

Age was assigned based on self-report. I dichotomized age into those 24 and younger and those over 24. Twenty-four was chosen because it is the average age of a first year medical student in the United States⁵⁵ as well as the mean age for our cohort of first year medical students. For papers 1 and 2 I felt it was important to control for age given that being older in age has been found to be associated with burnout and serious thoughts of dropping out of medical school.⁵⁶ In paper 3, there is some evidence that age (level of maturity) may have an impact on levels of empathy and patient-centeredness in the physician-patient relationship.⁵⁷

Socioeconomic status was captured in several different ways depending on the focus of the paper; I used both the highest education level of either parent and family income. For parental education, students were asked to indicate the highest degree

obtained by their mother or their father (PhD, Masters, Bachelors, Less than Bachelors). This variable was used as a covariate in paper 1 given the literature that suggests that education level is a predictor of mental health outcomes.⁵⁸ Because family income (i.e. the socioeconomic standing they experienced growing up) is more likely to have shaped medical student attitudes, values and beliefs than current income.⁵⁹ I chose to use family income as a categorical measure of SES. I categorized family income into three groups: low-middle SES was defined as a family income of less than \$10,000-\$74,999, upper-middle SES was defined as \$75,000-\$249,999 and upper SES was defined as \$250,000-\$500,000 or more. These three categories were selected based on knowledge from the US Census Bureau; Income, Poverty, and Health Insurance Coverage in the United States.⁶⁰ I matched the family income categories against the education level of parents using the work of Thompson and Hickey as a guide.⁶¹ In their work they suggest that low-middle income class groups are comprised of individuals with some college education and household incomes ranging from \$35,000 to \$75,000 annually. They suggest that upper-middle SES groups are comprised of educated individuals (some with graduate degrees) and annual incomes varying from the high five-figure range to commonly above \$100,000. The upper income class group according to Thompson and Hickey is comprised of top-level executives who are highly educated (professional degrees) and varying incomes ranging from at least \$250,000 to \$500,000 or more. I also created a variable assessing students' self-reported percentage of medical school costs they plan to finance using loans; this was used as a proxy for current financial situation. I explored several potential cut points for this variable and ultimately decided to dichotomize it

based on students who plan to finance 60% of medical school costs with loans versus those who will only use loans to finance 40% or less of their medical school costs. This decision was based on findings from the Association of American Medical Colleges (AAMC) data, which suggests that the education debt of medical school graduates varies by level of family income.⁶²

Self-rated health was assessed by asking medical students “*In general, would you say your health is: excellent, very good, good, fair, or poor?*” Respondents who indicated fair or poor were categorized as having poor overall health, and those who selected, good, very good, or excellent were categorized as having good overall health.⁶³

Other covariates

Time in medical school was measured based on the start date of medical school for each student and the time that the student completed our survey. This covariate was included in order to account for varying levels of exposure to the medical school environment.

Social desirability bias was assessed using 7 of 33 items of the Marlowe-Crowne Social Desirability Scale,⁶⁴ which measures an individuals’ propensity to respond to questions in a socially desirable way. Participants responded on a 7-point Likert-type scale ranging from 1 “Strongly Disagree” to 7 “Strongly Agree”. Sample questions include “*There have been occasions when I have taken advantage of someone*” and “*I’m always willing to admit it when I make a mistake*”. Given the stigma around mental health issues, I felt it was important to include social desirability as a covariate in both papers 1 and 2 in order to adjust for response bias. I also control for social desirability bias in

paper 3 given that analyses focus on attitudes and values around patient care. For all three papers, social desirability bias was not statistically significant nor did it substantively change any of the coefficients and therefore was excluded from final models. The Cronbach's Alpha for the social desirability scale was 0.63 and the item correlation range was 0.26 to 0.42.

Relationship status was assessed via self-report. Students answered the following question: "*What is your current marital and relationship status? (check all that apply)*". They had the option of indicating: Never married; Single; Have a boyfriend; Have a girlfriend; Separated; Divorced; Widowed; Engaged; Married or domestic partner; Living with romantic partner; Have more than one romantic partner. The CHANGES study team then collapsed responses into: not in a relationship, non-cohabitating relationship, engaged, married or living together. For my analyses, I dichotomized this variable into: "not in a relationship" and "in a relationship". Relationship status was included as a covariate in papers 1 and 2 given that it is significantly associated with a medical student's degree of mental health.⁶⁵

Parental status assessed whether or not the student has children. Participants responded "yes" or "no" to this question. Having a child was included as a covariate in papers 1 and 2 given that it is significantly associated with medical student's degree of mental health.⁶⁵

Reliability Analysis

I conducted principal components analysis (PCA) for all scales used in the three papers. I chose to use PCA given that some variables were highly correlated and because

it allowed me to find optimal ways of combining variables into a small number of subsets that accounted for most of the variance of the observed variables. I used varimax rotation to maximize the sum of the variances of the squared loadings (squared correlations between variables and factors). All PCA was conducted in SPSS PASW© Statistics 21.

Below I outline the psychometric evaluation results for each of the scales used in the analyses for this dissertation:

Mental Health Outcomes

PROMIS stands for Patient Reported Outcome Measurement Information System. PROMIS provides access to both adult and child patient-reported measures of symptoms, such as depression and anxiety. Each domain measure has undergone rigorous qualitative and psychometric evaluation and refinement through studies with patients with the goal to enable clinicians and researchers to have access to efficient, precise, valid, and responsive indicators of a person's health status.⁶⁶ These measures are available for use across a wide variety of chronic diseases and conditions and in the general population.

Depressive symptoms was assessed using the PROMIS Depression short form, a validated, 8-item instrument that assesses self-reported negative mood (sadness, guilt), decrease in positive affect and engagement (loss of interest, meaning and purpose), negative views of the self (self-criticism, worthlessness), and negative social cognition (loneliness, interpersonal alienation). Raw scores were standardized, where a score of 50 is the average for the United States general population with a standard deviation of 10, as per PROMIS scoring manual.⁶⁷ A higher PROMIS T-score represents more of the

concept being measured; therefore, a T-score of 60 is one SD worse than average. By comparison, a depression T-score of 40 is one SD better than average. For study analysis, we defined students who had a score greater than 60 (i.e. one standard deviation above the general population mean) as exhibiting depressive symptomology.⁶⁸ This represents a score that exceeds the minimally important difference from the mean as established by Yost.⁶⁸

The internal consistency of the PROMIS Depression scale was excellent with a Cronbach's alpha of 0.92. The item correlations were from 0.69 to 0.80 indicating a good internal consistency (Table 2).

Anxiety symptoms were assessed using the PROMIS Anxiety short form, a validated 7-item instrument that measures self-reported fear, anxious misery, and hyperarousal.⁶⁹ Similar to the depression instrument, a standardized anxiety score of 50 represents a general population mean, with a standard deviation of 10. However, the mean anxiety score in our sample of medical students was higher than the general population average (57.6 vs. 50), so a cut-off of 70 (i.e. two standard deviations above the general population mean) was selected instead, in order to increase the likelihood of capturing a meaningful difference between anxious and non-anxious medical students. The internal consistency of the PROMIS Anxiety scale was excellent with a Cronbach's alpha of 0.94. The item correlations were from 0.76 to 0.84 indicating a good internal consistency (Table 2).

Table 2. Results of Reliability Analysis for Anxiety and Depression

Scale	Cronbach's Alpha	Item-correlation
Anxiety	0.92	0.69 to 0.80
Depression	0.94	0.76 to 0.84

Resiliency factors

Active coping was adapted from the Brief COPE Inventory,⁷⁰ a 28-item self-report measure. Coping behaviors were assessed by adapting 12 of the 28 items in the Brief COPE Inventory. Using principal component analysis three subscales were identified, social coping by turning to others for help (two items), self-blaming or negative coping subscale, (three items) and active coping (four Items). Active coping was of particular interest because other studies of medical students have cited active coping as one of the more salient coping mechanisms.^{71,72} Participants responded on a four point Likert-type scale ranging from 1 “I don’t do this at all” to 4 “I do this a lot”. Sample questions included: “I get help and advice from other people,” “I blame myself for what has happened” and “I try to come up with a strategy about what to do.” Table 3 below shows the Cronbach’s Alpha and item-correlation for each sub-scale. The internal consistency of the Active Coping sub-scale was good with an alpha coefficient of 0.59 and the item correlations were from 0.21 to 0.44 indicating a good internal consistency. I dichotomized the active coping variable, splitting it at the median to form two groups: those with high levels of active coping and those with low levels of active coping.⁷³

Table 3. Results of Reliability Analysis for Coping Scale

Scale/Sub-scale	Cronbach's Alpha	Item-correlation
Social coping	0.78	0.63
Negative coping	0.50	0.26 to 0.34
Active coping	0.59	0.21 to 0.44

Social support was assessed using the Medical Outcomes Study (MOS) Social Support Survey Form,⁷⁴ a 19-item self report measure with three subscales (emotional support, tangible support, social support) measuring if someone has support available to them when they need it. Participants responded on a 5-point Likert-type scale ranging from 1 “None of the time” to 5 “All of the time”. Sample questions included: “Do you have: someone you can count on to listen to you when you need to talk; someone who shows you love and affection; someone to help you if you were confined to bed; someone to have a good time with. Table 4 below shows the Cronbach’s Alpha and item-correlation for the global scale and each of the sub-scales. The internal consistency of the social support scale was excellent with a Cronbach’s Alpha of 0.96 and an item correlation range of 0.68 to 0.79. I dichotomized the social support variable, splitting it at the median to form two groups: those with high levels of social support and those with low levels of social support.⁷³

Table 4. Results of Reliability Analysis for Social Support

Scale/Sub-scale	Cronbach's Alpha	Item-correlation
Emotional/Information & Affection	0.95	0.65 to 0.84
Tangible Support	0.94	0.83 to 0.91
Positive social interaction/activities	0.97	0.90 to 0.95
Global Scale	0.96	0.68 to 0.79

Mastery was measured with the Pearlin's Mastery Scale, a 7-item self-report measure.⁷⁵ In addition to the global scale, PCA indicated two subscales measuring the students' perception of control over their lives and their power to accomplish goals. Participants responded on a 7-point Likert-type scale ranging from 1 'Strongly disagree' to 7 'Strongly Agree'. Sample questions included "I have little control over the things that happen to me" and "what happens to me in the future mostly depends on me". The control subscale is composed of five items and has a Cronbach's Alpha of 0.84, and item correlation range of 0.56 to 0.72. The global scale had excellent internal consistency with a Cronbach's Alpha of 0.82 and item correlation range of 0.35 to 0.71. I dichotomized master variable, splitting it at the median to form two groups: those with high levels of mastery and those with low levels of mastery.⁷³

Table 5. Results of Reliability Analysis for Mastery

Scale/Sub-scale	Cronbach's Alpha	Item-correlation
Control	0.84	0.56 to 0.72
Power	0.64	0.47
Global Scale	0.82	0.35 to 0.71

Performance self-esteem was measured using the cognitive subscale of the State Self Esteem Scale, an 11-item self-report measure of current self-esteem.⁷⁶ For all scales, participants responded to statements with Likert-style responses. The State Self Esteem scale consisted of three subscales measuring: (1) performance or the students' confidence in their cognitive abilities, (2) satisfaction with their body, and (3) how concerned they were of how others viewed them. We chose to focus on the performance subscale given our interest in capturing the medical students confidence regarding their intellectual and cognitive abilities. Participants responded on a 5-point Likert-type scale ranging from 1 'Not at all' to 5 'Extremely'. Sample questions included "I feel as smart as others", "I am pleased with my appearance right now" and "I am worried about looking foolish." The internal consistency of the global scale was good with a Cronbach's Alpha 0.82 and item correlation range of 0.36 to 0.55. The performance subscale consisted of four items and had a Cronbach's Alpha of 0.83 and item correlation range of 0.59 to 0.74 (Table 6). I dichotomized performance self-esteem, splitting it at the median to form two groups: those with high levels of self-esteem and those with low levels of self-esteem.⁷³

Table 6. Results of Reliability Analysis for Self Esteem

Scale/Sub-scale	Cronbach's Alpha	Item-correlation
Performance	0.84	0.56 to 0.72
Body Satisfaction	0.64	0.56 to 0.75
Impression of others	0.82	0.35 to 0.71
Global	0.82	0.36 to 0.55

Attitudes towards patient-centered care

Attitudes towards patient-centered care were assessed using the Health Beliefs Attitudes Survey (HBAS). The HBAS was created to assess the importance of patient perspectives and beliefs, cultural competency and patient-centered care among physicians and physicians in training.⁷⁷ I used 6 of 15 items from the HBAS. These items were chosen because they specifically measured patient-centered care. Participants responded on a 7-point Likert-type scale ranging from 1 “Strongly Disagree” to 7 “Strongly Agree”. Sample questions included: “Physicians should ask patients for their opinions about their illnesses” and “Physicians should learn about their patients’ cultural perspective.” PCA yielded a Cronbach’s Alpha of 0.78 and item correlation range of 0.37 to 0.68 (Table 7).

I dichotomized the attitudes towards patient-centered care variable, splitting it at the median to form two groups: those with more positive attitudes towards patient-centered care and those with low levels of patient-centered care.⁷³

Table 7. Results of Reliability Analysis for Attitudes Towards Patient-Centered Care

Scale	Cronbach's Alpha	Item-correlation
Attitudes towards patient-centered care	0.78	0.37 to 0.68

Racial Identity

Racial Identity was measured from the Multi-dimensional Inventory for Black Identity (MIBI) to assess racial identity. The MIBI is a 56-item measure of the three stable dimensions of racial identity (Centrality, Ideology, and Regard) delineated in the Multidimensional Model of Racial Identity for African Americans.⁷⁸ The measures used in this study were taken from the centrality sub-scale which consisted of four items measuring the extent to which being African American is central to the respondents' definition of themselves (e.g., "Being Black is important to my self-image", "Overall, being Black has very little to do with how I feel about myself", "I have a strong attachment to other Black people", "Being Black is an important reflection of who I am"). A higher score on the centrality scale is indicative of race being a more important aspect of the individuals' definitions of self. I created a mean scale score and conducted principal component analysis for these items determining a Cronbach's Alpha of 0.88 and item correlation range of 0.38 to 0.57. Because we believe there are two distinct groups of individuals; those with high racial identity and those with low racial identity,⁷⁹ we dichotomized the racial identity variable, splitting it at the median to form two groups: one with high racial identity and one with low racial identity.⁷³ This practice is consistent with other studies using the MIBI.^{80,81}

Table 8. Results of Reliability Analysis for Racial Identity

Scale	Cronbach's Alpha	Item-correlation
Racial Identity	0.88	0.38 to 0.57

All scale variables were based on confirmatory factor analyses conducted for each set of scale and subscale items in the overall sample, and separately for African American and White students. Scales performed similarly for both groups.

Chapter 3

Depression, anxiety, health status and psychosocial resources in first year medical students: A comparison of the effects of race and gender

A Report from the Medical Student CHANGES Study

Importance: This study provides the first probability sample of African American medical students large enough to characterize their health. There is both a great need to increase the number of African American physicians as well as strong reason to be concerned that historical and current racial and gender discrimination may put African American medical students at risk for increased poor mental health outcomes and worse overall health during their medical school experience.

Objective: To determine the impact of race and gender on depressive symptomology, anxiety and self-rated health for a cohort of first year medical students and to understand which groups have more psychosocial resources (mental health protective factors) based on their race and gender.

Design: A stratified multistage sampling design was employed. In the first stage, medical schools were stratified by geographical region and public/private status into 11 strata and a probability sample of schools was selected. This study utilizes baseline data collected as part of *Medical Student CHANGES*, a large longitudinal study of individuals who matriculated in US medical schools in the fall of 2010.

Setting: This study took place in 49 US public and private medical schools.

Participants: Medical Student CHANGES is comprised of 4732 first-year

medical students. Analysis for this particular study focused on medical students who self identified as non-Hispanic White (N = 2890) or African American (N = 301).

Main Outcome(s) and Measure(s): Depressive symptoms were assessed using the PROMIS Depression short form. Anxiety was assessed using the PROMIS Anxiety short form. Self-rated health was assessed by asking medical students, “In general, would you say your health is: excellent, very good, good, fair, or poor?”

Results: African American students had a 59% greater risk of being classified as having depressive symptoms (95% CI, 1.37 to 2.40, $P < .01$) and 66% greater risk of being classified as having anxiety symptoms (95% CI, 1.08 to 2.71, $P < .05$). Female medical students had a nearly 40% greater risk of being classified as having depressive symptoms (95% CI, 1.07-1.63, $P < .01$) and female students were at 95% greater risk of being classified as having anxiety symptoms (95% CI, 1.39-2.84, $P < .001$). African American students had a 83% greater risk of lacking social support (95% CI, 1.08 to 2.49, $P < .05$) and 84% greater risk of having low levels of mastery (95% CI, 1.15 to 2.60, $P < .01$) while female medical students had a nearly 24% greater likelihood of having social support (95% CI, 1.08-2.49, $P < .01$).

Conclusions and Relevance: At the start of their first year of medical school, African American and female medical students were at a higher risk for depressive symptoms and anxiety than their White and male counterparts respectively. Additionally, African American students are at higher risk for lacking psychosocial factors such as social support to help them to deal with the rigors of medical school. Future research must seek to explain the role of psychosocial factors as mediators of the relationship between race

and gender and depressive and anxiety symptoms. The findings of this study have practical implications for both medical education and clinical care. First, poor mental and overall health inhibits learning and success in medical school. Additionally, physician distress (e.g., depression and anxiety) yields poor quality of clinical care.

Medical school, particularly the preclinical years, is conceivably one of the most stressful times in a budding physician's life. It is not surprising then that medical students experience high levels of psychological distress and mental illness,^{16,26,82-92} which progressively worsens throughout the four years of medical training.^{16,84,86,88,90,92-101} Estimates of the prevalence of depression among medical students range from 2% to 35%.^{84,88,90} Despite this wide range, there is evidence that medical students experience depression at higher rates than graduate students or young adults in the general population (8%–15%).¹⁰²⁻¹⁰⁵ Studies of the prevalence of anxiety among medical students revealed that between 40% to 79% of medical students experience high levels of anxiety.¹⁰⁶ Given that these studies were conducted at single medical schools, it is difficult to generalize their findings across all medical students.

It is important to understand and find ways to improve the mental health of medical students for a number of reasons. First, experiencing poor mental health may have potential adverse consequences on academic performance.¹⁰⁷ This issue is particularly relevant for African American students who have been found to experience more academic difficulties in medical school.¹⁰⁸ Poor mental health among medical students also contributes to academic dishonesty,^{18,109-112} substance abuse^{92,113-115} and increased cynicism and decreased compassion.^{14,116,117} Psychological distress can also impact a future physician's career trajectory, causing them to apply to less competitive residency programs.⁸² Poor mental health also contributes to poor overall health.^{92,118-121}

There is a growing literature on the health and well-being of medical students in general, yet few studies have had a large enough sample size to make comparisons based on socio-demographic characteristics such as race and gender.²³ Most studies of depressive and anxiety indicators among medical trainees are outdated or involved only one medical school. Additionally, few minorities and women were represented in these studies.¹²² Women in the general population have a higher lifetime risk of depression than men.^{18,23} Similarly, studies of medical residents have consistently shown higher rates of depression among females.²⁴⁻²⁶ However, studies comparing depressive symptoms by gender among medical students have been inconclusive, showing either no difference by gender or higher rates among female medical students.¹²³ In one study, female medical students were found to manifest higher levels of psychiatric symptomatology,^{49,50} and had greater number of general health and psychological identity problems⁵¹ in contrast to male medical students. The few studies examining depressive symptoms among minority medical trainees have had mixed results, reporting no differences, lower levels or higher levels. Limited findings suggest that race is profoundly related to distress for minority medical students who report frequent experiences of discrimination, isolation and/or prejudice.¹⁹ While there is some evidence to suggest that African American and female medical students may suffer from higher levels of distress in medical school we were unable to identify any studies that also investigate the intersection of these socio-demographic characteristics (e.g. African American female).

In this study, we sought to characterize race and gender disparities in mental health in a national sample of first-year medical students early in their medical school

experience. We also examined race and gender differences in several factors known to increase resiliency to stress. We hypothesized that African American and female medical students begin medical school at greater risk of depressive symptoms and anxiety compared to their White and male counterparts. We also hypothesize that African American and female medical students begin medical school with worse self-rated health and fewer psychosocial resources to cope with or protect themselves from the effects of stress, including practice with active coping techniques, social support, performance self esteem and mastery. We also hypothesize that when examining the interaction of race and gender, African American female medical students will have worse self-rated health, fewer psychosocial resources and be at greater risk for depression and anxiety than their white male counterparts.

Methods

Study Sample

This study uses baseline data collected as part of Medical Student CHANGES, a large longitudinal study of student experiences that is nationally representative of first year medical students who matriculated in US medical schools in the fall of 2010. We randomly selected 50 medical schools from strata of public and private schools in six regions of the country. To select the schools, we employed a proportional selection for the number of schools sampled from each stratum and a sample proportional to class size methodology within stratum (for sampling details, see Appendix 1).⁵³

We recruited first year students from the selected schools using a combination of three strategies: (1) emails of students interested in participating in the study obtained

through a question included as part of the Association of American Medical Colleges (AAMC) Matriculating Student Questionnaire, a voluntary annual survey sent to all students entering medical school; (2) a list of first year medical students (incomplete) purchased from an American Medical Association (AMA) licensed vendor; and (3) referral (i.e. snowball) sampling through recruited survey respondents. Students that agreed to participate in the study completed an extensive online survey questionnaire, and were randomized to complete various implicit attitude tests (e.g. race, sexuality, obesity). The University of Minnesota, Yale University, and Mayo Clinic Internal Review Boards approved the study. All students who completed the survey received a \$50 incentive for participation.

Between October 2010 and January of 2011, a total of 4,764 first year medical students completed the baseline survey, representing 81% of the 5,873 students invited to participate in the study, and 54% of all 8,763 first year students enrolled at the 50 sampled schools. Our survey response rate is comparable to other published studies of medical students.⁵⁴ The demographic characteristics of students in our sample were similar to the demographics of all students who enrolled in a medical school in 2010, as reported by the AAMC (See Table 1 Chapter 2).

One of the 50 schools sampled for our study was a military school that had highly unique features, including acceptance policies, curriculum structure, timing and student characteristics. Due to concerns for the generalizability of our study findings, students enrolled in this school (n=32) were excluded from the analysis, leaving a final sample of 4,732 students enrolled in 49 schools.

Measures

Socio-demographic characteristics were assigned based on self-identified race (White or African American) and gender (male/female/other). Those who indicated “other” for their gender (n=5) were excluded from analyses.

Depressive symptoms were assessed using the PROMIS Depression short form, a validated, 8-item instrument that evaluates negative mood, decrease in positive affect, negative views of the self, and negative social cognition. Raw scores were standardized, where a score of 50 is the average for the United States general population with a standard deviation of 10, as per PROMIS scoring manual.⁶⁷ A higher PROMIS T-score represents more of the concept being measured; therefore, a T- score of 60 is one SD worse than average. By comparison, a depression T-score of 40 is one SD better than average. For study analysis, we defined students who had a score greater than 60 (i.e. one standard deviation above the general population mean) as exhibiting depressive symptomology.⁶⁸ This represents a score that exceeds the minimally important difference from the mean as established by Yost.⁶⁸

Anxiety was assessed using the PROMIS Anxiety short form, a validated 7-item instrument that measures self-reported fear, anxious misery, and hyperarousal.⁶⁹ Similar to the depression instrument, a standardized anxiety score of 50 represents a general population mean, with a standard deviation of 10. However, the mean anxiety score in our sample of medical students was higher than the general population average (57.6 vs. 50), so a cut-off of 70 (i.e. two standard deviations above the general population mean)

was selected instead, in order to increase the likelihood of capturing a meaningful difference between anxious and non-anxious medical students.

Self-rated health was assessed by asking medical students “In general, would you say your health is: excellent, very good, good, fair, or poor?” Respondents who indicated “fair” or “poor” were categorized as having poor self-rated health, and those who selected, “good”, “very good”, or “excellent” were categorized as having good self-rated health.⁶³

We also evaluated the differences in psychosocial factors (reported by medical students). Active coping was adapted from the Brief COPE Inventory,⁷⁰ a 28-item self-report measure. Four of 28 items specifically measured active coping. Social support was assessed using the Medical Outcomes Study (MOS) Social Support Survey Form,⁷⁴ a 19-item self report measure. Mastery was measured with the Pearlin's Mastery Scale, a 7-item self-report measure.⁷⁵ Performance self-esteem captures the medical students confidence regarding their intellectual and cognitive abilities. It was measured using 4 of the 20 items of the performance subscale of the State Self Esteem Scale.⁷⁶ For all scales, participants responded to statements with Likert-style responses. We dichotomized each of the factors based on the median score into high levels and low levels.

Standard demographic questions were used to measure covariates such as student age, relationship status and parental status (whether students have children). Age was included as a covariate given that being older in age has been found to be associated with burnout and serious thoughts of dropping out of medical school.⁵⁶ Parental status and

relationship status were included as covariates given that both are significantly associated with medical student's degree of mental health.⁶⁵

Socioeconomic status was captured in three different ways. We used the highest education level of either parent as a proxy of SES of family origin. We also included family income as a proxy of SES of family origin. Finally, we created a variable assessing students' self-reported percentage of medical school costs they plan to finance using loans; this was used as a proxy for current financial situation. Social desirability bias was assessed using 7 of 33 items of the Marlowe-Crowne Social Desirability Scale,⁶⁴ which measures an individual's need to appear socially acceptable to others. We include this covariate in order to statistically adjust for response bias. Time in medical school was measured based on the start date of medical school for each student and the time that the student completed our survey. There was not a great deal of variability among the students with respect to time in medical school, as all had recently begun their first year of medical school, but we felt it important to account for varying levels of exposure to the medical school environment.

All scale variables are based on confirmatory factor analyses conducted for each set of scale and subscale items in the overall sample, and separately for African American and white students. Scales performed similarly for both groups.

Analysis

Frequencies and summary statistics for sample characteristics were calculated for both African American and White students. Separate bivariate analyses were done to assess the associations between race and depression, anxiety and self-rated health and

gender, depression, anxiety and self-rated health. Treating the three dependent variables (depression, anxiety and self-rated health) as dichotomous outcome measures, we estimated Relative Risks (RR) using Poisson regression models with a robust sandwich estimation of the error variance. We chose to use RR due to concerns with using odds ratios because they tend to exaggerate the effect size as compared to the RR.¹²⁴⁻¹²⁶ We implemented these analyses after observing a convergence problem when fitting log-binomial regression models.

In multivariate analyses, we adjusted models for age, relationship status, parental status, parental education, and percentage of loans used to finance medical school. We also adjusted for social desirability bias and the number of days the student had spent in medical school at the time of survey completion to account for varying levels of exposure to the medical school environment. These analyses were done for both independent variables: race and gender as well as for the interaction term of race*gender so that we could assess if the effect of race on mental health and self-rated health changed depending on the gender of the medical student.

The same bivariate analyses were conducted to examine the associations between race and psychosocial factors and gender and psychosocial factors. Again, we estimated Relative Risks (RR) for psychosocial factors using Poisson regression models with a robust sandwich estimation of the error variance. In multivariate analyses, we adjusted for the same covariates mentioned previously. These analyses were done for both independent variables: race and gender as well as for the interaction term of race*gender

so that we could assess if the effect of race on psychosocial factors changed depending on the gender of the medical student.

All of the generalized linear regressions took into account the sampling probability, stratification, and clustering in the two-stage design of the *CHANGES* survey. We obtained 95% confidence intervals and p-values for the model-estimated associations between each outcome and the independent variable. Statistical significance threshold was set *a priori* at alpha equal to 0.05.

Results

Sample characteristics

The distribution of demographic characteristics in our sample of students was similar to the overall medical student population demographic distribution reported by the AAMC. Demographic characteristics of African American and White students in our sample are shown in Table 9. The total sample size of African American and White first year medical students for analyses was 3,191. Of these individuals, 301 identified as African American and 2,890 identified as White. African American students were different from their White counterparts in terms of gender ($P < .01$)—there were a larger percent of African American women (66%) than White women (48%). African American and White students differed in parental status ($P < .01$) and age ($P < .01$). Nearly three-quarters (72%) of White students and 65% of African American students were between the ages of 18 and 24. Approximately half of students from each racial group reported that they were in a relationship. Half of African American students (52%) were of low-middle SES in comparison to 23% of their White counterparts. Slightly more

than half (55%) of White students and 38% of African American students classified as middle-upper SES and 10% of African American in comparison to 22% of White students were upper SES. More White students (37%) reported a parent with a PhD while 26% of African American students reported the same. More African American students (27%) reported that their parent had earned less than a Bachelor's degree versus 13% of White students. Over 60% of students from both racial groups reported that they will finance at least 50% of medical costs with loans.

{Table 9 about here}

Depression, anxiety and self-rated health

Although similar in ratings of self-rated health, African American first year medical students were significantly more likely than their White counterparts to report symptoms of depression and anxiety (Table 10). Nearly 17% of African American students reported depressive symptoms in comparison to 9% of White students ($P < .001$). Symptoms of anxiety were reported by 6.6% of African American students in comparison to 4% of White students ($P = .028$).

Female first year medical students were significantly more likely than male students to have symptoms of depression and anxiety. Just over 10% of women reported depressive symptoms in comparison to 8.7% of men ($P < .01$). Symptoms of anxiety were reported by 5.5% of women and 2.8% of men ($P < .001$). There was no significant difference between African American and White students nor female and male students with respect to self-rated health.

{{Table 10 about here}}

The mean level of depression for African American students was significantly higher than for their White counterparts ($P < .001$). The mean level of depression was also higher for women ($P < .01$). The same was found for levels of anxiety by race ($P < .05$) and by gender ($P < .001$). We also examined the interaction term of race*gender and found that African American males had higher levels of depression ($P < .001$) and slightly higher levels of anxiety ($P < .001$).

{{Table 11 about here}}

The bivariate and multivariate analyses are shown in Table 12 for race. The unadjusted, bivariate analyses show that African American students had 29% greater risk of being classified as having depressive symptoms (95% CI, 1.12-2.12; $P < .001$) compared to White students. African American students had a 70% greater risk of having anxiety symptoms than their White counterparts (95% CI, 1.09 to 2.40; $P < .05$). In multivariate analyses, African American students had a 59% greater risk of being classified as having depressive symptoms (95% CI, 1.37 to 2.40; $P < .01$) and 66% greater risk of being classified as having anxiety symptoms (95% CI 1.08 to 2.71; $P < .05$).

{{Table 12 about here}}

Table 13 illustrates the bivariate and multivariate analyses for gender. Unadjusted bivariate Poisson regression models show that women had a 32% greater risk of being classified as having depressive symptoms (95% CI, 1.22-2.12; $P < .001$) and 99% greater risk of having symptoms of anxiety (95% CI, 1.09 to 2.40; $P < .01$). In the multivariate

analysis, female medical students had a 39% greater risk of being classified as having depressive symptoms (95% CI, 1.07-1.63; $P < .01$). For anxiety, female students were at 95% greater risk of being classified as having anxiety symptoms (95% CI, 1.39-2.84; $P < .001$).

{{Table 13 about here}}

We also examined the interaction effect of race and gender (race*gender) to explore whether or not the effect of race on mental health and self-rated health changes depending on the gender of the medical student. There was not a significant interaction effect for the unadjusted bivariate model for depressive symptoms (Table 14). However we found a significant interaction between race and gender in the multivariate model ($P < .05$). This interaction effect appears to be mitigating the individual effect of race on depression suggesting that gender matters differently for depression by race. In other words, the impact of race on depression depends on gender such that being African American and male leads to a 50% greater risk of having depressive symptoms. The bivariate model for anxiety symptoms showed that for race, being African American and being a male had a 55% greater risk of having symptoms of anxiety.

{{Table 14 about here}}

Psychosocial factors

Table 15 shows the mean scores for psychosocial factors among African American and White medical students. We found that African American students had lower levels of social support ($P < .001$). African American students also had lower

performance self-esteem than their White counterparts ($P < .01$). When examining gender, we found that women had significantly higher levels of active coping ($P < .05$) and social support ($P < .001$). Women also had lower levels of mastery ($P < .001$). We also calculated the means for the interaction term race*gender. For social support, we found that African American males had the lowest levels of social support ($P < .001$). African American women had the lowest levels of mastery ($P < .01$) and performance self-esteem ($P < .001$).

{{Table 15 about here}}

The bivariate and multivariate analyses for psychosocial factors are shown in Table 16 for race. Unadjusted, bivariate Poisson regression models showed that African American students had a 79% greater risk of being classified as having low levels of social support (95% CI, 1.11-2.23; $P < .01$) compared to White students. African American students had a 77% greater risk of having lower performance self-esteem than their White counterparts (95% CI, .98 to 2.21; $P < .001$). In multivariate analyses, African American students had a 83% greater risk of lacking social support (95% CI, 1.08 to 2.49, $P < .05$) and 84% greater risk of having low levels of mastery (95% CI 1.15 to 2.60; $P < .01$).

{{Table 16 about here}}

Table 17 illustrates the bivariate and multivariate analyses for gender. Unadjusted bivariate Poisson regression models showed that women had nearly a 20% greater likelihood of having social support (95% CI, 1.09-2.40; $P < .001$). Women had a 87% greater risk of having low levels of mastery (95% CI 0.755 to 1.32; $P < .001$). In the

multivariate analysis, female medical students had a nearly 24% greater likelihood of having social support (95% CI, 1.08-2.49; $P < .01$). Women also had 87% greater risk of having low levels of mastery (95% CI 0.988 to 1.60; $P < .01$) and were 55% more likely to have high levels of self-esteem (95% CI 1.47 to 2.22 $P < .001$).

{{Table 17 about here}}

We also examined the interaction affect of race and gender to explore whether or not the effect of race on psychosocial factors changes depending on the gender of the medical student. The only significant interaction effect found in both bivariate and multivariate models was for social support where (95% CI 1.68 to 1.88; $P < .05$) we found that African American men were 74% more likely to lack social support.

{{Table 18 about here}}

Comment

In this study, we sought to address a gap in the literature by investigating the impact of race and gender on depressive symptomology, anxiety and self-rated health for a cohort of first year medical students. We also sought to understand which groups have more psychosocial resources based on their race and gender.

Consistent with our hypotheses, at the start of their first year of medical school, African American and female medical students were at a higher risk for depression and anxiety than their White and male counterparts respectively. We also found an interaction effect suggesting that African American males were at greatest risk for depressive symptomology and for anxiety in comparison to their counterparts. This finding is of

particular interest given that without considering the intersection of two social identities (race and gender) we may not truly understand who is suffering the most. Thus, this result speaks to the need to incorporate an intersectional approach when seeking to elucidate disparities and document the experiences of multiple marginalized groups.

With respect to African Americans, these findings are at odds with the prior studies conducted in non-medical student populations, showing that African Americans possess similar or better mental health than their White counterparts in most major psychiatric problems, despite socioeconomic disadvantages and discrimination.¹²⁷⁻¹³⁰ Future research is needed to understand why African American first year medical students do not seem to experience the advantage of better mental health compared to their non-medical school counterparts.¹³¹ One possible scenario for this is related to selection. Studies have indicated that medical students experience higher rates of depression and anxiety than the general population.^{18,102,103,105}

Additionally, African American students are at higher risk for lacking social support to help them to deal with the rigors of medical school. Numerous studies have shown that social support is linked to psychological and physical health outcomes^{132,133} and is observed to enhance mental health.¹³⁴ Women on the other hand, were found to have more social support than their male counterparts. This finding is positive in that women are finding the support they need as first year medical students, however it may carry negative consequences in subsequent years as a study of third year medical students found that higher levels of outside social support was associated with poorer clerkship grades for women.¹³⁵ The interaction effect of race*gender on social support illustrated

that regardless of race, women have higher levels of social support than their male counterparts. It also suggested that African American males suffer from the lowest levels of social support. Given that our study finds that women are at greater risk for depression and anxiety, further studies are warranted to understand social support as a potential mediator of the relationship between gender and mental health. Indeed, future research must seek to explore mediational path models that potentially explain the role of psychosocial factors as mediators of the relationship between race and gender and depressive and anxiety symptoms. Given the longitudinal nature of this study, future papers will allow us to explore this while providing a better way to guess the direction of causality between the resiliency factors and mental health outcomes.

African American students were at greater risk to experience lower performance self-esteem than their White counterparts. Performance self-esteem is important in that it represents the feelings of confidence medical students have about their cognitive ability and their intellectual capacities as a medical student. Studies have observed that mental health may have its most devastating impact on individuals when they have low performance self-esteem.¹³⁶ While in general, studies have found that for medical students, cognitive ability is higher in comparison to other populations,¹³⁷ the fact that a sub-group of the first year medical student population may be suffering from low self-esteem at the start of their medical training is concerning. The strong link between mastery and self-esteem has been noted in other studies of medical trainees where it was found that students who were likely to experience more unfavorable stress had both lower levels of mastery and had lower levels of self-esteem as compared to their classmates.¹³⁵

Performance self-esteem has also been associated with high rates of burnout in a sample of medical school trainees.^{137,138}

Consistent with the literature, women were found to have more active coping and social support than their male counterparts.¹³⁹ The stabilizing factor of active coping can potentially help individuals maintain psychosocial adaptation during stressful periods^{85,140,141} such as the first year of medical school. Thus, the combination of more active coping and social support suggests that women should not be at higher risk for depression and anxiety than their male counterparts. Conversely, women were found to have lower mastery than their male counterparts. It is not clear how mastery works with or against active coping and social support to impact depression and anxiety among these women.

The findings of this study have practical implications for both medical education and clinical care. First, poor mental and overall health inhibit learning and success in medical school.¹⁰⁷ Additionally, physician distress (e.g., depression and anxiety) yields poor quality of clinical care.¹⁴²⁻¹⁴⁴ Identifying and developing strategies to improve medical trainee well-being may positively impact the overall quality of care provided once these medical students enter the workforce. For example, Burgess and colleagues¹⁴⁵ suggest that creating identity-safe environments can go a long ways to both reduce stereotype threat and produce a more inclusive environment that values diversity. There are also broader implications for health care disparities. The absence of a sound patient-provider relationship is one factor that contributes to disparities in the quality of care received by minority populations.^{146,147} Several studies have demonstrated the importance

of a racially diverse workforce for improving underserved populations' access to care and improving the patient provider relationship.

This study had several limitations. First, it is cross-sectional and thus limiting our interpretations to associations rather than causality. A second limitation was caused by our inability to ascertain and invite all first year medical students in the school sample, creating potential sample bias. However, that is more of a concern when estimating population characteristics than it is in estimating relationships between variables.

Conclusion

This study represents a recent stratified random sample of 49 US medical schools, which resulted in responses from 301 African American medical students, thereby providing the first probability sample of African American medical students large enough to characterize their health. This is important because there is both a great need to increase the number of African American physicians as well as strong reason to be concerned that historical and current racial and gender discrimination may put African American medical students at risk for increased poor mental health outcomes and worse overall health during their medical school experience.

The findings of this study are particularly disturbing given the fact that these students are just at the beginning of their medical school experience and results from others studies suggest that their mental health will continue to decline. The longitudinal nature of the CHANGES study will allow us to examine this trajectory in more detail in the future.

Table 9: Characteristics of the study sample

	White (n=2,890)	African American (n=301)	P value
Gender			<i>.001</i>
Female	1390 (48%)	198 (66%)	
Male	1517 (52%)	103 (34%)	
Parental Status			<i>.001</i>
Have Children	79 (3%)	19 (6%)	
Don't Have Children	2833 (97%)	281 (93%)	
Age			<i>.017</i>
18-24	2085 (72%)	195 (65%)	
24-35 or older	811 (28%)	104 (35%)	
Relationship Status			<i>.277</i>
Not in a relationship	1227 (42%)	163 (54%)	
In a relationship	1684 (58%)	105 (46%)	
Family Income			<i>.001</i>
Low-middle Income	618 (23%)	145 (52%)	
Upper-middle Income	1501 (55%)	105 (38%)	
Upper Income	588 (22%)	29 (10%)	
Parental education			<i>.001</i>
PhD	1084 (37%)	79 (26%)	
Masters	752 (26%)	74 (25%)	
Bachelors	687 (24%)	64 (21%)	
Less than Bachelor degree	387 (13%)	82 (27%)	
Percentage of loans to finance medical school			<i>.218</i>
More than 50% loans	1950 (68%)	190 (64%)	
Less than 50% loans	939 (33%)	107 (36%)	

Table 10: Prevalence of depression, anxiety, and self-rated health among first year medical students

	No. / Total (%)			
	Overall	African American	White	<i>p</i> value ^a
Depressive symptoms ^b	621 / 4732 (13.1)	50 / 295 (16.9)	267 / 2860 (9.3)	.001
Anxiety symptoms ^c	299 / 4732 (6.3)	19 / 289 (6.6)	111 / 2863 (3.9)	.028
Worse self-rated health	311 / 4701 (6.6)	22 / 301 (7.3)	164 / 2896 (5.7)	.246
	No. / Total (%)			
	Female	Male		<i>p</i> value
Depressive symptoms ^b	178 / 1557 (11.4)	138 / 1592 (8.7)		.010
Anxiety symptoms ^c	86 / 1558 (5.5)	44 / 1588 (2.8)		.001
Worse self-rated health	92 / 1580 (5.8)	94 / 1611 (5.8)		.988

^a *P* value calculated by Pearson χ^2 test

^b Depression score 1 SD (10 points) above PROMIS standardized general population mean score of 50

^c Anxiety score 2 SD (20 points) above PROMIS standardized general population mean score of 50

Table 11: Mean scores for Depressive symptoms, anxiety and self-rated health

Mean (SD)			
	Depressive Symptoms	Anxiety	Self-rated Health
Race			
African American	51.8 (9.04)	58.7 (8.64)	2.43 (.799)
White	50.1 (8.45)	57.3 (7.72)	2.21 (.817)
<i>p</i> value	.001	.005	.001
Gender			
Female	51.0 (8.50)	58.6 (7.75)	2.29 (.803)
Male	49.51 (8.64)	56.3 (7.73)	2.18 (.829)
<i>p</i> value	.001	.001	.001
Race*Gender			
African American Female	51.5 (8.61)	58.6 (8.36)	2.48 (.804)
African American Male	52.5 (9.82)	58.8 (9.19)	2.31 (.780)
White Female	51.0 (8.48)	58.6 (7.66)	2.26 (.799)
White Male	49.3 (8.52)	56.2 (7.60)	2.17 (.831)
<i>p</i> value	.001	.001	.001

Table 12: Depressive symptoms, anxiety, and worse self-rated health among African American first year medical students compared to White first year medical students

	Bivariate		Multivariate ^a	
	RR ^b	95% CI	RR ^b	95% CI
Depressive symptoms ^c	1.29***	1.12 to 2.12	1.59**	1.37 to 2.40
Anxiety symptoms ^d	1.70*	1.09 to 2.40	1.66*	1.08 to 2.71
Self-rated Health	1.81	1.21 to 2.82	1.20	1.15 to 2.60

Abbreviations: β , association coefficient; RR, relative risk; CI, confidence interval

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

^a Multivariate analysis estimates adjusted for, age, gender, relationship status, parental status, SES (parental education, percentage of medical school financed by loans, family income)

^b Relative risks were estimated through Poisson regression model with a log link function

^c Depression score 1 SD (10 points) above PROMIS standardized general population mean score of 50

^d Anxiety score 2 SD (20 points) above PROMIS standardized general population mean score of 50

Social desirability bias and time in medical school were excluded from final models because they did not substantively change any of the coefficients
Estimates are weighted to account for probability of selection, stratification, and clustering

Table 13: Depressive symptoms, anxiety, and worse self-rated health among female first year medical students compared to male first year medical students

	Bivariate		Multivariate ^a	
	RR ^b	95% CI	RR ^b	95% CI
Depressive symptoms ^c	1.32***	1.22 to 2.12	1.36**	1.07 to 1.63
Anxiety symptoms ^d	1.99**	1.09 to 2.40	1.95***	1.39 to 2.84
Self-rated Health	0.99	.755 to 1.32	1.00	.788 to 1.60

Abbreviations: β , association coefficient; RR, relative risk; CI, confidence interval

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

^a Multivariable analysis estimates adjusted for, age, gender, relationship status, parental status, SES (parental education, percentage of medical school financed by loans, family income)

^b Relative risks were estimated through Poisson regression model with a log link function

^c Depression score 1 SD (10 points) above PROMIS standardized general population mean score of 50

^d Anxiety score 2 SD (20 points) above PROMIS standardized general population mean score of 50

Social desirability bias and time in medical school were excluded from final models because they did not substantively change any of the coefficients
Estimates are weighted to account for probability of selection, stratification, and clustering

Table 14: Interaction effect for Depressive symptoms, anxiety, and worse self-rated health

	Bivariate		Multivariate ^a	
	RR ^b	95% CI	RR ^b	95% CI
Depressive symptoms ^c				
Race*Gender (African American Male)	1.51	1.40 to 1.62	1.50*	1.40 to 1.62
Anxiety symptoms ^d				
Race*Gender (African American Male)	1.55*	1.52 to 1.64	1.52	1.44 to 1.74
Self-rated Health				
Race*Gender (African American Male)	1.47	1.39 to 1.57	1.32	1.29 to 1.43

Abbreviations: β , association coefficient; RR, relative risk; CI, confidence interval

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

^a Multivariable analysis estimates adjusted for, age, gender, relationship status, parental status, SES (parental education, percentage of medical school financed by loans, family income)

^b Relative risks were estimated through Poisson regression model with a log link function

^c Depression score 1 SD (10 points) above PROMIS standardized general population mean score of 50

^d Anxiety score 2 SD (20 points) above PROMIS standardized general population mean score of 50

Social desirability bias and time in medical school were excluded from final models because they did not substantively change any of the coefficients

Estimates are weighted to account for probability of selection, stratification, and clustering

Table 15: Mean scores for psychosocial factors

Mean (SD)	Active Coping	Social Support	Mastery	Performance Self-esteem
African American	1.55 (.497)	.397 (.490)	.480 (.500)	.305 (.461)
White	1.52 (.499)	.502 (.500)	.508 (.500)	.396 (.489)
<i>p</i> value	.361	.001	.379	.002
Female	1.55 (.497)	.537 (.498)	.471 (.499)	.306 (.461)
Male	1.50 (.500)	.448 (.497)	.535 (.498)	.467 (.499)
<i>p</i> value	.027	.001	.001	.001
African American Female	1.55 (.498)	.477 (.500)	.470 (.500)	.288 (.454)
African American Male	1.56 (.4908)	.237 (.427)	.500 (.502)	.334 (.476)
White Female	1.55 (.497)	.545 (.5498)	.471 (.499)	.310 (.462)
White Male	1.51 (.500)	.462 (.498)	.542 (.498)	.476 (.499)
<i>p</i> value	.115	.001	.002	.001

Table 16: Psychosocial factors among African American first year medical students compared to White first year medical students

	Bivariate		Multivariate	
	RR ^b	95% CI	RR ^b	95% CI
Active Coping	1.02	1.19 to 2.01	1.01	1.24 to 2.04
Social Support	.79**	1.11 to 2.33	.83*	1.08 to 2.49
Mastery	.95	1.12 to 2.44	.84**	1.15 to 2.60
Performance self-esteem	.77**	.98 to 2.21	.86	1.02 to 2.43

Abbreviations: β , association coefficient; RR, relative risk; CI, confidence interval

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

^a Multivariable analysis estimates adjusted for, age, gender, relationship status, parental status, SES (parental education, percentage of medical school financed by loans, family income)

^b Relative risks were estimated through Poisson regression model with a log link function

^c Depression score 1 SD (10 points) above PROMIS standardized general population mean score of 50

^d Anxiety score 2 SD (20 points) above PROMIS standardized general population mean score of 50

Estimates are weighted to account for probability of selection, stratification, and clustering

Social desirability bias and time in medical school were excluded from final models because they did not substantively change any of the coefficients

Table 17: Psychosocial factors among female first year medical students compared to male first year medical students

	Bivariate		Multivariate	
	RR ^b	95% CI	RR ^b	95% CI
Active Coping	1.02	1.32 to 2.12	1.03	1.24 to 2.04
Social Support	1.19***	1.09 to 2.40	1.24***	1.08 to 2.49
Mastery	.87***	.75 to 1.32	.87**	.99 to 1.60
Performance self-esteem	.65	.57 to 1.12	1.55***	1.47 to 2.22

Abbreviations: β , association coefficient; RR, relative risk; CI, confidence interval

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

^a Multivariable analysis estimates adjusted for, age, gender, relationship status, parental status, SES (parental education, percentage of medical school financed by loans, family income)

^b Relative risks were estimated through Poisson regression model with a log link function

^c Depression score 1 SD (10 points) above PROMIS standardized general population mean score of 50

^d Anxiety score 2 SD (20 points) above PROMIS standardized general population mean score of 50

Estimates are weighted to account for probability of selection, stratification, and clustering

*Social desirability bias and time in medical school were excluded from final models because they did not substantively change any of the coefficients

Table 18: Interaction effect for psychosocial factors

	Bivariate		Multivariate	
	RR ^b	95% CI	RR ^b	95% CI
Active Coping				
Race*gender	.91	.96 to 1.10	.91	.82 to 1.09
Social Support				
Race*gender	1.70*	1.38 to 2.20	1.74*	1.68 to 1.88
Mastery				
Race*gender	1.08	1.02 to 1.17	1.14	.91 to 1.23
Performance Self-esteem				
Race*gender	1.31	1.29 to 1.35	1.27	1.20 to 1.32

Abbreviations: β , association coefficient; RR, relative risk; CI, confidence interval

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

Estimates are weighted to account for probability of selection, stratification, and clustering

^a Multivariable analysis estimates adjusted for, age, gender, relationship status, parental status, SES (parental education, percentage of medical school financed by loans, family income)

^b Relative risks were estimated through Poisson regression model with a log link function

^c Depression score 1 SD (10 points) above PROMIS standardized general population mean score of 50

^d Anxiety score 2 SD (20 points) above PROMIS standardized general population mean score of 50

*Social desirability bias and time in medical school were excluded from final models because they did not substantively change any of the coefficients

Chapter 4

Is Racial Identity Protective? Depression and Anxiety Among A National Sample of African American First Year Medical Students

A Report from the Medical Student CHANGES Study

Based on a national sample of 301 African American medical students, who completed the baseline measurement of a longitudinal cohort study of 4732 medical students attending a stratified random sample of 49 medical schools, we examine the extent to which racial identity acts as a protective factor against depression and anxiety. We also examine the extent to which gender and SES (family income and parental education) interact with racial identity to impact depression and anxiety. We also sought to understand how racial identity and gender and racial identity and SES intersect to impact depression and anxiety. Racial identity was assessed using the centrality sub-scale of the Multidimensional Inventory of Black Identity. Findings suggest that a high racial identity is not protective. Instead, we find that students with high racial identity are at greater risk for depression and anxiety. We also find that being from low-middle SES background puts a student at greater risk for depression. Our results increase knowledge about the role of race as a core part of an individual's self-concept. More specifically, these findings provide new insight into the relationship between racial identity and psychological distress, particularly with respect to a group of high achieving young adults entering medical school.

Medical students experience mental illness at a higher rate than the general population.⁸² Stress caused by the demands of medical school may contribute to this difference.^{16,138} Indeed, medical students experience considerable distress, anxiety and poor mental health from the start of their medical training,^{16,93–96,98} and mental health worsens during the four years of training.^{16,85,86} Experiencing poor mental health may have potential adverse consequences on academic performance. Indeed, students who experience poor well-being and distress in medical school are at greater risk to struggle academically.¹⁸ Poor mental health may also impact professionalism,^{148–151} competency¹⁵² and empathy,¹⁵³ which in turn may impact the trainee's ability to provide high-quality patient care. Finally, poor mental health contributes to poor overall health.^{92,119,154} While researchers have identified that medical students are at greater risk for poor mental health, several important gaps exist in current knowledge about the mental health of medical students.

First, while there is a growing literature on the health and well-being of medical students in general, few studies have explored the experience of African American medical students.¹⁹ Indeed, few studies have had a large enough sample size to explore the health and well-being of sub-groups of medical students such as African Americans who may be particularly vulnerable to decrements in health and well-being, due to their membership in negatively stereotyped groups.^{23,155,156} In addition, there are few studies examining the factors that exacerbate versus protect the mental health of medical students, in general, and members of negatively stereotyped groups in particular. One

such factor is racial identity, which has been shown to be protective. Although racial identity has been explored among African American college students and adolescents as a potential protective factor for psychological distress, the protective benefits of racial identity have not been explored among African American medical students. Investigating the effects of racial identity on mental health can provide an understanding of how to protect the well-being of African American medical students who are already at higher risk for burnout, academic challenges, and other difficulties in medical school.¹⁵⁷

Drawing on the theoretical argument that racial identity is a protective factor for poor mental health, we investigate the impact of racial identity on depressive symptomatology and symptoms of anxiety among a cohort of first year African American medical students. We also examine the intersection of racial identity and gender and racial identity and socioeconomic status (SES) on depression and anxiety. Understanding the factors that protect mental health among African American medical students is important because there is both a great need to increase the number of African American physicians as well as strong reason to be concerned that historical and current racial discrimination may put African American medical students at risk for increased poor mental health outcomes during their medical school experience. Additionally, this study allows us to examine how racial identity theory can serve as a model for understanding the mental health of African American medical students.

Background

Depression and Anxiety Among Medical Students

Medical students have been found to experience high levels of psychological distress and mental illness.^{16,82–90,92,100} Indeed, medical students, in comparison with the general population and that of other professions, are exposed to academic and professional stress and therefore are vulnerable to psychosocial health problems and certain specific dysfunctions that may compromise their physical, mental, and social health.¹⁵⁸ Estimates of the prevalence of depression among medical students range from 2% to 35%.^{84,88,90} Despite this wide range, there is evidence that medical students experience depression at higher rates than graduate students or young adults in the general public (8%–15%).^{18,24,102,105} The first year of medical school is often the most stressful due to significant academic pressure, unfamiliarity in a new environment and dealing with unrealistic expectations. Studies suggest that mental health worsens during the first year of medical school and remains poor throughout training.^{16,84,86,88–90,92–98,100,101}

It is important to understand and find ways to improve the mental health of medical students for a number of reasons. First, experiencing poor mental health may have potential adverse consequences on academic performance.¹⁰⁷ Poor mental health among medical students also contributes to academic dishonesty,^{18,109–112} substance abuse^{92,113–115,120} and increased cynicism and decreased compassion.^{14,116,117} Psychological distress can also impact a future physician's career trajectory, causing them to apply to

less competitive residency programs.⁸² Poor mental health also contributes to poor overall health.^{92,118-121}

Depression and Anxiety in African American Medical Students

African American medical students may be particularly vulnerable to symptoms of depression and anxiety. For example, a study comparing African American and White first year medical students recently found disparities by race citing that African American first year medical students are at greater risk for depression and anxiety.¹⁵⁹ Several studies have evaluated the relationship between race/ethnicity and distress among US medical students, however the results are mixed, with some studies reporting no differences in students' mental health by race/ethnicity,^{41,160,161} and others suggesting that African American students suffer from worse mental health than their white counterparts.¹⁹ However, each of these studies was small (a total of five studies, enrolling a total of 228 minority students) and each was conducted at a single medical school, and therefore difficult to generalize beyond a single school and/or a single state.¹⁹ It has been well documented that African Americans in the general population, are at lower risk than their White counterparts for common mental disorders such as anxiety, mood, and substance use.¹⁶² Yet, the evidence is less clear whether there are differences in rates of psychological distress or depressive symptoms.¹⁶³ Some research indicates that African Americans may fare worse on these measures^{164,165} while other studies suggest that they may do better.¹⁶⁶ While other studies have determined that racial discrimination is a significant contributor to poor mental health among African Americans.^{167,168}

The African American Experience in Medical School

As underrepresented minorities in most medical schools, African American medical students often face the unique challenge of working with peers, professors and other colleagues whose cultural backgrounds are very different from their own. Furthermore, African American medical students have reported stresses and challenges associated with learning in what they perceive to be a prejudiced and hostile environment.^{169,170} Indeed, studies suggest that experiences of racial discrimination and social isolation throughout the medical school experience can play a significant role in their overall well-being and academic success.^{18,19} One study of underrepresented minority medical students found that African American medical students implicitly attributed their lack of support from faculty and administrators to racism.¹⁷¹ The same students also identified their race as an obstacle to receiving the academic and social support they needed to succeed in medical school.¹⁷¹

Another barrier to success in medical school for African American students is related to socioeconomic status (SES). Financial concerns have been found to pose an additional challenge to the academic and professional pursuits of African American medical students. One study of the African American medical student experience found that many minority students felt the need to provide monetary support to their own families, even while they were still students.¹⁷¹ This pressure to financially support their families heightened awareness of personal sacrifice during medical training. Participants felt that the lack of financial support from family and reliance on student loans created more difficulty for them than it did for many of their majority student colleagues, who

they felt received more financial support from their families. Such perceptions often undermined their satisfaction with academic and professional experiences.¹⁷¹

Gender may also play a role in the difficulties experienced by some African American medical students. Indeed, one study shows that experiences of discrimination were based not only on race but also gender for a sample of African American medical students.¹⁷¹ While there is a paucity of studies on the intersection of race and gender and the medical school experience; work by Hardeman et al (in progress) found that with respect to depression, African American female medical students are at greater risk while African American males are at greater risk for anxiety. Other studies have examined the experience of female medical students perceive regardless of race and find that women experience more stress, symptoms of depression and anxiety,^{22,122} manifest higher levels of psychiatric symptomatology,^{49,50} and have a greater number of general health and psychological identity problems in comparison to their male counterparts.¹⁷²

African American students who are in medical school environments where they are the minority are also at greater risk to experience stereotype threat.^{155,173} In one study in particular, students believed that their medical school environment created heightened concerns with being negatively stereotyped because of one's racial group membership and desires to dispel such stereotypes. This stereotype threat¹⁷⁴ often had a negative impact on their academic performance by creating cognitive distraction, self-doubt, and depression.¹⁷¹ Additionally, it is important to note that African American medical trainees are likely to experience other cues that activate threat, such as being mistaken for orderlies and nurses; feeling socially and numerically isolated among white-majority

medical school cohorts, experiencing a lack of underrepresented minority faculty role models and feeling pressure to represent their entire race in the classroom and in clinical settings.^{171,173,175}

Racial Identity and Psychological Well-being

Strong racial identity may have a protective effect on the mental and physical health of African American medical students. Racial identity is defined as a psychological attachment to a group or a collective identity based on race and shared history often rooted in racial oppression and discrimination.¹⁷⁶ The centrality dimension of racial identity is of particular importance given its focus on the extent to which a person normatively defines her/himself with regard to race. We choose to highlight this dimension of racial identity in these analyses because we feel it is most important for understanding its role as a protective factor given that it is an indicator of whether race is a core part of an individual's self-concept. Implicit in the conceptualization of centrality is a hierarchical ranking of different identities with regard to their proximity to the individual's core definition of self.¹⁷⁷

Researchers have documented that racial identity can play an important role in the emotional, mental and psychological well-being of African American children, adolescents, and adults. Racial identity has consistently been conceptually linked with the psychological functioning of African Americans.¹⁷⁸⁻¹⁸⁴ Racial identity also has a protective function, for African American children, enabling them to maintain positive school achievement and psychosocial health by diminishing the effects of discrimination.¹⁸⁵⁻¹⁸⁸ Not all studies, however, have found direct, positive associations

between racial identity and psychosocial outcomes.¹⁸⁹ For instance, Sellers and Shelton¹⁹⁰ found that racial identity attitudes were not significantly related to indicators of depression, anxiety, and perceived stress in a sample of African American college students. Sellers et al. (2003) also found little support for a direct link between racial identity attitudes and psychological distress in a longitudinal study of African American young adults.^{190,191}

While myriad scholars have documented the role and/or impact of racial identity on psychosocial well-being for African American adults, adolescents and children, there are dearth of studies examining the impact of racial identity on African American professional and graduate students. The literature on racial identity suggests that race plays an important role for high-achieving African Americans¹⁹²—a group of which African American medical students are conceivably a part of. For example, Chavous et al. (2003) find that high racial centrality is related to positive academic beliefs and that a strong group connection is related to discrimination awareness in ways that promote academic success.¹⁸⁵ Several studies also suggest that African Americans with a positive racial/ethnic identity perform better in school because they maintain high self-esteem resulting from a superior ability to manage negative environments and deal with discrimination.¹⁹³

Objectives

Using a nationally representative sample of first year medical students, the present study seeks to examine the impact of racial identity on symptoms of depression and anxiety for African American first year medical students. Of particular interest is the

potential role that racial identity might play as a protective factor for depressive symptomology and symptoms of anxiety. Given the potential role that gender and SES might also play in the African American medical school experience, we also aim to explore the interaction between gender and racial identity and SES and racial identity and their impact on depressive and anxiety symptoms. Based on the literature, we hypothesize that African American medical students with a higher or more positive racial identity centrality score will experience less depression and lower levels of anxiety. We expect that being an African American female and having a low racial identity centrality score will result in greater depressive and anxiety symptoms and that being of low or low-middle SES standing and having a low racial identity centrality score will result in greater depressive and anxiety symptoms.

DATA and METHODS

Sample

This study uses baseline data collected as part of Medical Student CHANGES, a large longitudinal study of student experiences that is nationally representative of first year medical students who matriculated in US medical schools in the fall of 2010. We randomly selected 50 medical schools from strata of public and private schools in six regions of the country. To select the schools, we employed a proportional selection for the number of schools sampled from each stratum and a sample proportional to class size methodology within stratum (for sampling details, see Appendix A).⁵³

Between October 2010 and January of 2011, a total of 4,764 first year medical students completed the baseline survey, representing 81% of the 5,873 students invited to

participate in the study, and 54% of all 8,763 first year students enrolled at the 50 sampled schools. Our survey response rate is comparable to other published studies of medical students.⁵⁴ The demographic characteristics of students in our sample were similar to the demographics of all students who enrolled in a medical school in 2010, as reported by the AAMC (See Table 1 Chapter 2).

One of the 50 schools sampled for our study was a military school that had highly unique features, including acceptance policies, curriculum structure, timing and student characteristics. Due to concerns for the generalizability of our study findings, students enrolled in this school (n=32) were excluded from the analysis, leaving a final sample of 4,732 students enrolled in 49 schools.

The sampled schools had 8,594 first-year students; we obtained e-mail addresses for 5823 (68%) of them via the procedures described in Figure 1. Of those, 4,732 chose to participate and were paid \$50, representing 81% of those contacted and 55% of the entire pool of first-year students at our sampled schools. This response rate is comparable to other published studies of medical students.⁵⁴ Analysis for this particular study focused on medical students who self identified as African American (N = 301).

Data Collection and Integrity

Students identified as MS1 in any of the sampled schools were sent an email or letter with a link to the informed consent page. Those who consented were linked to an online questionnaire that they advanced through by answering questions placed on consecutive screens (can be thought of as pages). Time spent on each screen (page) and total time to completion was recorded. If participants attempted to move to the next

screen (page) with an unanswered question on the current screen, a warning popped up and they were directed back to the unanswered question. If they chose not to answer that question, they had to click on a button to indicate their desire to skip the question. This protected participants' right to skip questions while eliminating any time-saving incentives for doing so. After students completed the entire questionnaire they completed two Implicit Associations Tests (IATs). All participants were given the Race IAT and 50% were randomly assigned to the Anti-fat or a homonegativity IAT each. Upon completing the IAT's participants were direct to a separate secure server where they provided their name and address so we could send them their \$50.00 cash incentive. This allowed us to identify and eliminate duplicates. It also allowed us to confirm that our snowball sampled respondents were MS1 students at the school they identified. While many medical schools carefully protect the list of and/or contact information for their first year class, in most cases it is possible to find the student and their matriculation year in school online directories if one already has their name and/or email address. Last, responses were examined for indications of systematic response bias (e.g. clicking the same response option to move rapidly through the questionnaire). Invalid or incomplete questionnaires were omitted (n=32).

Measures

Demographic factors. Students self-identified as African American. They also self-identified as male, female or other. Those who indicated "other" for their gender (n=5) were excluded from analyses. Socioeconomic status can be challenging to capture given that we are assessing SES during a transitional time in these students lives.

Therefore, we choose to use two indicators of SES: family income as a categorical measure of SES in which SES was categorized into three groups: low-middle SES (less than \$10,000-\$74,999), upper-middle SES (\$75,000-\$249,999) and upper SES (\$250,000-\$500,000) or more. We also used the highest education level of either parent as a proxy of SES of family origin.

Psychological well-being. Depressive symptoms were assessed using the PROMIS Depression short form, a validated, 8-item instrument that evaluates negative mood, decrease in positive affect, negative views of the self, and negative social cognition. Raw scores were standardized, where a score of 50 is the average for the United States general population with a standard deviation of 10, as per PROMIS scoring manual.⁶⁷ For study analysis, we defined students who had a score that was 3.0-4.5 points greater than 50 as exhibiting depressive symptomology. This represents a score that exceeds the minimally important difference (MID).^{68,194}

Anxiety was assessed using the PROMIS Anxiety short form, a validated 7-item instrument that measures self-reported fear, anxious misery, and hyperarousal.⁶⁹ Similar to the depression instrument, a standardized anxiety score of 50 represents a general population mean, with a standard deviation of 10. Again, we use an MID range of 3.0-4.5 to determine students who have anxiety symptoms.^{68,194}

Racial identity. This study employs measures from the Multi-dimensional Inventory for Black Identity (MIBI) to assess racial identity. The MIBI is a 56-item measure of the three stable dimensions of racial identity (Centrality, Ideology, and Regard) delineated in the Multidimensional Model of Racial Identity for African

Americans.⁷⁸ The measures used in this study were taken from the Centrality sub-scale which consists of eight items measuring the extent to which being African American is central to the respondents' definition of themselves (e.g., "Being Black is important to my self-image"). A higher score on the Centrality scale is indicative of race being a more important aspect of the individuals' definitions of self. We created a mean scale score and conducted factor analysis for these four items determining a Cronbach's alpha of 0.88. We dichotomized racial identity; a low racial identity score ranged from 1 to 3.5 and a high score ranged from 3.6 to 7.^{73,80,81}

Covariates. Standard demographic questions were used to measure covariates such as student age, relationship status and whether students have children. Age was included as a covariate given that being older in age has been found to be associated with burnout and serious thoughts of dropping out of medical school.⁵⁶ Having a child (parental status) and relationship status were included as covariates given that both are significantly associated with medical student's degree of mental health.⁶⁵

Social desirability bias was assessed using 7 of 33 items of the Marlowe-Crowne Social Desirability Scale,⁶⁴ which measures an individuals' need to appear socially acceptable to others. Given the stigma around mental health issues, we felt it was important to include social desirability as a covariate. We did not however, find any social desirability bias present with respect to these analyses. Time in medical school was measured based on the start date of medical school for each student and the time that the student completed our survey. This variable allows us to account for varying levels of exposure to the medical school environment. Both social desirability and time in medical

school did not substantively change any of the coefficients and therefore were not included in the final models.

All scale variables are based on confirmatory factor analyses conducted for each set of scale and subscale items in the overall sample, and separately for African American students.

Analytic Plan

Statistical analysis was performed using SPSS PASW© Statistics 21 software. After calculating descriptive statistics for all variables, we conducted bivariate tests comparing the means for depression and anxiety by racial identity, SES and gender; t-tests were used for continuous variables and chi-square tests were used for dichotomous variables. I also estimated unstandardized coefficients and standard errors in bivariate models for racial identity, gender and SES.

Frequencies and summary statistics for sample characteristics were calculated. Separate bivariate analyses were done to assess the associations between racial identity and depression and anxiety; gender, depression and anxiety; and SES (family income, parental education), depression and anxiety. Treating the two dependent variables (depression and anxiety) as dichotomous outcome measures, we estimated Relative Risks (RR) using Poisson regression models with a robust sandwich estimation of the error variance. We chose to use RR due to concerns with using odds ratios because they tend to exaggerate the effect size as compared to the RR.¹²⁴⁻¹²⁶

We implemented these analyses after observing convergence problem when fitting log-binomial regression models. In multivariate analyses, we adjusted models for

age, relationship status, and parental status. Five models in total were estimated for each dependent variable. Model 1 contained main effects of racial identity, gender and SES. Model 2 contained the main effects and covariates (age, relationship status and parental status). Models 4, 5 and 6 contained the main effects, covariates and interaction terms racial identity*gender, racial identity*family income and racial identity*parental education respectively. The interaction terms were entered separately into the regression equations. Significant interaction effects may suggest that racial identity may not be the only factor influencing the mental health outcomes of the students and that other social identities such as gender and socioeconomic status may intersect with racial identity to influence depressive symptomology and anxiety symptoms. All models took into account the sampling probability, stratification, and clustering in the two-stage design of the CHANGES study.

RESULTS

Sample Characteristics

Table 19 presents characteristics for the 301 African American medical students in our sample. Over half (65.8%) were female and most students did not have children (93.7%). Over half of students (65%) were 25 years of age or older. Approximately half (54%) reported that they were not in a relationship. While the education level of students' parents were nearly evenly distributed, over half of students reported their family income as low-middle income (\$10,000-\$74,999 annually).

{Table 19 About Here}

Table 20 illustrates the prevalence of depression and anxiety by racial identity, gender, family income and parental education. Nearly a quarter (23.1%) of low-middle income students reported depressive symptoms ($p < .05$) in comparison to 12% of upper-middle income and 7% upper income students. There were no statistically significant differences in depressive symptoms and anxiety by racial identity, gender and parental education level.

{Table 20 About Here}

Table 21 shows the mean scores of depression and anxiety stratified by levels of racial identity, gender and SES. Students with low racial identity had a mean depression score (SD) of 50(8.84). Students with high racial identity had a depression score of 54(8.82) ($p < .05$). Students with low racial identity had a mean anxiety score of 58(SD 8.52) and those with high racial identity had a anxiety score of 60(8.55) ($p < .001$). For PROMIS instruments such as PROMIS Depression and PROMIS Anxiety, a score of 50 is the average for the United States general population. A PROMIS T-score over 50 suggests that more of the concept being measured is present.⁶⁸ For example, a depression T- score of 60 is one SD worse than average. By comparison, a depression T-score of 40 is one SD better than average. For study analysis, we defined students who had a score greater than 53.5 as exhibiting depressive symptomology.^{68,194} This represents a score that exceeds the minimally important difference from the mean as established by Yost.⁶⁸ We did not find any statistically significant differences in mean scores for depressive symptoms and anxiety by gender or SES (family income and parental education).

{Table 21 About Here}

Table 22 illustrates the bivariate results for racial identity, gender and SES (family income and parental education) as predictors of depression and anxiety. Bivariate tests revealed that students with low racial identity have a lower risk for depression (RR, 0.62 [95% CI, .54 to .71]; $p < .001$). We also found that students who are low-middle income are at high risk for depression (RR, 3.35 [95%CI, 1.44 to 7.78]; $p < 0.05$)

{Table 22 About Here}

Table 23 illustrates the Poisson regression models for depression. Model 1 included the main effects of racial identity, gender and SES (family income and parental education). Just as we saw in the bivariate models, students who had low racial identity were at lower risk for depression (RR, .58 [95%CI .50 to .68]; $p < .05$) and students from low-middle income group were at greater risk for having depressive symptoms (RR, 4.04 [95% CI, 1.48 to 11.03]; $p < .05$). Model 2 included covariates: age, relationship status, and parental status. When these covariates were added in Model 2, the effect of racial identity was no longer significant and the effect of family income remained significant (RR, 4.01 [95% CI, 1.47 to 10.95]; $p < .05$). Models 3 and 4 included the interaction terms of racial identity*gender and racial identity*family income respectively. In both models we found that being of low-middle income had a greater risk for depression (RR, 4.01 [95% CI, 1.48 to 10.82], $p < .05$) and (RR, 6.64 [95% CI, 1.01 to 43.41]; $p < .05$). Model 5 included the interaction term racial identity*parental education. In this model, the interaction effect was not significant but we found that those with a low racial identity had a lower risk of depression (RR, .33 [95% CI, .18 to .59]; $p < .05$) and being of a low-

middle income group had a higher risk of depression (RR, 3.88 [95% CI, 1.45 to 10.40]; $p < .05$).

{Table 23 About Here}

The same models were run for the dependent variable, anxiety. Model 1 included the main effects of racial identity, gender and SES. We found that those with low racial identity were at lower risk for anxiety (RR, .85 [95% CI, .80 to .95], $p < .05$). Model 3 included covariates and the racial identity*gender interaction term and we found that those from a low-middle socioeconomic background had a slightly smaller risk of having anxiety (RR, .99 [95% CI, .98 to .99], $p < .05$) In Model 4 when the racial identity*family income interaction effect was included, age became statistically significant such that older students (over 24) were at greater risk for anxiety (RR, 1.21 [95% CI, 1.11 to 1.33], $p < .001$).

{Table 24 About Here}

DISCUSSION

This paper addresses an important gap in knowledge regarding the role of racial identity as a protective factor for African American medical students. To our knowledge, this study is the first of its kind to report on African American medical students from a nationally representative sample. We found that, contrary to our hypothesis; in our sample of African American first-year medical students those who had a stronger (high) racial identity experienced worse mental health outcomes (depressive symptoms and anxiety). We also found that those from a low-middle income group are at greater risk for depressive symptoms. The findings also revealed that gender and parental education as a

proxy for SES were not predictors of mental health nor were their interactions with racial identity significant.

Racial identity has consistently been conceptually linked with the psychological functioning of African Americans.¹⁷⁸⁻¹⁸¹ While contrary to much of the previous literature, these findings have important implications for the theoretical understanding of racial identity as a protective factor for poor mental health. There appear to be two distinct schools of thought regarding the concept of racial identity. First, there is a body of literature that suggests that having a high racial identity will protect African American individuals from psychological distress.^{193,195-197} Indeed, the literature suggests that positive racial identity should be associated with positive mental health for African Americans.¹⁹⁸ The second set of literature mostly comprised of work conducted by Sellers and colleagues suggests that we must consider both direct and indirect relationships between racial identity and mental health outcomes.^{189,191} The most salient of the indirect pathways is one that suggests that racial discrimination plays an important role in the relationship between racial identity and psychological well-being. Sellers et al found that the centrality dimension of racial identity was associated with more experiences of racial discrimination, which in turn was associated with higher levels of stress and poorer mental health outcomes.¹⁹¹ In other words, higher levels of racial centrality may serve as a risk factor for perceiving more racial discrimination, which subsequently leads to more depression and anxiety. For instance, someone with a high racial identity is more likely to make attributions about racial discrimination than low race central individuals.¹⁹⁹ It is also possible that individuals with high levels of racial

identity possess characteristics that result in individuals from other races discriminating against them more than low racial identity individuals. Indeed, individuals with high racial identity may make race salient thus triggering more out-group bias behavior from them.²⁰⁰ In order to determine if racial discrimination is influencing our finding that high racial identity predicts higher levels of depression and anxiety, future studies should include discrimination as a potential mediator.

Preliminary data by Shelton suggested that, in interracial interactions, Whites are more positive toward African Americans who are less identified with their racial group than they are toward African Americans who are more identified with their group.¹⁹⁰ This is a provocative finding that suggests that highly identified African Americans may be correct in their higher levels of perceived discrimination. That is, they are the targets of more negative racial incidents than their low identified peers. Additionally, this suggests that Whites may be picking up cues from more highly identified African Americans, which results in Whites reacting in more negative ways toward these African Americans. More research is needed to examine the processes that underlie the relationship between African Americans' level of racial identification and perceived racial discrimination.²⁰¹ The notion that students with a high racial identity might trigger more out-group bias behavior is an important one given the environment that our sample of medical students is in. Exploring how racial identity impacts out-group bias and its relationship to perceived racial discrimination and psychological distress may provide insight into our study findings.

Social identity may also be relevant to the role that racial identity plays in impacting depression and anxiety. Studies suggest that individuals who identify with and publicly claim a devalued identity are more likely to be the target of discrimination due to others' reactions to the increased salience of their identity.¹⁹⁰ Also, social identity theorists suggest that individuals who are psychologically attached to a group will be more likely to publicly claim that identity, and less likely to suppress it, during interpersonal interactions even when the group is perceived as devalued.²⁰² In this way, highly identified individuals (e.g. individuals with high racial identity) may choose not to compromise their sense of self as they interact with others. Instead, they appear to maintain internal consistency by presenting a public image that corresponds with their self-perception. This could be potentially isolating for these individuals leading to higher levels of depression and anxiety. It also may make them more apparent targets for discrimination, which has been linked to higher levels of depression and anxiety.

Given the salience of socioeconomic status to the student experience in medical school for African Americans and the potential impact of gender on the difficulties experienced by some African American medical students, we expected that being an African American female and having a low racial identity centrality score would result in greater depressive and anxiety symptoms and that being of low or low-middle SES standing and having a low racial identity centrality score would result in greater depressive and anxiety symptoms. While analyses did not confirm these hypotheses, we suspect that further research is needed to develop a deeper understanding of how intersecting social categories can influence mental health. These findings speak to the

need for researchers to further develop quantitative methodologies for measuring intersectionality in an effort to document disparities at the intersection of various social identities to truly understand who is most vulnerable and target interventions accordingly.

Our results increase knowledge about the role of race as a core part of an individual's self-concept. More specifically, these findings provide new insight into the relationship between racial identity and psychological distress, particularly with respect to a group of high achieving young adults entering medical school. There also may be something about the socialization process of medical school in general that influences racial identity for African American students. While the social process of medical training has been studied,^{1,2,14,203} little has been documented regarding the African American experience. Understanding school factors and the school environment may shed light on how racial identity is working among these students. Also, given that poor mental health has been found to worsen over the four years of medical training,²⁰⁴ exploring if and how racial identity fluctuates along with mental health is critical for a better understanding of this topic. Given that the nature of our study is longitudinal, we will have the ability to do this in the near future. Finally, it is important to consider the type of African American individual that applies to and are accepted into medical school. It is quite possible that there are certain characteristics intrinsic to a personality type that are impacting how racial identity impacts their psychosocial well-being. Indeed, more research on the role of racial identity for high achieving young adults may shed more light on this matter.¹⁹²

The primary limitation of this research is the cross-sectional nature of these data. These associations may co-occur or occur in the opposite direction than what is presented. However, these data were collected in a large national sample of medical students, using validated measures, and it is the first investigation of racial identity and well-being in African American medical students. Longitudinal study is needed to assess how racial identity continues to impact well-being throughout medical school.

This study has important implications for understanding how institutional forces can better support and protect the well-being of African American medical students who are already at higher risk for burnout, academic challenges, and other challenges in medical school.¹⁹ If students with high racial identity are at greater risk for depression and anxiety then we must determine what it is about high racial identity that causes distress. If it is indeed discrimination, the medical school environment must work to become more inclusive, eliminating occurrences of discrimination. If it is related to social isolation then improving diversity through the creation of a critical mass of African American students in medical school is vital. The creation of an identity-safe environment in which there are both subtle and overt cues promoting diversity are important. For example, increasing the number of minority faculty and individuals in positions of power and messaging that indicates that the school values diversity, Simultaneously, an absence of cues that indicate a threatening environment (e.g. indications of racism; low minority representation; and a “color blind” philosophy) are necessary.¹⁵⁵

Table 19: Characteristics of the study sample

n=301	n (%)
Gender	
Female	198 (65.8%)
Male	103 (34.2%)
Children	
Yes	19 (6.3%)
No	281 (93.7%)
Age	
18-24	104 (35%)
25-35 or older	195 (65%)
Relationship Status	
Not in a relationship	163 (54.2%)
In a relationship	138 (46.0%)
Parental education	
Less than Bachelor Degree	82 (27.4%)
Bachelor Degree	64 (21.4%)
Graduate Degree	153 (51.2%)
Family income	
Low-middle (\$10,000-\$74,999)	145 (52.0%)
Upper-middle (\$75,000-\$249,999)	105 (37.6%)
Upper (\$250,000-\$500,000)	29 (10.4%)

Table 20: Prevalence of depression and anxiety among first year medical students by racial identity, gender and SES

No. / Total (%)				
	Overall	High Racial Identity	Low Racial Identity	p value^a
Depression symptoms ^b	50 / 285 (17%)	34 / 160 (20.6)	16 / 125 (12.8)	.50
Anxiety symptoms ^c	20 / 280 (7.0%)	11 / 154 (7.1)	9 / 126 (7.0)	.79
No. / Total (%)				
	Female	Male	p value^a	
Depression symptoms	30 / 196 (15.4)	20 / 99 (20.2)	.290	
Anxiety symptoms	13 / 193 (6.7)	6 / 96 (6.6)	.875	
No. / Total (%)				
	Low-middle Income	Upper-middle Income	Upper Income	p value^a
Depression symptoms	33/143 (23.1)	12/101 (11.9)	2/29 (6.9)	.02
Anxiety symptoms	11/138 (8.0)	6/102 (5.9)	2/29 (6.9)	.82
No. / Total (%)				
	Less than Bachelors Degree	Bachelor Degree	Graduate Degree	p value^a
Depression symptoms	23/150 (15.3)	10/63 (15.9)	17/80 (21.3)	.50
Anxiety symptoms	8/145 (5.5)	5/63 (7.9)	6/79 (7.6)	.74

^a p value calculated by Pearson χ^2 test^b Depression score 1 SD (10 points) above PROMIS standardized general population mean score of 50^c Anxiety score 2 SD (20 points) above PROMIS standardized general population mean score of 50

Table 21: Mean scores for depression and anxiety by racial identity, gender and SES

Mean (SD)				
Racial Identity (RI)	Low RI	High RI	p value	
Depression symptoms ^a	50.0 (8.84)	54.0 (8.82)	.05	
Anxiety symptoms ^b	58.0 (8.52)	60.0 (8.54)	.001	
Gender	Male	Female		
Depression symptoms ^a	53.0 (9.83)	53.0 (8.61)	.37	
Anxiety symptoms ^b	59.0 (9.19)	59.0 (8.37)	.85	
SES (Family Income)	Low-middle	Upper-middle	Upper	
Depression symptoms ^a	53.0 (9.79)	51.0 (8.27)	50.64 (8.02)	.25
Anxiety symptoms ^b	59.0 (9.03)	58.0 (8.17)	57.0 (8.73)	.68
SES (Parental education)	Less than Bach	Bach	Grad	
Depression symptoms ^a	52.0 (10.47)	52.1 (8.67)	52.0 (8.37)	.59
Anxiety symptoms ^b	59.1 (8.51)	57.8 (9.34)	59.0 (8.29)	.93

^a Normative T-scores are standardized with the mean set at 50

^b Anxiety score 2 SD (20 points) above PROMIS standardized general population mean score of 50

Table 22: Bivariate results of Poisson regression for depression and anxiety

	Depressive Symptoms^a		Anxiety Symptoms^b	
	RR^c	95% CI	RR^c	95% CI
Racial Identity (ref: high racial identity)	0.62*	0.54 to 0.71	0.88	0.84 to 0.93
Gender (ref: male)	0.76	0.70 to 0.81	1.11	0.70 to 1.3
Family Income (ref: Upper income)				
Low-middle Income	3.35*	1.44 to 7.78	1.15	1.03 to 1.15
Middle-Upper Income	1.72	1.15 to 2.57	0.85	0.75 to 0.96
Parental Education (ref: Grad degree)				
Less than Bachelor Degree	0.72	0.65 to 0.79	0.73	0.61 to 0.85
Bachelor Degree	0.75	0.62 to 0.81	1.04	1.01 to 1.07

Abbreviations: RR, relative risk; CI, confidence interval

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

^a Depression score 1 SD (10 points) above PROMIS standardized general population mean score of 50

^b Anxiety score 2 SD (20 points) above PROMIS standardized general population mean score of 50

^c Relative risks were estimated through Poisson regression model with a log link function

Estimates are weighted to account for probability of selection, stratification, and clustering

Table 23 Part A: Poisson Regression of Racial Identity on Depression

	Model 1		Model 2		Model 3	
	RR ^a	95% CI	RR ^a	95% CI	RR ^a	95% CI
Racial Identity (ref: High Racial Identity)	0.58*	0.50 to 0.68	.605	.524 to .698	.460	.291 to .718
Gender (ref: Male)	0.79	0.82 to 0.72	.763	.709 to .821	1.00	1.00 to 1.06
SES (ref: Upper Income)	4.04*	1.48 to 11.03	4.01*	1.47 to 10.95	4.01*	1.48 to 10.82
Low-middle Income	1.89	1.17 to 3.06	1.89	1.17 to 3.03	1.83	1.16 to 2.89
Upper-middle Income						
Parental education (ref: Graduate degree)			1.11	1.07 to 1.15	1.10	1.06 to 1.13
Less than Bachelor Degree	1.13	1.08 to 1.17	1.08	1.05 to 1.11	1.11	1.06 to 1.15
Bachelor Degree	1.07	1.04 to 1.09				
Age			1.06	1.04 to 1.08	1.08	1.05 to 1.10
Relationship Status			.646	.568 to .735	.627	.547 to .718
Parental Status			1.27	1.09 to 1.49	1.40	1.12 to 1.75
Racial Identity X Gender					.460	.294 to .459
Low Racial Identity X Female						

Abbreviations: β , unstandardized coefficient; CI, confidence interval
* p<.05, ** p<.01, *** p<.001
Estimates are weighted to account for probability of selection, stratification, and clustering
^a Relative risks were estimated through Poisson regression model with a log link function

Table 23 Part B: Poisson Regression of Racial Identity on Depression

	Model 4		Model 5	
	RR ^a	95% CI	RR ^a	95% CI
Racial Identity (ref: High Racial Identity)	3.70	.650 to 21.03	.328*	.182 to .590
Gender (ref: Male)	.743	.686 to .805	.758	.703 to .818
SES (ref: Upper Income)	6.64*	1.01 to 43.41	3.88*	1.45 to 10.40
Low-middle Income	3.83	.980 to 15.00	1.83	1.15 to 2.91
Upper-middle Income				
Parental education (ref: Graduate degree)	1.12	1.08 to 1.16	.884	.847 to .922
Less than Bachelor Degree	1.09	1.06 to 1.13	.671	.556 to .801
Bachelor Degree				
Age	1.04	1.03 to 1.05	1.09	1.06 to 1.12
Relationship Status	.657	.580 to .744	.633	.553 to .724
Parental Status	1.27	1.09 to 1.48	1.29	1.09 to 1.52
Racial Identity X Family Income	.182	.017 to 1.86		
Low RI X Low-Middle Income	.078	.001 to 3.86		
Low RI X Upper-Middle Income				
Racial Identity X Parental Education			2.01	1.25 to 3.24
Low RI X Less than Bachelors			3.59	1.35 to 9.56
Low RI X Bachelor Degree				

Abbreviations: β , unstandardized coefficient; CI, confidence interval
* p<.05, ** p<.01, *** p<.001
Estimates are weighted to account for probability of selection, stratification, and clustering
^a Relative risks were estimated through Poisson regression model with a log link function

Table 24 Part A: Poisson Regression of Racial Identity on Anxiety

	Model 1 ^a		Model 2 ^a		Model 3 ^a	
	RR ^a	95% CI	RR ^a	95% CI	RR ^a	95% CI
Racial Identity (ref: Low RI)	.855*	.80 to .95	.885	.839 to .933	2.38	1.13 to 4.98
Gender (ref: Male)	1.10	1.05 to 1.15	1.00	1.00 to 1.01	2.04	1.18 to 3.53
Family Income (ref: Upper Income)						
Low-middle Income	1.02	1.0 to 1.03	1.01	1.00 to 1.02	.993*	.987 to .999
Upper-middle Income	.808	.678 to .963	.804	.674 to .804	.765	.616 to .950
Parental Education						
Less than Bachelor Degree	.771	.670 to .886	.787	.691 to .896	.771	.665 to .893
Bachelor Degree	1.13	1.05 to 1.21	1.21	1.08 to 1.35	1.26	1.09 to 1.45
Age			1.29	1.15 to 1.46	1.33	1.16 to 1.52
Relationship Status			.802	.722 to .891	.755	.660 to .864
Parental Status			1.27	1.09 to 1.49	1.27	1.09 to 1.49
Racial Identity (RI) X Gender						
Low RI X Female					.229	.053 to .987

Abbreviations: β, association coefficient; CI, confidence interval

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

Estimates are weighted to account for probability of selection, stratification, and clustering

^a Relative risks were estimated through Poisson regression model with a log link function**Table 24 Part B: Poisson Regression of Racial Identity on Anxiety**

	Model 4 ^a		Model 5 ^a	
	RR ^a	95% CI	RR ^a	95% CI
Racial Identity (ref: Low RI)	9.86	8.53 to 11.39	.499	.282 to .880
Gender (ref: Male)	.977	.966 to .988	.994	.991 to .996
Family Income (ref: Upper Income)				
Low-middle Income	.582	.376 to .900	.947	.907 to .988
Upper-middle Income	.906	.836 to .982	.790	.650 to .961
Parental Education				
Less than Bachelor Degree	.846	.771 to .929	.612	.450 to .832
Bachelor Degree	1.15	1.05 to 1.25	.651	.469 to .905
Age	1.21***	1.11 to 1.33	1.29	1.15 to 1.43
Relationship Status	.850	.786 to .850	.774	.684 to .774
Parental Status	1.27	1.09 to 1.48	1.29	1.09 to 1.52
Racial Identity (RI) X Family Income				
Low RI X Low-Middle Income	1.75	.002 to 1.15		
Low RI X Upper-Middle Income	2.67	.003 to 1.79		
Race Identity (RI) X Parental Education				
Low RI X Less than Bachelors			1.73	.945 to 3.17
Low RI X Bachelor Degree			3.70	.826 to 16.55

Abbreviations: β, association coefficient; CI, confidence interval

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

Estimates are weighted to account for probability of selection, stratification, and clustering

^a Relative risks were estimated through Poisson regression model with a log link function

CHAPTER 5

Medical student socio-demographic characteristics and attitudes towards patient centered care: Do race, socioeconomic status and gender matter?

A Report from the Medical Student CHANGES Study

Objective

Examine the relationship between socio-demographic characteristics (race, gender, socioeconomic status) in a cohort of first year African American and White medical students and their attitudes towards patient-centered care.

Methods

This study uses baseline data collected as part of Medical Student Cognitive Habits and Growth Evaluation Study (CHANGES), a national longitudinal study of first year medical students who matriculated in US medical schools in the fall of 2010. CHANGES is designed to address many experiences of medical students, including their own health and a variety of social attitudes. We examined the relationship between race, gender and SES and attitudes towards patient-centered care using multiple linear regressions.

Results

We found that female gender and SES (low-middle income) but not race were significant predictors of positive attitudes towards patient-centered care.

Conclusions

New medical students' attitudes toward patient-centered care may shape their response to curricula as well as the quality and style of care that they provide as physicians. Some students may be predisposed to attitudes that lead to higher-quality, more patient-centered

care. One strategy to improve the quality of patient-centered care provided by new physicians entering the workforce may be to increase efforts to recruit a diverse body of students (particularly individuals from all income levels). Medical schools should incorporate and evaluate the impact of curriculum emphasizing the importance of patient-centered care and its impact on the quality of care and disparities in health care.

INTRODUCTION

The physician-patient relationship is central to the delivery of high-quality care and has been shown to contribute to health disparities,^{205,206,147,207} partially through its influence on patient satisfaction and biological, psychological and social outcomes,^{208–212} the delivery of preventative care services^{213–215} and patient adherence to treatment.^{215–218} Patient-centeredness is a key aspect of interpersonal quality of care. The Institute of Medicine (IOM) defines patient-centered care as “Providing care that is respectful of and responsive to individual patient preferences, needs, and values, and ensuring that patient values guide all clinical decisions.”²¹⁹ Medical educators have recognized the importance of patient-centered care and its impact on the physician-patient relationship by instituting a variety of curricula to teach its tenets: respectful partnerships, open communication, shared decision making, and strength-based approaches to medical students.²²⁰ These curricula may be strengthened by understanding the individual characteristics that are associated with attitudes about patient-centered care.

The inherent complexity of the physician–patient relationship gives rise to substantial variability in quality of care provided.⁴⁸ There is vital need for a deep understanding of the characteristics of patient and provider that determine the dynamics of that relationship. While many studies have focused on the importance of patient socio-demographic characteristics and increasing physician's awareness of the role that patient race, socioeconomic status (SES) and gender play in the physician-patient relationship,^{48,146,206,221,222} fewer studies document the inverse—the influence of physician race, SES and gender on attitudes towards patient centered care.

While there is evidence that race concordant visits are longer, have greater patient positive affect,¹⁴⁶ and result in greater patient satisfaction,^{146,223} it's unclear how this related to providers' attitudes toward patient-centered care. Several studies have also explored the role of physician gender on the physician-patient relationship^{224–226} determining that female physicians have often been found to be more engaged in positive talk, partnership-building, question-asking and information-giving.^{207,227,228} Female physicians also exhibit more empathy than their male counterparts^{229–231} and tend to be more patient-centered in their communication.^{42–45} While these factors have been shown to be associated with patient-centered attitudes, there is a paucity of research that directly examines the impact of gender on patient-centeredness.²²⁷ Indeed, Tsimtsiou and colleagues²²⁷ described the need to further study the ways in which gender influences the physician–patient relationship, in order to eliminate disparities in the provision of patient-centered health care.

Compared to physician race and gender, very little research has been done to document the impact of physician SES on the physician-patient relationship. The majority of research focuses on the SES of the patient, showing that patients of lower SES receive inferior medical care, communicate less effectively with providers,²⁹ and have more limited access to care than higher SES patients.^{232–235} Physicians from lower SES backgrounds may be better equipped to care for patients who come from similar backgrounds.²⁹ However, physicians (and medical students) tend to come from high socioeconomic backgrounds.^{30,236}

Patient-centered care replaces a historical physician-centered system with one that

revolves around the patient. Effective patient-centered care is generally defined as care that occurs in consultation with patients rather than by physician dependent tools or standards. It includes improved communication, participatory decision-making and trust, all of which may translate into better patient adherence to health recommendations and perhaps outcomes.²³⁷ A patient-centered approach to health care has been widely advocated as an important component of the physician-patient relationship²³⁸⁻²⁴¹ and is often promoted as a way to improve the quality of that relationship.²⁴² The improvements that patient-centered care makes to the physician-patient relationship also have the potential to aid in the elimination of health disparities. Indeed, care that focuses on building a personal relationship, communication, trust and empathy while emphasizing patient dignity and patient empowerment can go a long way towards improving health care for populations often marginalized from the health care system.²⁴³

While a great deal has been documented about the salience of patient-centered care for improved health, there has been less of a focus on the characteristics of the physician that influence the type of care they provide. Historically, physicians have paid little attention to the influence of their own demographically based predispositions in their medical practice. The medical literature also evidences the presumption that clinicians are neutral operators and are unaffected by personal variables.⁴⁸ Indeed, there is a paucity of research that explores the socio-demographic characteristics of physicians and/or medical students and their impact on attitudes towards patient-centered care. One study found that patient-centered beliefs were not related to physician gender or ethnicity,²⁴⁴ and other studies of medical students have found that women had more

positive attitudes towards patient centered care. These studies did not report the impact of race or SES on patient-centeredness.^{245,246} While medical curricula have begun to focus on teaching students strategies for patient-centered care, some of the attitudes that may influence uptake of these behaviors are intrinsic based on the social background of the physician/future physician.⁴⁸

This study has important implications for strategies to diversify the US physician workforce. Increasing the proportion of African American physicians is one strategy that has been proposed to reduce the extensively documented race disparities in health care.²⁰⁵ The physician-patient relationship is often strengthened when patients see themselves as having similar beliefs, values, and characteristics as their physicians.²¹⁰ Accordingly and appropriately, U.S. medical schools place considerable emphasis on recruiting underserved minority medical students in hopes of creating a workforce that reflects the country's diversity in order to improve access to quality care for diverse patient populations.

In this study, we examine the relationship between socio-demographic characteristics and attitudes towards patient-centered care among 3,214 African American and White 1st year medical students.

METHODS

Study Sample

This study uses baseline data collected as part of Medical Student CHANGES, a large longitudinal study of student experiences that is nationally representative of first year medical students who matriculated in US medical schools in the fall of 2010. We

randomly selected 50 medical schools from strata of public and private schools in six regions of the country. To select the schools, we employed a proportional selection for the number of schools sampled from each stratum and a sample proportional to class size methodology within stratum (for sampling details, see Appendix A).⁵³

Between October 2010 and January of 2011, a total of 4,764 first year medical students completed the baseline survey, representing 81% of the 5,873 students invited to participate in the study, and 54% of all 8,763 first year students enrolled at the 50 sampled schools. Our survey response rate is comparable to other published studies of medical students.⁵⁴ The demographic characteristics of students in our sample were similar to the demographics of all students who enrolled in a medical school in 2010, as reported by the AAMC (See Table 1 Chapter 2).

One of the 50 schools sampled for our study was a military school that had highly unique features, including acceptance policies, curriculum structure, timing and student characteristics. Due to concerns for the generalizability of our study findings, students enrolled in this school (n=32) were excluded from the analysis, leaving a final sample of 4,732 students enrolled in 49 schools.

The sampled schools had 8594 first-year students; we obtained e-mail addresses for 5823 (68%) of them via the procedures described in Figure 5. Of those, 4732 chose to participate and were paid \$50, representing 81% of those contacted and 55% of the entire pool of first-year students at our sampled schools. This response rate is comparable to other published studies of medical students.⁵⁴ Analysis for this particular

study focused on medical students who self identified as non-Hispanic White (N = 2890) or African American (N = 301).

This study was approved by the Institutional Review Boards of the Mayo Clinic, the University of Minnesota and Yale University.

{{FIGURE 5 ABOUT HERE}}

Analysis for this particular study focused on medical students who self identified as non-Hispanic White (N = 2890) or African American (N = 301).

Study Measures

Dependent variable. Patient-centered care was assessed using 6 items contained in the 15-item *Health Beliefs Attitudes Survey* (HBAS).⁷⁷ These items were chosen because they specially measured patient-centered care. Participants responded on a 7-point Likert-type scale ranging from 1 “Strongly Disagree” to 7 “Strongly Agree”. We created a mean scale score and conducted principal component analysis determining a Cronbach’s alpha of 0.78 and item correlation range 0.37 to 0.68. This patient-centered care variable was scored such that a higher score on the scale from 1 to 7 indicated more positive attitudes towards patient-centered care.

Independent Variables. *Race* was collected through self-report. Students identified their race from the following choices: American Indian/Alaskan Native, East Asian, South Asian, Black, Native Hawaiian/Pacific Islander, White or Multiracial. Respondents who identified with multiple racial/ethnic groups were categorized into just one of those groups in the following order: African American, Hispanic, South Asian, East Asian, White. For example, all participants who marked “African American” were

categorized as African American. This analysis focuses on medical students who identified as White or African American.

Gender was collected for each student through self-report. Those indicating “other” (n=5) were excluded from our analyses.

Socioeconomic status can be challenging to conceptualize for this population given that we are assessing SES during a transitional time in these students’ lives. Because family income (i.e. the socioeconomic standing they experienced growing up) and parent education are more likely to have shaped the students’ attitudes than current income,⁵⁹ we use family income and parental education as categorical measures of SES for these analyses. Family Income was categorized into three groups: low-middle SES was defined as a family income of less than \$10,000-\$74,999, upper-middle SES was defined as \$75,000-\$249,999 and upper SES was defined as \$250,000-\$500,000 or more. Parents’ education was categorized into three groups: PhD, Masters degree, Bachelors degree and Less than a Bachelors degree. These three family income categories were selected based on knowledge from the “US Census Bureau; Income, Poverty, and Health Insurance Coverage in the United States: 2011.”⁶⁰ I used the 2011 median income of US households (\$50,054 annually) as a guide to determine the income levels. I matched the family income categories against the education level of parents using Thompson and Hickey⁶¹ as a guide. In their work they suggest that low-middle income class groups are comprised of individuals with some college education (less than a bachelors degree) and household incomes ranging from \$35,000 to \$75,000 annually. They suggest that upper-middle SES groups are comprised of educated individuals (at

least a Bachelors degree) and annual incomes varying from the high 5-figure range to commonly above \$100,000. The upper income class group according to Thompson and Hickey is comprised of top-level executives who are highly educated (professional degrees) and varying incomes ranging from at least \$250,000 to \$500,000 or more.

Covariate. In full models we controlled for self-reported age, which had little variance, and was dichotomized into those 24 and younger and those over 24. Twenty-four was chosen because it is the average age of a first year medical student in the United States⁵⁵ as well as the mean age for our cohort of first year medical students.

Statistical Analysis

Descriptive statistics were used to characterize the sample and explore the bivariate relationship between socio-demographic characteristics and attitudes towards patient care. Statistical significance was determined with analysis of variance (ANOVA). After noting the small but statistically significant differences in mean scores of attitudes towards patient-centered care, we calculated Cohen's *d* for each socio-demographic characteristic to determine if the effects we were seeing were truly significant and how large they were.

We used multiple linear regression to examine the relationships between race, SES, gender and attitudes towards patient care. We chose the multiple linear regression for several reasons. First, it was the best choice given that our dependent variable is continuous and that we have multiple independent variables. Second, multiple linear regression allowed us not only to determine the overall fit (variance explained) of the model(s) but also the relative contribution of each of the predictors (race, gender, SES)

to the total variance explained. For instance, we want to know how much of the variation in attitudes towards patient care can be explained by race, gender and SES as a whole but also the relative contribution of each of these characteristics in explaining the variance in attitudes towards patient-centered care. We also test interaction effects in order to determine if there are any combined effects of race, gender and SES on attitudes towards patient-centered care.

We performed all analyses using SPSS PASW© Statistics 21. To account for complex two-stage design of the *CHANGES* survey, all statistical analyses were adjusted to account for sampling probability, stratification, and clustering.

RESULTS

Sample Characteristics

Frequencies and summary statistics for sample characteristics were calculated for both African American and White students. Characteristics of the participants are presented in Table 25. There were a total of 3,214 students in our sample and of these, 2,890 were White and 301 were African American. African American students were different from their White counterparts in terms of gender, 48% of White students were female and 66% of African Americans were female. Nearly a quarter (23%) of White students were classified as low-middle income while slightly more than half (52%) of African American students were classified as such. Over half (63%) of White students reported that at least one of their parents had a graduate degree and 51% of African American students reported the same. Over a quarter (27%) of African American students reported that either parent had earned less than a bachelors' degree versus only

13% of White students. Nearly three-quarters (72%) of White students were between the ages of 18 and 24 and 65% of African American students were between the ages of 18 and 24.

{{TABLE 25 ABOUT HERE}}

Medical student attitudes towards patient-centered care

Figure 6 illustrates the distribution of attitudes towards patient-centered care among the 3,210 African American and White first-year medical students. The median score was 6.0 on a scale of 1-7. Students below the median ($n = 1,509$) were considered to have less positive attitudes towards patient-centered care. Most students indicated relatively favorable attitudes toward patient-centered care

{{FIGURE 6 ABOUT HERE}}

We also calculated the unadjusted mean score of attitudes towards patient-centered care. While the differences in score were small, there were statistically significant differences in attitudes towards patient-centered care by race ($P=0.002$), gender ($P=0.000$) and family income ($P =0.030$), with African American, female, and lower-middle income students holding significantly more positive attitudes towards patient-centered care (Table 26).¹

{{TABLE 26 ABOUT HERE}}

Results of the multiple regression models are shown in Table 27. Seven different models were run. The differences in the models was used to evaluate what happens

¹ Given the small differences in mean scores, we estimated the effect size using Cohen's d . For race we calculated a $d = 0.25$ (95% CI, .10 to .34). For gender $d = 0.30$ (95% CI, .23 to .37) and for family income, $d = 0.21$ (95% CI, .11 to .30).

when the interaction between each of the socio-demographic characteristics are taken into account. Model 1 tested the main effects of race, gender and SES (family income and parental education) as predictors for attitudes towards patient-centered care. In this model, the effect of race was no longer a significant predictor of attitudes towards patient-care as it was in the unadjusted bivariate model. We found that being male was associated with less favorable attitudes towards patient-centered care ($B = -.244$, 95% CI $[-.303$ to $-.186]$; $P < .001$). We also determined that family income specifically being of lower-middle income was associated with more positive attitudes towards patient-centered care ($B = .069$, 95% CI $[-.026$ - $.163]$ $P < .05$).

Model 2 tested the main effects of race, gender and SES and also included the covariate age. We found the same gender effect ($B = -.244$, 95% CI $[-.303$ to $-.186]$), the same income effect ($B = .060$ 95% CI $[-.034$ to $-.155]$) and the model showed that being older than the average age of US medical students (over 24 years old) is associated with more positive attitudes towards patient-centered care ($B = .090$ 95% CI $[-.026$ to $.155]$).

In models 3-7 we tested the interaction effects of all socio-demographic variables. These interaction effects were not statistically significant, nor did they substantially change the other coefficients. However, there is one exception to this finding, in model 6, when the interaction effect of gender*family income is added, the main effect of family income was no longer significant.

{{TABLE 27 ABOUT HERE}}

DISCUSSION

While much attention has been paid to increasing physician's awareness of the role

that a patients' race, SES and gender play in health care, fewer studies have explored how the socio-demographic characteristics of health care providers affect the care they deliver. We found that medical student socioeconomic status and gender have a significant impact on attitudes towards patient-centered care such that female medical students and medical students from a low -middle income SES background (less than \$10,000 to \$74,999 annually) have more positive attitudes towards patient-centered care than their male and upper class counterparts respectively. We also found that medical students who are older than the average age of US medical students (24) have more positive attitudes towards patient-centered care. There were no race differences in attitudes towards patient-centered care nor were interaction effects measuring the combined effects of race, gender and SES on patient-centered care significant. These findings are novel in that to our knowledge, they are the first to document how medical student medical student attitudes towards patient-centered care. Vary by their race and SES. This may be because the CHANGES study is the first sample of medical students with sufficient statistical power to test race differences in such attitudes.

While many studies have documented the importance of race in the physician-patient relationship, citing the impact of racially concordant care, race was not found to be a significant predictor of attitudes towards patient-centered care for our sample of first year medical students. Of course, this does not negate the importance of working towards a physician workforce that is as racially diverse as the patients served.

Our findings regarding student SES may result from low income students' experience of the privilege gap in medicine as described by Nahvi.²⁴⁷ The median family

income of American medical students is just over \$100,000.²⁴⁸ This is comparison to U.S. median household income, which was \$51,324 in the same year (2011).²⁴⁹ The unfortunate consequence of this is that patients sometimes struggle to be understood by well-meaning but ultimately privileged doctors who sometimes cannot relate to patients from other backgrounds.²⁴⁷ Our findings suggest that students from higher income groups tend to have less favorable patient-centered attitudes in comparison to their lower income counterparts. Thus, it is important that medical educators continue to incorporate a curriculum that directly encourages favorable attitudes toward patient-centered care. Such interventions should make explicit the notion that high-quality care is patient-centered.

Our findings regarding gender differences are consistent with a body of research showing that women physicians have, overall, higher quality interpersonal processes of care including longer visits, more positive statements, more partnership statements, more questions, more back-channel responses, and warmer non-verbal behavior including smiling and nodding more than male physicians.^{226,250} Over the past few years, the number of female medical students has continued to increase with women comprising 47.0% of all first year medical school students in the 2010-2011 school year.²⁵¹ While access to medical training appears to be less of an issue for women in the US, a greater concern may be that female medical students are at greater risk for psychological distress²⁵² which could potentially make it more challenging for them to complete their medical training and ultimately provide important patient-centered care as practicing physicians. Indeed, Dyrbye and colleagues have found that medical students in distress

are more likely to drop out, choose less competitive residency programs and have lower levels of empathy.^{123,204} Female medical students in particular have been found to be at greater risk for all of these issues.^{22,23,27} Thus, it is important the medical educators foster an environment where women are able to thrive as well as share their thoughts and point of view on patient-centered care with their male counterparts.

This study is novel in that it is the first large longitudinal study of individuals of varying socio-demographic backgrounds who matriculated in US medical schools. Nevertheless, this study had limitations. First, we were unable to ascertain and invite all first year medical students in the school sample, creating potential sample bias. Second, a longitudinal study is needed to assess whether these differences in attitudes towards patient-centered care persist throughout medical school.

Taking a patient-centered approach to providing health care is an important part of providing quality care and the elimination of health disparities.^{238,222} A temporary fix is to better train all students to deal with all types of patients and improve their attitudes towards patient-centered care. Many medical schools are doing this successfully.²⁴¹ A long-term solution, however, is □to recruit a more representative sample of students (particularly individuals from all income levels) into medicine and provide them support needed to complete their training. While efforts have been and currently are made to recruit students of diverse racial and ethnic groups into medicine, very little effort and thought is put into the recruitment of students from diverse socioeconomic backgrounds.²⁹ Because class and race are imperfectly correlated and index distinct (although over-lapping) attributes, both deserve attention in medical school admissions

decision.³⁰ Fundamentally though, for change to occur, admission committees must recognize the importance of getting more low-income students into our medical education system. Additionally, recruiting more medical students from lower-SES origins might help raise awareness around issues of social class through the socialization process that occurs during medical school.²⁹ Moreover, research findings suggest that physicians from lower socioeconomic groups might be better equipped to care for patients from similar backgrounds.²⁹ Consider that (1) physicians are non-representative of the overall population in their socioeconomic origins, (2) patients from lower-SES backgrounds encounter communication problems with their physicians, and (3) there is evidence that physicians from lower SES backgrounds communicate more effectively with and provide better treatment for patients from similar backgrounds.²⁹

The published research on the role of SES in medical education, while not conclusive, suggests that recruiting and admitting more medical students from socioeconomically disadvantaged backgrounds could help advance a variety of health policy objectives.²⁹ Recent challenges to affirmative action may offer an opportunity for critical reflection on the role of socioeconomic status in medical education. While the June 2013 Supreme Court opinion in *Fisher v. University of Texas* did not end race-based affirmative action programs, schools are required to prove that a workable race-neutral alternatives would produce the educational benefits of diversity before being able to factor race into their admissions decisions. The problem with this is lack of clarity regarding whether or not a race-neutral alternative truly exists. One solution might be what a 2001 bill in Texas²⁵³ aimed to do—which was to mandate that admissions

committee's compare a medical student's application with other applicants from similar socioeconomic backgrounds (to the extent that those backgrounds can be determined).²⁴⁸

Overall, policy solutions that expand the traditional definition of diversity from race/ethnicity in medical school classes to include consideration of socioeconomic status are vital for successful diversification of the health care workforce and the subsequent delivery of high quality health care.

Figure 5: CHANGES Study Sample

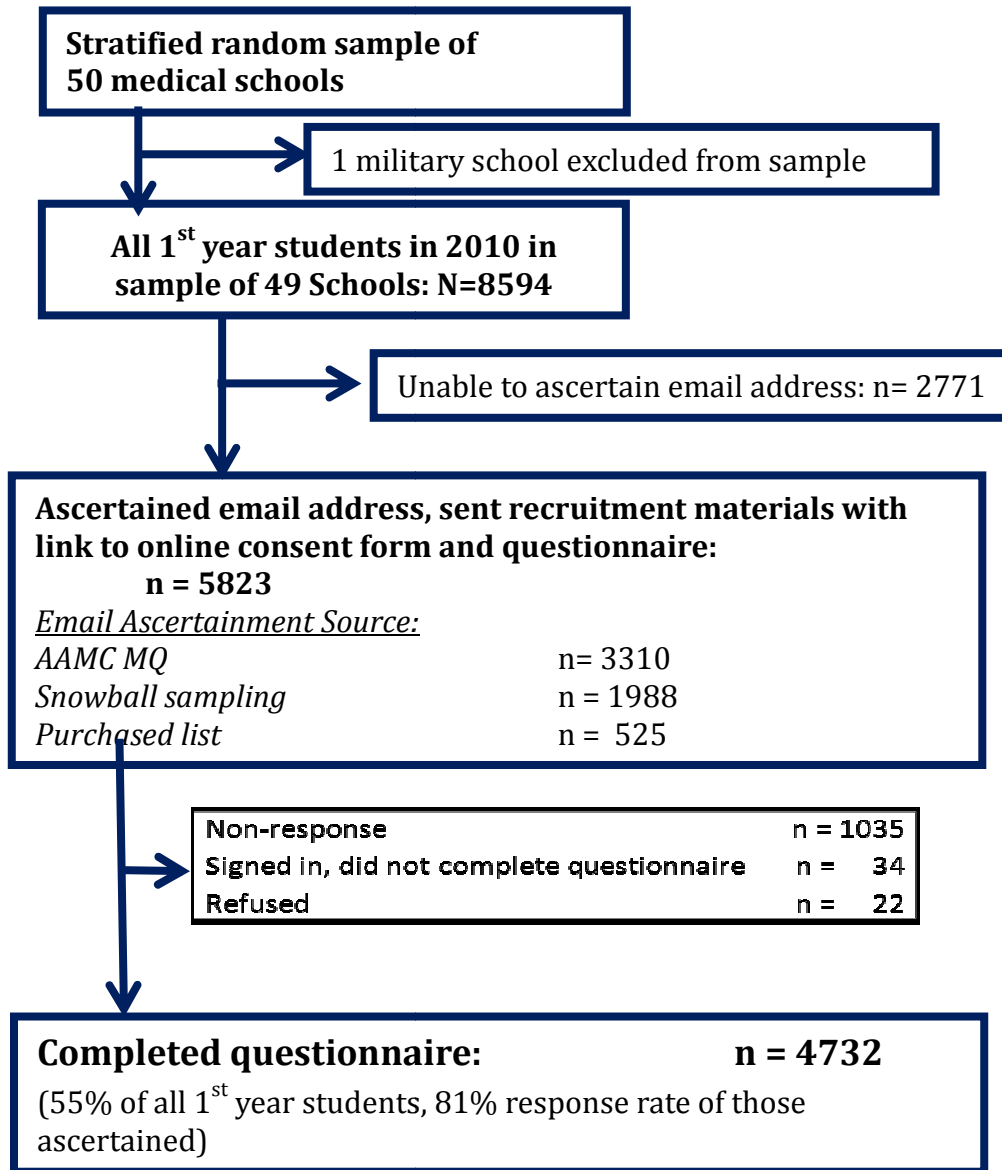


Table 25: Characteristics of the study sample stratified by race			
	White (n=2,890)	African American (n=301)	<i>P value</i>
Gender			<i>.001</i>
Female	1390 (48%)	198 (66%)	
Male	1517 (52%)	103 (34%)	
Family Income			<i>.001</i>
Low-middle Income (less than \$10,000-74,999)	618 (23%)	145 (52%)	
Upper-middle Income (\$75,000-249,999)	1501 (55%)	105 (38%)	
Upper Income (\$250,000-500,000 or more)	588 (22%)	29 (10%)	
Parental Education			<i>.001</i>
Graduate Degree	1836 (63%)	153 (51.2%)	
Bachelor Degree	687 (24%)	64 (21.4%)	
Less than Bachelor Degree	387 (13%)	82 (27.4%)	
Age			<i>.017</i>
18-24	2085 (72%)	195 (65%)	
25-35 or older	811 (28%)	104 (35%)	

Figure 6: Distribution of attitudes towards patient-centered care status

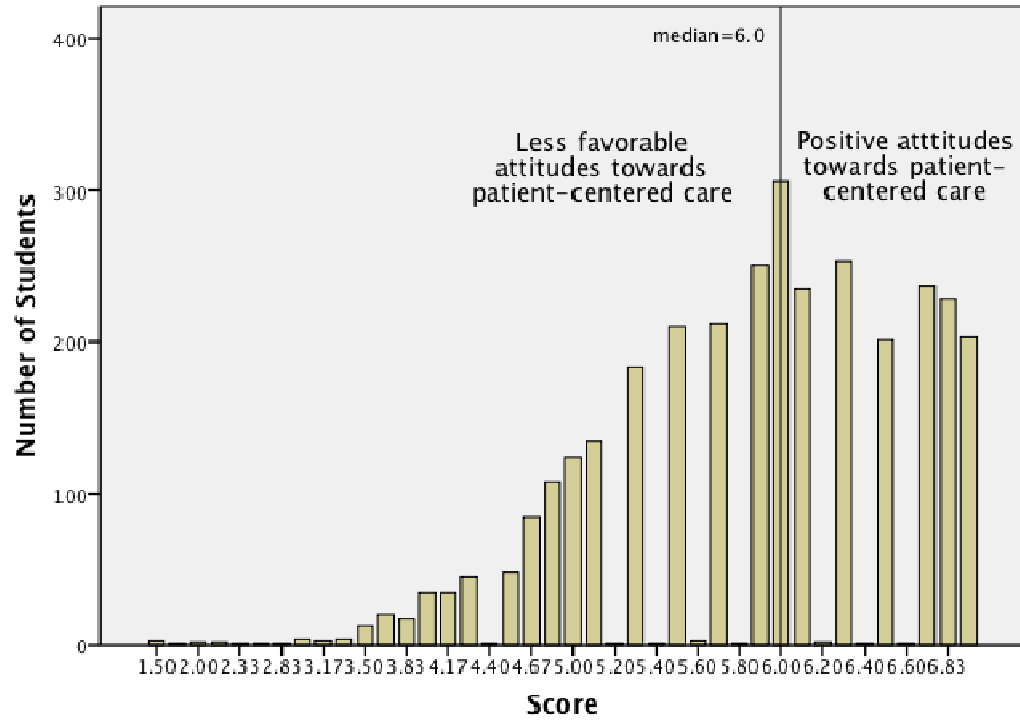


Table 26: Mean score of attitudes towards patient-centered care by race, gender and socioeconomic status (unadjusted)

	Mean (SD)	<i>P</i> value
Race		
African American	5.99 (.75)	.002
White	5.81 (.83)	
Gender		
Female	5.96 (.75)	.000
Male	5.72 (.87)	
Family Income		
Low-middle Income	5.90 (.81)	.043
Upper-middle Income	5.82 (.80)	
Upper Income	5.71 (.87)	
Parental Education		
Graduate Degree	5.83 (.82)	.538
Bachelor Degree	5.85 (.82)	
Less than Bachelor Degree	5.87 (.80)	

Table 27 Part A: Multiple Linear Regression Predicting Attitudes Towards Patient-Centered Care by Medical Student Socio-demographic Characteristics

	Model 1		Model 2		Model 3		Model 4	
	B (SE)	95% CI	B (SE)	95% CI	B (SE)	95% CI	B (SE)	95% CI
Race ^a	-.087 (.052)	-.189 to .016	-.077 (.052)	-.179 to .026	-.078 (.065)	-.205 to .049	.063 (.153)	-.237 to .363
Gender ^b	-.244 (.030)***	-.303 to -.186	-.244 (.030)***	-.303 to -.186	-.247 (.102)**	-.447 to -.048	-.244 (.030)**	-.303 to -.186
Family Income ^c								
Low-middle	.069 (.048)*	-.026 to .163	.060 (.048)*	-.034 to .155	.060 (.048)	-.034 to .155	.294 (.165)	-.030 to .617-
Upper-middle	.083 (.039)	.006 to .159	.087 (.039)	.010 to .163	0.87 (.039)*	.010 to .163	.123 (.169)**	.208 to .454
Parental Education								
Less than Bachelors	.056 (.047)	-.036 to .148	.059 (.047)	-.059 to .085	.059 (.047)	-.032 to .151	.054 (.047)	-.037 to .146
Bachelors	.013 (.037)	-.059 to .085	.013 (.037)	-.179 to .026	.013 (.037)	-.059 to .085	.012 (.037)	-.060 to .085
Age			.090 (.033)**	.026- to .155	.090 (.033)**	.026 to .155	.092 (.033)**	.028 to .157
Interactions								
Race*Gender					.003 (.106)	-.205 to .212		
Race*Family Income							-.261 (.170)	-.595 to .073
Race*LM							-.036 (.173)	-.376 to .304
Race*UM								

P < .001***, *P* < .01**, *P* < .05*

Estimates are weighted to account for probability of selection, stratification, and clustering

^a Reference group is White

^b Reference group is Male

^c Reference group is Upper Income

^d Reference group over 24

Initial models controlled for social desirability (a 7-item measure of propensity to respond to questionnaire items in a socially desirable way) and time in medical school. Neither were found to be statistically significant and neither substantively impacted final models and therefore are excluded.

Table 27 Part B: Multiple Linear Regression Predicting Attitudes Towards Patient-Centered Care by Medical Student Socio-demographic Characteristics

	Model 5		Model 6		Model 7	
	B (SE)	95% CI	B (SE)	95% CI	B (SE)	95% CI
Race ^a	.061 (.052)	-.280 to -.004	-.075 (.052)	-.178 to .027	-.078 (.052)	-.181 to .024
Gender ^b	-.246 (.030)***	-.304 to -.186	-.310 (.065)***	-.438 to -.182	-.261 (.038)**	-.335 to -.187
Family Income ^c						
Low-middle	.061 (.048)	-.033 to .155	.048 (.064)	-.078 to .174	.060 (.048)	-.035 to .155
Upper-middle	.085 (.039)**	.008 to .161	.031 (.055)	-.077 to .139	.086 (.039)*	.009 to .162
Parental Education						
Less than Bachelors	.041 (.116)	-.187 to .269	.059 (.047)	-.033 to .150	.024 (.067)	-.108 to .156
Bachelors	-.253 (.125)	-.499 to -.007	.010 (.037)	-.062 to .083	-.002 (.052)	-.104 to .099
Age	.089 (.033)**	.025 to .155	.089 (.033)**	.025 to .154	.090 (.033)**	.025 to .154
Interactions						
Race*Parental Ed						
Race*LBD	.014 (.124)	-.299 to .256				
Race*BD	.291 (.131)	.034 to .547				
Gender*Family Income						
Gender*LM			.025 (.088)	-.148 to .197		
Gender*UM			.110 (.077)	-.040 to .260		
Gender*Parental Ed						
Gender*LBD					.063 (.086)	-.107 to .232
Gender*BD					.031 (.072)	-.110 to .172

P < .001***, *P* < .01**, *P* < .05*

Estimates are weighted to account for probability of selection, stratification, and clustering

^a Reference group is White

^b Reference group is Male

^c Reference group is Upper Income

^d Reference group over 24

Initial models controlled for social desirability (a 7-item measure of propensity to respond to questionnaire items in a socially desirable way) and time in medical school. Neither were found to be statistically significant and neither substantively impacted final models and therefore are excluded.

CHAPTER 6 CONCLUSION

The fundamental proposition of my dissertation is that members of marginalized social positions start medical school with different resources and vulnerabilities than their counterparts who are part of the majority; and as a result, experience medical school socialization in a fundamentally different way. To that end, the goal of my dissertation was to explore the experience of medical school for minority students, specifically African Americans, women and students of low socioeconomic standing. In this dissertation, I draw upon diverse literatures and theoretical frameworks to inform my thoughts on how the experiences of medical school differ by race, gender and socioeconomic status. These theories include role adoption, the medical school socialization process and intersectionality theory. While my dissertation is not framed or bounded by any of these individual theories, I will use aspects of them to consider what these findings might mean for the experience of students from marginalized social positions in medical school. In this final chapter, I will first summarize the findings from each of the three manuscripts (chapters 3-5). I will then highlight important findings across the three papers and discuss their implications both practical (for medical education) and theoretical, drawing on the theoretical frameworks previously mentioned. Finally, I will articulate the implications of these findings for the field of health disparities research and conclude by discussing ideas for future research.

Summary of findings and conclusions

Each of the empirical chapters of this dissertation makes use of data from the CHANGES medical student data set. Chapter 3, *Depression, anxiety, health status and*

psychosocial resources in first year medical students: A comparison of the effects of race and gender, sought to address a gap in the literature by investigating the impact of race and gender on psychological distress for African American and White first year medical students. A secondary goal of this study was to identify if personal characteristics such as race and gender were associated with levels of psychosocial resources. Consistent with our hypotheses, at the start of their first year of medical school, African American and female medical students were at a higher risk for depression and anxiety symptoms than their White and male counterparts respectively. I also found an interaction effect suggesting that African American males were at greatest risk for depressive symptomology and African American women were at greatest risk for anxiety in comparison to their White counterparts. With respect to psychosocial resources, I found that African American students were at higher risk for lacking social support to help them to deal with the rigors of medical school. Regardless of race, women had higher levels of social support than their male counterparts. Although women had more social support, they experienced lower performance self-esteem than their male counterparts.

Chapter 4 entitled, *Is Racial Identity Protective? Depression and Anxiety Among A National Sample of African American First Year Medical Students* addressed an important gap in knowledge regarding the role of racial identity as a protective factor for depression and anxiety African American medical students. Given that previous studies suggest that racial identity can be protective, I expected that students with high racial identity would have lower levels of depression and anxiety but found instead that students with high racial identity suffered from higher levels of depression and anxiety. Given the potential role that gender and SES play in the African American medical

school experience, I also explored the interaction between gender and racial identity and SES and racial identity and their impact on depressive and anxiety symptoms. While there were no significant interaction effects, I did find that students from the low-middle income SES group (less than \$10,000 to \$74,999) were at greater risk for depression.

Chapter 5 entitled *Medical student socio-demographic characteristics and attitudes towards patient centered care: Do race, socioeconomic status and gender matter?* sought to explore the relationship between social position factor and attitudes towards patient care. I found that medical student socioeconomic status and gender, but not race, were significantly related to attitudes towards patient-centered care such that female medical students and medical students from a low-middle income SES background (less than \$10,000 to \$74,999) had more positive attitudes towards patient-centered care than their male and upper class counterparts respectively. I also found that medical students who were older than the average age of US medical students (24) had more positive attitudes towards patient-centered care. These findings are novel in that to our knowledge, they are the first to document how medical student race and SES influence medical student attitudes towards patient-centered care.

Implications of Findings

Taken together findings from all three papers suggest that we must continue to understand the experience of medical school from the perspective of students from marginalized social backgrounds. In this section, I highlight main findings and discuss their practical and theoretical implications for medical education and the delivery of high quality health care.

African American and female first year medical students are at greater risk

for depression and anxiety. Starting medical school with greater symptoms of depression and anxiety may have important implications for student's success in medical school. Thus, the findings of papers one and two (chapters 3 and 4) are particularly disturbing given the fact that these students are just at the beginning of their medical school experience and results from others studies suggest that their mental health will continue to decline.⁵⁶ These findings have practical implications for both medical education and the provision of high quality health care. First, poor mental and overall health inhibit learning and success in medical school.¹⁰⁷ Other studies have linked poor mental health to attrition, citing that medical students with high scores on the Beck Depression Inventory are at greater risk of dropping out of medical school.⁸⁹ Second, psychological distress among physicians may result in the provision of poor quality of clinical care.¹⁴²⁻¹⁴⁴ Indeed, studies have shown that psychological distress and burnout among medical students and residents result in suboptimal patient-care practices including suboptimal treatment of patients from a humanitarian standpoint.¹⁴⁴ Over the last decade, physician distress (burnout, depression, anxiety, stress) has also been recognized as an important influence on practice habits.²⁵⁴ Psychological distress during medical training may also parallel a decline in empathy,²⁵⁵ influence patient compliance²¹⁶ and patient satisfaction,²⁵⁶ and impact physician turnover,²⁵⁷⁻²⁵⁹ .

Some medical students experience substantial distress from the beginning of the training process.²⁰⁴ Causes of psychological distress among medical students are linked to a variety of issues ranging from a demanding course load to unfamiliarity with a new environment. For many individuals, distress arouses feelings of fear, incompetence, uselessness, anger, and guilt and can be associated with poor psychological health.¹⁰⁷

Little is known about who is at greatest risk to experience poor psychological health in medical school and why. Studies of the medical school socialization process suggest that upon entering medical school, students must shed their lay values as they are seen as inferior, dysfunctional, and in tension with conventional medical education.¹⁰ This expectation may cause stress and distress for students whose lay values differ significantly from those of the medical education institution.¹⁰ Little is known about which students deviate from the medical socialization process, holding on to their lay values and which students are more readily able to accept the new value system and incorporate it. It is possible that students who have had early and frequent contact with physicians, such as having a family member who is a doctor and/or students who are part of the majority (e.g. White, male, high SES) may have been pre-socialized into the medical school education environment. These students will have less of a need to deviate from their pre medical school values and norms. For those who must deviate from their values, beliefs and norms, this process can be stress inducing and may cause greater anxiety and distress among those students.¹⁵ If mental health and psychological well-being are linked to the medical school socialization process in any way, then the findings of papers one and two suggest that perhaps students from marginalized social positions (African Americans and women) may be the ones who struggle to shed their values and/or find their values in tension with conventional medical school norms.²¹ These students are then at greater risk to experience poor psychological health given the tenuousness of this process.

Identity may also play a role in understanding who is at greater risk for depression and anxiety in medical school. It was the premise of this dissertation that identity

becomes most salient to the medical socialization process when dealing with medical students of marginalized social status.²¹ Identity represents an individual's psychological relationship to the social category(ies) in which they are identified as being a part of (e.g. race, gender and SES).¹³ An individual enters medical school with a particular identity or identities (e.g. African American female or White, male, upper-middle class). This identity then interacts with the medical school socialization process in a systematic way. Understanding the impact of this interaction can have important implications for how we understand the experience of certain groups of students and its impact on their psychological well-being.

For African American students, navigating multiple identities while simultaneously navigating the medical socialization process may elicit more distress than being White. This notion is particularly salient given the significant race*gender interaction effects found in chapter 3 which suggest that African American men are at greatest risk for depression and African American women are at greatest risk for anxiety. Certainly, more work is needed to understand how the intersectional identities are impacted by or impact the medical socialization process. I speculate that always having to draw upon one identity or another depending on the situation one is confronted with can be exhausting and cause psychological and emotional distress.³³ I further explore this idea using Monrouxe's multiple identity scenarios with medical student, "Maria". Maria may represent her multiple identities through a process of differentiation and isolation resulting in compartmentalization. As a result, a different identity is activated within different contexts and situations throughout the medical socialization process. For example, in certain contexts in the medical school learning environment, she might draw

upon her identity as a doctor/medical student, adopting the values and norms of the “hidden curriculum” and her new professional identity. In other contexts, her gender or her race might dictate whom she identifies with, what she believes and how she responds to the socialization process. The ability to hold a complex representation of identities may be stressful for Maria and contribute to psychological distress.^{33,260} Conversely, if Maria has a hierarchical representation of her identities, placing her identity as African American over that of being a woman and over that of being a doctor, she may feel closer to others who are African American. As a result, she may consider individuals outside of her dominant identity to be out-group members. Given the small numbers of African American students in medical school, this may cause social isolation and social loneliness, both of which have been linked to depression and anxiety.¹⁹ Additionally, identity is often determined in social interactions. Thus, Maria’s classmates, professors and patients will also determine which identity is salient in a given situation and some will view her in a way that may be at odds with what she views as salient to the situation. The implications for this can be both positive and negative.

African American medical students with high racial identity are at greater risk for depression and anxiety. This finding has important implications for the psychological well-being of African American medical students and their experience as minority individuals in medical schools. For example, studies have linked racial identity to stereotype threat and academic success positing that a low racial identity is an important mechanism for African Americans in academic settings to circumvent stereotype vulnerability^{261,262}—the need to consistently disavow group-based negative feedback. Steele (1997) notes that increased reminders of barriers and stereotypes

compromise academic performance.²⁶³ He refers to this as stereotype threat, which occurs when individuals fear that their behavior(s) may confirm stereotypes (often negative) about a group to which they belong. Stereotype threat has important consequences for identity construction, making self-protection an important focus for African Americans^{264,265}. Having a low racial identity and committing to the ideology of the dominant social system (medical education) should diminish the adverse effects of persistent negative stereotypes about African Americans and allow them to freely adopt and engage in the mainstream cultural norms of the medical school.²⁶⁶ Conversely, having a high racial identity might increase the adverse effects of persistent negative stereotypes, ostracizing these students from the mainstream norms of the medical school environment and potentially putting these isolated students at greater risk for depression and anxiety.

Given that racial identity does not appear to be protective, future research must seek to understand what factors are protective and promote resilience for African American students. Scholars who suggest that having a strong racial identity is protective explain that high racial identity individuals may possess more effective coping repertoire for dealing with racial discrimination as a result of greater practice dealing with racist experiences.¹⁹¹ In paper one (chapter 3) African American students were found to have a less effective coping repertoire—less social support and lower performance self-esteem. While the implications of these findings will be discussed in the next section, it is important to note that there is potential for a link between high racial identity, fewer psychosocial resources and depression and anxiety that must be explored. Cross and colleagues suggest that high racial identity individuals may be shielded from the negative

effects of discriminatory experiences because their self-confidence and self-esteem about being African American helps them dismiss the experience rather than internalize it as one about themselves.¹⁷⁹ Given that African American students in this sample tend to have lower levels of self-esteem, we must also seek to understand how it mediates the relationship between racial identity and depression and anxiety.

This finding also has important implications for understanding the role of intersectionality in African American medical students and their experience as first year medical students. African American students with high racial identity may be contending with their multiple identities as described in Monrouxe's scenarios about Maria. Some students may maintain/hold on to their racial identity early on in medical school when confronted with their new environment and new values and norms while others may struggle to do so, constructing a hierarchy of identities, in which one takes precedence over the others. Students in our sample with high racial identity may be doing exactly this—placing their racial identity at the top of the hierarchy. The consequences of this appear to be harmful as these students with high racial identity are at greater risk for depression and anxiety than their low racial identity counterparts.

African American and female students are at greater risk to experience lower performance self-esteem than their White and male counterparts. Performance self-esteem is important in that it represents the feelings of confidence medical students have about their cognitive ability and their intellectual capacities as a medical student. Studies have observed that mental health may have its most devastating impact on individuals when they have low performance self-esteem.¹³⁶ While in general, studies have found that for medical students, cognitive ability is higher in comparison to other

populations,¹³⁷ the fact that two sub-groups of the first year medical student population may be suffering from low self-esteem at the start of their medical training is concerning. Performance self-esteem has also been associated with high rates of burnout in a sample of medical school trainees.^{137,138} Thus, these findings have important implications for the success of African American and female medical students for many of the reasons previously described.

The link between racial identity and self-esteem discussed above suggests that African American students with high racial identity will have higher levels of self-esteem. Given that students with high racial identity were found to be at greater risk for depression and anxiety we must seek to understand how self-esteem influences the relationship between racial identity and depression and anxiety. Future studies must explore specifically if African American students with high racial identity have high self-esteem, and if they do, what that means for their psychological well-being.

African American students are at greater risk of lacking social support and female medical students have more social support. Numerous studies have shown that social support is linked to psychological and physical health outcomes^{132,133} and is observed to enhance mental health.¹³⁴ Thus, social support is an important psychosocial resource that has the potential to help students deal with the rigors of medical school. The interaction effect of race*gender on social support illustrated that regardless of race, women have higher levels of social support than their male counterparts. It also suggested that African American males suffer from the lowest levels of social support. While it is positive that women are finding the social support they need as first year medical students, it is also concerning in that a study of third year medical students found that

higher levels of outside social support was associated with poorer clerkship grades for women.¹³⁵ Given that our study finds that women are at greater risk for depression and anxiety, further studies are warranted to understand social support as a potential mediator of the relationship between gender and mental health.

Female medical students and students from low-middle income SES have more positive attitudes towards patient-centered care. There is vital need for an understanding of the characteristics that determine the dynamics of the physician-patient relationship. While a great deal has been documented about the salience of the physician-patient relationship and patient-centered care for improved health, there has been less of a focus on the characteristics of the physician that influence the type of care they provide. This finding has important implications for understanding the role of physician social characteristics on an important aspect of patient care.

Some scholars suggest that values and beliefs about patient care are directly related to the medical school socialization process.^{1,10,21,267} They suggest that medical students are socialized into a discourse in which the medical ideology is based on values such as objectivity and authority used to maintain traditional hierarchical social orders and legitimate the biomedical model.^{39,40} This socialization process often marginalizes alternative perspectives.^{39,40,268} The development of these values and norms often is derived by what Hafferty refers to as the “hidden curriculum” of medicine.¹⁴ Students learn the value that is placed on the physician-patient relationship, internalizing subtle rules about the social hierarchy of a physician and how to think about, conceptualize and operationalize the physician-patient relationship.⁶

Understanding who is more susceptible to being socialized into the “hidden

curriculum” is not well understood. It is quite possible that certain students may begin medical school already socialized into the prescriptions and expectations of their social position and that they have maintained a set of values that differs from the new ones they encounter in their medical school environment. Hafferty suggests that the process of medical socialization is not a simple matter of substituting one value system with another when a student begins medical school.¹⁰ Instead, for a period of time, lay values overlap medical values and create tension. Long held lay values and attitudes first become suspect, then dysfunctional, and finally are deemed inferior. It is quite possible that these female and low-income students have not yet had to confront their long held value system in relation to their new social environment. Light suggests that this is unlikely given that medical students are confronted with the values and norms of medicine on day one and sometimes even before the first day of school.²⁶⁹ If this is the case, future work must seek to understand how and why certain groups of students resist the medical school socialization process. We must also seek to understand that happens over the four years of medical training and if as students become more entrenched in the socialization process, they begin to disengage from their previous value systems.

Monrouxe’s scenario of medical student Maria provides some insight into considering how some students might embrace or resist the hidden curriculum. Maria may choose to place physician/medical student at the top of her hierarchy of identities, placing her other identities below her new professional identity. In this scenario, she may be more successful at navigating the medical socialization process but it also may alter the values and norms she began her training with. On the other hand, Maria might place her identity as a woman at the top and identify less with being a physician. Very little is

known about how this process might impact the type of physician Maria will become. If she places physician at the top of her hierarchy of identities is she more likely to adopt the new values and norms of the “hidden curriculum”? If her gender takes precedence over her other identities, what does this mean for how she internalizes the new value system she is being socialized into? Ultimately, both scenarios have implications for the type of physician Maria will become. For example, students who are socialized into the norms and values of the “hidden curriculum” tend to have more authoritative attitudes towards patient care and tend to not value elements of patient-centeredness like shared decision-making.^{14,208} This is particularly concerning given the research that suggests that patient-provider racial concordance and gender concordance both have important impact on improvements in quality of care and health disparities.^{42,147}

These findings also have important implications for our understanding of the relationship between medical student depression and anxiety and values and beliefs around patient care. Findings from chapters 3-5 taken together suggest that the same students who are at greatest risk for depression and anxiety also have more positive attitudes towards patient-centered care. Thus, understanding the implications of depression and anxiety on attitudes towards patient care is a salient one. For example, studies suggest that medical students and physicians with higher levels of depression, distress and burnout are less likely to practice patient-centeredness.²⁰⁸ Hojat et al found that depression and anxiety can have a significant impact on levels of empathy such that students with higher mental distress will exhibit less empathy in their patient encounters.¹⁴⁹

Improving the experience for marginalized groups in medical school, a structural approach

While much of this dissertation is focused at the micro level on the experience of medical students from marginalized groups, it is also important to acknowledge the role that the larger institution (medical schools) might have in influencing the experience. Overall, I would suggest that medical schools must strive to create a climate of inclusivity, free from institutional racism, sexism and classism. This is a lofty goal and thus my recommendation is that leaders of medical schools consider employing relatively small, concrete interventions based on existing evidence to insulate marginalized students from the negative effects of the medical school socialization process.

For instance, the creation of identity-safe environments can go a long ways to both reduce stereotype threat and produce a more inclusive environment that values diversity.¹⁴² Medical schools might also consider explicitly discussing with faculty the experiences that marginalized groups have in medical school. This type of intervention has been successful in reducing stereotype threat. For example, Johns and colleagues found that telling female students that stereotypes about gender and math ability might cause anxiety that has nothing to do with one's actual ability, eliminated the underperformance of the female students, compared with the male students (who were not given such instructions).²⁶⁷ The same type of intervention might also be used with African American, female and other marginalized medical students. Although in this case, medical schools must be deliberate about creating identity-safe environments that allow these students to feel comfortable and safe and not singled out for any reason. Identity-safe environments are those that validate students' experiences, backgrounds, and

identities.¹⁴⁵ Contextual cues that signal an identity-safe environment in medical school might include an abundance of female and African American representation in faculty and other high ranking positions, a critical mass of students of color or students from a variety of diverse backgrounds enrolled in the school and a medical school curriculum that effortlessly embraces and promotes diversity. Attention to reducing overt race and gender based discrimination and harassment is fundamental to creating identity-safe environments with clear policies of what conduct is acceptable and how to report violations.^{268,269} For instance, in one study, providing information about the existence of auditing practices that guard against discrimination increased trust and reduced identity threat, even in settings with cues that signaled stereotype threat.²⁷⁰

Additionally, adjustments to institutional policy around recruitment and selection of future physicians must be considered. As I touched upon in Chapter 5, recruitment efforts must focus on soliciting a more representative sample of students (particularly individuals from all income levels) into medicine and provide them support needed to complete their training. While efforts have been and currently are made to recruit students of diverse racial and ethnic groups into medicine, very little effort and thought is put into the recruitment of students from diverse socioeconomic backgrounds.²⁹ Fundamentally, for change to occur, admission committees must recognize the importance of obtaining a more diverse medical student body. Unfortunately, as Saha recently explained, "...diversity is treated like an 'extra' or secondary consideration when selecting future physicians."²⁷¹ He goes on to suggest that for many medical schools, diversity would be nice as long as it does not require trade-offs in more important factors such as academic achievement. With this mind-set, lower than average grades and MCAT

scores among underrepresented minority students provide an easy excuse for admissions committees to be indifferent regarding issues of diversity.

Implications and Importance for Health Disparities Research

The findings of my dissertation have broad implications for health care disparities. Much of this work is strongly impacted by the demonstrated importance of a racially diverse workforce for improving underserved populations' access to care, improving the patient provider relationship and ultimately eliminating disparities in health care. Researchers and health policy makers alike espouse that diversifying the physician workforce will go a long ways towards the elimination of health disparities.^{203,272} Indeed, health care providers play an important role in both the formation and elimination of health disparities. The patient-provider interaction is often of primary importance for individual's adherence to a range of biomedical approaches.^{236,273–275} Physicians play a key role as a source of health information²⁷⁶, they influence medical decisions²⁷⁷ and they provide support when patients utilize the health care system.²⁷⁸ The absence of a sound patient–provider relationship is often cited as an important factor that contributes to disparities in the quality of medical care. Patient-provider racial concordance is frequently mentioned as a way to improve the patient-provider relationship and improve care for African American patients.^{42,146,147,220} Studies indicate that African American patients are significantly more likely to receive their care from African American providers.²⁷² Patient-provider racial concordance is also associated with greater satisfaction with care received and improved physician-patient communication.^{203,279,280}

Experiencing poor mental health may have potential adverse consequences on academic performance.²⁰² Other studies have found that students who suffer from poor mental health are more likely to apply to less competitive residency programs.⁸³ Poor mental health may also impact professionalism,¹⁴⁸¹⁴⁹¹⁵⁰¹⁵¹ competency¹⁵² and empathy, which in turn may impact the trainee's ability to provide high-quality patient care. If African American students are struggling with depression and anxiety, the implications for if and how they will practice are important. If these students struggle academically and apply to less competitive residency programs, this will impact efforts to diversify the healthcare workforce. If these students are completing medical school but have low levels of empathy and less professionalism their impact on the patient-provider relationship may not be as positive as we have believed it to be.

While much of the research that supports diversification of the health care workforce simply states that we must recruit more African Americans to become physicians, we often assume that by recruiting more African American students we are recruiting students from low-middle class backgrounds. This doesn't appear to be the case given that in all three studies that comprise this dissertation, we see that while there may be fewer African American students in the upper class bracket, that overall, they tend to be well off. Given that attitudes towards patient-centered care, an important component of the physician-patient relationship is impacted by SES, considering recruitment strategies and pipeline strategies that truly recruit students from low SES backgrounds may go a long ways in improving disparities. Understanding how SES impacts medical education is important as we move forward with efforts to diversify our health care workforce. For instance, if admissions efforts solely focus on recruiting

students from minority racial/ethnic groups without taking into account their SES, we may end up with a racially diverse group of very high income physicians which does not help or support the literature that suggest that physicians who come from low income background may be more effective at caring for patients from such backgrounds.⁴⁸

Additionally, before relying too heavily on the assumption that recruiting more students from minority communities will improve health disparities, we must better understand how the medical education socialization process is impacting these students. While we rely on the underlying assumption that minority providers will reduce disparities and improve quality of care, we may be overlooking how the medical school experience impacts the values and belief system of medical trainees. Little is known about if and how the professional identity impacts or influences other identities such as race, gender and SES. If students have adopted the values and norms of their new profession, how do they reconcile these norms with their values based on their social position? This could have important implications for how they are able to relate to their patients and provide patient-centered care. By protecting their identities, by acknowledging the need for multiple identities to exist and creating identity-safe environments where multiple identities can be nurtured and are respected, medical schools may be able to create physicians who are mentally healthy and better equipped to treat all patient populations.

Future Research

There are multiple avenues for future research based on the findings of these three papers. First, with respect to paper 1 (chapter 3), it is important to explore how psychosocial factors such as social support, active coping, self-esteem and mastery

mediate the relationship between race/gender and mental health outcomes. These psychosocial factors as mediators may help to explain the relationship between social position and mental health among medical students. Given that the CHANGES study is a longitudinal study, I've chosen to wait until the second data point is collected (4th year) to do so. The longitudinal data will provide a more sound way to guess the direction of causality between the psychosocial factors and mental health outcomes and will eliminate the often-mentioned concerns cited when applying a mediation model to cross-sectional data.²⁸¹

As previously mentioned, with respect to paper 2 (chapter 4), I found that racial identity was not protective against depression and anxiety. It is important to further unpack this finding in order to explain what is happening. Based on Sellers work, it is possible that discrimination is playing a role in the pathway between racial identity and mental health and that those with high or more positive racial identity are more discriminated against and as a result experience greater levels of depression and anxiety.¹⁸⁸ Future research will also take advantage of the longitudinal nature of the study exploring the impact of discrimination in the first year and how that changes over the 4 years of medical school to understand if and how the socialization process impacted racial and institutional discrimination and how the role of racial identity in that model, as well as its impact on mental health. Future research is also needed to understand the mechanisms driving the impact of social position on attitudes towards patient care. For instance, future research might include understanding how sociopolitical orientation fits into this model.

Finally, to date, there has been no research that has considered how medical

students construct relationships between their different identities. Varying relationships between one's multiple identities may have implications for the medical socialization process. Integrating new professional identities into personal ones is an easy process for people whose personal identities are consonant with their new professional role, but traumatic for those whose personal identities are dissonant with it.³³ Therefore, I believe that an area for future research must consider the salience of intersectionality theory in the medical school socialization process. Intersectionality is a theoretical framework that considers the effects of multiple influences and social identities.²⁸² It refers to the fluid processes inherent in possessing two or more social identities.^{282,283} These social identities are often used in our society to stratify or place individuals within a social hierarchy that contributes to the creation of different meanings for life experiences.²⁸⁴ Intersectionality allows us to acknowledge the simultaneous production of multiple social identities and consider how they intersect at the micro level of individual experience to reflect interlocking systems of privilege and oppression (i.e., racism, sexism, heterosexism, classism) at the macro social-structural level.

An intersectionality approach is an important next step forward in medical education research.²⁵⁷ We must take into account other social categories, particularly those of gender and SES/social class, in order to understand the dynamics of power and its implications for the experiences of minority medical students. Additionally, physicians who construct their identities as complex might demonstrate different communicative patterns, such as communicating in a manner that manifests less social distance and demonstrates greater acceptance and trust.⁴⁷ Furthermore, the ability to represent complexity within our multiple identities can have implications for patient care.³³ This

framework is necessary if we hope to explain or resolve processes of domination, oppression, inequality and discrimination in medical education and within the health care system.

Table 28: Main Findings and Their Implications			
FINDINGS	PRACTICAL IMPLICATIONS	THEORETICAL IMPLICATIONS	IMPLICATIONS FOR HEALTH DISPARITIES
PAPER 1: <i>Depression, anxiety, health status and psychosocial resources in first year medical students: A comparison of the effects of race and gender, A Report from the Medical Student CHANGES Study</i>			
African American first year medical school students are at greater risk for symptoms of anxiety and depression	<p>Anxiety and depression inhibit learning and success in medical school</p> <p>Depressed/anxious students are more likely to:</p> <ul style="list-style-type: none"> • Struggle academically • Burnout during their medical school training • Apply to less competitive residency programs • Exhibit less empathy in their patient encounters <p>Depressed/anxious students are:</p> <ul style="list-style-type: none"> • Less likely to practice patient-centered care <p>Medical schools must commit to identifying and developing strategies to improve medical trainee well-being. For example, creating identity-safe environments can go a long ways to both reduce stereotype threat and produce a more inclusive environment that values diversity.</p>	<p>Students enter medical school pre-socialized into a variety of social roles; some of these roles are congruent with medical school, others are not</p> <p>Pre-socialization’ can have detrimental affects on the individual if what they are ‘pre-socialized to be is dramatically different than the medical school socialization process</p> <p>The medical socialization process teaches students to shed their lay values as they are seen as inferior, dysfunctional, and in tension with the conventional medical education. This process may cause depression/anxiety among some students</p> <p>Students from marginalized social positions may be the ones who struggle most to shed their values and/or find their values in tension with conventional medical school norms.</p> <p>The ability to hold a complex representation of identities may be stressful and contribute to psychological distress</p>	Implications for diversification of the healthcare workforce

FINDINGS	PRACTICAL IMPLICATIONS	THEORETICAL IMPLICATIONS	IMPLICATIONS FOR HEALTH DISPARITIES
<p>African American and female students are at greater risk to experience lower performance self-esteem than their White and male counterparts</p>	<p>Negative factors associated with mental health (e.g. depression, anxiety) may have its most devastating impact on individuals when they have low self-esteem.</p> <p>If poor mental health persists in medical students with low self-esteem then – burnout and attrition may occur.</p> <p>Low self esteem in medical students compromises learning and achievement</p>	<p>Social identity in general and racial identity in particular may contribute heavily to the impact of low performance self esteem among women and African American medical students</p> <p>If the medical school socialization process is detrimental to students with high racial identity ultimately causing depression and anxiety it is possible that their self esteem would also suffer</p> <p>A lack of a relationship between performance (academic) self-esteem and global self-esteem will occur possibly due to the perpetuation of stereotype threat.</p> <p>As a result of this process, academic dis-identification occurs, whereby students dis-identify with their educational pursuits; instead, detaching their academic performance from their self-esteem. This problem is endemic to African American students, as they regularly encounter stereotypes in the classroom.</p>	<p>Implications for diversification of the healthcare workforce</p>

FINDINGS	PRACTICAL IMPLICATIONS	THEORETICAL IMPLICATIONS	IMPLICATIONS FOR HEALTH DISPARITIES
<p>African American students are at greater risk of lacking social support and female medical students have more social support</p>	<p>Social support is an important psychosocial resource that has the potential to help students deal with the rigors of medical school.</p> <p>Social support fosters a sense of belonging, creates a sense of self-worth and provides a feeling of security, therefore medical schools must create an environment that is inclusive for all students and promotes opportunities for African American students to feel supported</p>	<p>Social support is developed from social relationships, and because social relationships are embedded in the social roles, when understanding social support among African American and female medical students we must consider roles and structures as well as relationships</p> <p>Differences in the acquisition of social support can result from differential opportunities. For African American medical students these differential opportunities may have occurred before entering medical school but are further perpetuated as students enter their new social environment.</p> <p>The fact that women have comprised approximately 49% of medical school matriculants over the past few years may play an important role in understanding why women were found to have higher levels of social support. Female medical students may have greater opportunities to garner social support within the medical school environment without feeling socially isolated.</p> <p>Further studies are warranted to understand social support as a potential mediator of the relationship between gender and mental health.</p>	<p>Implications for diversification of the healthcare workforce</p>

PAPER 2: *Is Racial Identity Protective? Depression and Anxiety Among A National Sample of African American First Year Medical Students: A Report from the Medical Student CHANGES Study*

FINDINGS	PRACTICAL IMPLICATIONS	THEORETICAL IMPLICATIONS	IMPLICATIONS FOR HEALTH DISPARITIES
<p>African American students with high racial identity are at greater risk for depression and anxiety</p>	<p>High racial identity may be isolating and influence social loneliness which have important implications for depression and anxiety among medical students</p>	<p>The relationship between high racial identity and depression and anxiety may be a result of racial discrimination (past or present)</p> <p>African American students with high racial identity may be contending with their multiple identities</p> <p>Students with high racial identity may be placing their racial identity at the top of their hierarchy of identities. The consequences of this appear to be harmful as these students are at greater risk for depression and anxiety</p>	<p>Implications for diversification of the healthcare workforce</p>

PAPER 3: *Medical student socio-demographic characteristics and attitudes towards patient centered care: Do race, socioeconomic status and gender matter? A Report from the Medical Student CHANGES Study*

<p>Female medical students and medical students from a low-middle income SES background (less than \$10,000 to \$74,999) have more positive attitudes towards patient-centered care than their male and upper SES counterparts</p>	<p>The same students who suffer from depression and anxiety also have the most positive attitudes towards patient-centered care</p> <p>Better train all students to deal with all types of patients and improve their attitudes towards patient-centered care.</p> <p>Recruit a more representative sample of students</p>	<p>The adoption of new values and norms may have implications for the type of physician a student will become—for example, students who are socialized into the norms and values of the “hidden curriculum” tend to have more authoritative attitudes towards patient care and internalize subtle rules about the social hierarchy of a physician and how to think about, conceptualize and</p>	<p>The absence of a sound patient–provider relationship contributes to disparities in the quality of care received by minority populations</p> <p>A racially diverse workforce is needed to improve underserved populations’ access to care</p>
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	(particularly individuals from all income levels) into medicine and provide them support needed to complete their training	operationalize the physician-patient relationship	Recruitment and pipeline strategies that truly recruit students from low SES backgrounds may go a long ways in improving disparities
<i>Summary Cumulative Across All Three Papers</i>			
FINDINGS	PRACTICAL IMPLICATIONS	THEORETICAL IMPLICATIONS	IMPLICATIONS FOR HEALTH DISPARITIES
<ul style="list-style-type: none"> We must continue to understand the experience of medical school from the perspective of students from marginalized social backgrounds 	<ul style="list-style-type: none"> African American students are at greater risk for depression and anxiety Poor mental and overall health inhibit learning and success in medical school In addition to being at greater risk, they have access to fewer psychosocial resources Psychological distress among physicians may result in the provision of poor quality of clinical care; decline in empathy; influence patient compliance and satisfaction The same students who suffer from depression and anxiety also have the most positive attitudes towards patient-centered care 	<ul style="list-style-type: none"> Social position and identity play an important role in how certain populations of medical students are impacted by medical education and the medical socialization process Identity most salient to the process when dealing with medical students with marginalized social status. An individual enters medical school with a particular identity or identities which interacts with the socialization process in a systematic way Students whose identity prior to medical school aligns closely with their newly developed professional identity will have less stress as they reconcile the two; Students whose identities do not easily align may experience greater identity dissonance Navigating multiple identities while simultaneously navigating the medical socialization process may elicit distress Potential link between high racial identity, fewer psychosocial resources, depression and anxiety must be explored. 	<ul style="list-style-type: none"> Implications for the diversification of the health care workforce Medical students and physicians with higher levels of depression, distress and burnout are less likely to practice patient-centered care Depression/anxiety can have a significant impact on levels of empathy <p>We rely on the underlying assumption that minority providers will reduce disparities and improve quality of care, we may be overlooking how the medical school experience impacts the values and belief system of medical trainees</p>

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Appendix

- A. Additional Details about the Sampling Procedure for the Baseline Stage of Medical Student CHANGES
- B. Tables of full Poisson regression models for: Depression, anxiety, health status and psychosocial resources in first year medical students: A comparison of the effects of race and gender
- C. Correlation Matrix for Depression, anxiety, health status and psychosocial resources in first year medical students: A comparison of the effects of race and gender
- D. About PROMIS
- E. Graphs Illustrating Interaction Effects of Race and Gender on Depression, Anxiety and Self-rated Health
- F. CHANGES Survey

Appendix A

Additional Details about the Sampling Procedure for the Baseline Stage of Medical Student CHANGES

This study utilizes baseline data collected as part of Medical Student CHANGES, a large longitudinal study of individuals who matriculated in US medical schools in the fall of 2010. A stratified multistage sampling design was employed. In the first stage, medical schools were stratified by geographical region (6 regions) and public/private status. Because there were no private schools in the “Northwest” region, there were 11 strata. Schools were sampled from each stratum in roughly the same proportion (43%), resulting in the targeted sample size of 49 schools. Within stratum, the specific schools selected were randomly selected using a proportional to (first-year class) size sampling methodology.³² In the second stage, we recruited first-year students from the selected schools. As a comprehensive list of all first year medical students was not available at the time of recruitment, we ascertained participants using a combination of three strategies. First, we obtained emails of students interested in participating in the study through a question included as part of the Association of American Medical Colleges (AAMC) Matriculating Student Questionnaire, a voluntary annual survey sent to all students entering medical school. Second, we purchased an incomplete list of first year medical students from an AMA licensed vendor. Third, we employed referral (snowball) sampling through recruited survey respondents. Students volunteering to participate in the study completed an extensive online survey questionnaire, including the measures described in this paper, during the first semester of their first year of medical school,

between October 2010 and January 2011. We sent a thank-you letter and the \$50.00 incentive within 48 hours of the time each student completed the measures. To calculate sampling weights for analysis, we multiplied the first-stage inclusion probabilities used to sample schools from strata by an approximation of the second-stage inclusion probabilities computed by dividing the number of students recruited at a given school by the total number of first-year students at that school.

Appendix B

Tables of full Poisson regression models for Chapter 2: Depression, anxiety, health status and psychosocial resources in first year medical students: A comparison of the effects of race and gender

Table 29: Poisson Regression of Race on Depression ^a				
	Model 1		Model 2	
	RR ^b	95% CI	RR ^b	95% CI
Race (ref: White)	1.49**	1.34 to 1.72	1.17	1.13 to 1.23
Age (ref: younger than 24)	0.84	.82 to .86	0.84	.81 to .84
Gender (ref: male)	0.74**	.69 to .88	0.67**	.63 to .70
Relationship status (ref: in a relationship)	0.75**	.70 to 1.02	0.75**	.73 to .78
Parental status (ref: does not have kids)	1.16	1.01 to 1.23	1.15	1.02 to 1.17
Family Income (ref: upper income)	0.67***	.65 to .99	0.69***	.67 to .72
Parental education (ref: graduate degree)	.99	.97 to 1.01	1.00	.99 to 1.05
Percent medical school financed by loans (ref: less than 50%)	0.99	.98 to 1.02	.99	.98 to 1.02
Race x Gender				
African American X Female	1.49	1.23 to 1.62	2.01*	1.60 to 2.52

Abbreviations: β , unstandardized coefficient; CI, confidence interval
* p<.05, ** p<.01, *** p<.001
Estimates are weighted to account for probability of selection, stratification, and clustering
^a Depression score 1 SD (10 points) above PROMIS standardized general population mean score of 50
^b Relative risks were estimated through Poisson regression model with a log link function

Table 30: Poisson Regression of Race on Anxiety ^a

	Model 1		Model 2	
	RR ^b	95% CI	RR ^b	95% CI
African American	1.63	1.44 to 1.85	1.36	1.24 to 1.50
Age	0.84	.80 to .85	0.84	.82 to .87
Gender	0.54	.47 to .60	0.49	.45 to .57
Relationship status	1.27	1.21 to 1.32	1.26	1.21 to 1.32
Parental status	0.25	.20 to .55	0.25	.20 to .27
SES (ref: Upper Income)	0.81	.79 to .89	0.81	.79 to .99
Parental education (ref: Graduate degree)	1.00	.99 to 1.01	1.00	.99 to 1.01
Percent medical school financed by loans	0.67	.55 to .70	0.66	.65 to .87
Race x Gender				
African American X Female	1.63	1.23 to 1.73	1.93	1.36 to 2.74

Abbreviations: β , unstandardized coefficient; CI, confidence interval
* p<.05, ** p<.01, *** p<.001
Estimates are weighted to account for probability of selection, stratification, and clustering
^a Anxiety score 2 SD (20 points) above PROMIS standardized general population mean score of 50
^b Relative risks were estimated through Poisson regression model with a log link function

Table 31: Poisson Regression of Race on Self-rated Health

	Model 1		Model 2	
	RR^a	95% CI	RR^a	95% CI
African American	1.09	1.05 to 1.12	1.31	1.25 to 1.37
Age	1.31	1.25 to 1.37	1.06	1.01 to 1.07
Gender	1.03	1.01 to 1.09	0.76	.45 to .87
Relationship status	0.76	.73 to 1.10	1.21	1.00 to 1.37
Parental status	1.20	1.10 to 1.32	0.96	.90 to 1.17
SES (ref: Upper Income)	0.85	.80 to .99	1.07	1.00 to 1.14
Parental education (ref: Graduate degree)	1.07	1.01 to 1.17	0.76	.50 to .90
Percent medical school financed by loans	0.96	.95 to 1.12	0.85	.80 to 1.01
Race x Gender				
African American X Female	1.09	1.00 to 1.19	1.31	1.24 to 1.37

Abbreviations: β , unstandardized coefficient; CI, confidence interval
* p<.05, ** p<.01, *** p<.001
Estimates are weighted to account for probability of selection, stratification, and clustering
^a Relative risks were estimated through Poisson regression model with a log link function

Table 32: Poisson Regression of Race on Social Support

	Model 1		Model 2	
	RR ^b	95% CI	RR ^b	95% CI
Race (ref: White)	.82			
		.81 to .85	.96	.95 to .95
Age (ref: younger than 24)	.90	.89 to .91	.90	.89 to .91
Gender (ref: male)	.80***	.79 to .81	.83	.82 to .84
Relationship status (ref: in a relationship)	1.77***	1.71 to 1.73	1.78	1.72 to 1.84
Parental status (ref: does not have kids)	1.20	1.17 to 1.23	1.21	1.17 to 1.24
Family Income (ref: upper income)	1.07	1.06 to 1.07	1.07	1.06 to 1.07
Parental education (ref: graduate degree)	1.03	1.03 to 1.04	1.03	1.02 to 1.03
Percent medical school financed by loans (ref: less than 50%)	.98	.98 to .99	.97	.95 to .97
Race x Gender				
African American X Female				
Abbreviations: β , unstandardized coefficient; CI, confidence interval				
* p<.05, ** p<.01, *** p<.001				
Estimates are weighted to account for probability of selection, stratification, and clustering				
^b Relative risks were estimated through Poisson regression model with a log link function				

Table 33: Poisson Regression of Race on Mastery

	Model 1		Model 2	
	RR ^b	95% CI	RR ^b	95% CI
Race (ref: White)	0.98	.97 to 0.98	1.01	1.00 to 1.01
Age (ref: younger than 24)	0.99	.99 to 1.00	1.00	1.00 to 1.01
Gender (ref: male)	1.00	1.00 to 1.01	1.01	1.00 to 1.01
Relationship status (ref: in a relationship)	1.03	1.03 to 1.04	1.03	1.00 to 1.03
Parental status (ref: does not have kids)	1.00	1.00 to 1.02	1.01	1.00 to 1.03
Family Income (ref: upper income)	1.00	1.00 to 1.01	1.00	1.47 to 10.95 1.17 to 3.03
Parental education (ref: graduate degree)	1.00	1.00 to 1.01	1.01	1.07 to 1.15 1.05 to 1.11
Percent medical school financed by loans (ref: less than 50%)	.99	.98 to 1.00	.99	1.04 to 1.08
Race x Gender				
African American X Female			.92	.91 to .93

Abbreviations: β , unstandardized coefficient; CI, confidence interval
* p<.05, ** p<.01, *** p<.001
Estimates are weighted to account for probability of selection, stratification, and clustering
^a Depression score 1 SD (10 points) above PROMIS standardized general population mean score of 50
^b Relative risks were estimated through Poisson regression model with a log link function

Table 34: Poisson Regression of Race on Self-esteem

	Model 1		Model 2	
	RR ^b	95% CI	RR ^b	95% CI
Race (ref: White)	1.00	.98 to 1.01	1.01	1.00 to 1.01
Age (ref: younger than 24)	0.99	.98 to 1.01	0.99	.99 to 1.00
Gender (ref: male)	1.03	1.01 to 1.04	1.04	1.01 to 1.04
Relationship status (ref: in a relationship)	1.01	1.00 to 1.03	1.01	1.00 to 1.01
Parental status (ref: does not have kids)	0.98	.97 to .99	0.99	.97 to .99
Family Income (ref: upper income)	1.01	1.00 to 1.02	1.01	1.00 to 1.01
Parental education (ref: graduate degree)	0.99	.98 to 1.02	1.00	.99 to 1.01
Percent medical school financed by loans (ref: less than 50%)	1.00	.99 to 1.01	.99	.99 to 1.00
Race x Gender				
African American X Female			0.96	.96 to .99

Abbreviations: β , unstandardized coefficient; CI, confidence interval
* p<.05, ** p<.01, *** p<.001
Estimates are weighted to account for probability of selection, stratification, and clustering
^b Relative risks were estimated through Poisson regression model with a log link function

Table 35: Poisson Regression of Race on Active Coping

	Model 1		Model 2	
	RR ^b	95% CI	RR ^b	95% CI
Race (ref: White)	1.00	.99 to 1.01	1.00	.99 to .00
Age (ref: younger than 24)	1.01	1.00 to 1.01	1.01	1.00 to 1.01
Gender (ref: male)	0.97	.96 to .99	0.97	.96 to .99
Relationship status (ref: in a relationship)	1.05	1.00 to 1.05	1.05	1.00 to 1.05
Parental status (ref: does not have kids)	0.99	.98 to .99	0.98	.97 to .99
Family Income (ref: upper income)	.99	.98 to 1.01	0.99	.99 to 1.00
Parental education (ref: graduate degree)	1.01	1.00 to 1.02	1.01	1.00 to 1.01
Percent medical school financed by loans (ref: less than 50%)	1.00	.99 to 1.02	1.00	.99 to 1.00
Race x Gender				
African American X Female	1.03	1.01 to 1.03		

Abbreviations: β , unstandardized coefficient; CI, confidence interval
* p<.05, ** p<.01, *** p<.001
Estimates are weighted to account for probability of selection, stratification, and clustering
^b Relative risks were estimated through Poisson regression model with a log link function

Table 36: Poisson Regression of Gender on Depression ^a

	Model 1		Model 2	
	RR ^b	95% CI	RR ^b	95% CI
Race (ref: White)	0.90*	.85 to .97	0.81***	.74 to .88
Age (ref: younger than 24)	0.84	.82 to .86	0.84	.81 to .84
Gender (ref: male)	1.35*	1.23 to 1.37	0.63	.63 to .70
Relationship status (ref: in a relationship)	0.75*	.70 to 1.02	0.75***	.73 to .78
Parental status (ref: does not have kids)	1.16	1.01 to 1.23	1.15	1.02 to 1.17
Family Income (ref: upper income)	0.67*	.65 to .99	0.68***	.67 to .72
Parental education (ref: graduate degree)	0.99	.97 to 1.01	1.00	.99 to 1.05
Percent medical school financed by loans (ref: less than 50%)	0.99	.98 to 1.02	0.99	.98 to 1.02
Race x Gender				
African American X Female			1.19*	1.15 to 2.24

Abbreviations: β , unstandardized coefficient; CI, confidence interval
* p<.05, ** p<.01, *** p<.001
Estimates are weighted to account for probability of selection, stratification, and clustering
^a Depression score 1 SD (10 points) above PROMIS standardized general population mean score of 50
^b Relative risks were estimated through Poisson regression model with a log link function

Table 37: Poisson Regression of Gender on Anxiety^a

	Model 1		Model 2	
	RR ^b	95% CI	RR ^b	95% CI
Race (ref: White)	0.88	.88 to .89	0.79*	.75 to .80
Age (ref: younger than 24)	0.84	.82 to .86	0.84	.81 to .84
Gender (ref: male)	1.87	1.65 to 2.11	0.90	.88 to .94
Relationship status (ref: in a relationship)	1.27	1.21 to 1.32	1.26	1.21 to 1.32
Parental status (ref: does not have kids)	1.25	1.01 to 1.25	1.25	1.02 to 1.27
Family Income (ref: upper income)	0.81	.80 to .98	0.81	.67 to .82
Parental education (ref: graduate degree)	1.00	.97 to 1.01	1.00	.99 to 1.05
Percent medical school financed by loans (ref: less than 50%)	0.67	.65 to 1.02	0.66	.63 to .87
Race x Gender				
African American X Female			1.18	1.03 to 1.23

Abbreviations: β , unstandardized coefficient; CI, confidence interval

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

Estimates are weighted to account for probability of selection, stratification, and clustering

^a Anxiety score 2 SD (20 points) above PROMIS standardized general population mean score of 50

^b Relative risks were estimated through Poisson regression model with a log link function

Table 38: Poisson Regression of Gender on Self-rated Health

	Model 1		Model 2	
	RR ^b	95% CI	RR ^b	95% CI
Race (ref: White)	1.09	1.07 to 1.12	1.20	1.14 to 1.27
Age (ref: younger than 24)	1.31	1.25 to 1.37	1.31	1.25 to 1.37
Gender (ref: male)	1.03	1.01 to 1.03	1.06	1.05 to 1.07
Relationship status (ref: in a relationship)	0.76	.73 to .80	0.76	.73 to .80
Parental status (ref: does not have kids)	1.20	1.11 to 1.29	1.21	1.06 to 1.08
Family Income (ref: upper income)	0.85	.96 to .97	0.85	.83 to .86
Parental education (ref: graduate degree)	1.07	1.06 to 1.08	1.07	1.06 to 1.08
Percent medical school financed by loans (ref: less than 50%)	0.96	.96 to .97	0.96	.96 to .97
Race x Gender				
African American X Female			1.00	.98 to 1.01

Abbreviations: β , unstandardized coefficient; CI, confidence interval
* p<.05, ** p<.01, *** p<.001
Estimates are weighted to account for probability of selection, stratification, and clustering
^b Relative risks were estimated through Poisson regression model with a log link function

Table 39: Poisson Regression of Gender on Social support

	Model 1		Model 2	
	RR ^b	95% CI	RR ^b	95% CI
Race (ref: White)	1.05	1.00 to 1.11	1.16**	1.11 to 1.24
Age (ref: younger than 24)	0.90	.89 to 1.01	0.90	.69 to 1.01
Gender (ref: male)	1.24*	1.00 to 1.34	2.42**	2.01 to 3.12
Relationship status (ref: in a relationship)	1.78*	1.00 to 1.92	1.78**	1.23 to 1.98
Parental status (ref: does not have kids)	1.20	1.12 to 1.23	1.21	1.12 to 1.43
Family Income (ref: upper income)	1.07	1.01 to 1.17	1.07	1.02 to 1.18
Parental education (ref: graduate degree)	1.03	1.00 to 1.10	1.04	1.00 to 1.09
Percent medical school financed by loans (ref: less than 50%)	0.98	.89 to 1.05	0.98	.95 to 1.02
Race x Gender				
African American X Female			0.87*	.83 to 1.12

Abbreviations: β , unstandardized coefficient; CI, confidence interval
* p<.05, ** p<.01, *** p<.001
Estimates are weighted to account for probability of selection, stratification, and clustering
^b Relative risks were estimated through Poisson regression model with a log link function

Table 40: Poisson Regression of Gender on Active Coping

	Model 1		Model 2	
	RR ^b	95% CI	RR ^b	95% CI
Race (ref: White)	1.00	.99 to 1.01	1.01	1.00 to 1.04
Age (ref: younger than 24)	0.99	.97 to 1.11	0.99	.98 to 1.01
Gender (ref: male)	0.97***	.95 to 1.00	1.01	1.00 to 1.02
Relationship status (ref: in a relationship)	1.01	1.00 to 1.04	1.01	1.00 to 1.03
Parental status (ref: does not have kids)	0.98	.96 to 1.12	0.99	.98 to 1.00
Family Income (ref: upper income)	1.01	.99 to 1.01	1.01	1.00 to 1.02
Parental education (ref: graduate degree)	1.00	.99 to 1.00	1.00	.98 to 1.01
Percent medical school financed by loans (ref: less than 50%)	0.99	.98 to 1.02	0.99	.98 to 1.01
Race x Gender				
African American X Female			0.99	.98 to 1.01

Abbreviations: β , unstandardized coefficient; CI, confidence interval
* $p < .05$, ** $p < .01$, *** $p < .001$
Estimates are weighted to account for probability of selection, stratification, and clustering
^b Relative risks were estimated through Poisson regression model with a log link function

Table 41: Poisson Regression of Gender on Mastery

	Model 1		Model 2	
	RR ^b	95% CI	RR ^b	95% CI
Race (ref: White)	1.00	.97 to 1.01	1.02	1.00 to 1.05
Age (ref: younger than 24)	1.07	1.02 to 1.14	1.07	1.04 to 1.17
Gender (ref: male)	0.87**	.79 to .99	1.02	1.00 to 1.09
Relationship status (ref: in a relationship)	1.27	.101 to 1.33	1.27*	1.23 to 1.37
Parental status (ref: does not have kids)	0.94	.93 to 1.12	0.94	.88 to 1.01
Family Income (ref: upper income)	1.07	1.01 to 1.17	1.07	11.00 to 1.23
Parental education (ref: graduate degree)	1.01	1.00 to 1.07	1.01	1.00 to 1.07
Percent medical school financed by loans (ref: less than 50%)	0.97	.89 to 1.12	0.97	.96 to 1.09
Race x Gender				
African American X Female			0.97	.98 to 1.01

Abbreviations: β , unstandardized coefficient; CI, confidence interval
* p<.05, ** p<.01, *** p<.001
Estimates are weighted to account for probability of selection, stratification, and clustering
^b Relative risks were estimated through Poisson regression model with a log link function

Table 42: Poisson Regression of Gender on Performance Self Esteem

	Model 1		Model 2	
	RR ^b	95% CI	RR ^b	95% CI
Race (ref: White)	1.04	1.00 to 1.12	1.07	1.00 to 1.22
Age (ref: younger than 24)	0.97	.96 to 1.00	0.97	.96 to 1.00
Gender (ref: male)	0.65	.23 to .98	0.86	.78 to 1.01
Relationship status (ref: in a relationship)	1.12	1.00 to 1.32	1.12	1.00 to 1.22
Parental status (ref: does not have kids)	0.76	.72 to .99	0.76	.67 to .89
Family Income (ref: upper income)	1.03	1.00 to 1.12	1.03	1.00 to 1.09
Parental education (ref: graduate degree)	1.01	.99 to 1.12	1.01	.99 to 1.10
Percent medical school financed by loans (ref: less than 50%)	1.05	1.00 to 1.32	1.05	1.00 to 1.09
Race x Gender				
African American X Female			0.94	.90 to 1.02

Abbreviations: β , unstandardized coefficient; CI, confidence interval
* p<.05, ** p<.01, *** p<.001
Estimates are weighted to account for probability of selection, stratification, and clustering
^a Depression score 1 SD (10 points) above PROMIS standardized general population mean score of 50
^b Relative risks were estimated through Poisson regression model with a log link function

Appendix C

Correlation Matrix for Chapter 2: Depression, anxiety, health status and psychosocial resources in first year medical students: A comparison of the effects of race and gender

Table 43. Correlation Matrix for Depression, Anxiety and Self-rated Health

	Depression	Anxiety	Self-rated Health
Depression	1	.384**	.225**
Significance		.000	.000
N	3155	3096	3140
Anxiety	.384**	1	.145
Significance	.000		.000
N	3096	3152	3135
Self-rated Health	.225**	.145**	1
Significance	.000	.000	
N	3140	3135	3197

Table 44. Correlation Matrix for Psychosocial Factors

	Active Coping	Mastery	Performance Self-esteem	Social Support
Active Coping	1	.366**	.168**	.247**
Significance		.000	.000	.000
N	3207	3199	3206	3164
Mastery	.366**	1	.493**	.389**
Significance	.000		.000	.000
N	3199	3201	3200	3161
Self-esteem	.168**	.493**	1	.175**
Significance	.000	.000		.000
N	3206	3200	3213	3168
Social Support	.247**	.389**	.175**	1
Significance	.000	.000	.000	
N	3164	3163	3168	3168

Appendix D

About PROMIS®

PROMIS® stands for Patient Reported Outcomes Measurement Information System, which is a system of highly reliable, precise measures of patient–reported health status for physical, mental, and social well–being. PROMIS® tools measure what patients are able to do and how they feel by asking questions. PROMIS measures can be used as primary or secondary endpoints in clinical studies of the effectiveness of treatment, and PROMIS® tools can be used across a wide variety of chronic diseases and conditions and in the general population.

The data collected in PROMIS® provide clinicians and researchers with important patient–reported information about the effect of therapy that cannot be found in traditional clinical measures. When used with traditional clinical measures of health, PROMIS® tools allow clinicians to better understand how various treatments might affect what patients are able to do and the symptoms they experience. Not only can the reports be used to design treatment plans, but also can be used by patients and physicians to improve communication and manage chronic disease.

The uniqueness of PROMIS® lies in four key areas:

- **Comparability**—measures have been standardized so there are common domains and metrics across conditions, allowing for comparisons across domains and diseases.
- **Reliability and Validity**—all metrics for each domain have been rigorously reviewed and tested.

- Flexibility—PROMIS can be administered in a variety of ways, in a different forms.
- Inclusiveness—PROMIS encompasses all people, regardless of literacy, language, physical function or life course.

Acknowledgement:

PROMIS® was funded with cooperative agreements from the National Institutes of Health (NIH) Common Fund Initiative (U54AR057951, U01AR052177, U54AR057943, U54AR057926, U01AR057948, U01AR052170, U01AR057954, U01AR052171, U01AR052181, U01AR057956, U01AR052158, U01AR057929, U01AR057936, U01AR052155, U01AR057971, U01AR057940, U01AR057967, U01AR052186). The contents of this dissertation and manuscript use data developed under PROMIS. These contents do not necessarily represent an endorsement by the US Federal Government or PROMIS. See www.nihpromis.org for additional information on the PROMIS initiative.

Appendix E

Graphs Illustrating Interaction Effects of Race and Gender on Depression, Anxiety and Self-rated Health

Figure 7. Interaction Race*Gender for Depression

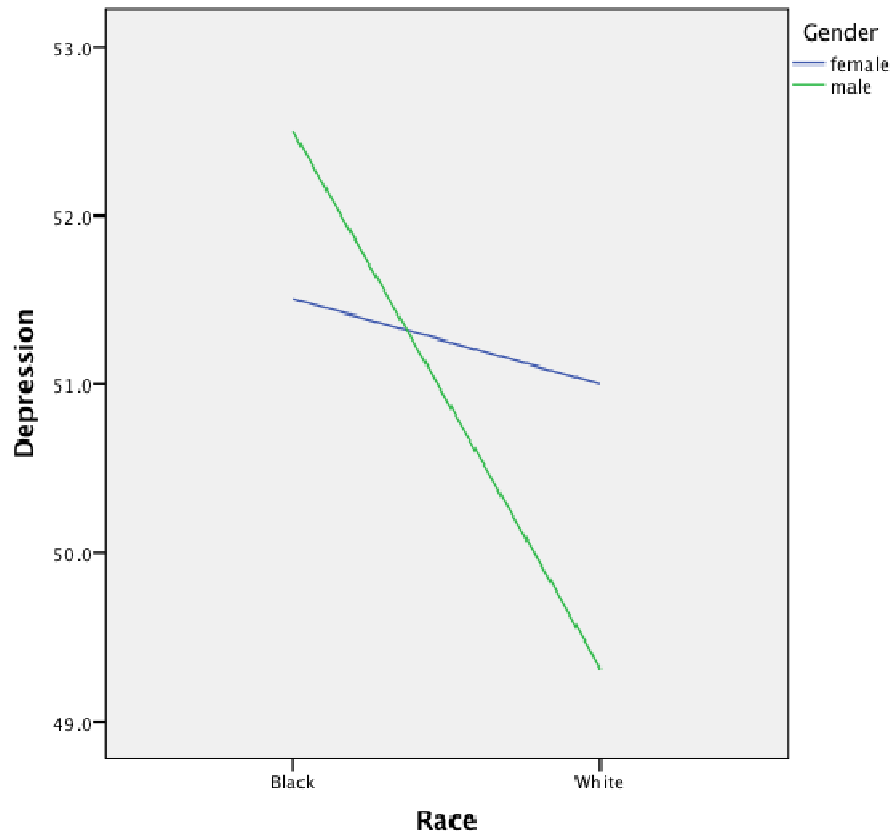
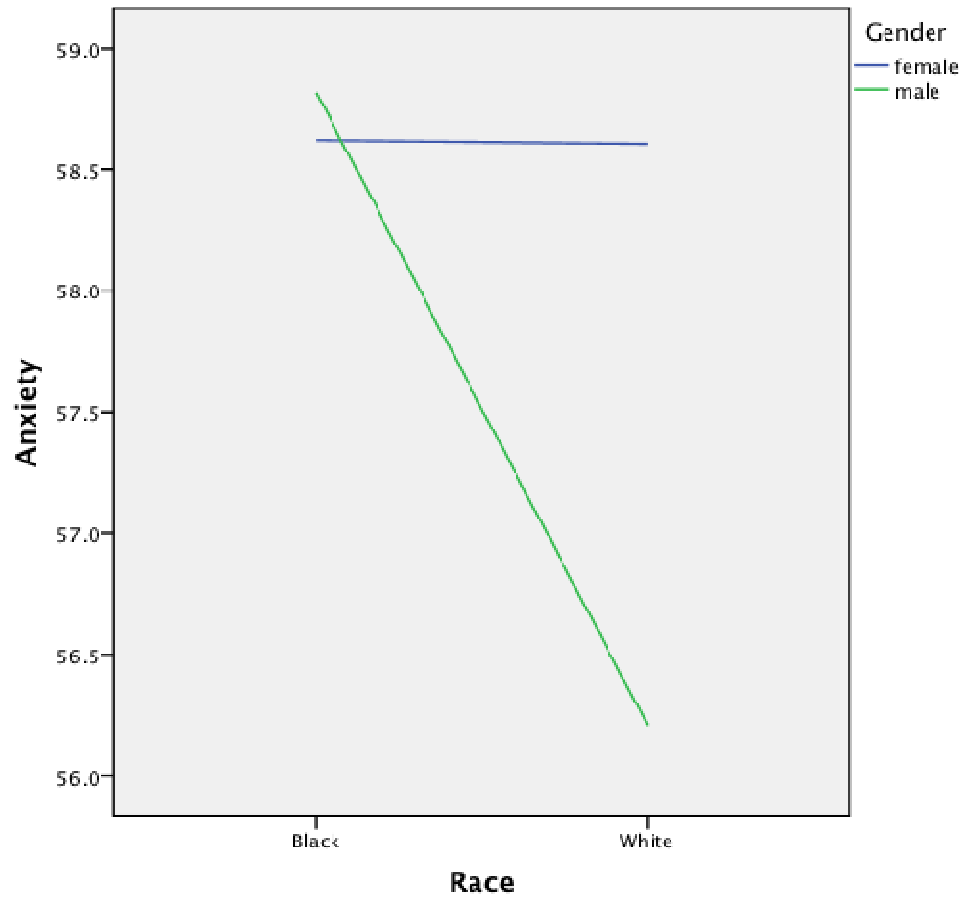


Figure 8. Interaction Race*Gender for Anxiety



APPENDIX F
CHANGES SURVEY

Consent Form

Welcome to the Medical Student CHANGES Research Study!

You have been asked to be a part of this study because you are currently enrolled as a first year medical student. Please read the on-line consent form below and scroll down to agree to participate in the study.

ON-LINE CONSENT FORM Medical Student CHANGES Study

We are asking you to participate in an important research study that will examine changes in medical students' quality of life, social relationships, attitudes, and beliefs over the course of medical school. The results of this study will help inform recommendations for improving medical student experiences and medical school education. We need your participation to make sure that the study findings are accurate and the recommendations relevant and representative. We ask that you read this form and ask any questions you may have before agreeing to be in the study. If you have questions you can email us at mchanges@umn.edu or call 1-877-629-1004. We will be happy to hear from you.

This study is being conducted by researchers at the University of Minnesota Medical School and was funded by the U.S. National Institutes of Health.

The National Institutes of Health provided \$50.00 payments to encourage participation. We have found that while most students appreciate the compensation, their main reasons for participating are because they:

1. Want to contribute to this important study;
2. Want to make their experiences and opinions known;
3. Are intrigued to be part of a longitudinal study; and
4. Want to help improve medical education for future students.

Procedures

This study has two measurement points involving on-line surveys. The first measurement point will take place now. You will be asked to fill out an on-line confidential survey about your current well-being, beliefs, attitudes and experiences. You will also be asked to complete two IATs, which are

reaction time measures, like a game. Altogether it takes most people around 45 minutes. During your 4th year of medical school, we will invite you to complete an interactive clinical vignette along with the same surveys you completed during your first year. Participating now does not commit you to participating later. If you participate in this study, we may invite you to participate in our related studies.

After completing this on-line consent, you will have the option to complete the survey now or defer until a more convenient time.

Risks and Benefits of Being in the Study

This is a minimal risk study, which means there is very little risk to participate in the study: Some people may experience psychological stress from filling out the surveys. You may experience frustration if your internet connection is slow and delays completion of the survey.

If you begin to feel tired or anxious, please feel free to take a break and sign back in at a later time.

There are no direct benefits to you from participating in this study. However, many people find helping with a study that will be used to create positive changes a rewarding experience.

Compensation

You will receive \$50.00 that will be sent to the address you provide at the end of the questionnaire. You will receive this whether you complete the entire web-based survey or not. Once you start the survey, you are free to skip any questions you don't wish to answer. You will receive additional compensation when we invite you to complete surveys later in your medical education. Completing the survey today does not obligate you to participating in surveys later. You are always free to refuse at any time.

Confidentiality

If you choose to participate, you have rights as a research participant. Your answers are **confidential**. They will never be associated with your name or medical school. We will report findings in aggregate and will never report on specific participants or a specific medical school. The records of this study will be kept private. Your answers will be linked to a

unique ID number, never your name. Research records will be stored securely and only researchers and technical support staff with security clearances will have access to the record. The rights of research participants are regulated and monitored by both the Universities involved and the funding agency. Confidentiality and privacy are a basic right for research participants.

The researchers who are conducting the study have, combined, conducted dozens of studies with thousands of participants. We have never had a privacy breach for any participant in any of our studies.

Voluntary Nature of the Study

Your participation is **voluntary** and you are free to refuse. If you let us know that you don't want to participate, we will not contact you again. Your decision on whether or not to participate is also confidential. No one outside of the study team will know whether you participate or not. If you decide to participate, you are free to skip any question and can withdraw at any time.

Contacts and Questions

You are encouraged to contact the study coordinator or the Principal Investigator, Dr. van Ryn, at:

The University of Minnesota Medical School Suite 220 Dinnaken Office Building 925 Delaware St. S.E. Minneapolis, MN 55414

Phone: 1-877-629-1004 E-mail: mchanges@umn.edu

If you have any questions or concerns regarding this study and would like to talk to someone other than the researcher(s), **you are encouraged** to contact the Research Subjects' Advocate Line, D528 Mayo, 420 Delaware St. S.E., Minneapolis, MN 55455; 1-612-625-1650.

You may print a copy of this information to keep for your records.

Statement of Consent

I agree to participate. Send me to the first page of the questionnaire now.

Q1 Statement of Consent

- I agree to participate. Send me to the first page of the questionnaire now. (1)
- I agree to participate. I will complete the online questionnaire at a more convenient time. (2)
- I do not wish to complete this questionnaire. (3)

Thank You If you have changed your mind and would like to complete the questionnaire now, please click on the ">>Continue" button in the lower right hand corner of the screen to get started. To leave this site now, without entering the questionnaire, please click on "EXIT NOW". EXIT NOW

We are interested in knowing why you do not want to complete this questionnaire. If you have a moment, please let us know why you have chosen not to participate.

Q11 We are interested in knowing why you do not want to complete this questionnaire.

If you have a moment, please let us know why you have chosen not to participate.

- Lack of interest (1)
- Lack of time (2)
- Distrust of web questionnaires (3)
- Not a first year medical student (5)
- Other (Please specify) (4) _____

Q113 If you have changed your mind and would like to complete the questionnaire now, please click on the ">>Continue" button in the lower right hand corner of the screen to get started. To leave this site now, without entering the questionnaire, please click on "EXIT NOW". EXIT NOW

Section A: Your Physical and Emotional Health and Well-Being

A1. Welcome! This section focuses on your current experiences and feelings. Focus on what you are thinking about yourself at this moment. There is no right or wrong answer for any statement. Answer these questions as they are true for you **RIGHT NOW**.

	Not at all (1)	A little bit (2)	Somewhat (3)	Very (4)	Extremely (5)
I feel confident about my abilities. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am worried about whether I am regarded as a success or a failure. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel satisfied with the way my body looks right now. (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am dissatisfied with my weight. (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel as smart as others. (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am pleased with my appearance right now. (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am worried about what other people think of me. (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel confident that I understand things. (8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel concerned about the impression that I am making. (9)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel that I have less scholastic ability right now than others. (10)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am worried about looking foolish. (11)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

A2a. These questions focus on your stress level during the last month. In the last month, how often have you felt...

	Never (1)	Almost Never (2)	Sometimes (3)	Fairly Often (4)	Very Often (5)
... that you were unable to control the important things in your life? (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
... confident about your ability to handle your personal problems? (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
... that things were going your way? (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
... difficulties were piling up so high that you could not overcome them? (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

A2b. How is your overall health right now? In general, would you say your health is:

- Excellent (1)
- Very Good (2)
- Good (3)
- Fair (4)
- Poor (5)

A2c1. How tall are you without shoes?

A2c2. About how much do you weigh?
_____ (1)

A2c3. On average, how many hours of sleep do you get in a 24-hour period?

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	8 (8)	9 (9)	10 (10)	11 (11)	12 (12)
Hours (1)												

A3. These questions focus on your fatigue level during the past 7 days. In the past 7 days,

	Never (1)	Almost Never (2)	Sometimes (3)	Fairly Often (4)	Very Often (5)
How often did you feel tired? (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
How often did you experience extreme exhaustion? (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
How often did you run out of energy? (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
How often did fatigue limit you at school or work (include work at home)? (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
How often were you too tired to think clearly? (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

A4. We want to know how you have been feeling over the past 7 days. How often have each of the statements below been true for you? In the past 7 days...

	Never (1)	Almost Never (2)	Sometimes (3)	Fairly Often (4)	Very Often (5)
I felt fearful. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt anxious. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt worried. (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I found it hard to focus on anything other than my anxiety. (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt nervous. (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt uneasy. (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt tense. (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt worthless (8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt that I had nothing to look forward to (9)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt helpless (10)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt sad (11)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt like a failure (12)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt depressed (13)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt unhappy (14)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt hopeless (15)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

A8. These questions focus on the typical ways you cope when there is stress in your life. How often do you do each of the following when dealing with something stressful?

	I Don't Do This at All (1)	I Do This a Little (2)	I Do This a Medium Amount (3)	I Do This a Lot (4)
I turn to work or other activities to take my mind off things. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I refuse to believe that this has happened. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I use alcohol or other drugs to make myself feel better. (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I get emotional support from others. (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I give up trying to deal with it. (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I concentrate my efforts on doing something about the situation that I am in. (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I get help and advice from other people. (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I try to come up with a strategy about what to do. (8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I look for something good in what is happening. (9)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I learn to live with it. (10)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I blame myself for things that have happened. (11)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

I pray or meditate. (12)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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A9a. These statements deal with your general feelings and opinions about yourself. How strongly do you agree or disagree with each of the statements below?

	Strongly Disagree (1)	Moderately Disagree (2)	Slightly Disagree (3)	Neither Agree nor Disagree (4)	Slightly Agree (5)	Moderately Agree (6)	Strongly Agree (7)
I have little control over the things that happen to me. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There is really no way I can solve some of the problems that I have. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There is little I can do to change many of the important things in my life. (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I often feel helpless in dealing with the problems of life. (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sometimes I feel that I'm being "pushed around" in	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

<p>life. (5)</p> <p>What happens to me in the future mostly depends on me. (6)</p> <p>I can do just about anything I really set my mind to. (7)</p> <p>I feel that I am a person of worth, at least on an equal plane with others. (8)</p> <p>I am able to do things as well as most other people. (9)</p> <p>I feel I do not have much to be proud of. (10)</p> <p>On the whole, I am satisfied with myself. (11)</p> <p>I wish I could have more</p>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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respect for myself. (12)							
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A9b. These statements deal with how you are feeling in medical school.

	Not at All (1)	A Little Bit (2)	Somewhat (3)	Very (4)	Extremely (5)
How much do you feel like you belong in medical school? (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
How much do you feel that you can "be yourself" in medical school? (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
How accepted do you feel in medical school? (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q124 What is your year of birth?

B2. Please indicate your gender.

- Male (1)
- Female (2)
- Other (3)

B3. Please indicate your ethnicity.

- Hispanic or Latino (1)
- Not Hispanic or Latino (2)
- Unknown (3)

B4. Please indicate your race. Choose ALL that apply.

- American Indian/ Alaska Native (1)
- East Asian (2)
- South Asian (3)
- Black (4)
- Native Hawaiian/ Pacific Islander (5)
- White (6)
- Unknown (7)

B5. What country were you born in?

- UNITED STATES (1)
- Afghanistan (2)
- Albania (3)
- Algeria (4)
- Andorra (5)
- Angola (6)
- Antigua & Deps (7)
- Argentina (8)
- Armenia (9)
- Australia (10)
- Austria (11)
- Azerbaijan (12)
- Bahamas (13)
- Bahrain (14)
- Bangladesh (15)
- Barbados (16)
- Belarus (17)
- Belgium (18)
- Brazil (19)
- Brunei (20)
- Bulgaria (21)
- Burkina Faso (22)
- Burundi (23)
- Cambodia (24)

- Cameroon (25)
- Canada (26)
- Cape Verde (27)
- Central African Rep (28)
- China (29)
- Chile (30)
- Croatia (31)
- Cuba (32)
- Cyprus (33)
- Czech Republic (34)
- Denmark (35)
- Djibouti (36)
- Dominica (37)
- Dominican Republic (38)
- East Timor (39)
- Ecuador (40)
- Egypt (41)
- El Salvador (42)
- Equatorial Guinea (43)
- Eritrea (44)
- Estonia (45)
- Ethiopia (46)
- Fiji (47)
- Finland (48)
- France (49)
- Gabon (50)
- Gambia (51)
- Georgia (52)
- Germany (53)
- Ghana (54)
- Greece (55)
- Grenada (56)
- Guatemala (57)
- Guinea (58)
- Guinea Bissau (59)
- Guyana (60)
- Haiti (61)
- Honduras (62)
- Hungary (63)

- Iceland (64)
- India (65)
- Indonesia (66)
- Iran (67)
- Iraq (68)
- Ireland Republic (69)
- Israel (70)
- Italy (71)
- Ivory Coast (72)
- Jamaica (73)
- Japan (74)
- Jordan (75)
- Kazakhstan (76)
- Kenya (77)
- Kiribati (78)
- Korea North (79)
- Korea South (80)
- Kosovo (81)
- Kuwait (82)
- Kyrgyzstan (83)
- Laos (84)
- Latvia (85)
- Lebanon (86)
- Lesotho (87)
- Liberia (88)
- Libya (89)
- Liechtenstein (90)
- Lithuania (91)
- Luxembourg (92)
- Macedonia (93)
- Madagascar (94)
- Malawi (95)
- Malaysia (96)
- Maldives (97)
- Mali (98)
- Malta (99)
- Marshall Islands (100)
- Mauritania (101)
- Mauritius (102)

- Mexico (103)
- Micronesia (104)
- Moldova (105)
- Monaco (106)
- Mongolia (107)
- Montenegro (108)
- Morocco (109)
- Mozambique (110)
- Myanmar (111)
- Namibia (112)
- Nauru (113)
- Nepal (114)
- Netherlands (115)
- New Zealand (116)
- Nicaragua (117)
- Niger (118)
- Nigeria (119)
- Norway (120)
- Oman (121)
- Pakistan (122)
- Palau (123)
- Panama (124)
- Papua New Guinea (125)
- Paraguay (126)
- Peru (127)
- Phillippines (128)
- Poland (129)
- Portugal (130)
- Qatar (131)
- Romania (132)
- Russian Federation (133)
- Rwanda (134)
- St. Kitts & Nevis (135)
- St. Lucia (136)
- San Marino (137)
- Sao Tome & Principe Saudi Arabia (138)
- Senegal (139)
- Serbin (182)
- Seychelles (140)

- St. Vincent & Grenadines (141)
- Samoa (142)
- Sierra Leone (143)
- Singapore (144)
- Slovakia (145)
- Slovenia (146)
- Solomon Islands (147)
- Somalia (148)
- South Africa (149)
- Spain (150)
- Sri Lanka (151)
- Sudan (152)
- Suriname (153)
- Swaziland (154)
- Sweden (155)
- Switzerland (156)
- Syria (157)
- Taiwan (158)
- Tajikistan (159)
- Tanzania (160)
- Thailand (161)
- Togo (162)
- Tonga (163)
- Trinidad & Tobago (164)
- Tunisia (165)
- Turkey (166)
- Turkmenistan (167)
- Tuvalu (168)
- Uganda (169)
- Ukraine (170)
- United Arab Emirates (171)
- United States (172)
- Uruguay (173)
- Uzbekistan (174)
- Vanuatu (175)
- Vatican City (176)
- Venezuela (177)
- Vietnam (178)
- Yemen (179)

- Zambia (180)
- Zimbabwe (181)
- United Kingdom (225)

B6. What is your current marital and relationship status? Select ALL that apply.

- Never married (1)
- Single (2)
- Have a boyfriend (3)
- Have a girlfriend (4)
- Separated (5)
- Divorced (6)
- Widowed (7)
- Engaged (8)
- Married or domestic partner (9)
- Living with romantic partner (10)
- Have more than one romantic partner (11)

B7. What is your sexual orientation:

- Heterosexual (1)
- Bisexual (2)
- Homosexual (3)
- Other (4) _____

B9. How many children do you have?

- 0 (1)
- 1 (2)
- 2 (3)
- 3 (4)
- 4 (5)
- 5 (6)
- >5 (7)

B8. If you have children....

	0 (1)	1 (2)	2 (3)	3 (4)	4 (5)	5 (6)	>5 (7)
How many of your children are under 5 years old? (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
How many children live with you 50% of the time or more? (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

B11. What year did you graduate with your undergraduate degree?

B12. Please Indicate the major field of study for your undergraduate degree. Select all that apply.

- Biological Sciences/ Life Sciences (1)
- Business (2)
- Communications (3)
- Computer and Information Sciences (4)
- Education (5)
- Engineering (6)
- Mathematics, Physical Sciences/ Technologies (7)
- Health Professions or Related Sciences (8)
- Humanities/ Liberal Arts (9)
- Law or Legal Studies (10)
- Psychology (11)
- Social Sciences or History (12)
- Visual or Performing Arts (13)
- Other (14)

B12. What is the highest level of formal education completed by your...

	Doctorate Degree or First Professional Degree (1)	Master's Degree (2)	Bachelor's Degree (3)	Associates Degree, Some College, or Technical Degree (4)	High School Diploma (5)	Less than High School Diploma (6)	Don't Know or Not Applicable (7)
Mother (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Father (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Spouse (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

B13. How do you characterize your political identification?

- Very Conservative (1)
- Conservative (2)
- Moderate (3)
- Liberal (4)
- Very Liberal (5)

C1. We are interested in your opinions and beliefs about doctors and patient care. There are no right or wrong answers. Please indicate how much you agree or disagree with each statement by selecting the option that is closest to your opinion.

	Strongly Disagree (1)	Moderately Disagree (2)	Slightly Disagree (3)	Neither Agree nor Disagree (4)	Slightly Agree (5)	Moderately Agree (6)	Strongly Agree (7)
Physicians should ask patients for their opinions about their illnesses. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Patients may lose confidence in a physician if the physician asks their opinion about their illness or problem. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Understanding patients' opinions about their illnesses helps physicians reach correct diagnoses. (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Physicians should ask their patients what they believe is the cause of their illness. (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Physicians should learn about their patients' cultural perspective. (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Physicians should ask their patients why they think their illness has occurred. (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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C2. We are interested in your opinions and beliefs about doctors and patient care. There are no right or wrong answers.

	Strongly Disagree (1)	Moderately Disagree (2)	Slightly Disagree (3)	Neither Agree nor Disagree (4)	Slightly Agree (5)	Moderately Agree (6)	Strongly Agree (7)
A physician who is able to view things from another person's perspective can render better care. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The physician's sense of humor contributes to a better clinical outcome. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Physicians' understanding of their patients' feelings and the feelings of their patients' families is a positive treatment factor. (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Understanding body language is as important as verbal communication in physician-patient relationships. (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Empathy is an important therapeutic factor in medical	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

<p>treatment. (5) Patients feel better when their feelings are understood by their physicians. (6)</p>	○	○	○	○	○	○	○
<p>Willingness to imagine oneself in another person's place contributes to providing quality care. (7)</p>	○	○	○	○	○	○	○
<p>A patient who feels understood can experience a sense of validation that is therapeutic in its own right. (8)</p>	○	○	○	○	○	○	○
<p>One important component of the successful physician-patient relationship is the physician's ability to understand the emotional status of his or her patients and their families. (9)</p>	○	○	○	○	○	○	○
<p>Because people are different, it is almost impossible for physicians to see things from their patients'</p>	○	○	○	○	○	○	○

<p>perspectives. (10)</p> <p>Empathy is a therapeutic skill without which the physician's success will be limited. (11)</p> <p>The best way to take care of a patient is to think like a patient. (12)</p>	<input type="radio"/> <input type="radio"/>	<input type="radio"/> <input type="radio"/>	<input type="radio"/> <input type="radio"/>	<input type="radio"/> <input type="radio"/>	<input type="radio"/> <input type="radio"/>	<input type="radio"/> <input type="radio"/>	<input type="radio"/> <input type="radio"/>
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C3. We are interested in your opinions and beliefs about doctors and patient care. There are no right or wrong answers.

	Strongly Disagree (1)	Moderately Disagree (2)	Slightly Disagree (3)	Neither Agree nor Disagree (4)	Slightly Agree (5)	Moderately Agree (6)	Strongly Agree (7)
Conscientious patients deserve better health care than those with self-inflicted problems. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Those who contribute the most to society should get better health care. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
More "health-care dollars" should be spent on those who contribute most to society. (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I resent tax money being spent on patients with self-inflicted diseases. (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Compliant patients are entitled to more of my time than non-compliant ones. (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Access to	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

care is a fundamental right. (6)							
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C4. We are interested in your opinions and beliefs about doctors and patient care. There are no right or wrong answers.

	Strongly Disagree (1)	Moderately Disagree (2)	Slightly Disagree (3)	Neither Agree nor Disagree (4)	Slightly Agree (5)	Moderately Agree (6)	Strongly Agree (7)
When interacting with Black patients, I will be unsure how to act in order to show them that I am not prejudiced. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When interacting with Black patients, I will be concerned they do not trust me. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I suspect Black patients will be watching my behavior closely for prejudice. (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I will be more nervous interacting with Black patients than with	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

<p>White Patients. (4)</p> <p>I will be as comfortable interacting with Black patients as I am with White patients. (5)</p> <p>I will get anxious when interacting with Black people. (6)</p> <p>When interacting with Hispanic patients, I will be unsure how to act in order to show them that I am not prejudiced. (7)</p> <p>When interacting with Hispanic patients, I will be concerned they do not trust me. (8)</p> <p>I suspect Hispanic patients will be</p>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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<p>watching my behavior closely for prejudice. (9)</p> <p>I will be more nervous interacting with Hispanic patients than with White patients. (10)</p> <p>I will be as comfortable interacting with Hispanic patients as I am with White patients. (11)</p> <p>I will get anxious when interacting with Hispanic people. (12)</p>	○	○	○	○	○	○	○
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D1. We are interested in the way students' opinions and beliefs change during their medical school experiences. Please express your true opinions without any concerns about what others may think. Your answers will never be linked to your name.

	Strongly Disagree (1)	Moderately Disagree (2)	Slightly Disagree (3)	Neither Agree nor Disagree (4)	Slightly Agree (5)	Moderately Agree (6)	Strongly Agree (7)
Just as in other species, male homosexuality is a natural expression of sexuality in human men. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lesbians just can't fit into our society. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Female homosexuality in itself is no problem, but what society makes of it can be a problem. (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I think male homosexuals are disgusting. (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lesbians are sick. (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Male homosexuality is a perversion. (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Male homosexuality is merely a different kind of lifestyle	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

that should not be condemned. (7)							
Female homosexuality is a sin. (8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Homosexual behavior between two men is just plain wrong. (9)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

D2. We are interested in the way student's opinions and beliefs change during their medical school experiences. Please express your true opinions without any concerns about what others may think. Your answers will never be linked to your name.

	Strongly Disagree (1)	Moderately Disagree (2)	Slightly Disagree (3)	Neither Agree nor Disagree (4)	Slightly Agree (5)	Moderately Agree (6)	Strongly Agree (7)
I really don't like fat people much. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have a hard time taking fat people seriously. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fat people make me feel somewhat uncomfortable. (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel disgusted with myself when I gain weight. (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I worry about becoming fat. (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fat people tend to be fat pretty much through their own fault. (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Some people are fat because they have no will power. (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

D3. We are interested in the way students' opinions and beliefs change during their medical school experiences. Please express your true opinions without any concerns about what others may think. Your answers will never be linked to your name.

	Strongly Disagree (1)	Moderately Disagree (2)	Slightly Disagree (3)	Neither Agree nor Disagree (4)	Slightly Agree (5)	Moderately Agree (6)	Strongly Agree (7)
If certain groups of people stayed in their place, we would have few problems. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It's probably a good thing that certain groups are at the top and other groups are at the bottom. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Inferior groups should stay in their place. (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sometimes other groups must be kept in their place. (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
We should do what	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

we can to equalize conditions for different groups. (5)							
Group equality should be our ideal. (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
We should strive to make incomes as equal as possible. (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
We would have fewer problems if we treated different groups more equally. (8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

D4. We'd like to get your feelings about the groups of people listed below. Below you will see categories of people with sliders next to them. Indicate how you feel towards each group by moving the slider all the way to the left (very cold or unfavorable), all the way to the right (very warm or favorable), or somewhere in between.

- _____ Criminals (1)
- _____ African Americans (2)
- _____ Obese people (3)
- _____ Caucasians (4)
- _____ Gay men (5)
- _____ Lesbians (6)
- _____ Poor people (7)
- _____ Intravenous drug users (8)
- _____ Asian Americans (9)
- _____ Hispanics (10)

E1. We'd like to get your general feelings and opinions about yourself.

	Strongly Disagree (1)	Moderately Disagree (2)	Slightly Disagree (3)	Neither Agree nor Disagree (4)	Slightly Agree (5)	Moderately Agree (6)	Strongly Agree (7)
Even though I know it's not appropriate, I sometimes feel that I hold unconscious negative attitudes toward Blacks. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When talking to Black people, I sometimes worry that I am unintentionally acting in a prejudiced way. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Even though I like Black people, I still worry that I have unconscious biases toward Blacks. (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I never worry that I may be acting in a subtly prejudiced way toward Blacks. (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

E2a. The following questions concern various reasons or motivations people might have for trying to respond in non-prejudiced ways toward other groups. Some of the reasons reflect internal-personal motivations whereas others reflect more external-social motivations. We want to emphasize that neither type of motivation is by definition better than the other. Remember that your first reactions are usually the most accurate.

	Strongly Disagree (1)	Moderately Disagree (2)	Slightly Disagree (3)	Neither Agree nor Disagree (4)	Slightly Agree (5)	Moderately Agree (6)	Strongly Agree (7)
Because of today's PC (politically correct) standards, I try to appear non-prejudiced toward people who are not of my race. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I try to hide any negative thoughts about people from a race different than mine in order to avoid negative reactions from others. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I attempt to appear non-prejudiced toward people who are not of	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

<p>my race in order to avoid disapproval from others. (3)</p> <p>I attempt to act in a non-prejudiced way toward people who are not of my race because it is personally important to me. (4)</p>	○	○	○	○	○	○	○
<p>I am personally motivated by my beliefs to be non-prejudiced toward people who are not of my race. (5)</p>	○	○	○	○	○	○	○
<p>Because of my personal values, I believe that using stereotypes about people who are not of my race is wrong. (6)</p>	○	○	○	○	○	○	○

E2b1a-c. How often have you been treated unfairly by teachers and professors because you are Black?

	Never (1)	Once in a While (Less than 10% of the Time) (2)	Sometimes (10%-25%) (3)	A Lot (26%-49%) (4)	Most of the Time (50%-70%) (5)	Almost All of the Time (More than 70%) (6)
How many times the past year? (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
How many times in your entire life? (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q123 How stressful was this for you?

- Not at all stressful (1)
- Slightly stressful (2)
- Somewhat stressful (3)
- Moderately stressful (4)
- Very stressful (5)
- Extremely stressful (6)

E2b2a-c. How often have you been treated unfairly by your employers, bosses, and supervisors because you are Black?

	Never (1)	Once in a While (Less than 10% of the Time) (2)	Sometimes (10%-25%) (3)	A Lot (26%-49%) (4)	Most of the Time (50%-70%) (5)	Almost All of the Time (More than 70%) (6)
How many times the past year? (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
How many times in your entire life? (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q141 How stressful was this for you?

- Not at all stressful (1)
- Slightly stressful (2)
- Somewhat stressful (3)
- Moderately stressful (4)
- Very stressful (5)
- Extremely stressful (6)

E2b3a-c. How often have you been treated unfairly by your fellow students because you were Black?

	Never (1)	Once in a While (Less than 10% of the Time) (2)	Sometimes (10%-25%) (3)	A Lot (26%-49%) (4)	Most of the Time (50%-70%) (5)	Almost All of the Time (More than 70%) (6)
How many times the past year? (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
How many times in your entire life? (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

E2b3d. How stressful was this for you?

- Not at all stressful (1)
- Slightly stressful (2)
- Somewhat stressful (3)
- Moderately stressful (4)
- Very stressful (5)
- Extremely stressful (6)

Q106 How often have you been treated unfairly by people in service jobs (store clerks, waiters, bartenders, bank tellers, and other) because you are Black?

	Never (1)	Once in a While (Less than 10% of the Time) (2)	Sometimes (10%-25%) (3)	A Lot (26%-49%) (4)	Most of the Time (50%-70%) (5)	Almost All of the Time (More than 70%) (6)
How many times the past year? (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
How many times in your entire life? (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q142 How stressful was this for you?

- Not at all stressful (1)
- Slightly stressful (2)
- Somewhat stressful (3)
- Moderately stressful (4)
- Very stressful (5)
- Extremely stressful (6)

Q108 How often have you been treated unfairly by strangers because you are Black?

	Never (1)	Once in a While (Less than 10% of the Time) (2)	Sometimes (10%-25%) (3)	A Lot (26%-49%) (4)	Most of the Time (50%-70%) (5)	Almost All of the Time (More than 70%) (6)
How many times the past year? (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
How many times in your entire life? (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q143 How stressful was this for you?

- Not at all stressful (1)
- Slightly stressful (2)
- Somewhat stressful (3)
- Moderately stressful (4)
- Very stressful (5)
- Extremely stressful (6)

Q110 How often have you been treated unfairly by people in helping jobs (doctors, nurses, psychiatrist, case workers, dentists, school counselors, therapists, social workers, and others) because you are Black?

	Never (1)	Once in a While (Less than 10% of the Time) (2)	Sometimes (10%-25%) (3)	A Lot (26%-49%) (4)	Most of the Time (50%-70%) (5)	Almost All of the Time (More than 70%) (6)
How many times the past year? (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
How many times in your entire life? (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q111 How stressful was this for you?

- Not at all stressful (1)
- Slightly stressful (2)
- Somewhat stressful (3)
- Moderately stressful (4)
- Very stressful (5)
- Extremely stressful (6)

Q136 How often have you been treated unfairly by your neighbors because you are Black?

	Never (1)	Once in a While (Less than 10% of the Time) (2)	Sometimes (10%-25%) (3)	A Lot (26%-49%) (4)	Most of the Time (50%-70%) (5)	Almost All of the Time (More than 70%) (6)
How many times the past year? (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
How many times in your entire life? (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q144 How stressful was this for you?

- Not at all stressful (1)
- Slightly stressful (2)
- Somewhat stressful (3)
- Moderately stressful (4)
- Very stressful (5)
- Extremely stressful (6)

Q115 How often have you been treated unfairly by institutions (schools, universities, law firms, the police, the courts, the Dept of Social Services, the Unemployments office, and others) because you are Black?

	Never (1)	Once in a While (Less than 10% of the Time) (2)	Sometimes (10%-25%) (3)	A Lot (26%-49%) (4)	Most of the Time (50%-70%) (5)	Almost All of the Time (More than 70%) (6)
How many times the past year? (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
How many times in your entire life? (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q116 How stressful was this for you?

- Not at all stressfull (1)
- Slightly stressful (2)
- Somewhat stressful (3)
- Moderately stressful (4)
- Very stressful (5)
- Extremely stressful (6)

Q117 How often have you been treated unfairly by people that you thought were your friends because you are Black?

	Never (1)	Once in a While (Less than 10% of the Time) (2)	Sometimes (10%-25%) (3)	A Lot (26%-49%) (4)	Most of the Time (50%-70%) (5)	Almost All of the Time (More than 70%) (6)
How many times the past year? (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
How many times in your entire life? (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q118 How stressful was this for you?

- Not at all stressful (1)
- Slightly stressful (2)
- Somewhat stressful (3)
- Moderately stressful (4)
- Very stressful (5)
- Extremely stressful (6)

Q119 How often have you been accused or suspected of doing something wrong (such as stealing, cheating, not doing your share of the work, or breaking the law) because you are Black?

	Never (1)	Once in a While (Less than 10% of the Time) (2)	Sometimes (10%-25%) (3)	A Lot (26%-49%) (4)	Most of the Time (50%-70%) (5)	Almost All of the Time (More than 70%) (6)
How many times the past year? (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
How many times in your entire life? (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q120 How stressful was this for you?

- Not at all stressful (1)
- Slightly stressful (2)
- Somewhat stressful (3)
- Moderately stressful (4)
- Very stressful (5)
- Extremely stressful (6)

Q121 How often have your intentions and motives been misunderstood because you are Black?

	Never (1)	Once in a While (Less than 10% of the Time) (2)	Sometimes (10%-25%) (3)	A Lot (26%-49%) (4)	Most of the Time (50%-70%) (5)	Almost All of the Time (More than 70%) (6)
How many times the past year? (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
How many times in your entire life? (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q122 How stressful was this for you?

- Not at all stressful (1)
- Slightly stressful (2)
- Somewhat stressful (3)
- Moderately stressful (4)
- Very stressful (5)
- Extremely stressful (6)

E2c.

	Very Much Agree (1)	Moderately Agree (2)	Slightly Agree (3)	Uncertain (4)	Slightly Disagree (5)	Moderately Disagree (6)	Very Much Disagree (7)
Overall, being Black has very little to do with how I feel about myself. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In general, being Black is an important part of my self-image. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have a strong attachment to other Black people. (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Being Black is an important reflection of who I am. (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

E3. We are interested in your personal experiences with unfair treatment. In your day-to-day life how often have any of the following things happened to you?

	Almost Every Day (1)	At Least Once a Week (2)	A Few Times a Month (3)	A Few Times a Year (4)	Less than Once a Year (5)	Never (6)
You are treated with less courtesy than other people. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
You are treated with less respect than other people. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
You receive poorer service than other people at restaurants or stores. (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
People act as if they think you are not smart. (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
People act as if they are afraid of you. (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
People act as if they think you are dishonest. (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
People act as if they're better than you are. (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

You are called names or are insulted. (8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
You are threatened or harassed. (9)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

E4. We are interested in your personal experiences with unfair treatment in your whole life. In your whole life...

	Yes (1)	No (2)
Do you think you have ever been unfairly fired or denied a promotion? (1)	<input type="radio"/>	<input type="radio"/>
For unfair reasons, do you think you have ever not been hired for a job? (2)	<input type="radio"/>	<input type="radio"/>
Have you ever been unfairly stopped, searched, questioned, physically threatened or abused by the police? (3)	<input type="radio"/>	<input type="radio"/>
Have you ever been unfairly discouraged by a teacher or advisor from continuing your education? (4)	<input type="radio"/>	<input type="radio"/>
Have you ever been unfairly prevented from moving into a neighborhood because the landlord or a realtor refused to sell or rent you a house or apartment? (5)	<input type="radio"/>	<input type="radio"/>
Have you ever moved into a neighborhood where neighbors made life difficult for you or your family? (6)	<input type="radio"/>	<input type="radio"/>
Have you ever had your academic work unfairly evaluated? (7)	<input type="radio"/>	<input type="radio"/>

E6. Please describe the racial/ethnic composition of the following:

	Nearly All Minorities (1)	Mostly Minorities (2)	50-50 (3)	Mostly White (4)	Nearly All White (5)
Neighborhood where you grew up (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
College from which you graduated (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Your friends in college (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

E5. Before coming to medical school, how much interaction did you have with people in each of the following groups?

	None (1)	Little (2)	Some (3)	Substantial (4)
Blacks/ African-Americans (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hispanics/ Latinos (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Whites/ Caucasians (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Obese people (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Gay, Lesbian, or Bisexual individuals (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q137 Before coming to medical school, how favorable were your interactions with people in each of the following groups?

	Very Unfavorable (1)	Unfavorable (2)	Favorable (3)	Very Favorable (4)
Blacks/ African-Americans (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hispanics/ Latinos (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Whites/ Caucasians (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Obese people (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Gay, Lesbian, or Bisexual individuals (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

F1. This section focuses on your preferences for dealing with decisions and a variety of challenges. Please indicate how much you agree or disagree with the statements below.

	Strongly Disagree (1)	Moderately Disagree (2)	Slightly Disagree (3)	Neither Agree nor Disagree (4)	Slightly Agree (5)	Moderately Agree (6)	Strongly Agree (7)
Even after I've made up my mind about something, I am always eager to consider a different opinion. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I don't like situations that are uncertain. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I like to have friends who are unpredictable. (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I enjoy the uncertainty of going into a new situation without knowing what might happen. (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel irritated when one person disagrees with what everyone else in a group believes. (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There have been occasions when I have	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

taken advantage of someone. (6) I'm always willing to admit it when I make a mistake. (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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F1. Problem Solving & Personal Style

	Strongly Disagree (1)	Moderately Disagree (2)	Slightly Disagree (3)	Neither Agree nor Disagree (4)	Slightly Agree (5)	Moderately Agree (6)	Strongly Agree (7)
In most social conflicts, I can easily see which side is right and which is wrong. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I sometimes try to get even rather than forgive and forget. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When considering most conflict situations, I can usually see how both sides could be right. (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I don't like to be with people who are capable of unexpected actions. (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When thinking about a problem, I consider as many	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

different opinions on the issue as possible. (5)							
I don't like to go into a situation without knowing what I can expect from it. (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I dislike it when a person's statement could mean many different things. (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q91 Problem Solving & Personal Style

	Strongly Disagree (1)	Moderately Disagree (2)	Slightly Disagree (3)	Neither Agree nor Disagree (4)	Slightly Agree (5)	Moderately Agree (6)	Strongly Agree (7)
I find that establishing a consistent routine enables me to enjoy life more. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I prefer interacting with people whose opinions are very different from my own. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel uncomfortable when someone's meaning or intention is unclear to me. (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am always courteous, even to people who are disagreeable. (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I always see many possible solutions to problems I face. (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I'd rather know bad news than stay in a state of uncertainty.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

(6) At times I have really insisted on having things my own way. (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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Q93 Problem Solving & Personal Style

	Strongly Disagree (1)	Moderately Disagree (2)	Slightly Disagree (3)	Neither Agree nor Disagree (4)	Slightly Agree (5)	Moderately Agree (6)	Strongly Agree (7)
I do not usually consult many different options before forming my own view. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I dislike unpredictable situations. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have never been irked when people expressed ideas very different from my own. (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have never deliberately said something that hurt someone's feelings. (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

F2. This section focuses on your preferences for dealing with decisions and a variety of challenges. Please indicate how much you agree or disagree with the statements below.

	Strongly Disagree (1)	Moderately Disagree (2)	Slightly Disagree (3)	Neither Agree nor Disagree (4)	Slightly Agree (5)	Moderately Agree (6)	Strongly Agree (7)
Before criticizing somebody, I try to imagine how I would feel if I were in their place. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If I'm sure I'm right about something, I don't waste much time listening to other people's arguments. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I sometimes try to understand my friends better by imagining how things look from their perspective. (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I believe that there are two sides to every question and try to look at them both. (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

<p>I sometimes find it difficult to see things from the "other guy's" point of view. (5)</p>	○	○	○	○	○	○	○
<p>I try to look at everybody's side of a disagreement before I make a decision. (6)</p>	○	○	○	○	○	○	○
<p>When I'm upset at someone, I usually try to "put myself in his shoes" for a while. (7)</p>	○	○	○	○	○	○	○
<p>When I see someone being taken advantage of, I feel kind of protective toward them. (8)</p>	○	○	○	○	○	○	○
<p>When I see someone being treated unfairly, I sometimes don't feel very much pity for them. (9)</p>	○	○	○	○	○	○	○
<p>I often have tender, concerned feelings for people less</p>	○	○	○	○	○	○	○

<p>fortunate than me. (10)</p> <p>I would describe myself as a pretty soft-hearted person. (11)</p> <p>Sometimes I don't feel sorry for other people when they are having problems. (12)</p> <p>Other people's misfortunes do not usually disturb me a great deal. (13)</p> <p>I am often quite touched by things that I see happen. (14)</p>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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G1. The next section focuses on the people in your life and your social relationships. First, we would like to know about your social interactions.

	More than Once a Day (1)	Once a Day (2)	2 or 3 Times a Week (3)	Less than Once a Week (4)	Never (5)
In a typical week, about how many times do you talk on the telephone with friends, neighbors, or relatives? (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
How often do you get together with friends, neighbors, or relatives? (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
How often do you usually attend religious services? (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
How often do you attend meetings or programs of groups, clubs, or organizations that you belong to? (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
How often do you get together with classmates, colleagues, or co-workers? (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
How often do you get together with a significant	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

other or romantic partner? (6) How often do you get together or have a date with a casual romantic partner? (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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G2. People sometimes look to others for companionship, assistance, or other types of support. How often is each of the following kinds of support available to you if you need it?

	None of the Time (1)	A Little of the Time (2)	Some of the Time (3)	Most of the Time (4)	All of the Time (5)
Someone you can count on to listen to you when you need to talk. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Someone to give you information to help you understand a situation. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Someone to give you good advice about a crisis. (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Someone to confide in or talk to about yourself or your problems. (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Someone whose advice you really want. (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Someone to share your most private worries and fears with. (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Someone to turn to for suggestions about how to deal with a personal problem. (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Someone who	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

understands your problems. (8)					
Someone to help you if you were confined to bed. (9)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Someone to take you to the doctor if you needed it. (10)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Someone to prepare your meals if you were unable to do it yourself. (11)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Someone to help with daily chores if you were sick. (12)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Someone who shows you love and affection. (13)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Someone to love you and make you feel wanted. (14)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Someone who hugs you. (15)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Someone to have a good time with. (16)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Someone to get together with for relaxation. (17)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Someone to do something enjoyable with. (18)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Someone to do things with to help you get your mind off things. (19)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

G3. The following questions ask about feelings that people sometimes have. Please check the box that best describes how you feel.

	None of the Time (1)	A Little of the Time (2)	Some of the Time (3)	Most of the Time (4)	All of the Time (5)
How often do you feel you lack companionship? (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
How often do you feel left out? (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
How often do you feel isolated from others? (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

H1. Please select the state, school, and campus (if applicable) of the medical education program that you are, or will be, attending.

H2. Indicate your career intentions from the options listed below. (Select only one.)

- Full-time academic faculty (teaching, research) (1)
- Full-time clinical practice (non-academic) (2)
- Other (please describe) (3) _____
- Undecided (4)

H3. What general specialty are you considering? (Please select your most likely specialty from the list below).

- Allergy and Immunology (1)
- Anesthesiology (2)
- Colon & Rectal Surgery (3)
- Dermatology (4)
- Emergency Medicine (5)
- Family Practice (6)
- Internal Medicine (7)
- Medical Genetics (8)
- Neurology (9)
- Neurological Surgery (10)
- Nuclear Medicine (11)
- Obstetrics & Gynecology (12)
- Ophthalmology (13)
- Orthopedic Surgery (14)
- Otolaryngology (15)
- Pathology (16)
- Pediatrics (17)
- Physical Medicine & Rehabilitation (18)
- Plastic Surgery (19)
- Preventive Medicine (20)
- Psychiatry (21)
- Radiology (22)
- Surgery (23)
- Thoracic Surgery (24)
- Urology (25)

H5. Please indicate the setting in which you plan to work after the completion of your medical education:

- Large city (population 500,000 or more) (1)
- Suburb of a large city (2)
- City of moderate size (population 50,000 to 500,000) (3)
- Suburb of moderate size city (4)
- Small city (population 10,000 to 50,000- other than suburb) (5)
- Town (population 2,500 to 10,000- other than suburb) (6)
- Small town (population less than 2,500) (7)
- Rural/unincorporated area (8)
- Undecided or no preference (9)

H6a. Do you plan to locate your practice in an under-served area?

- Yes (1)
- No (2)
- Undecided (3)

H6b. Since you answered “yes”; please indicate the likely location. (Select only one.)

- Rural Community (1)
- Inner-city Community (2)
- Other (3)

H7. Regardless of location, do you plan to work primarily with minority populations?
(Select only one.)

- Yes, I plan to work primarily with minority populations (1)
- No, I do not plan to work primarily with minority populations (2)
- Undecided (3)

H8 Indicate the minority population you intend to work with. (Select only one.)

- Black/ African American (1)
- Hispanic/ Latino (2)
- Native American (3)
- Asian (4)
- Other (please specify): (5) _____

H9. What is your family income?

- Less than \$10,000 (1)
- \$10,000 to \$19,999 (2)
- \$20,000 to \$29,999 (3)
- \$30,000 to \$39,999 (4)
- \$40,000 to \$49,000 (5)
- \$50,000 to \$74,999 (6)
- \$75,000 to \$99,999 (7)
- \$100,000 to \$249,999 (8)
- \$250,000 to \$499,999 (9)
- \$500,000 or More (10)

H10. Regardless of your dependency status, please indicate your parents' combined gross income for last year (a rough estimate is sufficient).

H11. The above figure represents the income of :

- Father Only (1)
- Mother Only (2)
- Both Parents (3)
- Other: (4) _____

H12. Do you have any outstanding educational loans for your college/ premedical education that you are legally required to repay?

- Yes (1)
- No (2)

H13. How were your college/ premedical costs paid? Please enter a percentage for each applicable category to total 100%. Enter 0 (zero) for non-applicable categories. Note: The total of all sources must equal 100%.

- _____ Scholarships or awards: (1)
- _____ Loans: (2)
- _____ Work-study program: (3)
- _____ Personal income and savings: (4)
- _____ Money from parents or family: (5)
- _____ Money earned by spouse (6)
- _____ Other: (7)

H14. How do you plan to finance your medical school education? Please enter a percentage for each applicable category to total 100%. Enter 0 (zero) for non-applicable categories. Note: The total of all sources must equal 100%.

- _____ Scholarships or awards: (1)
- _____ Loans: (2)
- _____ Work-study program: (3)
- _____ Personal income and savings: (4)
- _____ Money from parents or family: (5)
- _____ Money earned by spouse: (6)
- _____ Other: (7)

Q103 You are almost done! Last, you will be routed to a secure web page where you will be asked to fill in the study ID and then complete two reaction time games (called Implicit Attitudes Tests).

It's important to the study to find out how implicit (unconscious, automatic) attitudes change between the 1st and 4th year of medical school. This last section will take around 5 minutes.

You will need the study ID on the next page, so please write it down. You can also copy and paste it using your browser.