Examining Undergraduate Engineering Students' Knowledge, Beliefs, and Attitudes

Regarding Affirmative Action Admissions Policies:

A Hierarchical Regression Analysis

by

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ABSTRACT

Affirmative action is an education policy adopted by higher education institutions in the 1960s, where an applicant's race is taken into account to some degree when being evaluated for admission to a college or university. The practice of affirmative action, or race conscious-admissions, has been repeatedly challenged in the legal system and remains a controversial and polarizing topic amongst the general public, campus leaders, and policy makers. Despite a vast amount of research on the effects of affirmative action policies on student and institutional behaviors and outcomes, such as college applications and enrollments, considerably less research has examined students' attitudes towards race-conscious admissions policies. Even less research has focused on students in academic disciplines, especially STEM or engineering. Likewise, there is a paucity of research that explores students' perceptions and knowledge of how affirmative action is implemented in practice. To address these gaps, this study investigates undergraduate engineering students' knowledge of and attitudes towards affirmative action admissions policies in higher education. The Student Attitudes Towards Admissions Policies Survey (SATAPS) was designed to assess students' knowledge of and attitudes regarding affirmative action practices in higher education admissions. This survey was administered to undergraduate engineering students and a comparison group of education students at 42 colleges/universities in the United States. Data were analyzed utilizing confirmatory factor analysis and hierarchical regression. Results demonstrated that students have low levels of knowledge about affirmative action, and have misconceptions about how the policy functions in practice. There was no difference in engineering and education students' level of support for affirmative action; however, underrepresented minority students in engineering were more supportive of affirmative action. Results also

indicated that students' beliefs and values were the strongest predictors of attitude towards affirmative action, so much so that this negated the significance of demographic and personal characteristics, which was observed in the majority of previous studies. Results highlight a complicated relationship between demographic characteristics, personal variables, knowledge, institutional context, beliefs/values, and attitude towards affirmative action admissions policies in higher education.

DEDICATION

This work is dedicated to:

My mom, Jen, for cultivating my passion for learning.

And for your unconditional love, without you this would not be possible.

and

My sister, Marissa, for being there, always.

ACKNOWLEDGMENTS

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GLOSSARY OF TERMS

Affirmative action: Within this study, affirmative action refers to race-conscious admissions policies and practices used in higher education institutions. Currently, the use of race in admissions policies is part of a holistic review process, where race is considered as one factor among many factors. Therefore, current race-conscious admissions policies examine many factors of applicants, with race being one of these, but still relying heavily on the framework of race-neutral practices.

Engineering/Computer Science (ECS): This study is focused particularly on engineering students, across all sub-disciplines (e.g., civil, electrical, mechanical). Since many colleges of engineering also house computer science programs, these majors were included in the sample of interest. Moving forward these students will be referred to as ECS students.

Percent plans: A more recent form of race-neutral admissions practices is percent plans, which were developed as a response to the proscription of affirmative action policies. Percent plans, enacted by state legislatures, guarantee admissions to selective state institutions to students who graduate within the top "x" percent of their high school class. The percentage of students with guaranteed admissions varies by states, ranging from 78% in Texas to 25% in Arizona (Education Commission of the States, 2016).

Race-neutral admissions policy: Race-neutral policies do not consider race as a factor in admissions decisions. This admissions structure considers student performance and merit when evaluating candidates. Primary factors evaluated include the Scholastic Aptitude Test (SAT) and the American College Test (ACT) scores, class rank, and student GPA.

Socioeconomic status (SES): Socioeconomic status is a construct that represents sociological and economic conditions. SES is strongly tied to the social standing or class of an individual or group. It is often measured through a combination of education, income, employment status, and/or occupation. Most often, class is thought of in terms of popular understandings of four groups: lower, middle, upper middle, and upper.

STEM: Academic disciplines of science, technology, engineering, and mathematics.

Underrepresented minorities (URM): Blacks, Latinxs, Native Americans and Alaska Natives. Students from these racial groups are historically and currently underrepresented within higher education institutions (McFarland et al., 2017). Hereafter, underrepresented minority students will be referred to as URM students.

CHAPTER 1

INTRODUCTION

In part a response to pressure from the Civil Rights Movement, the practice of affirmative action in the United States was established by President Lyndon B. Johnson via Executive Order 11246 in 1965, which expanded on a previous executive order (No. 10925) from President John F. Kennedy in 1961. Affirmative action policies were meant to expand equal education, employment, and contract opportunities for defined minority groups, mainly women and people of color, as a means to ameliorate past discrimination and oppression in the United States. Though originally adopted with the intention of improving hiring practices and employment opportunities with government contractors, higher education institutions also embraced affirmative action through admissions policies and practices in the 1960s with the aim of increasing diversity in postsecondary education. Race-conscious admissions policies have served as a strategic method for many colleges and universities to establish and/or maintain a diverse student body.

Shortly after the adoption of race-conscious admissions policies, these practices gained strong opposition and were challenged in the legal system. Opponents of affirmative action argue that these practices are not necessary to ensure a diverse student body and result in unfair discrimination against students.[1] Further, critics claim that affirmative action admissions practices result in unqualified minority students being admitted to colleges and universities ahead of more qualified nonminority students, and therefore assert that merit and academic achievement should be the only factors for consideration in admissions decisions (Consovoy et al., 2015; Fish, 2000; Thernstrom &

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[1] Historically opponents of affirmative action argued that these practices were discriminatory against White applicants. Though in recent years, this argument has been expanded to Asian and Asian-American applicants (e.g., *Students for Fair Admissions v. Harvard University).*

Thernstrom, 1997). The most recent Supreme Court ruling on affirmative action, *Fisher v. University of Texas at Austin* (2016), upheld the constitutionality of race-conscious admissions practices. Despite this ruling, higher education administrators, policymakers, education scholars, and the general public continue to debate the use of affirmative action practices in higher education. Currently, affirmative action admissions policies are being challenged in the lower courts in a number of cases, including *Students for Fair Admissions v. Harvard University* (2017).

Given the controversy around affirmative action practices in higher education, many scholars have studied the outcomes of employing race-conscious admissions practices in higher education. These studies have focused on a broad range of issues, including college applications (Andrews, Rancho, & Sathy, 2010; Card & Krueger, 2005; Dickson, 2006), admissions and enrollments (Kain, O'Brien, and Jargowsky, 2005; Long & Tienda, 2008; Tienda, Leicht, Sullivan, Maltese, & Lloyd, 2003), and student outcomes, such as persistence, achievement, and graduation rates (Cortes, 2010; Garces, 2013; Massey & Mooney, 2007). Despite this heavy research base on the effects of affirmative action, fewer scholars have focused on students' attitudes about these admissions practices (e.g., Aberson, 2007; Park, 2009; Sax & Arredondo). Even fewer studies have examined students' knowledge of admissions practices in higher education (Crosby, Iyer, & Sincharoen, 2006). The paucity of research that connects directly to students' own knowledge and attitudes is somewhat surprising considering the continued racial disparities of students in some academic disciplines, such as the STEM fields, and specifically within engineering. Despite efforts by federal agencies and other organizations to encourage students to earn a degree in and pursue a future career in engineering (e.g., National Academy of Sciences, National Academy of Engineering, and

Institute of Medicine, 2007; National Commission on Mathematics and Science, 2000), students of color remain highly underrepresented in the field. Therefore, this study contributes to the literature by examining undergraduate students' knowledge of and attitudes towards admissions policies and practices in higher education, with a focus on engineering students. Understanding students' attitudes towards affirmative action within engineering as students of color are most absent in this field. Examination of students' attitudes towards affirmative action could provide important insight campus environment/culture, which influences students' academic performance, choice of major, and campus experiences.

Statement of the Problem

Over the past two decades, higher education enrollment and graduation rates have increased substantially. Between 1986 and 2016, the percentage of adults aged 25 – 29 with a bachelor's degree or higher increased 14%, whereas the percentage of people with a high school degree in this same age group only increased 6% (Ryan & Bauman, 2016). Yet this increase in postsecondary education is not keeping up with the shifting demographics in the United States, and in particular the growth in the percentage of non-Whites or racial minorities (Colby & Ortman, 2015) who are less likely to attend college than White or Asian American students. In addition, the educational achievement gap between White and Asian students and underrepresented minority (URM) students remains wide (McFarland et al., 2017), with a difference of up to 42% in attainment of Bachelor's degrees for people aged 25 – 29 years old in 2016 (Ryan & Bauman, 2016). This racial disparity is further magnified in science, technology, engineering, and mathematics (STEM) academic disciplines where the percentage of bachelor's degrees

conferred to Black (11%), Latinx (14%), and American Indian (14%) students is lower than White (16%) and Asian (30%) students (Musu-Gillette et al., 2016).

To address these racial gaps in STEM, industry professionals, policymakers, researchers, and scholars have made multiple calls to bolster the STEM workforce. Policymakers and researchers have emphasized the important relationship between the economic development of the country and participation in the STEM workforce, as essential to economic development (Hrabowski, 2011). Discourse and debates in both policy and popular contexts have centered on this economic rationale, coupled with the focus on the need for more diversity in STEM. Researchers, administrators, and policymakers have emphasized the importance of diversifying STEM education and, in turn, the workforce, as evidenced by the many programs dedicated to improving equity in STEM (e.g., Briggs, 2003; Center for Gender Equity in Science & Technology, 2017; National Center for Women & Information Technology, 2017; National Science Foundation, 2017a; Staley, 2016). Over the past 50 years, there has been notable improvement in the enrollment of URM students in STEM programs, with total enrollment increasing from 13% to 20% (NSF, 2017b). Despite this progress, there are still many challenges to achieving and maintaining diversity levels within STEM, including achievement gaps and a chilly climate for URM students.

One strategy employed by colleges and universities to increase enrollments of URM students in higher education programs is the admissions process. Many higher education institutions have utilized affirmative action, or race-conscious admissions policies, to increase the enrollment of URM students. For the general public, affirmative action is one of the most controversial higher education policies (Fish, 2000; Moses, 2016). People tend to hold strong, emotional opinions about affirmative action policies

and practices (Moses, 2016). Further, people have developed well-organized efforts to challenge affirmative action. As such, the use of affirmative action admissions practices is highly debated amongst the general public and policymakers, and these practices have been challenged repeatedly in the legal system, in cases such as, *Regents of the University of California v. Bakke* (1978)*, Grutter v. Bollinger* (2003)*, Fisher v. The University of Texas at Austin* (2016).

Scholars have examined students' attitudes and beliefs regarding affirmative action in higher education (e.g., Aberson, 2007; Aberson & Haag, 2003; Park, 2009; Sax & Arredondo, 1999; Smith, 2006). However, very few studies have examined student attitudes within specific academic disciplines (e.g., Park, 2009), and hardly any specifically investigated engineering students' attitudes towards affirmative action admissions policies/practices. Further, very few studies have focused on understanding students' awareness or knowledge of current affirmative action and admissions practices utilized by higher education institutions (Park, 2009; Crosby, Iyer, & Sincharoen, 2006). Given the frequent shifts in and controversy surrounding higher education admissions practices in general, but particularly affirmative action, it is likely that students may not be aware of what these policies entail and how they are implemented (Sax & Arredondo, 1999). Therefore, research assessing student attitudes towards affirmative action policies, should also consider students' knowledge of admissions practices (Park, 2009). This study examines undergraduate engineering & computer science (ECS) students' attitudes towards and knowledge of admissions practices in higher education. A more detailed discussion of the enrollment landscape and challenges within STEM, as well as student attitudes towards affirmative action is provided in Chapter Two.

Conceptual Framework

Researchers have shown that there are many factors that contribute to individuals' attitudes towards affirmative action, such as demographic characteristics, self-interest, political orientation, racial ideology, and beliefs about merit and fairness (Aberson, 2007; Crosby & Cordova, 1996; Crosby et al., 2006; Park, 2009). The guiding conceptual framework for this study was adapted from Kravitz and Klineberg's (2000) research on understanding attitudes towards affirmative action. The framework draws on social psychology theory to operationalize beliefs, values, and attitudes as components related to attitude towards affirmative action. Further, the framework utilizes Bonilla-Silva's (2010) conceptualization of contemporary racism to understand and examine beliefs relevant to affirmative action.

In the first part of this section, I present the conceptual framework for the study. Next, I provide a short discussion about the way in which I operationalized beliefs, values, and attitudes within the conceptual framework. In the final section, I discuss the racial theories that were employed to examine beliefs relevant to affirmative action.

Framework

The conceptual framework is comprised of (a) predictors of attitudes towards affirmative action and (b) attitude towards affirmative action. The predictors of attitude towards affirmative action are categorized into five dimensions: (a) *demographic characteristics*, (b) *personal variables*, (c) *institutional context*, (d) *knowledge of affirmative action and admissions policies*, and (e) *beliefs and values relevant/specific to affirmative action*. Figure 1 provides a pictorial representation of the conceptual framework for this study. A more detailed discussion of the current research on these characteristics is provided in Chapter Two.

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                          │ Relevant to AA ----→│ Specific to AA │
                          ├────────────────────┼────────────┤
                          │ • View on discrimination │ • Fairness │
                          │ • Value of diversity     │ • Merit    │
                          │ • Role of HED in diversity │        │
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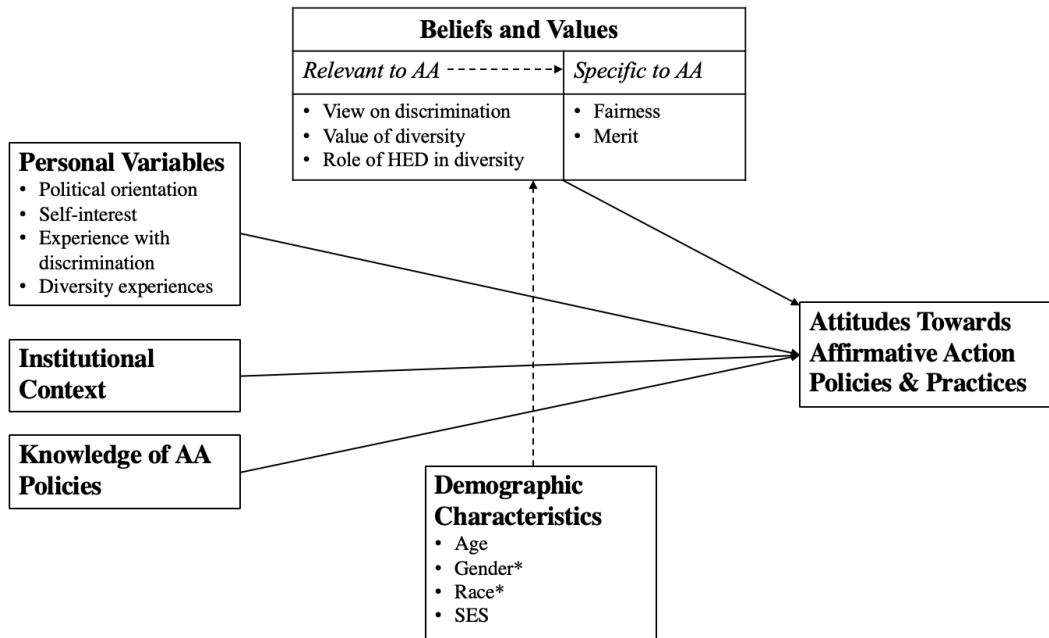
Figure 1. Conceptual framework.

The framework rests on a few key assumptions, which are supported by previous research studies (e.g., Aberson, 2007; Kravitz & Klineberg, 2000; Park, 2009; Sax & Arredondo, 1999). First, it is assumed that (a) *demographic characteristics*, (b) *personal variables*, (c) *institutional context*, (d) *knowledge of affirmative action and admissions policies*, and (e) *beliefs and values relevant/specific to affirmative action all influence* (f) *attitudes towards affirmative action policies and practices* (as indicated by the arrows). Within this framework, *demographic characteristics* moderate the relationship between *beliefs and values related/specific to affirmative action* and overall *attitude towards affirmative action* (as indicated by the dashed arrow in Figure 1). Further, *beliefs and values related to affirmative action* moderate *beliefs specific to affirmative* action (again indicated by the dashed arrow in Figure 1). In sum, this conceptual framework is comprised of six dimensions. The first five dimensions (demographic characteristics, personal variables, institutional context, knowledge of affirmative action, and beliefs and

values relevant to affirmative action) all influence the final dimension, attitude towards affirmative action policies and practices.

Beliefs, Values, & Attitudes

Though often used interchangeably, the terms beliefs, values, and attitudes have unique meanings within this framework. Drawing on belief system theory (Rokeach, 1968; 1973; 1980) in social psychology, this framework distinguishes between beliefs, values, and attitudes as separate, but interconnected concepts, which influence how people think about phenomena such as affirmative action policies in higher education.

Rokeach (1968) describes three types of beliefs, based on what is true and false (descriptive), good or bad (evaluative), and what is desirable or undesirable (prescriptive). In belief system theory, Rokeach (1968) argues that beliefs are aligned along a centrality dimension, where some beliefs are more central than others. Based on this hierarchy, changes in a more central belief will lead to shifts in other, less central beliefs. In this theory, attitudes and values are subsystems of the overarching belief system framework.

Within belief system theory, attitudes are defined as motivational properties that predispose people to respond preferentially (or not) to certain objects or situations (Rokeach, 1980). Further, social controls, such as laws or policies, that influence positions towards the object/situation of interest, elicit differential attitudinal responses.

According to Rokeach (1973; 1980), values are hierarchically organized subsets of beliefs that transcend objects or situations. Within this theory, values include certain ideals about "states of existence" that are preferable to other states of existence. Values function as individual needs expressed into socially acceptable, public declarations of beliefs or ideals. Values are abstract ideals, and can be underlying factors that contribute

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to attitudes towards different objects or situations (Rokeach, 1968). Values are central to the belief system, and thus changes in one value can lead to shifts in related values and attitudes. Racial theory was utilized as a framework to understand beliefs, values, and attitudes related to affirmative action.

Racial Theory

In the United States, race has been an important and highly controversial topic. Furthermore, the concept of race stems from a deep and complicated history of racial oppression and social classification (Omi & Winant, 2015). In the 1960s, overt legal discrimination ended in the United States with the elimination of the Jim Crow laws. Following these policy changes, some argue that racism has ended, and we have moved into a post-racial era (D'Souza, 1996). While racist laws were declared unconstitutional, the structures under Jim Crow laws persisted, and so racism persists "despite its nearly universal condemnation by the state and the government by state policy and by the norms of polite society" (Harris, 2012, p. 5).

Many scholars assert that following the end of overt systematic racial subordination, we have progressed into a "color-blind" society, which perpetuates racial inequalities more covertly than the explicit racism of the Jim Crow era (e.g., Bonilla-Silva, 2010; Omi & Winant, 2015; Winant, 1997). Howard Winant (1997) explored these changing racial dynamics in his racial dualism theory. He argues that people in the United States think about race in generally one of two ways. In the first paradigm, people believe that we exist in a post-racial society, where race is no longer a pressing concern since racism has ended (Cho, 2009; Winant, 1997). In the second group, people contend that we live in a society where race is a salient matter, (Bonilla-Silva, 2010; Winant,

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1997). Hereafter, I will refer to those in the first group as post-racialists, and those in the latter as race-conscious people.

Since affirmative action is a race-based policy, the application of racial theory is important to better comprehend students' beliefs and attitudes towards the policy and practice. Racial ideology directly relates to many of the factors laid out in the conceptual framework, particularly the items under the dimension *beliefs and values relevant/specific to affirmative action*. Within this conceptual framework I focus on those two major ideologies: post-racialism and race-consciousness. In the post-racial mindset, people do not believe that racial discrimination is a problem, and therefore do not support race-based initiatives, such as affirmative action. Whereas those who fall into the race-conscious paradigm acknowledge the salience of race and the prevalence of racial discrimination in the United States' government, institutions, and broader society, and are more likely to support race-based programs and policies. Within both ideologies, people have their own views on the prevalence of discrimination, ideas about merit and fairness, and support for different targeted programs/policies. In the first section below, I discuss the two major views on race and discrimination in society. In the following, I detail the ways in which these views on discrimination extend to beliefs about the role of race in policies and practices.

View on discrimination & race. In following one or the other of the major paradigms toward race (post-racial or race-conscious) people carry those views into how they look at a wide array of topics and matters, from social life to politics.

Post-racial ideology rests on the assumption that society has made significant racial progress. People with this point of view believe that within the United States the historically discriminatory and overtly racist policies and practices have ended, and that

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following the end of institutional discrimination we have made significant racial progress by transcending past racial discriminations and divisions. People who ascribe to this post-racial mindset do not deny the past discrimination; rather they frame historical racism as a tragic part of history, but not a present issue (Baber, 2016). By framing racial progress in this light, post-racial theorists attempt to simplify current racial problems by presenting discrimination as an uncomplicated remnant of the past (Cho, 2009).

Further, post-racialists assert that when examining current inequalities, other factors, such as cultural deficiencies, are at play, rather than racism or discrimination (Baber, 2016). Bonilla-Silva (2010) explains that this happens through the frames of naturalization and cultural racism. Naturalization is the process by which White people explain away racial phenomena through justification of natural occurrences (Bonilla-Silva, 2010). Within this frame, people explain racial differences and inequalities through other ideas, and not due to racism and oppression. For example, many people justify current residential segregation patterns through rationalizations that people just naturally select for self-segregation. Further, these often involve cultural justifications to explain the standing of minorities in society. Cultural racism is often expressed in stereotypes that perpetuate negative beliefs about people of color, which is used to explain racial inequalities.

On the other hand, those who are race-conscious, or people who acknowledge the salience of race and the racialization of society believe that race still matters in the U.S. (Winant, 1997). Within this mindset, people recognize race shapes individuals' life chances through everyday interactions, but also through formal policies and practices (Bonilla-Silva, 2010; Lipsitz, 2006; Span, 2015; Omi & Winant, 2015; Winant, 1997). People who employ a race conscious mindset criticize the current color-blind approach

and believe that race is deeply embedded in our society within the legal system and other institutions in the United States and that racial discrimination persists (Bonilla-Silva, 2010; Delpit, 1995; Omi & Winant, 2015).

Those with a race-conscious mindset acknowledge that the racial subjugation and exclusion of people of color has resulted in privileges for White people, who have benefitted legally and economically (Harris, 1993; Lipsitz, 2006). The historical legacy of racial oppression and structural racism continues to provide significant advantages to White people in many forms, including a greater range of educational opportunities (Tatum, 1997). As such, race-conscious people affirm that race is an element of social structure, and should be treated as central to American society, and not as an irregularity (Omi & Winant, 2015).

People who are race-conscious criticize the dominant color-blind approach and contend that it is essential to include a racial analysis when looking at problems in society. Further, a color-blind approach, which is rooted in an implicit White norm, sends a message that it is a "problem" to be a certain race, and can also make people of color feel "invisible" (Delpit, 1995, p. 177). Within this mindset, notions of color-blindness are problematic because they ignore the past and contemporary role of race in society, and this color-blind approach now functions as another form of racism masked through ideas falsely predicated on equality (Bonilla-Silva, 2010).

The ways in which people think about and perceive discrimination and racial inequality directly corresponds with the factor of *view on discrimination* in the beliefs relevant to affirmative action dimension in the conceptual framework. This viewpoint also connects with *attitude towards affirmative action* policies and practices component of the framework. Those who believe that racial discrimination is no longer a problem are

less likely to support affirmative action, as they do not think it is a necessary practice for higher education institutions. However, people who believe that racial inequity is due to structural and institutional discrimination are likely supporters of affirmative action or ameliorative policies aimed at improving access for URM students in higher education.

Role of race in policies and practices. Based on their view on discrimination and the role of race in society, people are likely to have different beliefs about the role of race in government and systematic policies and practices. People tend to either support or oppose the use of race-conscious policies, such as affirmative action.

Rooted in the belief that significant racial progress has been made, post-racial theory argues that "the state need not engage in race-based decision-making or adopt race-based remedies, and that civil society should eschew race as a central organizing principle of social action" (Cho, 2009, p. 1594). Therefore, post-racialists call for race-neutral universalism, or the development of policies and practices that are color-blind and do not account for race. It is assumed that race-based policies and remedies are not only no longer necessary, but are also divisive (Cho, 2009). Post-racial scholars argue that these race-based policies only benefit people of color, and not society as a whole. Rather, post-racial theorists contend that policies should serve the universal interests of all Americans, not just specific groups of people.

Some post-racialists argue that deviation from race-neutral universalism is problematic for two main reasons. First, race-conscious policies actually obscure a more fundamental and pressing concern, inequalities based on class (Cho, 2009; Darder & Torres, 2004). Second, on a practical level, race-based policies are problematic because they ask for White people to suffer unfair treatment, and even injuries, without any gain, while people of color receive the benefits (Cho, 2009).

Other post-racialists liken current race-based policies to past racially discriminatory laws because both practices involved special treatment, either good or bad, based on racial generalizations (Cho, 2009). Or in other words, they consider any form of race-based treatment (even ones meant to be ameliorative) as morally equivalent to previous Jim Crow discrimination laws, and thus should not be utilized. Further, post-racialists argue that racialized treatment, both Jim Crow laws and the race-based policies that resulted from the Civil Rights Era, are equally polarizing in society. They also believe that any use of race in policy decisions is wrong, and that group identity (especially racial identity) should not play a key role in policies or treatment, either for grievances or remedies (Cho, 2009).

Based on these assumptions, those who ascribe to a post-racial ideology believe that race should not be a factor when discussing inequalities or evaluating individuals (Carter Andrews & Tuitt, 2013). Those who follow the post-racial mindset advocate for liberalism, including individualism, choice, and meritocracy (Bonilla-Silva, 2010). The color-blind principle asserts that since racial discrimination is no longer a problem, race should not be a factor for consideration when evaluating an individual (Bonilla-Silva, 2010). This sentiment is reflected in the commonly held belief that people should just judge individuals and not their skin color. Within the post-racial mindset, meritocracy is the dominant way to evaluate individual performance. This philosophy contends that people should be rewarded according to their individual talent and personal achievement, or their own merit (Lansford, 2011).

Alternatively, race-conscious people acknowledge the significance of race in society and recognize the past and present structural racism built into legal system and government institutions. Therefore, within this paradigm, people contend that it is

essential to include a racial analysis when examining problems in society. Through this lens, people believe that a state or government should engage in race-conscious decision-making practices and policies (Cho, 2009).

Whereas post-racialists advocate for merit as the fair way to evaluate individuals, people with a race-conscious mindset are critical of this practice. First, meritocracy assumes that everyone starts off at an equal level and has the same advantages and opportunities (McNamee & Miller, 2009). Race-conscious people acknowledge that many White people have significant privileges and advantages over people of color (Bonilla-Silva, 2010; Harris, 1993; Tatum, 1997). Race-conscious scholars, including critical race theorists, focus heavily on the myth of meritocracy, arguing that it is an inherently unfair and unrealistic practice. Within the context of education, they cite notable opportunity gaps in education, where White students generally have access to better quality education, with more resources, which has resulted in White students achieving at a higher level (Ladson-Billings, 2006). Ladson-Billings (2006) argues that the racial achievement gap in education grew out of structural inequality, which resulted in cumulative opportunity gaps over generations – a term she coins as "educational debt". To address the achievement gap, we need to examine the historical marginalization of people of color through legal, economic, and sociocultural lenses to understand the nature of the problem and to determine methods of ameliorating the past discrimination to improve conditions for present and future generations.

Ultimately, those who fall into the race-conscious paradigm recognize that despite the elimination of *de jure* segregation and overt legal discrimination, there are still instances of racism through legal and discursive practices and challenges against policies (Donnor, 2016). Based on the understanding that racism and racial discrimination is still

a problem within society (e.g., Carter Andrews & Tuitt, 2013), race-conscious people assert that race matters, and advocate for restorative policies and practices that take race into account.

Beliefs about the role of race in policies and practices correspond directly with view on discrimination and the prevalence (or lack thereof) of race in society. The ideas with this section are related to the *view on discrimination* factor in the conceptual framework. Additionally, the call for race-neutral/universal or race-conscious treatment and policies also connect with the *role of higher education* factor in the beliefs relevant to affirmative action dimension. Finally, these ideas are closely tied to the *merit* and *fairness* factors, which fall under the beliefs specific to affirmative action dimension.

Given the centrality of race to affirmative action policies, it is important to consider both racial paradigms in the study of student attitudes towards race-conscious admissions practices and policies, as many of the factors that influence attitudes towards affirmative action are rooted in beliefs about racial discrimination, fairness, and merit, all of which are closely tied to racial views and paradigms.

Purpose of Study

The focus of this study is examining and assessing undergraduate ECS students' knowledge of and attitudes towards admissions policies and practices in public United States higher education intuitions. The following research questions will be addressed:

1. To what extent are undergraduate ECS students knowledgeable about affirmative action admissions policies and practices in higher education?

2. What are the attitudes of undergraduate ECS students towards race-conscious admissions practices?

3. To what degree do undergraduate ECS students' characteristics, institutional context, and beliefs related to affirmative action affect their attitudes towards race-conscious admissions policies/practices?

Significance of Study

This study adds to the existing literature by examining students' attitudes towards admissions practices and determining the connection to demographic and personal variables. Given the recent Supreme Court ruling in *Fisher* (2016), and the continued legal challenges against race-conscious admissions practices (for example, *Students for Fair Admissions v. Harvard University)*, contemporary research should be conducted to understand current postsecondary students' attitudes towards affirmative action.

Additionally, this study will provide an understanding of students' knowledge of affirmative action admissions practices in higher education, due to limited research on awareness of these policies. Given the controversy around affirmative action, it is likely that students have many misconceptions about how these policies are implemented in practice (Sax & Arredondo, 1999). Therefore, this study will add important knowledge by gauging student awareness of these policies. Further, since perceptions regarding admissions practices can influence beliefs about, and subsequently, attitudes towards affirmative action, accounting for this knowledge is important when examining students' attitudes about affirmative action in higher education.

Unlike previous research studies that concentrated on higher education in general, this study focuses on engineering students' attitudes towards affirmative action. Given the racial disparities of representation of students in STEM, especially in engineering, it is important to better understand all factors that may contribute to this challenge and environment. Attitudes towards affirmative action may be indicative of general student

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attitudes about diversity, which can influence classroom and campus environment. This study builds on the existing literature base by shedding light on one of the subtler factors that might be influencing STEM undergraduate students' attitudes and experiences.

      Understanding student attitudes towards affirmative action is important to inform policy makers and campus leaders about student responses to this controversial practice. Additionally, student attitudes towards affirmative action can inform researchers about student attitudes regarding race, equity, and fairness, which can extend to the classroom and campus environments. These attitudes may contribute to fostering a chilly climate or negative student experiences for URM students in STEM. Further, it is important to understand how students are reacting to controversial policy issues, not only as a current group affected by these policies, but also as future citizens.

CHAPTER 2

LITERATURE REVIEW

There is a long and persistent history of educational attainment gaps for people of color in higher education (e.g., McFarland et al., 2017; Musu-Gillette et al., 2016). Though racial differences have lessened in recent years, significant disparities remain in higher education attainment. This discrepancy is further magnified in STEM programs, and even more so within specific STEM disciplines (e.g., Musu-Gillette et al., 2016; National Science Foundation, 2017b). In recent years, there has been a strong emphasis on achieving a critical mass of diverse students in higher education, (Baber, 2015) especially within STEM fields Malcom & Malcom-Piqueux, 2013).[2] Though compositional diversity should not be the sole focus, it is an important component of working towards achieving equity in STEM.

Researchers have suggested numerous explanations for the low representation of students of color and lack of parity in STEM, including K-12 educational experiences, a chilly climate, stereotype threat, and implicit bias (Hall & Sandler, 1984; Museus, Palmer, Davis, & Maramba, 2011). Increasing representation of URM students, and consequently moving towards a critical mass of these students, will help alleviate several factors that challenge equity within STEM. First, achieving a critical mass will likely help break down the chilly climate for URM students within STEM by reducing people's stereotypes about students of color (Inzlicht & Ben-Zeev, 2000). Second, greater representation of their peers will increase URM students' sense of belonging, which

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[2] In *Grutter v. Bollinger* (2003), the Supreme Court upheld the use of affirmative action admissions practices in higher education, so long as the policy worked towards achieving a "critical mass" of minorities. There is not a preset definition or standard of what constitutes a critical mass, in terms of a number or percentage. However, a general standard of a critical mass is an environment where URM students do not feel isolated.

directly influences decisions to major and persist in STEM (Museus et al., 2011). Finally, achieving a critical mass can help foster institutional climate change, which is critical to the retention and success of minority students (Malcom & Malcom-Piqueux, 2013). Though a focus on compositional diversity is a fundamental part of equity within STEM, this alone cannot be the only factor focused on for diversity initiatives. Rather, institutional climate and culture needs to be accounted for and shifted to promote lasting change in STEM diversity initiatives and in higher education institutions more broadly (Hurtado, Clayton-Pederson, Allen, & Milem, 1998; Whittaker & Montgomery, 2012).

Affirmative action is one policy or practice that can help increase the number of URM students in higher education, and therefore achieving a critical mass of students. Though following the adoption of this race-based admissions policy, affirmative action was challenged in the legal system and remains one of the most controversial issues in higher educational policy debates (Moses, 2016). As such, examination of students' knowledge of and attitudes regarding affirmative action is important to inform researchers, practitioners, and policymakers on how students understand and think about race-conscious admissions practices.

Within this chapter, I first provide an overview of the current higher education landscape of student diversity, both broadly and in STEM. I then discuss some of the major challenges to achieving racial equity within STEM. Next, I provide a review of the research on student attitudes towards affirmative action. Finally, I conclude with a discussion about how this study addresses existing knowledge gaps and add to the current literature base.

Current Landscape of STEM Higher Education Attainment

Despite increases in higher education attainment levels across all races, significant gaps remain (Table 1). Asian Americans have consistently had the highest undergraduate educational attainment rates since 2004, with Whites as the second highest group earning bachelor's degrees. Across all groups, Blacks and Latinxs have the lowest percentages of undergraduate degrees.

Table 1

Percent of People 25 or Older with Bachelor's Degree, by Race

Year	White	Black	Asian	Latinx	Total
2004	30.6	17.6	49.4	12.1	27.7
2010	33.2	19.8	52.4	13.9	29.9
2016	37.3	23.3	55.9	16.4	33.4

Source: U.S. Census Bureau, Current Population Survey, 2017.

Over the past two decades, the racial educational attainment gap has lessened, though significant disparities remain, particularly within STEM fields (see table 2). Overall, Asians are the most likely to earn a STEM degree. Asian students account for 7% of all bachelor's degrees, but 30% of those degrees are in STEM fields (Musu-Gillette et al., 2016). Further, Asian students comprise 13% of all STEM students, when they only account for 5% of all students in higher education (Musu-Gillette et al., 2016). White students earn the majority of STEM degrees, though their representation in STEM is slightly lower than their proportion across all undergraduate disciplines. The percentage of Black and Latinx undergraduate students is lower in STEM than their representation in overall bachelor's programs (by 4% and 2%, respectively) (McFarland et al., 2017). In comparison to their proportions in the general population, both Latinx and Black students remain considerably underrepresented in STEM (7% and 6%, respectively). In contrast both Asian and White students are overrepresented in STEM

relative to their proportion in the general population. In general, representation by race is similar across all degree levels (bachelors, masters, and doctorate) (NSF, 2017b).

Table 2

Percentage of Bachelor's Degrees in 2014-2015, by Race

Race	STEM Degrees[a]	All Undergraduate Degrees[a]	2014 Population[b]
Asian	13	7	4.9
Black	7	11	12.2
Latinx	10	12	16.9
White	66	67	62.8

Sources: (a) NCES, Condition of Education Report, 2017 (McFarland et al., 2017); (b) U.S. Census Bureau, American Community Survey, 2014.

Representation by STEM Discipline

Racial parity is greatest within the biological and social sciences,[3] where the proportion of URM students is high. The largest percentage of Latinx people is within biosciences (10%) and social sciences (13%). Black students in STEM are also well represented within psychology (12%) and the social sciences (11%) (NSF, 2017b).

Within engineering and computer science disciplines, the number of URM students remain low. Latinx students accounted for approximately 10% of students studying both engineering and computer science at the undergraduate level (NSF, 2017b). The proportion of Black students is markedly low in engineering, with these students accounting for just under 4% of all undergraduate engineering students (NSF, 2017b). However, the number Black students pursuing an undergraduate degree in computer science is notably higher, at 10% (NSF, 2017b).

In mathematics and statistics programs, the representation of students of color remains low, especially for Latinx and Black students. In 2014, the representation of

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[3] According to NSF classifications, social sciences include anthropology, archeology, criminology, economics, geography, international relations, political science, sociology, and urban studies.

Latinx students was just under 8% of all students in mathematics and statistics programs, whereas Black students comprised only 5% of these fields of study (NSF, 2017b).

URM students are well represented in biological sciences and social sciences categorized as STEM. Yet, the proportion of URM students remains decidedly low in engineering, computer science, mathematics, and statistics.[4] The disproportional representation of URM students in STEM, particularly within math-intensive STEM fields, has been and continues to be a key focus of educators, researchers, administrators, and policymakers.

Challenges in STEM

Over the past few decades, significant progress has been made in encouraging URM students to pursue STEM degrees (NSF, 2017b), and ultimately enter the STEM workforce. But their representation in STEM remains low, particularly within math-intensive STEM fields (NSF, 2017b). Multiple challenging and interacting factors influence low participation of URM students in STEM fields, including K-12 education, chilly climate, stereotype threat, and implicit bias.[5]

K-12 Education

There is a critical connection between the success of students at the K-12 level and in higher education STEM programs (Anderson, 1996; National Science Foundation, 2006). Therefore, it is integral to understand K-12 education trends that negatively influence STEM higher education attainment among underrepresented groups. There is a

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[4] Though not discussed within this section, it is worth noting that, within each racial group, female students obtain a lower percentage of STEM degrees than their male counterparts, with the smallest gender gap among Black students at 12 percent (Musu-Gillette et al., 2016).

[5] This is not an exhaustive discussion on all challenges to achieving equity in STEM, but rather an overview of some of the more prevalent factors. There are many other components that serve as contributing factors (see Museus et al., 2011), for a thorough review of other factors and challenges).

vast amount of literature focused on the racial disparities in educational outcomes within K-12 education (e.g., Haycock, 2001; Ladson-Billings, 2006; Lee, 2002). According to data from the National Center for Education Statistics (McFarland et al., 2018), these include lower grades, completion rates, and scores on academic tests, all of which influence participation in postsecondary education, and within STEM majors.[6]

The Condition of Education (McFarland et al., 2018) provides the most recent and comprehensive overview of K-12 educational attainment data in the United States for the 2015-2016 academic year. The concentration of students in high poverty schools[7] was highest among Black (45%), Latinx (45%), and American Indians/Alaska Natives (37%), compared to White (8%) and Asian (15%) students. In 2015, the high school graduation rate of Blacks (76%), Latinx (79%), and American Indians/Alaska Natives (72%) was significantly lower than their White (88%) and Asian (91%) counterparts. This disparity is significant, as graduating from high school directly affects students' ability to apply to and enroll in postsecondary education programs.

Museus and colleagues (2011) conducted a thorough literature review related to educational disparities in STEM. They identified several major components from the K-12 level that contribute to the continued racial inequities in education, including funding inequalities in and across school districts, tracking into remedial courses, low participation in Advanced Placement courses, and early departure from high school (i.e., dropouts). All these directly affect students and, subsequently, influence student achievement. However, these factors can also be thought of as the opportunity gap

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[6] It should also be noted that socioeconomic status plays a key role in academic achievement among students in K-12 education. Given the strong correlation between minorities and high poverty schools (discussed below), I focus my attention in this section only on racial disparities in education.
[7] A high poverty is school is defined as a school where more than 75% of students qualify for the free or reduced price lunch program (McFarland et al., 2018).

between Whites and URM students. So, not only do disparities hamper the participation of URM students in higher education and STEM programs, but also negatively influence future opportunities and life chances for people.

Research studies have shown that STEM higher education success is closely related to K-12 academic preparation (Bonous-Hammarth, 2006; Maton, Hrabowksi, & Schmitt, 2000; NSF, 2006). Ultimately, within the context of advancing equity and access for URM students in STEM, there is a need for further efforts to reduce educational disparities among students in the K-12 education system (Ladson-Billings, 2006), as this will support the future enrollment, persistence, and success of URM students in STEM (Museus et al., 2011).

Chilly Climate

Significant attention has been paid to the culture and environment within STEM programs. Hall and Sandler (1982; 1984) introduced the notion of a "chilly climate" with their research focused on environments for women in STEM higher education programs. Their original concept has since been expanded to other groups, including people of color. A chilly climate is defined as a setting or atmosphere where individuals do not feel welcomed or supported. One aspect of a chilly climate is explicit and implicit messages that membership in a particular group may be a liability in STEM (Flam, 1991). Specifically, students may feel that their group membership singles them out, or signals that they do not belong in their academic discipline.

Students from underrepresented groups, such as women and/or people of color, are most likely to feel a chilly climate in the classroom and across the institution overall. Further, a chilly climate may be exemplified through several different behaviors, such as sexist, racist, or derogatory marks about appearance and ability of individuals from a

certain group (Hall and Sandler, 1982; Johnson, 2012). This environment deters unrepresented groups from entering STEM, or in some cases has resulted in their near exclusion from these disciplines (Committee on Equal Opportunities in Science and Engineering, 2013).

A chilly climate has negative effects on students in STEM. First, the low numbers of underrepresented groups in STEM could send a message about ability to those students, as well as their White and male counterparts. Multiple research studies demonstrate that URM students report feelings of a hostile or chilly climate, which can cause them to feel as though they do not belong (Fries-Britt, Younger, & Hall, 2010; Hurtado et al., 1999). Students who experience this may be more likely to seek majors outside of STEM fields where they feel a sense of belonging and accepted (Good, Rattan, & Dweck, 2012; Morris & Daniel, 2008; Museus et al., 2011; Thoman, Arizaga, Smith, Story, & Soncuya, 2014). Consequently, a chilly climate can deter URM students from selecting STEM as a major, and can negatively influence persistence of students in these disciplines.

Stereotype Threat

Stereotype threat, which is closely related to a chilly climate, is another challenge for URM students in STEM. Steele (1988a; 1988b) originally developed the concept of stereotype threat theory through his research with Black and White students in higher education. He defined stereotype threat as a situational threat that can affect members of any group about which negative stereotypes exist. Stereotype threat occurs when individuals experience anxiety about the possibility of confirming negative stereotypes related to their group identities. Since Steele's initial work, there has been a plethora of research focused on the effects of stereotype threat, both in K-12 and higher education,

and within the context of STEM disciplines (e.g., Aronson, Quinn, & Spencer, 1998; Good, Aronson, & Inzlicht, 2003).

Prior research shows that stereotype threat negatively influences students' academic achievement and self-esteem (Nguyen & Ryan, 2008; Steele & Aronson, 1995; Inzlicht & Ben-Zeev, 2000). Additionally, stereotype threat can hinder the academic performance of racial minority students on academic tests (Good, et al., 2003). Brown (2004) affirms that stereotype threat plays a significant role in the academic achievement of URM students, and therefore it is imperative to focus on mitigating the cultural consequences of negative stereotypes. Further, stereotype threat is a key barrier that impedes the participation of URM students in STEM (e.g., Brown, 2004; Steele, 1999).

Within the context of affirmative action, some worry that students of color will be negatively affected by stereotype threat. Specifically, critics of affirmative action argue that race-conscious admissions policies could cause people to think that students of color were only admitted to higher education institutions because of their race, and not due to their academic performance, which continues to reinforce negative stereotypes about people of color and academic achievement. This issue may be exacerbated in certain colleges of engineering, which often have higher admissions standards than other colleges or departments across a university (e.g., the College of Engineering at Arizona State University).

Van Laar, Levin, & Sinclair (2008) examined the effect of perceived admission under affirmative action on academic performance to understand the effects of stereotype threat on Black and Latinx students in higher education. They found that perceptions of affirmative action admission negatively influenced achievement among Blacks and Latinx students who experienced high levels of stereotype threat, although, this negative

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effect was not observed among individuals with low levels of stereotype threat. They concluded that individuals are likely to experience stereotype threat for two main reasons: either concern for the self or concern for the group. Owens and Massey's (2011) research confirmed that stereotype threat contributes to academic achievement. They found that externalization, or expecting to be judged because of their race or skin color, plays a significant role in the academic achievement of minority students. However, internalization, or the process where individuals believe the stereotypes about them, proves to have an even larger negative effect on academic achievement. Though, their research also suggests a strong link between internalization and academic performance, suggesting that academic achievement, not stereotype threat, may be the cause for this relationship.

Some scholars argue that affirmative action can be used to help combat stereotype threat in higher education. First, affirmative action practices could help mitigate the negative effects of stereotype threat through acknowledgment that affirmative action policies are still meritocratic (Walton, Spencer, & Erman, 2013). Further, informed implementation of affirmative action policies can also aid in reducing stereotype threat by emphasizing the importance and purpose of these policies for all student groups (Schmader & Hall, 2014). Additionally, increasing the representation of students of color can help reduce and prevent stereotypes about minorities (Inzlicht & Ben-Zeev, 2000). Nonetheless, it is important to bear in mind the potential negative stereotypes that might result about individuals and/or groups because of affirmative action practices in colleges and universities.

Implicit Bias

Implicit bias is another challenging factor for underrepresented groups in STEM, especially within male-dominated fields (Hill, Corbett, & St. Rose, 2010). Explicit stereotypes and biases (as seen with a chilly climate and stereotype threat) are dynamics that people are deliberately conscious of; whereas, implicit stereotypes are subconscious and often hard to detect associations or beliefs (Greenwald, McGhee, & Schwartz, 1998). Implicit bias can be observed through association of concepts (e.g., gender or race) and evaluations (e.g., good, bad, etc.).

Multiple researchers have documented implicit bias, as it relates to STEM. Nosek et al. (2007) found that people are more likely to connect "male" with science and "female" with liberal arts. Other researchers have documented that men are generally more associated with success and capability in science than women, as shown in a study by Knobloch-Westerwick, Glynn, and Huge (2013). This gender bias is persistent across K-12 and higher education, which can depress the participation of women, and especially women of color, in STEM (CEOSE, 2004).

Racial implicit bias is also well-documented (Nosek et al., 2007), although comparatively less research has been done on implicit racial bias within STEM fields. However, there is a substantial literature base that has focused on the effects of implicit bias towards people of color in education (Warikoo, Sinclair, Fei, & Jacoby-Senghor, 2016). In a college lab setting, Dovidio, Kawakami, and Gaertner (2002) found evidence of implicit bias among White students with higher pro-White/anti-Black implicit associations. In their study, the researchers observed less interaction, or nonverbal unfriendliness (e.g., less eye contact and smiling) towards Black students in the classroom setting. Further, the Black students in their study picked up on these nonverbal

cues. Implicit bias can lead to poorer academic performance among underrepresented students of color (Mendoza-Denton, Downey, Purdie, Davis, & Pietrzak, 2002).

Through implicit attitudes, people engage in unconscious behaviors that can discourage others from participating in STEM. Likely due to increased attention on the negative effects of implicit bias in STEM, some more recent studies have suggested that people are actively attempting to ameliorate effects of implicit bias through corrective actions aimed at improving opportunities for underrepresented groups in STEM fields (Judson; Williams & Ceci, 2015). In spite of this, there is still a need to continue to examine the role of implicit bias in the underrepresentation of groups in STEM, especially for URM students.

Student Beliefs about Affirmative Action

Researchers have looked at both education and employment contexts when studying attitudes and beliefs regarding affirmative action policies and practices. A considerable amount of prior research has focused on understanding people's attitudes towards affirmative action policies in higher education (see Crosby et al., 2006). Scholars have identified several specific factors influence attitudes towards affirmative action (Aberson, 2007; Aberson & Haag, 2003; Crosby, 1994; Edley, 1996; Park, 2009; Plous, 1996; Sax & Arredondo, 1999). Demographic characteristics or group memberships have both been shown to be influential predictors of attitude towards affirmative action (e.g., Aberson, 2007). Additionally, other individual characteristics, including political orientation, self-interest, views on discrimination, and beliefs about merit and fairness have repeatedly been identified as significant factors that influence attitude towards affirmative action (e.g., Aberson & Haag, 2003; Park, 2009). Finally, research demonstrates that the type of program or policy (i.e., tiebreak versus a quota) being

considered also effects people's overall attitudes towards affirmative action (e.g., Kravitz & Klineberg, 2000).

Within this section, the discussion is focused specifically on a review of research related to attitudes and awareness of affirmative action policies and practices in higher education admissions. The first three sections align with three dimensions of the conceptual framework presented in Chapter One: *(a) demographic characteristics, (b) personal variables, and (c) beliefs/values relevant/specific to affirmative action.* The next section addresses how different presentations or perceptions of affirmative action practices in higher education admissions influences individual attitudes towards the policy. Finally, the last section addresses the consideration of socioeconomic status in admissions practices.

Demographic Characteristics

Researchers have found demographic and background characteristics to be reliable predictors of attitudes towards affirmative action. Within these studies, the major demographic characteristics examined are gender, race, age, and socioeconomic status.

Gender. Gender has consistently been found as a significant predictor of attitude towards affirmative action. In general, women are more supportive of affirmative action programs or policies than men (Aberson, 2007; Crosby et al., 2006; Kravitz et al., 1997; Park, 2009; Sax & Arredondo, 1999, Smith, 1998; Smith, 2006; Zamani-Gallaher, 2007); though a couple studies did not report any gender-based differences for support for affirmative action policies (Fletcher & Chalmers, 1991; Stoker, 1998). But, this may be due to the type of affirmative action program being studied, such as examining differences between affirmative action program types (Heilman, Battle, Keller, & Lee, 1998). Further, because of the high number of research studies where gender-based

patterns among support for affirmative action was observed, consideration of gender is an important factor to consider when examining attitude towards affirmative action programs and policies. Additionally, previous research did not focus specifically on gender-based differences in attitudes regarding affirmative action among STEM students.

Race. Race is also another compelling predictor of attitude towards affirmative action practices. Findings regarding race, as it relates to attitude towards affirmative action, were the same across nearly all studies (e.g., Aberson, 2007; Kravitz & Klineberg, 2000; Park, 2009; Sax & Arredondo, 1999, Smith, 1998; Smith, 2006; Zamani-Gallaher, 2007). In general, White people are the least supportive of affirmative action practices, in comparison to all other racial groups. As a group, Asian-Americans fall closely behind Whites in terms of lower levels of support for affirmative action initiatives. Latinas/os and Blacks are quite supportive of affirmative action programs, with Black people tending to be the most approving of affirmative action initiatives. Consistent with previous findings about gender, women in all racial groups tended to be more supportive of affirmative action than the men in their same racial group. In spite of these general trends, Sax & Arredondo (1999) found that within each racial group, many students had some level of ambivalence regarding attitude towards affirmative action. Further, as with gender, pervious research has not focused on examining attitudes towards affirmative action, by race, within STEM.

Age. Some of the studies that examined student attitudes towards affirmative action accounted for age in their analyses (e.g., Elizondo & Crosby, 2004; Zamani-Gallaher, 2007); whereas, many other researchers did not control for age (e.g., Aberson, 2007; Park, 2009). Elizondo and Crosby (2004) did not find that age was a significant predictor of attitude towards affirmative action. However, Zamani-Gallaher (2007)

observed that older African American and White students were more likely to be supportive of affirmative action practices in college admissions.

Socioeconomic status. While gender and race have been shown to be two influential predictors of attitude towards affirmative action, research indicates that socioeconomic status should also be considered. In general, students from a higher SES background tend to be less supportive of affirmative action programs, whereas students from low SES are more approving of affirmative action initiatives (Sax & Arredondo, 1999). Further, differences exist in support for affirmative action within SES levels by race. For instance, Sax & Arredondo (1999) found similar attitudes across White, Asian-American, and Mexican-American students from similar SES backgrounds; however African American students at all SES levels tended to have divergent attitudes towards affirmative action. Although, in one study, Park (2009) found that SES was non-significant after controlling for other demographic factors, such as gender and race. Ultimately, multiple demographic factors should be accounted for when examining individual attitudes towards affirmative action practices in higher education admissions.

Personal Variables

Several personal factors have also been identified as important predictors of attitudes towards affirmative action. Unlike demographic characteristics, which are more categorical, personal variables are either personal beliefs or experiences. The factors in this section include political orientation, self-interest, and personal experiences with discrimination and diversity.

Political orientation. Previous research demonstrates that political orientation likely plays an important role in affirmative action attitudes. Typically, those with liberal political beliefs are more likely to support affirmative action initiatives, while

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conservatives tend to oppose affirmative action (Aberson, 2007; Aberson & Haag, 2003; Kravitz & Klineberg, 2000; Park, 2009; Sax & Arredondo, 1999; Sidanius, Pratto, & Bobo, 1996). This trend also holds true for political parties, with Democrats being more likely to support affirmative action policies than Republicans (Stoker, 1998). Park (2009) found that students' political beliefs at the end of college was a more significant predictor of affirmative action policies than political attitudes upon entering college, though political orientation was significant at both time points.

Self-interest. Early work by Lawrence Bobo (e.g., Bobo & Kleugel, 1993; Bobo & Smith, 1994; Bobo, 1998; Bobo & Hutchings, 1996) demonstrated that self-interest is another factor that influences beliefs regarding affirmative action practices. Self-interest can be thought of at two separate levels: individual and group. Often the concern for individual self-interest can be observed through maintenance of group status or privilege. In this case, individuals may seek to advance their own self-interest through supporting the maintenance of policies or practices which benefit the group that they belong to, such as racial or gender groups.

Individuals or groups who have more to gain or lose from affirmative action policies will respond by either supporting or opposing the policy (Jacobson, 1985; Bobo & Kluegel, 1993). For example, students with higher levels of academic achievement are more likely to oppose affirmative action (Park, 2009) because they feel that the practice hurts their own chances for admissions. Conversely, students with lower levels of academic achievement may recognize the unequal distribution of educational opportunities at the K-12 level, and therefore feel that there is a need for ameliorative practices in terms of admissions practices for higher education institutions.

Further, this principle extends to the racial identity of applicants, since it is perceived that certain groups may receive more direct benefits from affirmative action practices (Liu, 2002; 2012). Much of the anti-affirmative action sentiment stems from people who believe that the policy hurts their chances for admissions to higher education (Donnor, 2016; Hughes, Thompson Dorsey, & Carillo, 2016; Moses, 2016). Within the context of self-interest, as observed in the demographic section above, URM students tend to be more supportive of affirmative action policies and practices (e.g., Park, 2009; Kravitz & Klineberg, 2000; Zamani-Gallaher). Though not explicitly stated, this could be due to self-interest.

Personal experience with discrimination. Personal experience with discrimination can also influence attitude towards affirmative action. Perceived discrimination and attitude towards affirmative action tends to vary by demographic group. In general, Whites who believe they have experienced discrimination are less likely to be supportive of affirmative action policies and practices (Kravitz et al., 2000; Aberson, 2007). Blacks and Latinxs who believe they have experienced discrimination are more likely to support affirmative action initiatives (Kravitz et al., 2000; Aberson, 2007). This is closely related to the idea of self-interest, as those who feel they did not receive admissions to higher education because of affirmative action will be less likely to support race-conscious admissions practices.

Diversity experiences. Limited research has focused on the role of student experiences with diversity as it relates to attitudes towards affirmative action. Despite this, it stands to reason that more experiences with diversity could influence beliefs about those from other racial groups, which could further extend to attitudes regarding affirmative action.

Aberson (2007) observed that students with more diversity experiences, such as exposure to information about other groups or a particular course/program focused on diversity or people of color, held more favorable attitudes towards affirmative action. This could be due to the fact that diversity experiences influence how people value of diversity, which likely effects attitude towards affirmative action. Therefore, accounting for student experiences with diversity is an important aspect to consider when examining attitudes towards affirmative action policies.

Institutional & Disciplinary Context

The majority of studies (e.g., Aberson, 2007; Aberson & Haag, 2003; Sax & Arredondo, 1999) did not control for institutional factors or student discipline in their examination of student attitudes regarding affirmative action admissions practices. Park (2009) accounted for multiple institutional factors in her study of attitudes towards affirmative action admissions policies, including institutional selectivity, region of the university/college, and type of institution (public or private) where the student was enrolled. She observed that higher institutional selectivity is negatively associated with wanting to abolish affirmative action. Institution type, in this case private, was not a significant predictor after controlling for other variables. She also accounted for disciplinary context by examining six categories of student majors/disciplines: realistic, social, conventional, enterprising, artistic, and scientific. In comparison to the reference group, scientific majors, she found that realistic, enterprising, and artistic majors were more likely to support abolishing affirmative action. Institutional factors might influence students' attitudes towards affirmative action admissions policies, and therefore, should be included in analysis.

Beliefs & Values Related to Affirmative Action

Affirmative action was originally established as an ameliorative policy aimed at remedying past discrimination. Despite the Supreme Court ruling in *Bakke* (1978)*,* which asserted that affirmative action could not be used to address historical wrongs, many people still associate the policy/practice with addressing discrimination. Therefore, beliefs about race and racial discrimination are highly associated with support of affirmative action practices in higher education admissions (Aberson, 2007; Jacobson, 1985). Another aspect which is related to attitude towards affirmative action is the extent to which individuals value diversity. Further, these beliefs about race also influence the way that people think about the role formal systems, such as higher education or government, have in addressing racial inequalities. Finally, the concepts of merit and fairness are closely connected to these ideas about race, as well as beliefs about affirmative action practices.

View on discrimination. Beliefs about prevalence of racial discrimination in the United States is a highly polarizing subject. Though a complicated issue, for the sake of simplicity, the discussion here is focused on two major groups: those who believe that racism is no longer a problem and those who do. People who do not think that racial discrimination is a current issue in society ascribe to post-racial ideology, which asserts that we have moved beyond issues of race (Cho, 2009). Bonilla-Silva (2010) critiques this post-racial ideology, and asserts that we have moved from overt discrimination to color-blind racism, which still perpetuates the oppression of people of color, but under the guise of color-blind or race neutral practices. So, though not expressed through explicit bias or prejudice, people may oppose race-based policies, such as affirmative action (Bonilla-Silva, 2010).

Belief in the prevalence or absence of racial discrimination is highly related to support of or opposition to affirmative action. Prior research shows that individuals who fall under the post-racial mindset are more likely to oppose affirmative action practices; whereas those who are race-conscious are more likely to support affirmative action initiatives (Aberson, 2007; Aberson & Haag, 2003; Park, 2009; Sax & Arredondo, 1999; Zamani-Gallaher, 2007).

Further, racial beliefs can greatly influence ideas about opportunity structure and life chances can be influenced by cultural or racial beliefs. Specifically, some people explain current racial inequalities through other justifications, rather than attributing them to discrimination. This aligns closely with Bonilla-Silva's (2010) concepts of naturalization and cultural racism, which is the idea that racial differences are justified by cultural differences, and not because of racism or oppression. Under a post-racial ideology, people do not believe that racial differences are because of structural barriers, but rather are from individual or cultural attributes, and therefore race-based policies are not necessary and are applied to those who are undeserving. Beliefs in cultural inferiority of people of color, or what is also termed cultural pathology, are strongly associated with opposition to affirmative action (Smith, 2006).

Value of diversity. Students' attitudes towards diversity are closely related to racial ideology. Several research studies have examined the relationship between students' beliefs about diversity and support of, or opposition to, affirmative action practices. Park (2009) found that students who have a strong commitment to promoting racial understanding were more likely to favor affirmative action policies. Aberson and Haag (2003) demonstrated that belief in the value of diversity was associated with support for affirmative action practices. Students who value diversity may be more likely

to favor affirmative action initiatives because they believe in the efficacy and outcomes of these practices, which is increasing the number of URM students on campus.

Role of higher education in diversity. The general public tends to advocate for egalitarian principles, but does not hold consistent beliefs how to achieve these goals (e.g., Tuch & Martin, 1997). Similarly, people hold varying attitudes about the ways in which government/systematic intervention, through formal policies, should intervene toward the goal of equity. Also, the public debates how much the state (or other systems, like higher education institutions) should formally work towards these goals, such as racial equity. For example, people with a post-racial mindset believe that the state should not consider race in their decision-making processes and it should not be incorporated into policies (Cho, 2009).

This general principle may extend to public higher education institutions, as they follow governmental policies and regulations. Within the context of their attitudes towards affirmative action, people may value diversity, but they may not believe that higher education institutions should promote and advance diversity through formalized admissions policies. Though their work was not related to higher education admissions policies, Kravitz and Klineberg (2000) found that people who support the role of the government in advancing diversity were more likely to support affirmative action policies in employment contexts. Previous studies on student attitudes towards affirmative action have not incorporated the role of higher education institutions in supporting or advancing diversity as a component that could influence beliefs. However, this should be accounted for as it could affect overall attitude towards affirmative action.

Beliefs about merit. At the heart of the affirmative action debate is the concept of merit. Meritocratic philosophy contends that people should be rewarded according to their own merit, which is often measured through talent and personal achievement (Lansford, 2011). Currently, the higher education admissions process is strikingly meritocratic, and evaluates student applications based on their performance in high school. Further, within the context of academic achievement, merit has been increasingly defined by performance on standardized test scores, such as the SAT and ACT (Fish, 2000; Karabel, 2005; Lemann, 1999; Zamudio, Russell, & Rios, 2011).

Those in favor of race-neutral admissions practices assert that schools should admit students primarily based on merit (Fish, 2000). Opponents of affirmative action advocate for merit as the primary way to determine who should be granted admission to higher education institutions, as this is the fairest way to decide who deserves to be there, since it is indicative of academic achievement (Alon & Tienda, 2007; Durlauf, 2008; Project on Fair Representation, 2012 & 2015). Individuals with a strong belief in merit tend to oppose affirmative action practices (Aberson, 2007; Aberson & Haag, 2003; Plous, 1996).

A key assumption of meritocracy is the notion that everyone starts off at an equal level and has the same advantages and opportunities (McNamee & Miller, 2009). But some people argue that meritocracy as a practice is inherently unfair and biased without accounting for race and/or class, given the persistent discrimination and racial inequalities in the United States. Under this framework, supporters of affirmative action assert that past and present discrimination should be accounted for when evaluating student applications for higher education admissions by considering race, in conjunction with merit (Donnor, 2016; Solórzano & Yosso, 2002; Zamudio et al., 2011). People with

less confidence in merit, or traditional measures of merit, tend to be more supportive of affirmative action initiatives (Aberson, 2007; Aberson & Haag, 2003; Plous, 1996).

Beliefs about fairness. One of the most popular arguments against affirmative action is that the practice is unfair. Many of the legal challenges to affirmative action assert that the practice resulted in unfair treatment of White students, whose race is held against them in the admissions process (e.g., *Regents of the University of California v. Bakke,* 1978; *Hopwood v. University of Texas,* 1996; *Grutter v. Bollinger,* 2003; *Fisher v. University of Texas at Austin*, 2016). This argument has been extended to Asian-American students in recent years (e.g., Students for Fair Admissions, 2017). The claim of unfairness is often accompanied with the term "reverse racism", where individuals are being discriminated against because of their race. Specifically, they argue that affirmative action discriminates against people who apply for admissions to higher education by giving preference to URM students (Consovoy et al., 2015).

The link between attitude towards affirmative action and belief about fairness is well grounded in the literature. Belief that affirmative action is unfair is highly associated with strong opposition to the policy (Aberson, 2007; Aberson & Haag, 2003; Kravitz, 1995; Kravitz & Klineberg, 2000). Individuals who believe that affirmative action as a practice is unfair tend to emphasize merit as the primary way that prospective students should be evaluated within the higher education admissions process.

Framing of Affirmative Action

Affirmative action policies in the United States have evolved through multiple iterations. For instance, when first established, a quota system was in place, where a certain number of spaces were reserved for students of color in particular academic programs. This practice was eliminated following the Supreme Court ruling in *Bakke*

(1978), which found quota programs unconstitutional. Following this ruling, higher education institutions continued to use affirmative action practices but with a narrower use of race. The current legal use of affirmative action falls under a holistic review process, where race is considered as one factor, among many, in the admissions evaluation process.

Despite the formal policies of affirmative action, many people have their own conceptions of what affirmative action practices are and how they are implemented. One common idea about affirmative action is a tiebreak policy, which is where two equally qualified candidates are being evaluated for a spot in admissions (or for a job) and the deciding factor is race, which is usually in favor of the minority. Diversity initiatives or scholarships can also be perceived as affirmative action programs. Finally, affirmative action can also be thought of as the practice of race-conscious admissions practices in evaluating candidates. Researchers have studied student perceptions about different forms of affirmative action.

Kravitz and Klineberg (2000) examined attitudes towards two forms of affirmative action between racial groups. The first form of affirmative action was described as "typical" as construed by the respondents, and the other was a tiebreak policy. The authors found that Whites preferred a tiebreak policy, whereas Blacks and Latinxs were more in favor of a typical affirmative action policy (Kravitz & Klineberg, 2000). The results from this study indicated that there is ambivalence among respondents about how they conceive and understand affirmative action policies.

Other research has been conducted to better understand students' framing of other diversity initiatives. For instance, Smith (2006) examined race-targeted programs, on campus, such as special scholarships or financial aid, targeted admissions programs,

special support programs or facilities, and curriculum diversity issues (such as women's or ethnic studies courses). Similar to previous research, he found that race was the greatest predictor of support for race-targeted programs and curriculum initiatives. Within this study, he observed that there was variability in support of different initiatives. For example, White students are more supportive of targeted initiatives that provide aid or opportunity enhancing programs, for minority students such as scholarships or academic support services, rather than race-conscious admissions practices. This finding is consistent with previous research that demonstrates White people are more likely to support affirmative action if it is framed in terms of outreach or training, rather than targeted admissions programs, such as quotas or preferential treatment (see Bobo & Kluegel, 1993; Bobo & Smith, 1994; Kravitz, 1995).

Haley and Sidanius (2009) also studied how different groups framed or think about affirmative action. Consistent with general racial attitudes towards affirmative action, they found that people in minority groups are more likely to frame affirmative action in positive terms, whereas White people are more likely to cast affirmative action in a negative light. The authors also studied reactions to affirmative action depending on how it was framed (such as a tiebreak or quota). Though previous research demonstrated that racial differences corresponded with support of different policy types, Haley and Sidanius (2009) found agreement across all racial groups about which frames made affirmative action "look good" or not. Specifically, quota practices are viewed in a negative light, whereas programs that do not employ preferential treatment are viewed more positively (Haley & Sidanius, 2009).

In general, research shows that different forms of affirmative action are perceived differently and have various levels of support from students or individuals, by race. These

studies show that the way people think about affirmative action will influence their support of the policy or program. Therefore, knowledge and awareness of affirmative action practices should be accounted for when examining attitudes towards affirmative action. Though, to date, few researchers have studied how people understand current affirmative action practices, and specifically what the policy looks like in practice (Crosby et al., 2006; Park, 2009).

Consideration of Class

Some opponents to traditional affirmative action programs argue that race-conscious admissions practices should not be utilized in higher education, and instead advocate for the use of class-based affirmative action or admissions programs that provide preferential treatment based on socioeconomic status. Post-racialists argue that the use of race-based programs or policies obscure a more fundamental problem, which is inequalities based on class (Cho, 2009; Darder & Torres, 2004). Further, they state that the continued focus on race and equity is distracting from solutions where class is concerned. Therefore, an emphasis on the consideration of class-based admissions strategies has become more popular in recent years.

Kovacs, Truxillo, Bauer, and Bodner (2013) found that women are more likely to support traditional affirmative action programs, whereas men favor alternative, class-based affirmative action practices. However, they also found that any statement of diversity-based practices (gender, race, or class) on job applications were deemed more unfair than those without diversity statements. Ultimately, little research has been done on actual perceptions of SES-based admissions plans despite the popularity in these policies (Kovacs, Truxillo, Bauer, & Bodner, 2013). Research shows that race-based affirmative action programs yield a more racially diverse student body (Reardon, Baker,

Kasman, Klasik, & Townsend, 2015). Further, given the more common use of race-based affirmative action policies, this study focuses on attitudes towards race-conscious admissions practices in higher education.

Conclusion

Just as there are varied attitudes among policymakers and the general public (Moses, 2016), research shows that students are also very divided on their feelings and attitudes towards affirmative action (see Aberson, 2007; Aberson & Haag, 2003; Crosby et al., 2006; Park, 2009; Sax & Arredondo, 1999). Further, the literature also demonstrates that multiple factors play a critical role in shaping student attitudes towards affirmative action. Demographic characteristics, including race, gender, and SES, are significant predictors related to student attitudes towards affirmative action. Other beliefs that influence attitudes towards affirmative action include political and racial ideologies and ideas about merit and fairness. Further the way in which affirmative action is framed or the type of affirmative action initiative being presented can influence whether or not people support or oppose to the policy/practice.

Considerably less research has been focused on examining individuals' awareness of affirmative action (Crosby et al., 2006). Nearly all of the previous studies did not assess knowledge of affirmative action, but just attitudes towards the targeted program. Yet if people have misconceptions about current affirmative action admissions policies in higher education, such as incorrectly believing tiebreak policies are still in effect, this could unduly influence their attitudes towards the programs. Previous researchers acknowledge this gap (Park, 2009) and have encouraged future research to examine the levels of awareness among students about different types of admissions policies, as students may have misconceptions about affirmative action practices (Sax & Arredondo,

1999). This study will assess student attitudes, while also measuring knowledge of current affirmative action practices in colleges and universities, which can provide useful information to campus administrators and policymakers.

Hardly any of the research studies examined possible variations in attitudes towards affirmative action among students by major. Park (2009) categorized majors into six groups (realistic, social, conventional, enterprising, artistic, and scientific) based on Holland's (1985) typology. Her analysis found that realistic, enterprising, and artistic majors were more likely to oppose affirmative action than those in scientific majors. Although most of the previous research did not focus on student majors, and even more specifically, none of the current research studies have examined affirmative action attitudes within STEM disciplines, let alone engineering. Umbach and Milem (2004) found evidence to support that different major environments influence students' attitudes towards diversity. Therefore, research should be conducted to better understand student beliefs about affirmative action within those specific academic disciplines where students of color are most absent.

This study will add to existing literature by specifically examining students' attitudes regarding access, fairness, and equity of affirmative action admissions practices. Understanding student attitudes towards and knowledge of affirmative action practices can provide important insight for researchers, policy makers, and campus administrators regarding this highly contested education policy, which can influence campus environments and students' experiences.

CHAPTER 3

METHODS

The purpose of this study was to examine undergraduate students' knowledge of

and attitudes towards affirmative action admissions policies and practices in higher

education. This study draws from previous research studies (Aberson, 2007; Kravitz and

Klineberg, 2000; Park, 2009; Sax and Arredondo, 1999) to inform the conceptual

framework, survey design, and research methods. Based on the conceptual framework

outlined in Chapter One, the Student Attitudes Towards Admissions Policies Survey

(SATAPS) was designed to assess students' attitudes regarding, and knowledge of,

affirmative action practices in higher education admissions. The survey was administered

to undergraduate engineering and education students. Data were analyzed using

confirmatory factor analysis, descriptive statistics, and hierarchical regression analysis. In

this chapter, I describe the survey design, the SATAPS instrument, sampling strategy,

and data analysis methods.

Survey Design

The SATAPS was designed to assess students' attitudes towards affirmative

action admissions policies in higher education. The conceptual framework, presented in

Chapter One, yielded the SATAPS taxonomy. In this section, I first provide the SATAPS

taxonomy and then discuss previous relevant survey instruments that helped inform the

design of the final SATAPS instrument.

SATAPS Taxonomy

The conceptual framework for this study consists of six dimensions. The first five

dimensions: (a) demographic characteristics, (b) personal variables, (c) institutional

context, (d) knowledge of affirmative action, and (5) beliefs and values relevant/specific

to affirmative action all influence the final dimension, (f) attitude towards affirmative action policies and practices. The conceptual model (refer to Figure 1) was used to develop the SATAPS taxonomy (table 3).

The SATAPS taxonomy shows the major survey components, which were utilized to develop the final instrument. The full details of the instrument are presented in the following section.

Table 3

SATAPS Taxonomy
1.0 Demographic Characteristics
      1.1 Age
      1.2 Gender
      1.3 Race
      1.4 SES
2.0 Personal Variables
      2.1 Political orientation
      2.2 Self-interest
      2.3 Experience with discrimination
      2.4 Diversity experiences
3.0 Institutional Context
4.0 Knowledge of Affirmative Action Admissions Practices
      4.1 Knowledge of Policies
            4.1.1   Affirmative action perception
            4.1.2   Affirmative action knowledge items
            4.1.3   Other knowledge items
5.0 Beliefs and Values
      5.1 Relevant to Affirmative Action
            5.1.1   View on discrimination
            5.1.2   Value of diversity
            5.1.3   Role of higher education
      5.2 Specific to Affirmative Action
            5.2.1   Fairness
            5.2.2   Merit
6.0 Attitude Towards Affirmative Action Policies and Practices
      6.1 Support or opposition of different affirmative action programs (legacy, SES, URM students)
      6.2 Support or opposition of affirmative action practices for URM students
      6.3 Belief that higher education institutions benefit from admitting URM students through affirmative action

Previous Studies

Michigan Student Study. The University of Michigan developed a longitudinal, mixed-methods research program in 1990 to assess student attitudes regarding diversity, campus initiatives towards diversity, and students' beliefs regarding race and opportunity structure in the United States (Matlock, Wade-Golden, and Gurin, 2015). The Michigan Student Study (MSS) utilized comprehensive survey instruments to measure these factors over students' enrollment in and after they graduated from the university.

The MSS surveys were developed within the context of an institutional study on the impact of diversity on college students. The surveys underwent considerable revisions, development, and validation. The findings from the MSS have been presented at over 150 different forums, including national conferences (Matlock et al., 2015). Further, research by Aberson (2007) utilized this study to specifically examine students' attitudes towards affirmative action.

Based on the strong development and previous use of this survey in other research studies, I utilized several items from the MSS (Matlock et al., 2015) in the development of the SATAPS, especially items relating to beliefs about diversity and use of affirmative action practices in higher education admissions. I adapted eight items from the MSS to measure beliefs relevant to affirmative action. To assist with measuring SES, I modified an additional question from the MSS regarding family education level.

Aberson and Haag Study. Aberson and Haag (2003) conducted a study that measured attitudes and beliefs about affirmative action in the workplace and hiring practices. They developed a survey instrument that contained a series of items that measured belief in merit, fairness, and value of diversity. In a confirmatory factor analysis, they found valid measures of each subscale: fairness (4 items, $\alpha = .90$), belief in

merit (3 items, α = .76), and value of diversity (4 items, α = .78). For the SATAPS

instrument, I adapted the fairness, merit, and value of diversity items to address these

three constructs within the context of higher education affirmative action practices.

SATAPS Pilot

The SATAPS instrument was piloted with a group of undergraduate students

enrolled in a section of Physics I at Arizona State University. This group was selected for

the pilot survey because the students in this course are similar to the primary sample of

interest: undergraduate engineering students. The professor invited students to participate

in the pilot study via email. Students were informed that this was a pilot study and the

primary purpose of their participation was to share feedback and information on the

overall design and clarity of the instrument, but that their responses were anonymous and

would not be included in any formal analyses. As an incentive for participation, the

professor informed students that one participant would be randomly selected to receive a

$25 Amazon gift card. A total of 55 students were enrolled in the course, and 19

completed the pilot survey.

The pilot survey was administered via Qualtrics. Each page of the survey included

an open-ended text box where students had the option to write any comments or

questions about the items on that page. The last page of the pilot survey invited

respondents to indicate if they were uncomfortable answering any items on the survey,

and if so, which ones, and leave any final comments for the research team to consider

regarding the SATAPS instrument. I utilized the feedback from the pilot to clarify item

language and revise the instrument before the final administration.

SATAPS Instrument

SATAPS was designed to assess undergraduate students' knowledge of and attitudes towards admissions practices in higher education institutions. The SATAPS instrument focused particularly on race-conscious or affirmative action admissions practices in place at four-year higher education institutions in the United States. The survey supports two main goals: (a) to assess students' knowledge of current admissions practices in higher education and (b) to measure and evaluate students' attitudes towards affirmative action.

As discussed in Chapter One, the survey was designed with a conceptual framework (refer to Figure 1) where attitude towards affirmative action is influenced by five dimensions, including *demographic characteristics, personal variables, institutional context, knowledge of affirmative action and admissions policies, and beliefs and values relevant/specific to affirmative action*.

The SATAPS has multiple sections, each aligned with dimensions from the conceptual framework. See Appendix A for a full draft of the SATAPS instrument. In the following, I provide a description of each survey section, including items and layout.

Context and Basic Academic Information

The items in this section address college enrollment and other relevant details of participants, particularly intuitional context. This information was used to determine the institutional and discipline specific contexts for individuals, and was matched to a database of information about each college/university in my sample, including if it is public/private and the acceptance rate for each university. Additionally, this information was utilized to determine the proportion of respondents from each college.

The first item asked respondents to report the state where they graduated from high school. Respondents were also asked to select the state they are currently attending college. The next item prompted respondents to report the colleges they are currently attending by selecting the name of their universities from a drop-down menu. Students were also asked to indicate their current classification in college: freshman/first-year, sophomore, junior, senior, graduate student, or unclassified. Respondents reported their current college GPA, selecting from a range of preset values in .5 increments from less than 1.5 through 4.0. Next, students selected their current majors from a drop-down menu with 20 choices, including engineering and education. If students selected engineering from this list, they were then presented with a sub-question that asked them to report their specific engineering discipline. Since the main group of interest for this study was engineering, this question was important in potential future analyses investigating differences between specific engineering disciplines.

Demographic Characteristics

The first four questions in this section prompted students to indicate their gender, age, ethnicity, and race. Each of these items included preset choices for respondents to select. For the gender question, students were presented with multiple options that were meant to be inclusive of multiple gender identities, including transgender and gender non-conforming. Students reported their age in a text box. The ethnicity and race questions followed standards from the U.S. Census Bureau (2017). The final question asked respondents to indicate which country or countries they have citizenship in from a drop-down list.

SES is typically measured through proxy or indicator variables, including educational achievement level or income (American Psychological Association, 2018;

Cowan et al., 2012). Measuring parental income can be difficult with college students, as they might not know how much money their parents make. However, most students do know the education details for their parents. Though not a perfect measure, the Pell Grant serves as a common indicator for low-income students that is widely used in education research (Delisle, 2017).

The survey included three questions to serve as a proxy for SES: one related to family education level and one related to financial aid. The family education level question asked students to indicate the highest level of education completed (ranging from 1-8 years through Doctorate degrees) for their mother/guardian, father/guardian, and their sibling with the highest level of education. This item was used as a distal measure of SES (American Psychological Association, 2018). The next item asked if they received a Pell grant at the college/university where they are attending.

Personal Variables

Respondents then advanced to the personal variables section to measure political orientation, self-interest, experiences with discrimination, and experiences with diversity.

Political orientation. Students' political ideology was assessed via two items. The first item asked respondents to indicate their political views on a 7-point Likert scale from *extremely liberal* to *extremely conservative*, with an option to state that they have not thought much about their political beliefs. The next item asked respondents to select the political party they identify most with from a list of Democrat, Independent, Republican, or Other.

Self-interest. As previously discussed, self-interest relates to students' perceptions of whether or not affirmative action hurt or helped their chances of being admitted to a college/university. Previous researchers used high school achievement data

as an indicator of self-interest (e.g., Park, 2009). On the SATAPS, three items were used to measure self-interest. The first of these three questions asked students to report their high school GPA. The choices for high school GPA followed the same set of options that was used for the college GPA question. Next, students self-reported their SAT and/or ACT scores from a preset scale in 200 point increments. Students had the option to select from the "old" or "new" version of the SAT and/or the ACT. Scores for each of these were compressed into 7 categories from which students could select. Finally, students were asked if they were admitted to their first choice of university and academic college, with an option to indicate yes or no.

Personal experience with discrimination. Three items were included to determine respondents' personal experience with discrimination. The first question asked students to report if they believe they have faced discrimination or hostility based on their: gender, race/ethnicity, religion, and sexual orientation. Students responded to this question on a 4-point Likert scale ranging from strongly disagree to strongly agree for each characteristic.

The next two items addressed discrimination in higher education. The first of these questions asked respondents to indicate if they believe they experienced discrimination while applying to or during their time in college. Respondents answered this on a 4-point Likert scale from *strongly disagree* to *strongly agree*. Next, students reported on the role of affirmative action in their pursuit of higher education. They indicated whether they thought that affirmative action hurt, helped, or had no effect on their pursuit of college (with an option of don't know).

Diversity experiences. The next two items assessed students' experiences with diversity. The first question asked students to indicate the racial/ethnic composition of

three places: the neighborhoods where they grew up, the high schools they graduated from, and their friends at university. Students rated the ethnic composition of these settings on a 4-point Likert scale from *all or nearly all people of color* to *all or nearly all white*. The second item prompted students to report how much interaction they have with students of different racial or ethnic groups on campus. For each racial group, which is the same list from the demographics section, students reported their interactions on a 4-point Likert scale from *no interaction* to *substantial interaction*.

Knowledge of Affirmative Action

The knowledge portion measured students' knowledge of affirmative action policies and general admissions practices in higher education. First, respondents were prompted to select the option that most closely describes current affirmative action practices in higher education admissions from a list of three statements. Each of these statements described common ideas about how higher education institutions implement affirmative action policies in their admissions process, including tiebreak policies, quotas, and the holistic review process.

Next, students advanced to a subsection where they were presented with a working definition of affirmative action: "Affirmative action is the process where universities consider race as one of many factors when evaluating an applicant for admissions." The first item in this section asked students to self-report how informed they are on affirmative action practices in higher education. Students responded on a 4-point Likert scale from very uninformed to very informed. The next question asked respondents to select the most recent Supreme Court ruling about affirmative action from the following choices: *Grutter v. Bollinger, Fisher v. UT Austin, Students for Fair Admission v. Harvard University*, and don't know. Another item asked students if all

public universities are allowed to utilize affirmative action practices, with an option of responding yes, no, or don't know. The last two items focused on a more recent development of admissions policies in higher education: percent plans. The first of these items asked students if percent plans are a form of admissions practices. The second asked students if the state where they graduated from high school utilized percent plans, with an option to select true, false, or don't know.

Beliefs and Values Relevant/Specific to Affirmative Action

The next portion of the survey addressed beliefs and values relevant/specific to affirmative action, which map onto the five factors from the conceptual model. The first three are beliefs and values relevant to affirmative action: *(a) view on discrimination, (b) value of diversity,* and *(c) the role of higher education*; the next two factors are beliefs specific to affirmative action: *(d) fairness* and *(e) merit*. At the beginning of this part students were again provided the same working definition of affirmative action from earlier in the survey. For all the items in this section, participants were asked to think about and report their levels of agreement with each of the six statements on a four-point Likert scale from *strongly disagree* to *strongly agree*.

View on discrimination. In this first part, respondents were presented with six statements which assess their views about racial discrimination in the United States. Two of the items were worded in a way to reflect a race-conscious view on racial discrimination. The other four items reflected the idea that the United States is a post-racial society where racial discrimination is no longer a problem. These six items were used to create a composite score for *view on discrimination*.

Value of diversity. The next subset of questions asked respondents to indicate their levels of agreement with five statements about the value of diversity. The first item

addressed the value of interacting with people of other ethnicities. The next four items specifically focused on the value of diversity within the context of higher education. These items addressed the unique skills and experiences that URM students can bring to a college campus or the idea that a diverse student body enhances education of all students and prepares them for a multicultural society. One of these items is associated with a negative view of diversity, by stating that emphasizing diversity contributes to disunity on campus. These five items were utilized to create a composite score to measure respondents' overall *value of diversity.*

Role of higher education in promoting diversity. This subsection was comprised of seven questions that measured students' belief whether higher education institutions should promote diversity or not. Two of these items addressed the topic of incorporating racially diverse components into the core curriculum of higher education. The next two questions asked respondents about providing resources to minority students to attend college. Another asked about if universities should be responsible for enhancing students' abilities to live in a multicultural society. The next question asked students if higher education institutions should bear the responsibility to correct racial injustice. The last three questions focused on if higher education institutions should aggressively recruit more students of color. Altogether, these seven items were utilized to create a composite variable to measure belief in the *role of higher education.*

Fairness and Merit. The fairness and merit sections focused on measuring beliefs specific to attitudes towards affirmative action. Three items assessed if respondents believe affirmative action practices are fair or not. In particular, these questions assessed if groups of students receive fair chances for being evaluated for admissions to colleges/universities under affirmative action practices. Two questions

evaluated perceived consequences of affirmative action for White and Asian-American students, and the third question asked if URM students receive an unfair advantage due to affirmative action policies.

Three items measured belief in merit, as it relates to higher education admissions. Two of the items focused solely on the function of merit in higher education admissions. The other item addressed the role of race, in conjunction with merit, as a means of evaluating prospective students. As with the previous beliefs/values components, factor variables were created for both *fairness* and *merit.*

Attitudes towards Affirmative Action Practices

The final part of the survey assessed attitudes towards affirmative action and was comprised of seven items. The first three items asked respondents to rate their level of support for consideration of legacy, economically disadvantaged, and underrepresented minorities in the admissions process on a 4-point Likert scale from *strongly oppose* to *strongly support*, with an option to state that they have no opinion. The next two items prompted students to state their level of agreement on a 4-point Likert scale. The first of these items asked students if affirmative action practices should be utilized in higher education. The second item addressed whether colleges and universities benefit from admitting racially diverse students through affirmative action. The three items that directly addressed URM, racially diverse students, and affirmative action benefiting higher education were used to create a factor variable called *support for affirmative action*, which was the dependent variable of interest in this study. The survey ended with two open-ended questions, which were optional, prompting students to write about their thoughts and opinions regarding affirmative action.

Sampling Strategy

The target sample group for this study was undergraduate students enrolled in four year institutions in the United States. The primary group of interest was engineering students. Education students were also surveyed and used as a comparison group.[8]

The primary sample for this study was drawn from the 50 largest colleges of engineering by enrollment at four year institutions in the United States. The list of target universities was identified through an annual report released by the American Society for Engineering Education (Yoder, 2016). Only those universities that had both colleges of education and engineering were included in the sample. Forty-four universities from this list also have colleges of education. Two universities were excluded due to IRB procedures. The final sample was comprised of 84 colleges evenly divided between engineering and education at 42 institutions. Of these, 39 are public and 4 are private. Nine are located in the Midwest, 5 in the Northeast, 15 in the South, and 13 in the West. The selectivity of the institutions ranged between 5 to 87%.[9] See Appendix B for a list of universities for the sample in this study.

Student participation was recruited through faculty. A distribution list was created by extracting publicly available email addresses of faculty members from the engineering and education colleges included in the study. Then, to recruit the students, I sent emails to faculty members from each college about the survey. The email detailed information

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[8] Education and engineering are very different disciplines, and therefore are suitable for comparison. First, the demographic make-ups of engineering and education are quite different (McFarland et al., 2017). Engineering disciplines have higher percentages of male students, in comparison to education, which has high percentages of female students. Additionally, engineering tends to have higher proportions of White and Asian-American students than education. Finally, education is generally thought of as having a more welcoming environment than engineering colleges and disciplines.

[9] Acceptance rates utilized in this study are for the entire university/institution (not for specific colleges/departments). Fall 2016 figures were extracted from U.S. News & World Report Best Rankings (2018).

about the purpose of the study and the survey. Additionally, the message included a script that the faculty could use to share the survey with their students via email. Students received information about the survey electronically. They were provided with a short message about the purpose of the study and a link to complete the survey. In compliance with IRB, the first page of the survey included detailed information about the purpose of the study and consent, as well as the contact information for the supervising faculty and IRB at ASU. See Appendix C for these recruitment materials.

To incentivize participation, three students were randomly selected to receive a $100 Amazon gift card. To submit their names for the gift card drawing, students were given a separate link at the end of the survey where they entered their contact information. This separate survey maintained anonymity from the responses students entered on SATAPS. At the close of the survey, three randomly selected respondents received the gift card via email.

Data Analysis

Data analysis followed a multi-step approach. Data were first screened for missing data and multivariate outliers. Then, a confirmatory factor analysis was conducted to determine the relationships between the survey items and the latent variables in the data. Following the factor analysis, I conducted a descriptive statistical analysis to examine students' (a) knowledge of affirmative action and (b) the relationship between demographic characteristics and the other parts of the conceptual framework to assess for trends in beliefs and values related/specific to affirmative action and attitude towards affirmative action. Finally, a hierarchical regression was utilized to assess the relationship between the dependent variable of interest (attitude towards affirmative action) and the independent variables, which were drawn from the conceptual model:

demographic characteristics, personal variables, institutional context, knowledge of affirmative action, and *beliefs and values relevant/specific to affirmative action*. With the exception of the factor analysis, all data cleaning, descriptives, and regression analyses was conducted in SPSS (IBM, 2016).

Data Cleaning Procedures

In total 3,141 participants responded to the survey. All students who were not undergraduate education or ECS students were removed from the pool. Next, all cases with more than 25% missing data on the variables included in the regression model were removed from the pool of respondents. This left 1,799 valid cases.

Missing data were handled through two approaches. For demographic characteristics, personal variables (with the exception of racial experiences variables), institutional context, and knowledge of affirmative action variables, missing data were accounted for using dummy coding; blank items were coded as 0. Different procedures were followed for the remaining variables: diversity experience items (n=7), beliefs relevant/specific to affirmative action variables (n=26), and items related to support of affirmative action (n=3). First, they were assessed for patterns in missing data. Utilizing the missing values analysis in SPSS, separate variance tests were conducted; analysis indicated that the data were missing at random ($p < .05$). Next, to address the missing values, an expectation-maximization (E-M) algorithm was utilized. The E-M algorithm is an iterative method that replaces missing values using data from other variables to impute an estimate (expectation) for a case while also checking if that estimate is most likely (maximization) (Cohen, Cohen, Aiken, & West, 2003). This process repeats until the most likely value is imputed. The E-M method is appropriate for sample sizes greater than 200 (Cohen et al., 2003).

The final sample was assessed for multivariate outliers. With the final regression model, leverage, discrepancy, and influence statistics were examined. Cases with both high leverage (>0.03) and global influence ($\pm$0.25) were removed from analysis. In total, 29 cases were identified as outliers and removed from the sample. The final sample was comprised of 1,770 cases.

Factor Analysis

Since I already had theoretical underpinnings and hypothesized ideas about which items are associated with each factor, I utilized a confirmatory factor analysis (CFA) (Thompson, 2004). The CFA was used to test the conceptual model proposed in Chapter 1. The factor analysis was conducted to examine the loading of the relationships of the factors and identify the latent variables in the data. This was used to evaluate the extent to which the latent variables in the data aligned to the conceptual model for the study. This form of analysis provides the ability to determine the degree to which the proposed model is consistent with the observed data points collected from the final sample. A CFA allows researchers to build constructs for latent variables, and get a more precise measurement of each of the factors. Further, a CFA was utilized by researchers in multiple studies that examined student attitudes towards affirmative action (e.g., Aberson and Haag, 2003; Sidanius et al., 1996).

In the CFA, items were specified to load onto one particular factor (see Table 4 and survey outline in Appendix A for a detailed list of these items). These items were then utilized to create a composite score for each construct/factor. I expected to have 7 factors in total. The CFA was conducted via MPlus Software version 9.1 (Muthén & Muthén, 2017). A maximum likelihood estimation with robust standard errors was

utilized, which is robust to issues of non-normality, non-independence, and complex data samples Muthén & Muthén, 2017).

Table 4

CFA Planning

Factor Name	Number of Items	Part of Conceptual Model
Diversity experiences	8	Personal variables
View on discrimination	6	Beliefs relevant to affirmative action
Value of diversity	5	Beliefs relevant to affirmative action
Role of higher education	7	Beliefs relevant to affirmative action
Fairness	3	Beliefs specific to affirmative action
Merit	3	Beliefs specific to affirmative action
Support for affirmative action	3	Attitude towards affirmative action

Descriptive Statistics

In the next stage of analysis, I conducted descriptive statistical analysis to examine general trends in the data and to assess for any demographic differences in the various constructs and attitudes towards affirmative action. This part of the analysis aligns with the first two research questions:

1. To what extent are undergraduate ECS students aware of or knowledgeable about admissions policies and practices in higher education?

2. What are the attitudes of undergraduate ECS students towards race-conscious admissions practices?

First, descriptive statistics were utilized to characterize and examine the data for general trends. Frequency counts were calculated for demographic characteristics, such as gender, race, SES, and context to better understand the percentages of each group among the respondents. Cross-tabulations were also conducted to assess for trends among demographic groups. In this stage, the factor variables created from the CFA were utilized to assess for group differences, specifically, gender, race, and major.

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Hierarchical Regression Analysis

The main part of my analysis was a hierarchical regression to predict students' attitudes towards affirmative action. Regression analysis is a commonly used technique that allows researchers to examine the relationship between an outcome (e.g., attitude towards affirmative action) with a set of predictor variables (e.g., demographic characteristics and beliefs relevant to affirmative action). The use of a hierarchical regression allowed me to estimate the effects of different characteristics and variables on attitudes towards affirmative action (Aberson and Haag, 2003; Elizondo & Crosby, 2004; Park, 2009). Independent variables were entered in seven blocks, which included demographic characteristics, personal variables, institutional context, knowledge of affirmative action, beliefs and values relevant/specific to affirmative action, student major, and interaction terms. This analysis addressed the final research question:

3. To what degree do undergraduate ECS students' characteristics, institutional context, and beliefs related to affirmative action affect their attitudes towards race-conscious admissions policies/practices?

The dependent variable of interest is attitude towards affirmative action. This is measured through a composite variable, calculated from the CFA, of three individual items that measured support of affirmative action from the final SATPAS section. Higher scores on the composite variable indicated higher levels of support for affirmative action.

The first block included demographic characteristics. Age was entered as a continuous variable, as reported by respondents. Gender was entered as a dummy variable coded for female (this included female and transgender female). Race was coded as a binary variable of URM status or not. Racial groups included as URM were Black, Latino/a, Native American, and multiracial. The reference group in the analysis was

White and Asian/Asian-American students (combined). Finally, SES was controlled for through the variable of Mother's education level. This was entered into analysis in the form of a dummy variable, for mother's education level at or above a bachelor's degree. The other family education level variables were not included due to high multicollinearity.

The second block was comprised of personal variables. Political orientation was entered into the regression with a dummy variable for liberal, which was computed utilizing the self-reported political scale item. Self-interest was measured by a set of variables indicating low, medium and high achievement in high school calculated from a composite variable of SAT or ACT score and high school GPA that was used to divide the sample into three equal groups. The reference group for the regression was low high school achievement. Next, experience with discrimination was entered into the regression as a dummy variable for those who reported experiencing discrimination based on any of the four categories from SATAPS (gender, race/ethnicity, religion, sexual orientation). The last part of the personal characteristics dimension was diversity experiences. A composite variable was created with eight items from SATAPS (three related to racial composition of different places and five Likert-scale items related to level of interaction with different racial groups). This composite variable was then divided into three groups (low, medium, and high) – the reference group for the regression was those categorized as the low level of diversity experiences.

The third block of the regression included knowledge of affirmative action. Three variables were entered here. First, perception of affirmative action was entered, as dummy variables of tiebreak or quota perceptions (compared to those who thought affirmative action was a holistic review). Next, a knowledge score was computed using

two items that directly knowledge of affirmative action – higher scores meant greater knowledge of affirmative action. Finally, the self-rated informed variable was entered, where higher values indicating that the respondent thought they were more informed.

The fourth block of the regression included variables related to institutional context. These variables were entered based on the university that respondents reported as attending in their survey responses. A dummy variable for public college/university status was created (reference group was private college/university). Next, dummy variables for region were created for South, West, and Midwest (with Northeast as reference group). Finally, to measure selectivity of the institution, the undergraduate acceptance rate for each institution (as reported by U.S. News & World Reports for the Fall 2016 class) was grouped into low, medium, or high selectivity levels. Dummy variables were computed for these and medium and high selectivity levels were entered into the regression, with low selectivity as the reference group. Year in school variables were also included here, with freshman/first-year as the reference group.

The fifth block of the regression was comprised of the beliefs relevant/specific to affirmative action. In this stage, the factor scores computed from the CFA were entered into the regression for each of the five variables in this dimension: *view on discrimination, value of diversity, role of higher education*, *merit*, and *fairness*. The factor scores were computed by average the values for each of the items related to the constructs. Within the regression these variables were also mean-centered for ease of interpretation, and to reduce potential for multicollinearity with the interaction terms entered in the seventh step.

In the sixth block, student major was entered to assess for differences between academic disciplines. A dummy variable was created for ECS students (education as the

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reference group) and was entered into the final step of the regression. Two other variables were entered in this stage: an interaction term for female and ECS students, and the other for URM and ECS students.

Moderation between multiple variables was tested in the last block of the regression. Moderation was checked for by creating interaction terms with centered variables to prevent multicollinearity issues (Cohen, et al., 2003). In this stage, I focused on moderation of two demographic variables (gender and race) and two of the *beliefs and values relevant/specific to affirmative action* variables. In particular, interaction terms between female and URM and the *view on discrimination* and *value of diversity* variables (four interaction terms total). Additionally, I also checked for possible moderation between the *view on discrimination* and *role of higher education* variables and *merit* and *fairness* (with four interaction terms entered into this stage of the regression). A total of eight interaction terms were entered into the final stage of the regression.

The hierarchical regression analysis controlled for demographic factors, while also assessing the importance of the different factors from my conceptual model, as it relates to predicting attitude towards affirmative action. Further, by entering predictor variables in stages, I was able to examine the changes for each variable in the model with the addition of each set of independent variables. This is important because it allowed the results to indicate the magnitude of each variable within the overall regression model. Results from the confirmatory factor analysis, descriptive statistics, and hierarchical regression are presented in the next chapter.

CHAPTER 4

RESULTS

In this chapter the results from the SATAPS data analysis are presented. First, the final sample is described in terms of demographics and institutional characteristics. Next, the results of the SATAPS confirmatory factor analysis are presented. Descriptive statistics are presented to explore the nature of the data and to attend to the first two research questions regarding students' knowledge of and attitudes towards affirmative action admissions policies and practices. Finally, to address the third research question, the hierarchical regression model results are presented to examine students' attitudes regarding affirmative action.

Final Sample

The final sample was comprised of 1,770 individuals. Table 5 provides a breakdown of the sample by student major and gender and race. The sample was comprised of mostly ECS students, at just over 80%; compared to approximately 20% education students in the sample. Since the largest colleges of engineering were the target population for this study, this proportion of respondents by student major makes sense. Sample demographics within each of the major groups align with current trends in higher education (McFarland et al., 2017). For instance, the education students in this sample were comprised mostly of female respondents (89%), whereas the engineering students in this sample consisted of 60% male students.

Table 5

Demographic Characteristics, by Major

	Education		ECS	
	Count	Percentage	Count	Percentage
Total	326	18.42	1444	81.58
Gender				
Female	290	88.96	588	40.72
Male	36	11.04	856	59.59
Race				
Asian/Pacific Islander	9	2.76	275	19.04
Black	9	2.76	34	2.35
Latinx	43	13.19	169	11.70
Multiracial	12	3.68	73	5.06
Native American	2	0.61	5	0.35
White	249	76.38	884	61.22
Racial Categories for Analysis				
URM	66	20.06	281	19.46
Not URM	260	79.94	1163	80.54

Demographics of this sample also aligned with overall trends across higher education when examined by race. For instance, across both groups, White students were the majority, at 76% of education and 61% of ECS students. Asian students were considerably over-represented in ECS (19%) compared to education (< 3%). Black, Latinx, Multiracial, and Native American students were under-represented in both academic disciplines, but especially so within the group of ECS students. Of the URM ECS students, Latinx students made up the highest proportion at nearly 12%, in comparison to Black (2%), multiracial (5%), and Native American (< 1%) students. Due to the low numbers of URM students across both disciplinary groups, for the final analysis students were categorized into one of two racial groups: underrepresented

minority (Black, Latinx, Multiracial, Native American) or not underrepresented minority (White, Asian). For both education and ECS groups, URM students were the minority at approximately 20% of the sample.

Table 6 presents the institutional context of the final sample, disaggregated by major. Nearly all of the students in the sample were at public institutions (95% for ECS and 100% for education). The Northeast region provided the lowest proportion of respondents - less than 10% of the ECS student sample. Students attending colleges or universities in the Southern region made up the largest percentage of respondents, at 51% for education and 24% for ECS students. The Midwest and Western regions were more closely balanced, and comprised approximately 50% of the final sample of education students and 56% for ECS students. The final sample for this study was comprised of more upper-level students (juniors and seniors) than those in their first two years of undergraduate study. Over 60% of students in both education and ECS were either juniors or seniors. Year in school was fairly similar across the ECS and education groups, differing by less than 5% between groups.

Table 6

Institutional Context, by Major

	Education		ECS	
	Count	Percentage	Count	Percentage
Total	326	18.42	1444	81.58
Institution Type				
Public	325	100.00	1374	93.47
Private	0	0.00	57	3.88
Region				
Northeast	2	0.61	142	9.66
South	165	50.15	491	33.40
Midwest	67	20.36	445	30.27
West	91	27.66	353	24.01
Year in School				
First-year	50	15.20	257	17.48
Sophomore	53	16.11	298	20.27
Junior	111	33.74	437	29.73
Senior	112	34.04	452	30.75

Confirmatory Factor Analysis

A confirmatory factor analysis (CFA) was conducted to examine whether 36 items from SATAPS fit the 7 proposed factors (outlined in Table 4 in Chapter 3). MPlus8 software (Muthén & Muthén, 2017) was used to analyze the SATAPS responses for the CFA. The final CFA model was adjusted using expected parameter changes reported in the Modindices output from MPlus. To improve model fit, covariances were allowed between different items. The final CFA model is presented in Figure 2.

Figure 2. *Theoretical model for CFA.*
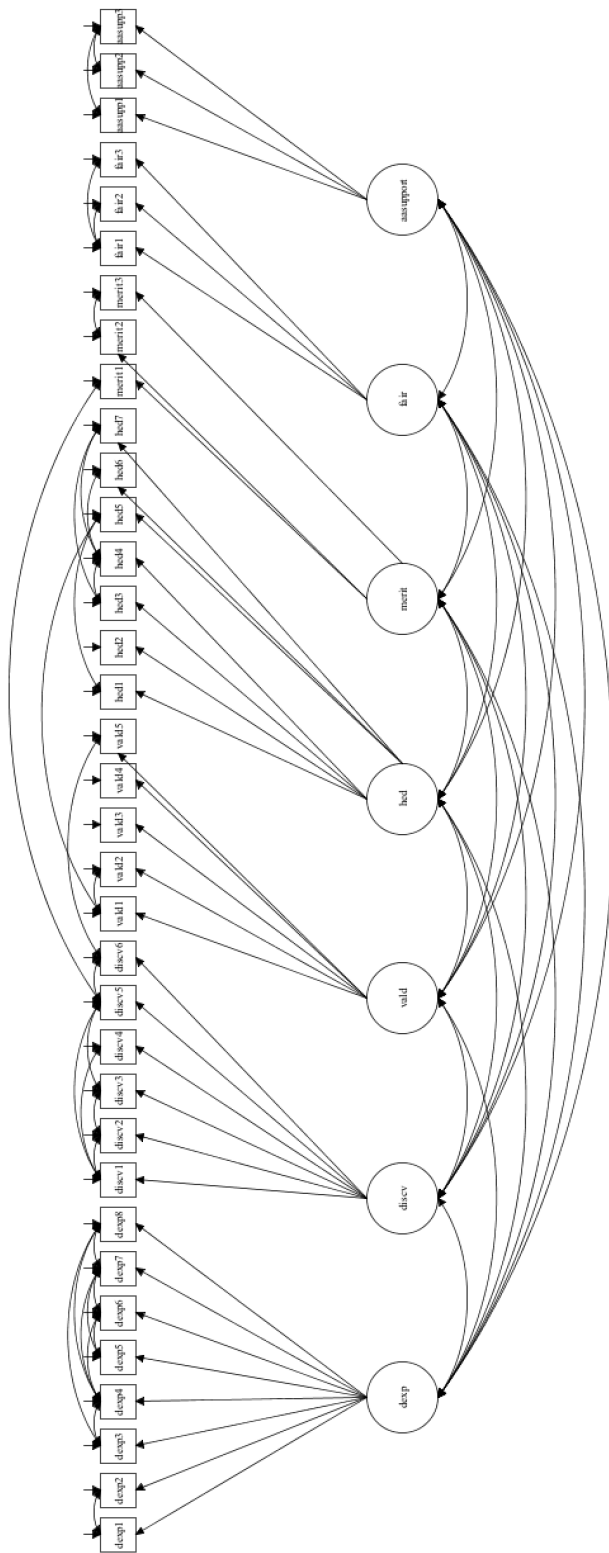
Legend
  dexp = Diversity Experiences
  discv = View on Discrimination
  vald = Value of Diversity
  hed = Role of Higher Education
  merit = Merit
  fair = Fairness
  aasupp = Support for Affirmative Action

The final CFA model was evaluated using goodness of fit indices, reported in Table 7. The model chi-square value was significant ($p < .05$). This may be an indicator of poor model fit. However, the chi-square statistic is sensitive to large sample sizes, and for sample sizes with more than 400 cases the chi-square statistic is almost always significant (Kenny, 2015) and therefore should not be the only fit statistic used to evaluate the CFA. All of the other fit statistics indicated that the final CFA model was an acceptable fit. The Comparative Fit Index (CFI) is an incremental fit index which measures the improvement of model fit in increments over the baseline or null model, which does not allow for covariances between items (Bentler, 1990). The CFI for the final CFA model was .950, which is at the customary threshold for CFI values indicating an acceptable fit of the model to the data (Hu & Bentler, 1999). The Standardized Root mean Square Residual (SRMR) is a measure of absolute fit that measures differences between observed and predicted correlations, where a value of 0 indicates perfect fit. The SRMR for the final CFA model was .04, which was well below .08 which is the threshold for a measure of good fit (Hu & Bentler, 1998). The Root Mean Square Error of Approximation (RMSEA) measures fit as a function of degrees of freedom (Steiger, 1990). For the final CFA model, the RMSEA value was less than .04, which indicates a close fit of the model to the data (Browne & Cudeck, 1993). The Akaike Information Criterion (AIC) is a measure of comparative fit; the model that is the best fit for the data will have the lowest AIC value of all models (Kenny, 2015). The final CFA model had the lowest AIC value of all models tested, which is an indicator of best fit when comparing models (Kenny, 2015). Overall, the fit indices indicate that the final CFA model is a good fit for the data.

Table 7

Goodness-of-Fit Indices for CFA Model

Model	χ^{2*}	df	CFI	SRMR	RMSEA (90% CI)	AIC
Final CFA Model	1,467.691	509	0.950	0.040	0.035 (.033, .037)	126,010.732

Note: CFI = Comparative Fit Index; SRMR = Standardized Root Mean Square Residual; RMSEA = Root Mean Square Error of Approximation; 90% CI: 90% Confidence Interval for RMSEA

*Chi-Square statistic was calculated using the Satorra-Bentler correction since MLR was used in analysis.

The items from each of these factors were used to create composite scores for data analysis. For the five factors under the beliefs/values dimension, these factor scores were then averaged so that each factor was set to the same scale (out of 4 points), and would have the same weight in the regression analysis (DiStefano, Zhu, & Mîndrilă, 2009). Higher scores on the *view on discrimination* (discv) factor are indicative of a race-conscious view, whereas lower scores for this factor are more representative of a color-blind view. The greater the score an individual has on the *value of diversity* (vald) factor, the more they value diversity. Larger scores on the *role of higher education* (hed) indicate that respondents believe that higher education institutions have an important role in supporting diversity initiatives. For both the *merit* and *fairness* (merit and fair) factors higher scores mean respondents have a strong belief in merit and that affirmative action as a practice is inherently unfair. Finally, the main variable of interest in this study is the *support for affirmative action* (aasupp) factor, which is measured through three items and with a maximum score of 12 points. The *support for affirmative action* factor was not averaged, since it was entered into the regression as the dependent variable and to allow for more variability in the data (DiStefano et al., 2009). Higher scores on this factor indicate greater support for affirmative action admissions policies in higher education.

Descriptive Statistics

Knowledge of Affirmative Action

To address the first research question, regarding students' knowledge of affirmative action admissions policies, descriptive statistics were utilized to evaluate students' knowledge. Of particular interest in this study were students' responses to three knowledge questions from SATAPS. The first item measured students' understanding of affirmative action as one of three options: holistic review, tiebreak policy, and quota (the correct answer is holistic review). Next, students were asked to identify the most recent Supreme Court case concerning affirmative action in higher education on a multiple choice item of 3 options (the correct answer is *Fisher v. UT Austin*). Then, students were asked a true/false question whether all states are allowed to use affirmative action (the correct answer is false). For both of the last two items, students had an option to indicate that they did not know. Lastly, students were asked to self-rate how informed they were about affirmative action policies on a four-point Likert scale. Descriptive statistics for all knowledge and perception of knowledge items are presented in this section.

Table 8 shows the descriptive statistics for the perception of affirmative action and two knowledge items. Just under half of the students (n= 793, 45%) correctly identified holistic review process as the way affirmative action is used in practice. Thirty percent (n=534) of students thought of affirmative action as a tiebreak policy and 24% (n=425) of students selected quota as the definition of affirmative action. Less than 15% of students were able to correctly identify *Fisher v. UT Austin* as the most recent Supreme Court case. Over 50% of students did not know if all states were allowed to use affirmative action. And 37% of students incorrectly reported that all states can use affirmative action admissions policies in higher education.

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Table 8

Frequency Counts of Knowledge Items, n=1,770

Knowledge Item	Correct	Wrong	Don't Know
Type of Affirmative Action	793	977	--
Supreme Court Case	244	117	1,409
All States Can Use Affirmative Action	200	660	910

A knowledge score was computed from the multiple-choice Supreme Court case item and T/F allowed to use affirmative action item to denote students' overall knowledge of AA admissions policies. For each correct answer, respondents were given one point, with a total possibility of two points. Higher values for the knowledge score indicate greater knowledge of affirmative action admissions policies. Only three percent of students (n=58) correctly answered both the Supreme Court case and all states allowed to use affirmative action questions correct. Nearly 80% percent (n=1,384) had a zero for a knowledge score, and just under 20% (n=328) of students only got one item correct. The average knowledge score was 0.251 (SD=0.504).

Next, students self-rating of how informed they were on affirmative action policies was examined. Over 70% of students (n=1,309) indicated that they did not feel informed on affirmative action admissions policies. Twenty-four percent of respondents indicated that they felt informed (n=424) about affirmative action admissions policies and practices in higher education, but only 2% (n=35) felt very informed.

Beliefs, Values, & Attitudes – Affirmative Action

The factors from the beliefs and values relevant to affirmative action dimension and *support for affirmative action* factor were then examined. Of particular interest were the five factors from the *beliefs relevant/specific to affirmative action* dimension and the

support for affirmative action factor. In this section, the average scores of the composite

variables confirmed during the CFA are presented by subgroup (see table 9).

Across the *view on discrimination*, *value of diversity*, and *role of higher education*

factors, female, URM, and education students all had significantly higher average scores

than their counterparts (male, not-URM, and ECS students). Male, not URM and ECS

students all had significantly higher average scores on the *merit* and *fairness* factors. In

line with previous findings in the literature, female and URM had higher average scores

on the *support for affirmative action* factor. ECS students had lower levels of *support for*

affirmative action than their education counterparts. See table 9 for descriptive statistics

and results of the independent samples t-tests for these demographic groups.

Table 9

Average Score on Support and Beliefs Factors, by Subgroup

	Mean (SD)								
Factor	Female (n=878)	Male (n=892)	t-value	URM (n=347)	Not URM (n=1423)	t-value	Edu (n=326)	ECS (n=1444)	t-value
View on Discrimination	2.83 (0.48)	2.62 (0.55)	8.761***	2.85 (0.52)	2.69 (0.52)	4.730***	2.79 (0.47)	2.71 (0.54)	2.608**
Value of Diversity	3.31 (0.47)	3.00 (0.52)	13.044***	3.32 (0.46)	3.11 (0.52)	6.942***	3.30 (0.49)	3.12 (0.52)	5.728***
Role of Higher Education	2.89 (0.50)	2.58 (0.54)	12.121***	2.94 (0.52)	2.68 (0.54)	8.038***	2.91 (0.49)	2.69 (0.55)	7.122***
Merit	2.78 (0.64)	2.96 (0.68)	-5.167***	2.75 (0.63)	2.90 (0.67)	-3.968***	2.80 (0.62)	2.89 (0.68)	-2.433**
Fairness	2.22 (0.63)	2.51 (0.65)	-9.722***	2.15 (0.61)	2.42 (0.65)	-7.505***	2.27 (0.56)	2.39 (0.67)	-3.533***
AA Support	8.45 (1.73)	7.58 (2.02)	-9.719***	8.72 (1.79)	7.84 (1.93)	-8.159***	8.38 (1.62)	7.93 (1.98)	-4.308***

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

Regression Results

Assumptions

A hierarchical linear regression was conducted to explore students' attitudes towards affirmative action. Assumptions tests were conducted to assess the following attributes: linearity, homoscedasticity, normality, issues of independence, outliers/influential cases, and multicollinearity.

Linearity. A key assumption of multiple regression is that the relationship between the dependent and independent variables is linear. If this assumption is violated, then all estimates from the regression can be biased, which can result in incorrect significance tests and confidence intervals (Cohen et al., 2003).

The assumption of linearity was checked by plotting the residuals against the predicted *support for affirmative action* scores, or the dependent variable. The predicted score for affirmative action functions as a weighted composite of the independent variables (Keith, 2015). A lowess line was fitted to the scatterplot of the standardized residuals and the standardized predicted values (*support for affirmative action* score). The lowess line was generally straight, and therefore the assumption of linearity was assumed met (Cohen et al., 2003).

Homoscedasticity. Another important assumption in multiple regression is that the error of variance around the regression line is consistent across independent variables. Essentially, there should be no pattern of residuals plotted against the fitted values and the residuals should be consistently spread out across different levels of the independent variables (Keith, 2015). If there is a pattern to the residual variance, then it is characterized as heteroscedastic. Heteroscedasticity can result in biased standard errors.

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To assess the variance of errors, the scatterplot of the standardized residuals and the standardized predicted values (score for affirmative action support) was examined. Visual inspection of the plot revealed a mostly even distribution around 0 for the residuals. There were some potential heteroscedasticity issues, so variance of errors was further explored. Predicted values of affirmative action, or the standardized predicted values, were categorized into five groups. The variance of the residuals was then compared across each group. The ratio of variance between the five groups was 2, which is well under the acceptable threshold of 10 according to Keith (2015). Therefore, the assumption of homoscedasticity was met.

Normality. Normally distributed residuals, or errors, is another important assumption in multiple regression (Cohen et al., 2003). Violations of this assumption can produce biased p- and t-values in the regression. This is easily tested through plots produced from software programs. First, a histogram was constructed of the standardized residuals. The histogram revealed a normal distribution. Another common method for examining normality of residuals is a p-p plot, which compares the observed versus expected probabilities. The data points in the p-p plot lined up along the 45-degree line, which indicated a normal distribution of errors.

Issues of independence. Another critical assumption of multiple regression is independence of residuals. Specifically, this assumption is focused on potential of data to be nested/clustered or related, which could result in similarities between data points from similar groups. Independence violations can bias standard errors.

To check for independence of the data, the university and region where students attended school was examined using boxplots. Visual inspection of these plots confirmed that there was not much deviation from zero. Next, intraclass correlation (ICC) was

calculated using SAS software (SAS Institute Inc., 2018). The ICC is a statistic that quantifies the levels of clustering within a dataset (Cohen et al., 2003). An ICC of 0 indicates that there is complete independence within the data (Cohen et al., 2003). The ICC for universities was .08, and it was .05 for region. These values are considered small and not a violation of independence assumption (Maas & Hox, 2005; Vajargah and Masoomehnikbakht, 2014). Therefore, this assumption was also considered met.

Outliers & influential cases. Another assumption of regression is that none of the cases have an extreme influence on the regression model. Outliers, or extreme data points, can influence the regression line and results, and therefore need to be assessed (Keith, 2015). Outliers and influential cases were examined using leverage, discrepancy, and influence diagnostics. Leverage assesses how much the independent variables for each case contribute to the model. Discrepancy is a measure of difference between the observed and predicted scores for the dependent variable. Influence measures the effect that individual cases have on the regression line or coefficients. Influence is characterized in one of two ways: either global influence, which looks at the regression as a whole, or local influence, which looks at how individual independent variable data points affect the regression. Once the hierarchical regression model was finalized, leverage, studentized deleted residuals, DfFits, and DfBeta and statistics were saved through SPSS.

For this study, the primary means for determining outliers was through leverage and global influence. If cases were flagged as potential outliers on both leverage and global influence, they were removed from the analysis. Cases that were outside of the appropriate thresholds for both leverage ($> \pm .03$) and global influence (standardized DfFits $> \pm .2$) were flagged as outliers and removed from the final analysis. In total, 30

cases were identified as outliers and removed from the final sample for data analysis, which left a total of 1,770 cases.

Multicollinearity. Multicollinearity occurs when highly related independent variables are included in the regression model (Cohen et al., 2003). Multicollinearity was assessed using Variance Inflation Factor (VIF) and Tolerance statistics from the regression in SPSS. A table with VIF and tolerance values is presented in Appendix D. The majority of variables in the regression fell within the acceptable range for both VIF (< 10) and tolerance ($> .1$) (Cohen et al., 2003). A few of the variables did have VIF values greater than 10, or above the acceptable threshold for multicollinearity. These variables include the categorical dummy variables of Female and URM, the interaction terms of Female by ECS, four interaction terms of female and URM by *view on discrimination* and *value of diversity*. However, these violations are not problematic since dummy variables and interaction terms frequently have high VIF values (Allison, 2012). Further, the multicollinearity does not affect the p-values for the dummy and interaction variables (Allison, 2012). Therefore, multicollinearity was not deemed a problem within this hierarchical regression model.

Final Model

To address the last research question, a hierarchical linear regression was conducted. The dependent variable of interest was *support of affirmative action*. Variables were entered in seven stages:

- Block 1 - <u>demographic variables</u>: age, gender, race, and SES
- Block 2 - <u>personal variables</u>: political orientation, self-interest measured through high school achievement, personal discrimination, and diversity experiences

- Block 3 - <u>knowledge of affirmative action</u>: knowledge score, perception of affirmative action, and self-rated informed status on affirmative action policies

- Block 4 - <u>institutional context</u>: public or private, region of the United States, university selectivity status measured through acceptance rate, year in school

- Block 5 - <u>beliefs and values relevant/specific to affirmative action</u>: five composite scores created from the factor analysis for *view on discrimination, value of diversity, role of higher education, merit, fairness*[10]

- Block 6 - <u>student major</u>: ECS major, interaction terms for female and URM by ECS major (female*ECS and URM*ECS)

- Block 7 – <u>moderation checks</u>: interaction terms of *view on discrimination* and *value of diversity* by gender and URM; interaction terms of *view on discrimination* and *role of higher education* by *merit* and *fairness*

Table 10 shows the change in R^2 and the significance testing for each block of variables entered into the regression model.

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[10] Note: these variables were averaged so that each of these factor scores were on the same scale. Within the regression these variables were also centered for ease of interpretation and to reduce multicollinearity with the interaction terms entered later in the model.

Table 10

R² and Change Statistics for Regression Model

Model	R^2	R^2 Change	F Change
1: Demographic characteristics	0.086	0.086	40.962***
2: Personal variables	0.206	0.119	43.224***
3: Institutional context	0.275	0.069	41.208***
4: Knowledge of affirmative action	0.283	0.008	2.067*
5: Beliefs & values	0.667	0.385	395.388***
6: Student major	0.669	0.002	2.602
7: Interaction terms	0.678	0.009	5.939***

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

Each of the blocks made a significant contribution to the variance of students'
support for affirmative action. The first step, which contained the four demographic
variables of interests, had a very low R^2, accounting for less than 10% of the variance in
attitude towards affirmative action. The addition of the personal variables resulted in a
considerable increase in the variance accounted for (11%) explaining about 21% of the
variance in the dependent variable. The addition of the institutional context variables in
the third block had a smaller impact on the regression model, with a 7% increase in
variance explained. In the fourth block, the addition of the knowledge variables in the
fourth block resulted in a very small increase in R^2 (<1%) to account for 28% of variance
in attitude towards affirmative action. Overall, the inclusion of demographic
characteristics, personal variables, institutional context, and knowledge of affirmative
action accounted for just under 30% of the variance in students' attitudes regarding
affirmative action.

The addition of the *beliefs and values relevant/specific to affirmative action* in
the fifth block resulted in a large increase in R^2. The inclusion of these variables resulted

in a 38% increase in the variance accounted for in *support for affirmative action*, which was the largest increase of all the steps. The next block, which accounted for student major resulted in a very small increase in R^2, accounting for only a .1% change in variance. The addition of student major was not a significant step in the regression. In the final block, the addition of the interaction terms resulted in a small change, 1% increase, in variance accounted for in the model. Altogether, the independent variables in the final model, which included all seven steps, accounted for 68% of the variance in students' attitudes toward affirmative action.

Table 11 displays the standardized beta (β) coefficients after each block of the independent variables were entered into the regression. Significance of each beta coefficient is also provided. A full table with all of the final regression model statistics is included in Appendix D.

In the first block, which controlled for demographic characteristics, only gender and race were significant predictors ($p < .001$). Age and mother's education level, which was entered as a proxy for SES, were not significant predictors ($p > .05$). Female students show greater *support for affirmative action* than men *($\beta = 0.228$, $p < .001$)*. URM students also had greater levels of *support for affirmative action* ($\beta = 0.190$, $p < .001$) than non-URM students. In this block, being a female student was the greatest predictor of *support for affirmative action*.

Table 11

Hierarchical Regression Model Standardized Coefficients

	β After Block 1	β After Block 2	β After Block 3	β After Block 4	β After Block 5	β After Block 6	β After Block 7
Block 1: Demographic Characteristics							
Age	-0.010	0.002	-0.011	-0.036	-0.024	-0.023	-0.024
Female	0.228***	0.200****	0.175***	0.178***	-0.008	-0.023	0.028
URM	0.190***	0.146***	0.123***	0.125***	0.030*	-0.047	-0.054
Mother Edu. ≥ UG	0.006	0.000	0.005	0.005	0.025	0.023	0.027
Block 2: Personal Variables							
Liberal		0.337***	0.303***	0.301***	0.016	0.015	0.023
Med. HS Achievement		-0.052*	-0.034	-0.040	-0.027	-0.027	-0.025
High HS Achievement		0.001	0.032	0.030	-0.002	-0.002	-0.001
Exp. Personal Discrimination		0.003	0.020	0.019	-0.006	-0.005	0.004
Medium Diversity Exp.		0.014	0.007	0.007	-0.018	-0.017	-0.013
High Diversity Exp.		0.070**	0.060*	0.067**	0.019	0.019	0.020
Block 3: Knowledge of AA							
Knowledge Score			-0.083****	-0.083****	-0.039**	-0.040**	-0.032*
Perception: Tiebreak			-0.273***	-0.273***	-0.066***	-0.067****	-0.063***
Perception: Quota			-0.097****	-0.099****	-0.031*	-0.032*	-0.029
Self-Rate Informed			-0.009	-0.007	-0.010	-0.009	-0.004

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

Table 11 continued

	β After Block 1	β After Block 2	β After Block 3	β After Block 4	β After Block 5	β After Block 6	β After Block 7
Block 4: Institutional Context							
Public				0.020	-0.008	-0.008	-0.004
Region: Midwest				-0.056	-0.069**	-0.069**	-0.066*
Region: South				-0.070	-0.078***	-0.080**	-0.076**
Region: West				-0.093*	-0.101*	-0.098*	-0.100***
Med. Accept. Rate				-0.024	-0.026	-0.024	-0.025
High Accept. Rate				-0.011	0.028	0.032*	0.035*
Year: Sophomore				0.044	0.028	0.029	0.030
Year: Junior				0.020	0.027	0.028	0.028
Year: Senior				0.087*	0.028	0.029	0.031
Block 5: Beliefs & Values							
View on Discrimination					0.078***	0.079***	0.065*
Value of Diversity					0.099***	0.099***	0.090***
Role of Higher Education					0.380***	0.381***	0.378***
Merit					-0.181***	-0.181***	-0.187***
Fairness					-0.211***	-0.209***	-0.207***
Block 6: Student Major							
ECS						-0.021	-0.025
ECS*URM						0.089**	0.092**
ECS*Female						0.020	0.028
Block 7: Interaction Terms							
View on Discrimination*Fairness							0.017
View on Discrimination *Merit							0.036
Role of Higher Education*Fairness							0.052*
Role of Higher Education*Merit							0.006
View on Discrimination*URM							0.005
View on Discrimination*Female							-0.005
Value of Diversity*Female							-0.003
Value of Diversity*URM							0.017

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

In the next block, personal variables were entered. In this block, female and URM students remained significant, positive predictors of support for affirmative action, though the magnitude of support decreased slightly ($\beta = 0.200$ and $\beta = 0.146$, respectively, $p < .001$). Liberal students had higher levels of *support for affirmative action* policies than their non-liberal counterparts ($\beta = 0.337$, $p < .001$). The high school achievement and experienced personal discrimination variables were not significant predictors ($p > .05$). Those with high diversity experiences were more likely to be supportive of affirmative action ($\beta = 0.070$, $p < .01$).

In block 3, the knowledge variables were entered. The female, URM, liberal, and high diversity experiences variables all remained significant, positive predictors of *support for affirmative action* ($p < .001$). The knowledge score variable (out of 2 possible points) was a significant, negative predictor of affirmative action support ($\beta = -0.083$, $p < .01$), indicating that for every point correct on the knowledge score, *support for affirmative action* decreased. Next, the affirmative action perception question was entered as two dummy variables: tiebreak and quota, with holistic review as the reference group. Tiebreak and quota perceptions were also significant, negative predictors of *support for affirmative action* ($\beta = -0.273$ and $\beta = -0.097$, respectively, $p < .001$), indicating that those who perceived affirmative action as tiebreak or quota policies had lower support levels than those who thought of affirmative action as a holistic review. Students' self-rated perception of how informed they were on affirmative action was not a significant predictor of *support for affirmative action* ($p > .05$).

After adding in the institutional context variables in block 4, the same variables remained significant predictors in the same direction and of similar magnitude. Of the institutional context variables in the fourth block, only two were significant. First,

students who attended a college/university in the Western region of the United States had lower levels of *support for affirmative action* than those attending higher education institutions in the Northeast region (β = -0.093, $p < .05$). Seniors had greater *support for affirmative action* policies than freshman/first-year students ($\beta = 0.087$, $p < .01$).

The fifth block of the regression resulted in a very large increase in variance accounted for ($\Delta R^2 = .386$). After entering in the five belief and value composite score variables created from the CFA, the regression model changed substantially. Being a female or liberal were no longer significant predictors of *support for affirmative action* ($p > .05$). Being URM was still a significant predictor, though the magnitude decreased substantially ($\beta = 0.030$, $p < .05$). The knowledge items retained their significance and direction, though the magnitude decreased considerably for all three significant items. After controlling for beliefs and values, all three region variables became significant predictors ($p < .05$) of support for affirmative action. Attending school in the West, Midwest, and Southwest negatively affected *support for affirmative action* when compared to those students who attended college/university in the Northeast region (β = -0.101, β = -0.069, β = -0.078, respectively). All five of the beliefs and values relevant/specific to affirmative action factor variables were highly significant predictors ($p < .001$). As predicted, those with higher average *view on discrimination* scores (which indicates a race-conscious view), *value of diversity*, and *role of higher education* all showed higher levels of *support for affirmative action* policies and practices *($\beta = 0.078$,* $\beta = 0.099$, $\beta = 0.380$, respectively). Those with higher scores on the *merit* and *fairness* factors had lower levels of *support for affirmative action* admissions practices

(β = -0.181, β = -0.211, respectively). Of all five *beliefs relevant/specific to affirmative action* factors, *role of higher education* was the predictor with the greatest magnitude.

In the next block of the regression, student major (ECS) was entered into the regression model. Additionally, the interaction terms of ECS*URM and ECS*female were entered into the model to check for moderation. After this stage, there was a nonsignificant change in the regression. All of the variables maintained the same general magnitude and direction of *support for affirmative action* as in the previous block. Of particular interest in this block was the ECS variable to test for differences in *support for affirmative action* between ECS majors and education majors. The ECS variable was not significant ($p > .05$), indicating that there was no difference in level of *support for affirmative action* between ECS and education majors. Being a female ECS student was also not significant ($p > .05$), indicating that there was no moderation between gender and student major, in terms of effects on attitude towards affirmative action. However, being an URM ECS student was significant (β = 0.089, $p < .01$), which means that these students had greater levels of *support for affirmative action*. The URM*ECS variable had a greater magnitude than both the *view on discrimination* and *value of diversity* factors.

In the last stage of the regression, interaction terms were entered to test for moderation. Only one of the moderation terms was significant: *fairness* and *role of higher education* (β = 0.052, $p < .05$). The other interaction terms were not significant ($p > .05$), which indicates that there was no moderation between any of these variables. Otherwise, the regression model held the same from the previous block, with similar magnitudes and directions for variables than in the sixth step. The only change was that students attending a university/college with a high acceptance rate (lower selectivity) had greater *support for affirmative action* than those attending a school with a low acceptance rate.

The interaction between belief in *fairness* and belief in the *role of higher education* was further examined. A graphical representation of the interaction between *fairness* and *role of higher education* was created using Preacher's website (Preacher, Curran, & Bauer, 2018) and is presented below as a simple slopes plot in Figure 3. Within this model, higher values of *fairness* scores indicate a stronger belief that the practice of affirmative action is unfair, and low *fairness* scores indicate possessing a weaker belief that affirmative action is unfair. As can be seen the figure, having a low belief that affirmative action is unfair corresponds to stronger beliefs in the *role of higher education* in promoting diversity, which positively influences *support for affirmative action*. Strong beliefs that affirmative action is an unfair practice corresponds to lower values placed on the *role of higher education* in promoting diversity, and in turn, lower levels of *support for affirmative action*.
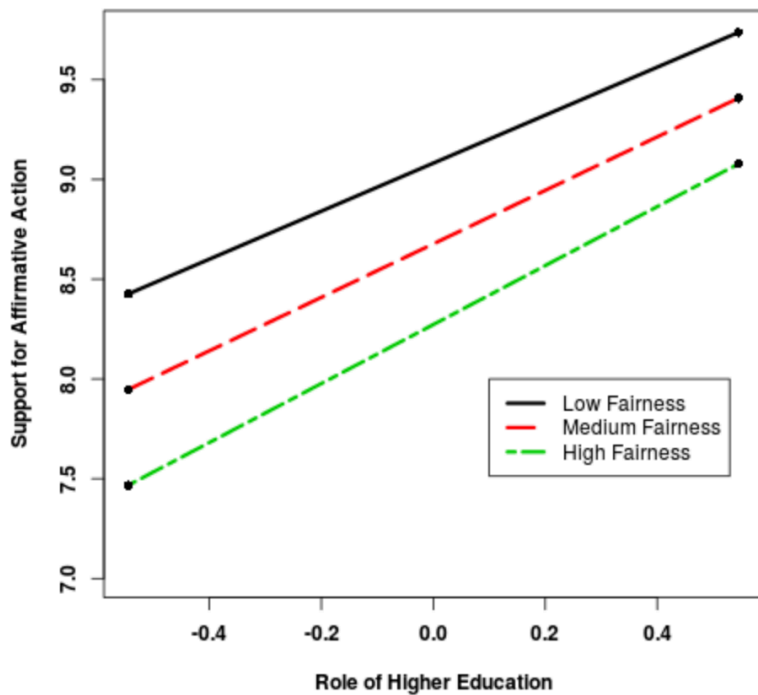
Figure 3. Simple slopes plot of interaction between role of higher education and fairness on support for affirmative action.

In the final model, none of the demographic characteristics were significant predictors of support for affirmative action. The knowledge score and perceptions of affirmative action variables were all significant, negative predictors of affirmative action support. Students attending college/university in the West, South, or Midwest had lower levels of *support for affirmative action* than those attending school in the Northeast. Additionally, students attending schools with lower levels of selectivity had higher levels of *support for affirmative action* policies. A race-conscious *view on discrimination*, high *value of diversity*, and strong belief in the *role of higher education* in supporting diversity initiatives all were significant, positive predictors of supporting affirmative action. Strong belief in *merit* and in the idea that affirmative action is unfair from the *fairness* factor were negative predictors of support for affirmative action. Though ECS major was not a significant predictor, URM students who were majoring in ECS had greater *support for affirmative action* policies. Further, there is a significant interaction term between belief in *fairness* of affirmative action and belief in the *role of higher education*, where greater belief that this admissions practice is unfair negatively influences belief in the role of HED, which results in lower *support for affirmative action*.

Power Analysis

A post-hoc power analysis was conducted to evaluate the overall probability of detecting a true effect within the regression model. G*Power software (Faul, Erdfelder, Buchner, & Lang, 2009) was utilized to examine the regression model, based on effect size of the final model ($f^2 = 2.106$), total number of predictors (n=39), and a sample size of 1,770 based on an alpha level of .05. The power analysis indicated that the regression had a power level of 1.0, which was above the acceptable threshold of 0.8, signifying that the regression model has sufficient power, or ability to detect true effects.

CHAPTER 5

DISCUSSION

The purpose of this study was to determine undergraduate ECS students' (a) knowledge of affirmative action admissions policies, (b) their attitudes towards affirmative action practices in higher education, and (c) the connections between individual characteristics/institutional contexts/beliefs and overall attitude towards affirmative action. In this chapter, I first summarize the findings from the study. Then, I describe the limitations of this study. The chapter ends with a discussion on the implications of the study and possible directions for future research.

Findings

Knowledge of Affirmative Action

Of the previous studies that examined students' attitudes towards affirmative action, very few examined knowledge or awareness of affirmative action admissions policies. In fact, very little scholarship at all has focused on students' knowledge of affirmative action (Crosby et al., 2006). However, previous research demonstrates that students' perceptions of affirmative action can greatly influence attitude towards affirmative action (Haley & Sidanius, 2009; Kravitz, 1995). Further, researchers have called for the examination of students' knowledge or perception of affirmative action when examining their attitude towards the race-conscious admissions policy (Crosby et al., 2006; Park, 2009; Sax & Arredondo, 1999).

Therefore, the first research question of this study focused on examining students' knowledge of affirmative action admissions policies. The analysis revealed that students had low overall knowledge of affirmative action. To assess knowledge, three questions were asked to measure how well students knew about affirmative action policies.

The first of these questions focused on assessing students' perceptions of the way in which affirmative action practices were implemented in higher education admissions processes. In general, the results also indicated that despite a consistent application of the holistic review process in higher education institutions (as ruled in the Supreme Court case of *Grutter v. Bollinger, 2003)*, students still have very mixed perceptions of what affirmative action actually is and how it functions in practice. Less than half of the students in this sample correctly identified holistic review as the correct definition for affirmative action. Over half of the students think that affirmative action is still implemented through either tiebreak or quota practices. This is a surprising finding considering that quota systems, where a proportion of seats/spots are reserved for certain groups, were ruled unconstitutional in *Bakke* (1978), and have not been used since the late 1970s. The majority of students in this sample were born about 25 years after *Bakke,* so this perception of a quota policy is interesting. Tiebreak practices are also not used by higher education institutions. Further, the holistic review process, where race is considered as one factor among many, has been practiced by many higher education institutions since the early 2000s (*Grutter v. Bollinger,* 2003; Bastedo, Bowman, Glasener, Kelly, & Bausch, 2017). This analysis revealed that many students possess misconceptions about what affirmative action is and how it is implemented in the higher education admissions process.

Two additional questions were used to assess students' knowledge of affirmative action. One item asked about the most recent Supreme Court case, while the other question asked students if they thought all 50 states were allowed to use affirmative action practices. For each item, students were given a set of possible answers, with an option to indicate "Don't Know." Eighty percent of students reported that they did not

know the most recent Supreme Court case related to affirmative action, even though the case made national headlines and was heard and decided in the summer of 2016 (*Fisher v. UT Austin*, 2016), less than two years prior to the administration of the study. Further, over 50% reported that they did not know if all states utilized affirmative action admissions policies. This was also surprising since nearly one-third of the colleges/universities (n=15) surveyed in the SATAPS administration were in states where affirmative action was not allowed. Echoing the same trend on perception of affirmative action, students had low levels of knowledge on affirmative action on these two questions.

Generally, students had low knowledge of affirmative action policies in the United States. Of those that attempted to answer all three of the knowledge questions, only 1% of the students got all three of the questions about affirmative action correct, and 43% of students did not answer any of the questions correct. In this sample, students had an average knowledge score of 0.3 (out of 2 total points), which indicates very low knowledge of affirmative action, as measured through the two SATAPS items.

Another question on the SATAPS asked students to indicate how informed they were about affirmative action (4-point scale from very uninformed to very informed). The majority of students (70%) reported that they did not feel informed about affirmative action admissions practices; and only 2% of students stated that they felt very informed. Students' low ranking of their own knowledge is consistent with their actual knowledge scores. This suggests that though students have low knowledge of affirmative action policies, they are also aware of their lack of information on the subject.

Attitude towards Affirmative Action

The primary goal of this study was to examine ECS students' attitudes towards affirmative action admission policies in higher education. To address the research questions 2 and 3, a seven-step, hierarchical regression was conducted to understand students' attitudes towards affirmative action (measured by the dependent variable of *support for affirmative action.*

The first four stages of the regression included demographic characteristics, personal variables, knowledge of affirmative action, and institutional context. With all four of these blocks of variables in the model, 28% of variance in attitude towards affirmative action was accounted for by the model. However, after the addition of the five *beliefs and values relevant/specific to affirmative action* factor scores in the fifth block, the amount variance accounted for increased by nearly 40%, with a total of 66% variance accounted for in *support for affirmative action*. The final regression model accounted for 68% of the variance in attitude towards affirmative action. The discussion of the regression model is split into two parts: before the entry of the beliefs and values block and the final model from step 7.

Regression Model before Controlling for Beliefs/Values. In the first four steps of the regression, being female, an URM, and having a liberal political orientation were significant, positive predictors of support for affirmative action. In general, these findings were consistent with previous literature. Previous researchers found that being female, a minority (e.g., Black, Latinx, Native American, or Multiracial), and more liberal were three very important predictors of greater support for affirmative action (e.g., Aberson, 2007; Aberson & Haag, 2003; Kravitz & Klineberg, 2000; Park, 2009; Sax & Arredondo, 1999). Interestingly, some of the variables which were not significant in this study

differed from previous findings in the literature. For instance, Sax and Arredondo (1999) found that SES was a significant predictor of attitude towards affirmative action. However, mother's education level, which served as an SES proxy variable, was not a significant predictor across any of the stages. This finding was consistent with Park (2009), who found that SES was not significant after controlling for other demographic factors.

Additionally, those with average (or medium) high school achievement were less supportive of affirmative action than those who were in the low high school achievement group. There was no difference in support for affirmative action between those with high and low levels of high school achievement. Moreover, those with higher levels of experience with diversity had greater support for affirmative action admissions policies than those with low levels of diversity experience, which was consistent with Aberson's (2007) findings. Previous researchers (Kravitz et al., 1997; Aberson, 2007) found that perceived discrimination was an important predictor of affirmative action; however, that was not observed in this regression model.

The next block assessed for knowledge of affirmative action. Those with a greater knowledge score had lower levels of support for affirmative action than students with less knowledge. This finding was somewhat surprising, but not completely unexpected since there is not much supporting research in the literature on the connection between students' knowledge of and attitudes towards affirmative action. Students who perceived affirmative action practices as either tiebreak or quota were less supportive of affirmative action than those who correctly perceived affirmative action as the holistic review. Students' self-perception of their knowledge of affirmative action was not a significant predictor.

Of the institutional context variables, at the end of the fourth block, only two variables were significant. Relative to those at a college or university in the Northeast, students attending schools in the Western region of the United States were less likely to support affirmative action. Additionally, seniors had greater support for affirmative action in comparison to first-year students. Although very few studies have examined institutional context, the findings were consistent with Park (2009), wherein institution type was not a significant predictor.

Regression Model after Controlling for Beliefs & Values. After the addition of the beliefs and values, the model changed considerably. First, all of the demographic characteristics and personal variables were no longer significant predictors of *support for affirmative action*. This was surprising, considering that nearly all of the previous studies that focused on affirmative action attitudes found that demographic characteristics, especially gender, race, and political orientation, were the most important predictors of support or opposition to affirmative action (Aberson, 2007; Aberson & Haag, 2003; Crosby et al., 2006; Kravitz & Klineberg, 2000; Park, 2009; Sax & Arredondo, 1999; Smith, 1998, Smith, 2006; Zamani-Gallaher, 2007). Discussion around demographic characteristics and the influence that these identity groups have on attitudes towards affirmative action seemed to dominate much of the focus in the literature.

Among the personal variables, self-interest, experience with personal discrimination, and diversity experiences were found to be important predictors in previous studies, but were not significant predictors in this study. In particular, a number of previous studies observed that self-interest had a strong influence on attitude towards affirmative action (Bobo & Kleugel, 1993; Bobo & Smith, 1994; Bobo, 1998; Bobo & Hutchings, 1996; Jacobson, 1985; Park, 2009). However, in this study, self-interest,

which was measured through high school achievement, was not significant after controlling for beliefs and values. Limited research found that higher diversity experiences were associated with greater levels of support for affirmative action (Aberson, 2007), which was the case in the first part of the regression, but did not hold after the inclusion of beliefs and values in the regression.

The same knowledge variables remained significant after entry of beliefs and values. The overall knowledge score was a negative, but small predictor of support for affirmative action. Additionally, those who perceive affirmative action as tiebreak or quota practices were less likely than those who thought of affirmative action as holistic review to support affirmative action. Very few previous studies focused on students' knowledge of affirmative action, so there was not much prior literature with which to compare these results. However, the findings related to lower levels of support for affirmative action when framed as either tiebreak or quota practices are consistent with some previous findings (e.g., Haley & Sidanius, 2009).

In the final model, all three of the region variables were significant predictors. In comparison to those attending college in the Northeast, students attending universities in the South, Midwest, and West had lower levels of support for affirmative action. None of the year variables were significant, nor was the institution type (public v. private).

Of the beliefs and values factor scores entered in the model, all five were significant predictors of support for affirmative action. Consistent with the literature (e.g., Park, 2009), those with a post-racial *view on discrimination* were less likely to support affirmative action policies. This is reflective of the call for universalism and support for race-neutral policies, even when meant to be ameliorative (Cho, 2009). Whereas those with more race-conscious views were more likely to support affirmative action, which is

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consistent with ideas of those who call for race-conscious views and practices (Bonilla-Silva, 2010). Further, students with a higher *value of diversity* had greater support for affirmative action practices, which echoed findings from Aberson and Haag (2003) and Park (2009). Next, the predictor with the greatest magnitude was the factor score associated with belief in the *role of higher education*. For this factor, greater belief that higher education institutions should formally work towards diversity goals was associated with higher levels of support for affirmative action policies. Those with stronger beliefs in *merit* and that affirmative action is an unfair (*fairness)* practice were less likely to support affirmative action.

   The crux of this dissertation study was focused on examining undergraduate ECS students' attitudes regarding affirmative action. To do this, education students were selected as a comparison group. Therefore, a critical part of this study was the addition of the student major and student major interaction variables in step 6. The ECS major variable was not found to be significant, indicating that there was no difference in attitude towards affirmative action between ECS and education students. This finding was somewhat surprising given assumptions about the differences between the two disciplines. However, with limited prior research focused on student majors/disciplines and attitudes regarding affirmative action, there was not much to compare this finding to in the literature. Two interaction terms were entered into the model to understand if being a female, ECS student or an URM, ECS student had an effect on attitude towards affirmative action. The female*ECS variable was not a significant predictor, indicating that female, ECS students did not hold significantly different views or attitudes regarding affirmative action. However, the URM*ECS variable was significant, which means that URM students majoring in ECS had greater levels of support for affirmative action.

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In the final block, a number of interaction terms were added in order to test for possible moderation between variables to measure these effects on attitude towards affirmative action. In the development of the theoretical model, it was hypothesized that gender and race could potentially moderate some of the beliefs related to affirmative action, particularly *view on discrimination* and *value of diversity*. None of these interaction terms were significant, indicating no potential moderation. Next, moderation was tested between beliefs relevant to affirmative action and beliefs specific to affirmative action (fairness and merit). The only one of these terms that was significant was *fairness* and *role of higher education*. Further exploration of this interaction term revealed that those who had a greater belief that higher education institutions should formally support diversity initiatives had weaker belief that affirmative action is unfair, which resulted in greater *support for affirmative action*.

Overall, it was unexpected to see how much the model changed after the addition of the beliefs and values. All of the demographic characteristics and personal variables, including gender, race, and political orientation, were no longer significant predictors of support for affirmative action. Given the strong emphasis on demographic characteristics in previous studies, this was particularly surprising. Further, the knowledge variables remained significant after the entry of beliefs and values. Of particular importance among the knowledge variables was that a tiebreak perception resulted in lower *support for affirmative action*.

Many of these studies used data from surveys or questionnaires, which did include a couple of items related to affirmative action, but had other primary goals for data collection. The large majority of related studies did not explicitly examine beliefs and values connected to affirmative action and the ways that those beliefs might be

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connected to overall attitude towards the policy in an in-depth manner. Further, most other studies did not account for students' knowledge of affirmative action admissions policies at all. However, some prior research demonstrated that both beliefs and knowledge can influence attitude towards affirmative action, so many researchers have called for studies focused on examining these two areas in conjunction with affirmative action attitude (e.g., Crosby et al., 2006; Park, 2009; Sax & Arredondo, 1999). When accounting for these items, many of the previous factors or characteristics that were believed to be important predictors of support or opposition of affirmative action were not found as significant in this study of students' attitudes towards these admissions practices.

Limitations

Despite careful attention during the design and implementation, this study is not without limitations. In particular, two potential limitations of this study are measurement error and sampling techniques.

One possible limitation with all survey research is measurement error, which is associated with how well a question or item measures an accurate answer from the respondent (Weisberg, 2005). One type of measurement error is that the items are not written in a way that will correctly solicit or measure the true response from the participant. A number of steps were taken to reduce measurement error associated with SATAPS. First, during the development of the instrument, I drew upon previously established surveys to utilize items that had already been validated. Additionally, the SATAPS instrument was piloted with a group of students to solicit feedback on item clarity, which was utilized to develop the final instrument. Finally, the CFA indicated that

the theoretical model was a good fit for the data, which demonstrated that the items did measure the intended construct.

Another potential form of measurement error, and therefore an additional limitation associated with this study is social desirability, which is where people report what they believe is a socially acceptable answer. Since this survey dealt with sensitive topics, including views on race and value of diversity, some people may have felt pressure through social desirability bias. However, item wording was carefully constructed to make people more comfortable with answering the questions. Additionally, online surveys provide more anonymity, which can help reduce social desirability bias (Weisberg, 2005).

A second limitation of this study comes from the sampling technique. This study utilized a form of non-probability sampling, known as purposive or judgment sampling. Non-probability sampling is more prone to selection bias (Blair & Blair, 2015). Even though a form of non-probability sampling, judgment sampling has the potential to produce a final sample that is still somewhat representative of the population of interest (Blair & Blair, 2015). In the context of this study, a large-scale sampling technique was employed to help minimize selection bias. The main interest for this study was undergraduate ECS and education students, so the sampling technique focused on large colleges and universities in an attempt to yield a large representation of students attending colleges and universities within those two academic disciplines. By employing such a large-scale recruitment of participation in this study via faculty, efforts were made to ensure the validity and representation of the final sample. Nonetheless, the results from this study speak to the sample, students in ECS and education who attend large public universities, and cannot be generalized to all college students.

Implications and Future Research

One important implication of this study, for researchers, policymakers, and practitioners, is related to students' knowledge of affirmative action policies and practices. Students' knowledge of admissions policies could influence their college application behavior, affect their attitudes towards admissions policies/processes, and inform other aspects related to student experiences in higher education. Overall, the students in this sample had low levels of awareness about affirmative action admissions practices, and though this was not examined in this study, it stands to reason that this trend spans across other admissions practices and policies, or areas such as financial aid policy. Further, the lack of knowledge about admissions processes could exacerbate the undermatching process of low-income students (Bastedo et al., 2017). Therefore, there is a strong need for increasing students' awareness of these policies, as the resulting practices directly affect their path in higher education. Though this study briefly looked at and evaluated knowledge of affirmative action policies, there is still a need for further research in this area. More research should be conducted to better understand students' knowledge of affirmative action. Future studies should also examine how students' knowledge or awareness of broader admissions practices in higher education influences their behavior, such as choices in high school, where they decide to submit applications, and college choice outcomes.

The results from this study suggest that while there might be important distinctions between different demographic groups on attitude towards affirmative action, overall attitude is much more influenced by beliefs and values related to affirmative action, such as views on discrimination, value of diversity, or beliefs about merit. Previous research studies did not account for these important beliefs in their analysis, and

therefore demographic characteristics appeared to be the most significant predictors of attitude towards affirmative action in those studies.

Given the magnitude of effect that beliefs and values had on the overall regression model, the results from this study suggest that attitude towards affirmative action is greatly affected by the beliefs and values measured by the SATAPS instrument. Further, previous research demonstrates that values are central to belief systems, and therefore changing values can result in widespread changes of a person's attitudes (Grueb, Mayton, & Ball-Rockeach, 1994). As such, if there is interest in shifting opinions or attitudes about affirmative action, efforts may yield better results if focused on changing values and beliefs relevant to affirmative action rather than changing feelings directly related to the policy and practice of affirmative action.

Future studies should be conducted to further explore the nuanced relationship between beliefs and values and attitudes as they relate to affirmative action. To date, most studies have focused on surface-level measurements of attitudes, with very little attention paid to the role of beliefs and values. In line with this, previous researchers (Park, 2009; Sax & Arredondo, 1999) have called for other studies to focus on the connections between specific beliefs/values and attitudes towards affirmative action. This study builds on the work of previous researchers and addresses the call for a more in-depth examination of the complex relationships between beliefs/values and attitude towards affirmative action. Even so, there is a need for other researchers to further study this area for increased understanding. The findings from this study have theoretical implications for the way that we conceptualize and think about the components that influence attitudes regarding affirmative action, which should be incorporated into future research design of studies that examine attitudes towards admissions policies and affirmative action. While

these findings are suggestive of implications just for those studies focused on admissions policies, those studying attitudes towards other educational policies should consider the complex relationships between beliefs, values, and attitudes towards formal policies.

Another interesting finding in this study was that attitudes towards affirmative action are the same across ECS and education students. This finding was somewhat surprising given the different demographics in each discipline (i.e. gender and racial balances), as well as the different institutional cultures between the two disciplines. Prior research indicates a chilly climate and related challenges in STEM fields for women and students of color. Beliefs about affirmative action attitudes serve as one potential indicator of this chilly climate and implicit biases within STEM fields. The similarity between the ECS and education students in this sample may indicate a shift in culture and context within engineering and computer science, which is reflective of other emerging findings that have demonstrated an effort to reduce bias and make engineering fields and disciplines more welcoming for faculty members (e.g., Judson, Ross, & Glassmeyer, 2019; Williams & Ceci, 2015). However, the interaction between ECS*URM students was significant, indicating that these students hold significantly different views on attitude towards affirmative action. Their greater support for affirmative action could suggest need for further developing a more welcoming, less chilly climate.

Given the paucity of research on differences in attitudes regarding affirmative action practices between various academic disciplines, further research should be conducted to better determine if any differences exist. Specifically, future research should focus on other STEM disciplines, and majors outside of STEM, such as business, humanities, etc., as possible disciplines or environments for conducting studies. Likewise, researchers should look for potential differences between specific engineering

disciplines regarding attitudes towards affirmative action admissions practices. An additional area for future research is considering differences in attitudes between undergraduate and graduate students, or between graduate students in different academic disciplines. Further, a replication study should be conducted with different sampling techniques, such as looking at a different subset of colleges/universities to determine if the findings from this study are generalizable. Lastly, qualitative studies should be conducted to gain greater depth and a more nuanced understanding of the beliefs and values of students, which in turn can help inform the connections between these beliefs/values and attitudes regarding affirmative action.

The findings from this study have implications for campus administrators and leaders to inform strategies for diversity in higher education. Since perception of affirmative action has a significant effect on attitudes towards race-conscious admissions policies, campus administrators, policy makers, and high school should work to clearly communicate how these policies work in practice in order to increase transparency around the process. This could lead to greater support for affirmative action. To change attitudes towards a policy, it is important to determine the major beliefs that contribute to that attitude, and then work to shift those beliefs. One way to work on this within the context of diversity in higher education is to provide classes/courses about diversity or to increase exposure to diversity experiences on campus, which might lead to shifts in views on discrimination and value of diversity.

Conclusion

This study employed a hierarchical regression to examine undergraduate ECS students' attitudes regarding affirmative action. Utilizing a conceptual framework which posits that multiple components, including demographic characteristics, personal

variables, institutional context, knowledge of affirmative action admissions policies, and beliefs/values, influence or contribute to students' attitudes towards affirmative action. At the start of this study, it was theorized that there were likely significant differences between ECS and education students. However, the analysis indicated that there were no differences in the ways that these groups think about affirmative action. What was more revealing was the significant influence of beliefs and values on attitudes, which negated the influence of demographic characteristics previously found in the majority of studies focused on examining students' attitudes towards affirmative action. Ultimately, there is a need for continued study and exploration to better understand students' attitudes towards these policies and to determine the effects of improving students' awareness about affirmative action admissions practices.

This study adds to the existing literature by specifically examining the academic discipline of ECS students, which has not been a primary focus of previous studies. Additionally, this study incorporated students' knowledge of these policies into the overall study of attitudes, which also was not a main focus of researchers in past studies. Students' attitudes towards affirmative action admissions policies provide important insight into students' beliefs around equity, fairness, and race, which could influence the experiences of the peers that they attend school with, which is especially important within those academic disciplines where students of color are most absent, such as engineering. Gaining insight into what students think about these controversial policies is important to understand how students are reacting to admissions policies, but also as future citizens. Greater understanding of students' attitudes towards and knowledge of these policies could provide insight for policy makers and campus leaders on outreach strategies, campus environment, and student experiences.

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APPENDIX A

SATAPS INSTRUMENT

Section 1

Item Text	Item Choices
Gender	• Female • Male • Transgender female • Transgender male • Gender variant/non-conforming • Other • Prefer not to answer
Age	Open entry text box
Race	• American Indian or Alaska Native • Asian American/Asian • Black or African American • Hispanic/Latinx • Native Hawaiian or Other Pacific Islander • White • Two or more races • Other
Which country are you a citizen of?	Dropdown list of countries
Please indicate the highest level of education completed by each of the following members of your family: • Mother or guardian • Father or guardian • Sibling with highest level of education	• Not applicable • 1-8 years • 9-11 years • High school graduate • Some college • Bachelor's degree • Master's degree (MSW, MBA, MA, etc.) • J.D., M.D., Ph.D., D.D.S., or Other doctoral degree • Not sure
Did you receive a federal Pell grant this year?	• Yes • No • Don't Know

Section 2

Item Text	Item Choices
Where did you graduate from high school?	• List of 50 states • Puerto Rico • Washington D.C.
What was your approximate high school GPA?	• 4.0 – 3.5 • 3.49 – 3.0 • 2.9 – 2.5

	• 2.49 – 2.0 • 1.9 – 1.5 • Less than 1.49 • Don't know
Did you take the SAT or ACT?	• Old SAT (600-2400) • New SAT (400-1600) • ACT • I did not take either of these tests
If select "Old SAT" > What was your approximate SAT score?	• 2210 – 2400 • 2020 – 2200 • 1840 – 2000 • 1660 – 1830 • 1510 – 1650 • 1320 – 1500 • 1150 – 1310 • 940 – 1130 • 920 or less
If select "New SAT" > What was your approximate SAT score?	• 1520 – 1600 • 1420 – 1510 • 1310 – 1410 • 1200 – 1300 • 1100 – 1190 • 980 – 1090 • 860 – 970 • 730 – 850 • 710 or less
If select "ACT" > What was your approximate ACT score?	• 34 – 36 • 31 – 33 • 28 – 30 • 25 – 27 • 22 – 24 • 19 – 21 • 16 – 18 • 13 – 15 • 12 or less
Were you admitted to your top choice university?	• Yes • No
What university are you currently attending?	• List of institutions from Appendix B • Other
What is your current classification in college?	• Freshman/first-year • Sophomore • Junior

	• Senior • Graduate student • Unclassified
What is your current GPA?	• 4.0 – 3.5 • 3.49 – 3.0 • 2.9 – 2.5 • 2.49 – 2.0 • 1.9 – 1.5 • Less than 1.49 • Don't know
What is your major or intended major?	• Accounting • Art • Biology • Business • Chemistry • Computer science/computer engineering • Construction management • Economics • Education • Engineering • English • Environmental science • Finance • History • Journalism • Mathematics • Music • Nursing (RN/BSN) • Political science • Other
What is your engineering discipline?	• Aerospace • Architectural • Biomedical • Biological & agricultural • Chemical • Civil • Computer science • Electrical • Engineering management • Engineering science & engineering physics • Environmental

	- General engineering - Industrial/manufacturing systems - Information technology - Mechanical - Metallurgical & materials - Mining - Nuclear - Petroleum - Software engineering - Other

Section 3

Item Text	Item Choices
Please select the option that most closely describes current affirmative action practices in higher education admissions in the United States.	- Students are evaluated through a holistic review process where race is just one factor among many that is considered in their admissions. - When two students are equally qualified, a minority student would be selected for admission above a White student. - Universities reserve a certain number of seats for minority students in their admitting classes.

Section 4

Introductory text:

For the rest of this survey, please use the following definition:
Affirmative action is the process where universities consider race as one of many factors when evaluating an applicant for admissions.

Item Text	Item Choices
How informed are you about affirmative action admissions practices in higher education?	- Very uninformed - Uninformed - Informed - Very informed
What was the most recent Supreme Court ruling about affirmative action?	- Grutter v. Bollinger - Fisher v. UT Austin - Students for Fair Admission v. Harvard University - Don't know
All public universities are allowed to use affirmative action practices in higher education admissions decisions.	- True - False - Don't know

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The majority of states use a percent plan for their higher education admissions practices, where students who graduate in the top X percent of their high school class are guaranteed admission to a state college or university.	• True • False • Don't know
The state where I graduate from high school has a percent plan in place.	• True • False • Don't know

Section 5
Introductory text:
For the rest of this survey, please use the following definition:
Affirmative action is the process where universities consider race as one of many factors when evaluating an applicant for admissions.

Item Text	*Item Choices*
Thinking about your political views, please indicate where you would place yourself on this scale.	• Extremely liberal • Liberal • Slightly liberal • Moderate, middle of the road • Slightly conservative • Conservative • Extremely conservative • Haven't thought much about it
With what political party do you most identify?	• Democrat • Independent • Republican • Other (write-in)
How would you describe the racial composition of the following? • Neighborhood where you grew up/lived the longest when you were growing up • High school that you graduated from • Your friends at your current university	• All or nearly all people of color • Mostly people of color • Half white and half people of color • Mostly white • All or nearly all white
Please indicate the extent to which you interact with students from each of the following groups? • African Americans/Blacks • Asian Americans/Pacific Islanders • Native Americans/American Indians/Alaskan Natives	• No interaction • Little interaction • Some regular interaction • Substantial interaction

• Hispanic/Latinx • White	
Indicate your level of agreement with the following statement: I have personally experienced discrimination because of my _____. • Religion • Race • Sexual orientation • Gender	• Strongly disagree • Disagree • Agree • Strongly agree
I believe I experienced discrimination when applying to college.	• Strongly disagree • Disagree • Agree • Strongly agree
How do you think affirmative action has affected you in your pursuit of higher education?	• Hurt • Helped • No effect • Don't know

Section 6

Introductory text:
For the rest of this survey, please use the following definition:
Affirmative action is the process where universities consider race as one of many factors when evaluating an applicant for admissions.
Please indicate your level of agreement with the following statements.

Item Text	Item Choices
What one can achieve in life depends mostly on their family background. (DV)	• Strongly disagree • Disagree
Since the Civil Rights Movement, our society has done enough to promote the advancement of people of color. (DV)	• Agree • Strongly agree
People of color are no longer discriminated against in this country. (DV)	Note: the following key indicates which items loaded onto the specified factors.
The system prevents people of color from getting their fair share of better jobs and more money. (DV)	• DV = discrimination view • Val = value of diversity • HED = role of higher education
A person's race does not interfere with what they want to achieve. (DV)	• Fair = fairness • Merit = merit
White people are discriminated against in society. (DV)	
Contact with individuals of different races is a valuable experience. (Val)	
Underrepresented minority students are valuable to universities because they	

possess different experiences from non-minority students. (Val)	
Increasing the racial diversity of the student body makes a positive contribution to the education of all students. (Val)	
A racially diverse campus environment prepares students for leadership. (Val)	
Emphasizing diversity creates tension on campus. (Val)	
Universities should have a requirement for graduation to take at least one course that covers the role of race in society. (HED)	
Universities should provide resources to support cultural and social activities run by different groups of color. (HED)	
Universities do not have a primary responsibility to correct racial injustice. (HED)	
A high priority should be given to see that students from low income families receive financial aid for education after high school. (HED)	
Enhancing a student's ability to live in a multicultural society should be a part of a university's mission. (HED)	
Universities should aggressively recruit more underrepresented minority students. (HED)	
White students will lose out if affirmative action is continued. (Fair)	
Race doesn't affect how people will perform academically. (Merit)	
It is unfair to base admissions decisions on any factor other than merit. (Merit)	
Affirmative action gives an unfair advantage to underrepresented minority students. (Fair)	
Affirmative action can punish student applicants who are White. (Fair)	
People should be admitted to colleges/universities based exclusively on ability. (Merit)	

Section 7
Introductory text:
Definition of affirmative action:
Affirmative action is the process where universities consider race as one of many factors when evaluating an applicant for admissions.

Item Text	Item Choices
When considering applicants for admission, many colleges and universities consider a variety of factors to determine a student's admissibility. Do you support or oppose giving consideration for the following factors? • Applicants whose family members graduated from the college to which the student is applying • Applicants from economically disadvantaged backgrounds • Applicants from underrepresented minority groups	• Strongly oppose • Oppose • Support • Strongly support
Please share your opinion on affirmative action admissions policies in higher education by responding to the following statements: • Affirmative action should be utilized in higher education admissions. • Universities benefit from admitting underrepresented minority students through affirmative action.	• Strongly disagree • Disagree • Agree • Strongly agree

Section 8
Introductory Text:
This section is OPTIONAL. If you would like to, please fill out these short answer questions below.

Item Text	Item Choices
How do you feel about affirmative action in higher education admissions practices? Why do you feel that way?	Open entry text box
Are there any other factors that you think should be utilized when evaluating students for admissions to college?	Open entry text box

APPENDIX B

LIST OF UNIVERSITIES IN SAMPLE

Arizona State University

Auburn University

California State Polytechnic University, Pomona

California State University, Long Beach

Clemson University

Cornell University

Drexel University

Florida International University

George Mason University

Iowa State University

Louisiana State University

Michigan State University

Missouri University of Science and Technology

North Carolina State University

Oregon State University

Pennsylvania State University

Purdue University

Rutgers University

Stanford University

Stony Brook University

Texas A&M University

Texas Tech University

The Ohio State University

The University of Alabama

The University of Texas at Austin

University of California, Berkeley

University of California, Davis

University of California, Irvine

University of California, Los Angeles

University of California, San Diego

University of Central Florida

University of Colorado Boulder

University of Florida

University of Illinois - Urbana-Champaign

University of Maryland, College Park

University of Michigan

University of Minnesota, Twin Cities

University of Missouri

University of Southern California

University of Washington

University of Wisconsin-Madison

Virginia Tech

Washington State University

West Virginia University

APPENDIX C

RECRUITMENT MATERIALS & CONSENT FORM

Email Sent to Faculty

Subject Line:
Studying Student Attitudes Towards Admissions Practices in Higher Education

Dear Faculty Members:

I am a Doctoral Student in the Education Policy program at Arizona State University. For my dissertation, I am investigating undergraduate student attitudes towards higher education admissions policies and practices in the United States. In order to study this, I would like to ask for your help.

To study student attitudes, I have designed a survey which takes about 10-15 minutes to complete. Within the survey students are asked questions regarding diversity, discrimination, and practices in higher education admissions.

What I would like to ask from you is to share this survey with current students you have in your class/classes. I have included a short message (below) that you may use as a recruitment script/message with your students.

If you have any questions about your rights as a subject/participant in this research, or if you feel you have been placed at risk, you can contact the Chair of the Human Subjects Institutional Review Board, through the ASU Office of Research Integrity and Assurance, at (480) 965-6788. Please let me know if you wish to be part of the study.

Thank you,

Lydia Ross   Eugene Judson
Graduate Student   Associate Professor
Lydia.Ross@asu.edu   Eugene.Judson@asu.edu

Message to Share with Students

Dear Students,

I am a doctoral student at Arizona State University. I am currently conducting a study that looks at student attitudes towards higher education admissions policies and practices in the United States. I would like to ask for your help with this study by completing a survey.

The survey will take about 10 – 15 minutes. Within the survey, you will be asked questions regarding your thoughts and beliefs about admissions practices in higher education. You may skip any of the survey questions. Resulting data will be aggregated. You and your institution will not be identified in any resulting reports. Your participation is voluntary. If you have any questions, please call me at 480-727-5216.

Three participants will be entered into a drawing for a $100 Amazon gift card (three total cards will be given out).

You may skip any of the survey questions. Resulting data will be aggregated. You and your institution will not be identified in any resulting reports. Your participation is voluntary. If you have any questions, please call me at 480-727-5216.

Please follow this <u>link to the survey</u>. Participating in the survey indicates your consent for data you provide being contributed to the study.

If you have any questions about your rights as a subject/participant in this research, or if you feel you have been placed at risk, you can contact the Chair of the Human Subjects Institutional Review Board, through the ASU Office of Research Integrity and Assurance, at (480) 965-6788. Please let me know if you wish to be part of the study.

Thank you,

Lydia Ross   Eugene Judson
Graduate Student   Associate Professor
Lydia.Ross@asu.edu   Eugene.Judson@asu.edu

Student Attitudes Towards Admissions Policies Consent Form

I am a graduate student under the direction of Dr. Eugene Judson in Educational Policy & Evaluation PhD program of the Mary Lou Fulton Teachers College at Arizona State University. I am conducting a research study to examine student attitudes towards admissions practices and policies in higher education.

I am inviting your participation, which will involve 10-15 minutes of your time in a short survey regarding your own attitudes towards admissions practices in higher education institutions. You have the right not to answer any question, and to stop participation at any time.

Your participation in this study is voluntary. If you choose not to participate or to withdraw from the study at any time, there will be no penalty. Three participants will be selected at random to receive a $100 Amazon gift card. Your entry into the raffle for the gift card will not be connected to any of the responses on the survey. You must be 18 or older and a current undergraduate student enrolled at a four-year higher education institution to participate in the study. There are no foreseeable risks or discomforts to your participation.

All responses will be anonymous. Further all results will be reported in aggregate. The results of this study may be used in reports, presentations, or publications.

If you have any questions concerning the research study, please contact the research team at: Lydia.Ross@asu.edu or Eugene.Judson@asu.edu. If you have any questions about your rights as a subject/participant in this research, or if you feel you have been placed at risk, you can contact the Chair of the Human Subjects Institutional Review Board, through the ASU Office of Research Integrity and Assurance, at (480) 965-6788. Please let me know if you wish to be part of the study.

By completing the following survey, you are consenting to be a part of the study.

APPENDIX D

FULL REGRESSION TABLE

Model	B	Std. Error	β	t	Sig.	Collinearity Statistics Tolerance	VIF
1 (Constant)	7.502	0.325		23.102	0.000		
Age	-0.006	0.014	-0.010	-0.446	0.656	0.963	1.038
Female	0.880	0.089	0.228	9.902	0.000	0.994	1.007
URM	0.927	0.115	0.190	8.087	0.000	0.954	1.048
Mother Edu. ≥ UG	0.023	0.096	0.006	0.242	0.809	0.925	1.081
2 (Constant)	6.847	0.330		20.718	0.000		
Age	0.001	0.014	0.002	0.078	0.938	0.918	1.089
Female	0.771	0.087	0.200	8.880	0.000	0.909	1.100
URM	0.713	0.110	0.146	6.475	0.000	0.900	1.111
Mother Edu. ≥ UG	0.000	0.092	0.000	0.001	0.999	0.875	1.142
Liberal	1.304	0.085	0.337	15.253	0.000	0.943	1.060
Med. HS Achievement	-0.200	0.095	-0.052	-2.110	0.035	0.765	1.307
High HS Achievement	0.007	0.139	0.001	0.050	0.960	0.750	1.333
Exp. Personal Discrimination	0.012	0.089	0.003	0.137	0.891	0.916	1.092
Medium Diversity Exp.	0.058	0.098	0.014	0.598	0.550	0.819	1.221
High Diversity Exp.	0.308	0.108	0.070	2.854	0.004	0.771	1.297
3 (Constant)	7.641	0.348		21.928	0.000		
Age	-0.007	0.013	-0.011	-0.527	0.598	0.911	1.097
Female	0.677	0.084	0.175	8.078	0.000	0.893	1.120
URM	0.599	0.106	0.123	5.656	0.000	0.890	1.123
Mother Edu. ≥ UG	0.019	0.088	0.005	0.219	0.827	0.875	1.143
Liberal	1.172	0.083	0.303	14.201	0.000	0.925	1.082
Med. HS Achievement	-0.132	0.091	-0.034	-1.448	0.148	0.760	1.315
High HS Achievement	0.179	0.135	0.032	1.322	0.186	0.726	1.377
Exp. Personal Discrimination	0.078	0.086	0.020	0.910	0.363	0.899	1.112
Medium Diversity Exp.	0.031	0.094	0.007	0.326	0.744	0.811	1.233
High Diversity Exp.	0.266	0.104	0.060	2.552	0.011	0.761	1.315
Knowledge Score	-0.318	0.083	-0.083	-3.829	0.000	0.899	1.112
Perception: Tiebreak	-1.145	0.095	-0.273	-12.050	0.000	0.821	1.219
Perception: Quota	-0.438	0.101	-0.097	-4.350	0.000	0.849	1.178
Self-Rate Informed	-0.027	0.064	-0.009	-0.423	0.672	0.912	1.096
4 (Constant)	8.045	0.392		20.497	0.000		
Age	-0.022	0.015	-0.036	-1.480	0.139	0.720	1.389
Female	0.688	0.084	0.178	8.197	0.000	0.884	1.131

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	URM	0.610	0.108	0.125	5.657	0.000	0.856	1.168
	Mother Edu. ≥ UG	0.018	0.089	0.005	0.205	0.838	0.864	1.157
	Liberal	1.163	0.083	0.301	14.052	0.000	0.914	1.094
	Med. HS Achievement	-0.155	0.091	-0.040	-1.700	0.089	0.751	1.331
	High HS Achievement	0.168	0.137	0.030	1.224	0.221	0.699	1.430
	Exp. Personal Discrimination	0.077	0.086	0.019	0.897	0.370	0.893	1.120
	Medium Diversity Exp.	0.030	0.095	0.007	0.318	0.750	0.786	1.272
	High Diversity Exp.	0.295	0.109	0.067	2.695	0.007	0.683	1.463
	Knowledge Score	-0.320	0.083	-0.083	-3.856	0.000	0.894	1.119
	Perception: Tiebreak	-1.145	0.095	-0.273	-12.043	0.000	0.815	1.227
	Perception: Quota	-0.449	0.101	-0.099	-4.459	0.000	0.844	1.184
	Self-Rate Informed	-0.020	0.064	-0.007	-0.315	0.753	0.902	1.109
	Public	0.041	0.043	0.020	0.967	0.334	0.984	1.016
	Region: Midwest	-0.240	0.163	-0.056	-1.472	0.141	0.284	3.517
	Region: South	-0.280	0.159	-0.070	-1.754	0.080	0.262	3.817
	Region: West	-0.411	0.178	-0.093	-2.314	0.021	0.260	3.843
	Med. Accept. Rate	-0.100	0.099	-0.024	-1.012	0.312	0.735	1.361
	High Accept. Rate	-0.046	0.091	-0.011	-0.502	0.615	0.811	1.234
	Year: Sophomore	0.211	0.132	0.044	1.598	0.110	0.557	1.797
	Year: Junior	0.082	0.125	0.020	0.658	0.511	0.467	2.139
	Year: Senior	0.363	0.132	0.087	2.740	0.006	0.410	2.437
5	(Constant)	8.714	0.269		32.389	0.000		
	Age	-0.015	0.010	-0.024	-1.453	0.146	0.713	1.403
	Female	-0.031	0.060	-0.008	-0.522	0.602	0.802	1.246
	URM	0.148	0.074	0.030	1.986	0.047	0.836	1.197
	Mother Edu. ≥ UG	0.100	0.061	0.025	1.647	0.100	0.861	1.162
	Liberal	0.060	0.063	0.016	0.955	0.340	0.727	1.375
	Med. HS Achievement	-0.103	0.063	-0.027	-1.641	0.101	0.738	1.355
	High HS Achievement	-0.014	0.095	-0.002	-0.145	0.885	0.681	1.469
	Exp. Personal Discrimination	-0.023	0.059	-0.006	-0.383	0.702	0.888	1.126
	Medium Diversity Exp.	-0.073	0.065	-0.018	-1.123	0.262	0.784	1.276
	High Diversity Exp.	0.082	0.075	0.019	1.089	0.276	0.673	1.485
	Knowledge Score	-0.150	0.057	-0.039	-2.648	0.008	0.888	1.127
	Perception: Tiebreak	-0.278	0.068	-0.066	-4.067	0.000	0.732	1.367
	Perception: Quota	-0.142	0.069	-0.031	-2.041	0.041	0.829	1.206
	Self-Rate Informed	-0.029	0.044	-0.010	-0.661	0.509	0.896	1.116
	Public	-0.017	0.029	-0.008	-0.589	0.556	0.978	1.023

	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
Region: Midwest	-0.293	0.111	-0.069	-2.631	0.009	0.284	3.522
Region: South	-0.310	0.109	-0.078	-2.856	0.004	0.262	3.819
Region: West	-0.446	0.121	-0.101	-3.671	0.000	0.260	3.853
Med. Accept. Rate	-0.110	0.068	-0.026	-1.625	0.104	0.734	1.362
High Accept. Rate	0.113	0.062	0.028	1.804	0.071	0.801	1.249
Year: Sophomore	0.134	0.090	0.028	1.488	0.137	0.556	1.799
Year: Junior	0.112	0.085	0.027	1.312	0.190	0.467	2.143
Year: Senior	0.114	0.091	0.028	1.261	0.207	0.408	2.449
View on Discrimination	0.287	0.075	0.078	3.802	0.000	0.459	2.179
Value of Diversity	0.367	0.073	0.099	5.036	0.000	0.506	1.976
Role of Higher Education	1.345	0.080	0.380	16.721	0.000	0.378	2.648
Merit	-0.522	0.052	-0.181	-9.980	0.000	0.591	1.691
Fairness	-0.623	0.060	-0.211	-10.361	0.000	0.468	2.138
6 (Constant)	8.778	0.336		26.127	0.000		
Age	-0.014	0.010	-0.023	-1.389	0.165	0.709	1.411
Female	-0.088	0.204	-0.023	-0.433	0.665	0.070	14.387
URM	-0.231	0.159	-0.047	-1.456	0.146	0.182	5.481
Mother Edu. ≥ UG	0.091	0.061	0.023	1.509	0.131	0.858	1.165
Liberal	0.057	0.063	0.015	0.908	0.364	0.725	1.379
Med. HS Achievement	-0.105	0.065	-0.027	-1.631	0.103	0.692	1.446
High HS Achievement	-0.014	0.097	-0.002	-0.142	0.887	0.649	1.541
Exp. Personal Discrimination	-0.022	0.059	-0.005	-0.367	0.713	0.886	1.129
Medium Diversity Exp.	-0.071	0.065	-0.017	-1.102	0.271	0.783	1.277
High Diversity Exp.	0.084	0.075	0.019	1.117	0.264	0.672	1.488
Knowledge Score	-0.152	0.057	-0.040	-2.681	0.007	0.884	1.131
Perception: Tiebreak	-0.279	0.068	-0.067	-4.087	0.000	0.731	1.368
Perception: Quota	-0.144	0.069	-0.032	-2.081	0.038	0.829	1.207
Self-Rate Informed	-0.027	0.044	-0.009	-0.620	0.536	0.894	1.119
Public	-0.016	0.029	-0.008	-0.548	0.584	0.977	1.024
Region: Midwest	-0.293	0.112	-0.069	-2.621	0.009	0.281	3.561
Region: South	-0.319	0.111	-0.080	-2.884	0.004	0.252	3.968
Region: West	-0.434	0.123	-0.098	-3.532	0.000	0.252	3.967
Med. Accept. Rate	-0.098	0.068	-0.024	-1.446	0.148	0.722	1.384
High Accept. Rate	0.130	0.063	0.032	2.071	0.038	0.790	1.266
Year: Sophomore	0.140	0.090	0.029	1.556	0.120	0.556	1.800
Year: Junior	0.116	0.085	0.028	1.361	0.174	0.466	2.145
Year: Senior	0.118	0.091	0.028	1.298	0.194	0.407	2.455

	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
View on Discrimination	0.288	0.075	0.079	3.824	0.000	0.459	2.180
Value of Diversity	0.367	0.073	0.099	5.039	0.000	0.505	1.980
Role of Higher Education	1.348	0.080	0.381	16.772	0.000	0.377	2.655
Merit	-0.524	0.052	-0.181	-10.013	0.000	0.591	1.693
Fairness	-0.616	0.060	-0.209	-10.245	0.000	0.466	2.146
ECS Major	-0.106	0.203	-0.021	-0.525	0.600	0.117	8.555
ECS*URM	0.472	0.177	0.089	2.673	0.008	0.175	5.712
ECS*Female	0.080	0.213	0.020	0.377	0.706	0.072	13.869
7 (Constant)	8.773	0.332		26.387	0.000		
Age	-0.014	0.010	-0.024	-1.454	0.146	0.708	1.413
Female	-0.109	0.202	-0.028	-0.540	0.590	0.069	14.421
URM	-0.265	0.161	-0.054	-1.641	0.101	0.173	5.774
Mother Edu. ≥ UG	0.108	0.060	0.027	1.801	0.072	0.854	1.170
Liberal	0.087	0.063	0.023	1.391	0.165	0.718	1.392
Med. HS Achievement	-0.095	0.064	-0.025	-1.488	0.137	0.689	1.451
High HS Achievement	-0.007	0.096	-0.001	-0.069	0.945	0.647	1.546
Exp. Personal Discrimination	0.018	0.059	0.004	0.300	0.764	0.858	1.166
Medium Diversity Exp.	-0.052	0.064	-0.013	-0.802	0.423	0.779	1.284
High Diversity Exp.	0.086	0.075	0.020	1.159	0.247	0.668	1.496
Knowledge Score	-0.122	0.056	-0.032	-2.157	0.031	0.875	1.142
Perception: Tiebreak	-0.266	0.068	-0.063	-3.931	0.000	0.729	1.372
Perception: Quota	-0.130	0.069	-0.029	-1.897	0.058	0.822	1.216
Self-Rate Informed	-0.011	0.043	-0.004	-0.256	0.798	0.884	1.131
Public	-0.009	0.029	-0.004	-0.314	0.754	0.964	1.037
Region: Midwest	-0.282	0.111	-0.066	-2.556	0.011	0.280	3.568
Region: South	-0.303	0.109	-0.076	-2.772	0.006	0.252	3.974
Region: West	-0.444	0.122	-0.100	-3.652	0.000	0.252	3.973
Med. Accept. Rate	-0.102	0.067	-0.025	-1.524	0.128	0.721	1.388
High Accept. Rate	0.142	0.062	0.035	2.276	0.023	0.783	1.277
Year: Sophomore	0.143	0.089	0.030	1.597	0.111	0.553	1.808
Year: Junior	0.118	0.084	0.028	1.393	0.164	0.462	2.163
Year: Senior	0.127	0.090	0.031	1.412	0.158	0.405	2.471
View on Discrimination	0.236	0.101	0.065	2.342	0.019	0.250	4.003
Value of Diversity	0.335	0.095	0.090	3.537	0.000	0.293	3.410
Role of Higher Education	1.341	0.080	0.378	16.788	0.000	0.373	2.680
Merit	-0.540	0.052	-0.187	-10.371	0.000	0.582	1.717

Fairness	-0.609	0.060	-0.207	-10.133	0.000	0.457	2.190
ECS Major	-0.123	0.201	-0.025	-0.614	0.539	0.117	8.583
ECS*URM	0.489	0.176	0.092	2.776	0.006	0.172	5.820
ECS*Female	0.117	0.211	0.028	0.553	0.580	0.072	13.911
View on Discrimination *Fairness	0.080	0.118	0.017	0.674	0.501	0.284	3.525
View on Discrimination *Merit	0.178	0.113	0.036	1.571	0.116	0.355	2.819
Role of Higher Education*Fairness	0.229	0.113	0.052	2.031	0.042	0.286	3.496
Role of Higher Education*Merit	0.027	0.111	0.006	0.238	0.812	0.337	2.965
View on Discrimination*URM	0.041	0.143	0.005	0.291	0.771	0.618	1.619
View on Discrimination *Female	-0.030	0.122	-0.005	-0.246	0.806	0.398	2.511
Value of Diversity*Female	-0.014	0.124	-0.003	-0.116	0.908	0.407	2.457
Value of Diversity*URM	0.154	0.158	0.017	0.977	0.329	0.620	1.614