

## **ABSTRACT**

WOMBLE, CALLIE CHANTEL. Investigating Black Male Intersectionality: Counternarratives of High-Achieving Black Male Engineering Undergraduates at a Predominantly White Institution. (Under the direction of Dr. Joy Gaston Gayles).

The purpose of this qualitative research study was to understand how being both Black and male (i.e., Black male intersectionality) shaped the lived experiences and academic success of high-achieving Black male undergraduates in engineering majors at a predominantly White institution (PWI). Consistent with prior research, high-achieving was defined as having earned a cumulative grade point average (GPA) at or above 3.0. A counternarrative approach was used to obtain the stories of this understudied population who has achieved academic success in college, despite all that is stacked up against them. Southeastern University (pseudonym), a large, public PWI located in an urban city within the Southeastern region of the United States, was selected as the study site because it has consistently been nationally ranked as a top producer of engineering bachelor's degrees awarded to underrepresented racial and ethnic minority students, particularly Black students. Eight high-achieving Black male undergraduates in engineering majors at Southeastern University were selected for the study through two specific types of purposeful sampling procedures: criterion and snowball sampling.

This study used analysis of narratives to construct the primary data, which were collected through an online demographic survey, an online narrative exercise, individual interviews, and a focus group with the eight participants, into themes. Three themes and six subthemes emerged using a priori coding, informed by Critical Race Theory and the anti-deficit achievement framework for studying students of color in STEM constructs, and open coding. This study also used narrative analysis to organize these themes into a sequential

order. Findings indicated that for these high-achieving Black male undergraduates in engineering majors, their experiences were shaped by their access to fiscal resources and built-in communities of college-educated individuals (the theme of *“I was extremely privileged”*). Additionally, because they identified as male, participants felt some sense of belonging in the engineering field and were able to connect with their fellow male peers that identified as White (the theme of *“I was extremely privileged”*). Participants were also highly aware of their racial minority status in predominantly White spaces and often responded by managing negative stereotypes about them; still, every participant encountered racism (the theme of *“I was basically in two different worlds”*). Moreover, participants’ families modeled positive attributes of Black culture, and participants acknowledged the need to build community amongst their same-race peers (the theme of *“I was basically in two different worlds”*). Finally, as participants managed their identities as high-achieving Black males in engineering majors, they felt pressure from themselves and their families to perform academically or professionally (the theme of *“It’s a lot of pressure from a lot of different areas”*). The study concludes with a discussion of the findings in the context of existing literature, as well as study limitations, theoretical implications, and recommendations for practice and future research.

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Investigating Black Male Intersectionality: Counternarratives of High-Achieving Black Male  
Engineering Undergraduates at a Predominantly White Institution

by  
Callie Chantel Womble

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## DEDICATION

I dedicate this dissertation to my biggest supporter and advocate, my Momma. You always knew this day would come to pass, even on the days when my faith wavered. We did it, Momma! All your sacrifices and encouragement paid off. I could not have done this without you. This Ph.D. is just as much yours as it is mine.

I also dedicate this dissertation to the eight young men who shared their stories with me: Marcos, Isaiah, Lamar, James, Saadiq, Jermaine, Anthony, and Carter (pseudonyms). Your stories informed, inspired, and challenged me as an educational researcher. I know you each will continue to impact the world, as you did in this study. Thank you!

## BIOGRAPHY

Callie Chantel Womble was born and raised in Durham, North Carolina. She is the daughter of Bryan O. Womble and Gloria G. Cole-Womble. She is a proud 2008 graduate of Hillside High School, a historically Black high school in Durham, North Carolina. Also, in 2008, Callie earned the Gates Millennium Scholarship, a highly competitive merit and need-based scholarship for undergraduate, graduate, and doctoral studies to use at any accredited college or university awarded to 1,000 students nationwide each year. Through the Gates Millennium Scholarship, Callie went on to earn her Bachelor of Science in Public Health in Health Policy and Management (2012) and Master of Public Health in Health Behavior (2014) from the University of North Carolina at Chapel Hill. While in her master's program, Callie served as a half-time Health Outreach Specialist and a half-time Student Wellness Specialist at UNC Student Wellness. Through these transformative experiences, Callie realized her passion for working with college students and serving in higher education administration. In the fall of 2014, Callie enrolled in the Doctor of Philosophy (Ph.D.) program in Educational Research and Policy Analysis, with a specialization in Higher Education Administration at North Carolina State University.

While at North Carolina State University, Callie has been an avid researcher. She presented over 26 peer-reviewed conference presentations and 19 invited presentations. She also published two single-author peer-reviewed manuscripts and worked on other single and team manuscripts. In addition, Callie served in several professional roles such as a half-time Graduate Research Assistant in the Office of Assessment (2014-2017), a part-time Academic Coach (2015-2016), a part-time Program Coordinator in the Office of Minority Engineering Programs (2016-2017), a Co-Instructor of undergraduate and graduate courses (2016-2017),

and a Public Health Education Consultant (2016). She has earned numerous honors, awards, and grants. Three she is most proud of include being named as 2016-2017 Preparing the Professoriate Fellow, and a Special Recognition Graduate (2015) and Graduate Scholar (2016) of the Equal Opportunity Institute – all at North Carolina State University. Also, in April 2018, the North Carolina State University higher education program faculty selected Callie's dissertation study for the 2018 Higher Education Dissertation of the Year Award.

Outside of the University, Callie has developed two community-based organizations to support students and professionals of color: The Life Of A Scholar, LLC. and The Scholar Academy, LLC. She earned the 2015 Gates Millennium Scholar Alumni Association Excellence in Service Award for her community outreach efforts. In December 2017, Callie began her career in state government. Currently, she is a Commission Research Specialist with the North Carolina Department of Commerce.

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*“And we know that all things work together for good to them that love God, to them who are the called according to His purpose.”*

*Romans 8:28*

I must first acknowledge my Lord and Savior Jesus Christ, without Him none of this would be possible. I am eternally grateful for Your everlasting love, grace, mercy, and favor. I once heard the phrase, “your talent is God’s gift to you, what you do with it is your gift back to God”. Pursuing my Ph.D. was a goal I set when I was awarded the Gates Millennium Scholarship in 2008 and seeing the fulfillment of this dream is surreal. Thank You for this gift! I vow to use this degree to pay forward the incredible educational opportunities I have been afforded and help others.

Secondly, I must acknowledge my loving birth family, which includes my Momma, Daddy, Grandparents, Aunties, Uncles, and Cousins both on Earth and in Heaven. You all have always encouraged me to pursue academic excellence and supported me throughout my educational journey. A special shout-out to my Momma, there are not enough words to express how much you mean to me. Our mother-daughter bond is one of my greatest blessings. Thank you for your countless sacrifices and for always reminding me that no dream is too big. I am everything I am because you loved (and continue to love!) me.

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## CHAPTER 1: INTRODUCTION

### The Research Problem

Numerous reports document the value of science, technology, engineering, and mathematics (STEM) trained professionals in today's global marketplace (National Academy of Engineering, 2004; National Academy of Sciences, National Academy of Engineering, & Institute of Medicine, 2007; National Science Board, 2014). STEM-trained professionals contribute to society in several important ways, such as enhancing national security, economic vitality, quality of life, and technological innovation (National Academy of Sciences et al., 2007; National Science Board, 2014). The National Academy of Sciences et al. (2007) asserted, "much of everyday life in the United States and other industrialized nations, as evidenced in transportation, communication, agriculture, education, health, defense, and jobs, is the product of investments in research and in the education of scientists and engineers" (p. 41). Given the vast demand for STEM expertise to advance human life, countries need competent STEM-trained professionals to remain globally competitive (Bybee & Fuchs, 2006; National Academy of Sciences et al., 2007). Unfortunately, the United States' insufficient supply of STEM-trained professionals continues to reduce its comparative advantage amongst nations worldwide (Freeman, 2006). Currently, there are not enough Americans earning STEM undergraduate degrees to meet the country's workforce demands (Frehill, Di Fabio, & Hill, 2008; Jackson, 2003; National Academy of Sciences et al., 2007). Moreover, there is a lack of racial and ethnic diversity in the American STEM workforce as most STEM-trained professionals in the United States identify as non-Hispanic White males (National Science Board, 2014). Thus, broadening STEM workforce participation to underrepresented racial and ethnic groups may enhance the country's ability to meet its

workforce demands. Additionally, broader diversity in the STEM workforce may also enhance the country's inventiveness by introducing new perspectives to solve grand challenges. Specifically, Black males are sources of talent that remain sorely underrepresented in STEM fields (National Urban League, 2007; Strayhorn, 2015). Black males have important yet underutilized contributions to these critical areas of need, including their intellect, creativity, and ability to understand the increasingly diverse STEM customer base. As the United States seeks to maintain its global competitiveness, Black male undergraduates in STEM majors represent a subgroup of students that colleges "need to do a better job recruiting (i.e., broadening participation) and retaining (i.e., increasing success)" (Strayhorn, 2015, p.45). In particular, high-achieving Black males in STEM majors, or those who have earned a cumulative grade point average (GPA) at or above 3.0, represent a subgroup of students that can provide valuable insights regarding strategies that facilitate Black male persistence in STEM.

### **The United States and its Pursuit of Global Competitiveness**

Scholars describe the inadequate supply of STEM-trained professionals in the United States as both "a crisis in science and engineering talent and expertise" (Jackson, 2003, p. 5) and "the new American dilemma" (Frehill et al., 2008, p. 3). In 2004, data predicted that the number of retirements from American science & engineering (S&E) degreed-employees would increase dramatically by the year 2024, causing the need for younger S&E-degreed employees to fill vacant roles (National Science Board, 2004). Eight years later, the President's Council of Advisors on Science and Technology (2012) quantified the demand for more STEM-trained professionals in the United States by focusing on undergraduate STEM degree production. In their report, *Excel to Engage*, the President's Council of



Advisors on Science and Technology (2012) estimated that between the years 2012 and 2022 the United States must add “approximately 1 million more STEM [trained] professionals than the [United States] will produce at current rates” (p. 1). In other words, the United States’ production rate of STEM undergraduate degrees needs to increase by 34 percent to meet the demand of new STEM-trained professionals (President’s Council of Advisors on Science and Technology, 2012).

As the demand for new STEM-trained professionals rises in the United States, international competitors are also producing considerably more STEM undergraduate degrees than the United States. For example, according to the National Science Board (2014), 31.5 percent of American undergraduate students earn S&E degrees, compared to 59.3 percent of Japanese undergraduates and 49.8 percent of Chinese undergraduates. More alarming degree production disparities exist among engineering degrees. The National Science Board (2014) reported that 31 percent of Chinese undergraduates earn Bachelors’ degrees in engineering, while only 5 percent of American undergraduates earn equivalent degrees. Together, the increased demand for new STEM-trained professionals in the United States accompanied with the increased supply of international STEM-trained professionals places the United States at a competitive disadvantage. Simply put, the United States must significantly increase its STEM undergraduate degree production to circumvent foreign countries from seizing its preeminent status (President’s Council of Advisors on Science and Technology, 2012).

### **Broadening Participation in United States STEM Education**

Efforts to broaden participation in STEM education provide a significant opportunity to increase the United States’ STEM undergraduate degree production. Within the United

States, historically marginalized racial and ethnic groups (i.e., racial and ethnic minorities), such as Blacks, Hispanics, American Indians, and Alaskan Natives, are increasing at an “unprecedented rate” (Museus, Palmer, Davis, & Maramba, 2011, p. 2). According to the United States’ Census Bureau (2012) by the year 2060 racial and ethnic minorities will comprise 57 percent of the overall population, a first in the nation’s history. These demographic shifts have not, however, manifested in STEM education. Today, most STEM undergraduate degree earners in the United States identify as non-Hispanic White males, as they have for almost thirty years (Chipman & Thomas, 1987; National Science Board, 2014). Simultaneously, racial and ethnic minorities continue to be underrepresented as STEM undergraduate degree earners both in comparison with the majority group and in comparison with their proportion of the United States’ population (National Science Board, 2014). Racial and ethnic minorities represent a large and growing reservoir of untapped talent as the United States is rapidly becoming more racially and ethnically diverse (U.S. Census Bureau, 2012). This talent reservoir must be developed to meet the United States’ STEM workforce demands. As such, broadening participation in STEM education is one promising strategy to augment the small number of new STEM-trained professionals entering the field.

Moreover, the value added of broadening participation in STEM education extends beyond the economics of supply and demand. In addition to helping the United States meet its STEM workforce demands, broader participation in STEM education will also enhance the workforce by capitalizing on the nation’s complete intellectual capacity. More specifically, professional work teams and client-practitioner relationships are two aspects of the STEM workforce that will benefit from broader diversity. First, many STEM-trained professionals often collaborate in work teams (Louis, Holdsworth, Anderson, & Campbell,

2007; National Academy of Engineering, 2004). The lack of STEM workforce diversity can negatively impact the collective problem-solving behavior of STEM work teams. For instance, a homogenous STEM work team may stifle innovation due to a lack of new or different perspectives when problem solving (N. R. Anderson & West, 1998; De Dreu & West, 2001; Nijstad & De Dreu, 2002; West, 2002). On the contrary, a heterogeneous STEM work team may facilitate innovation due to an influx of new or different perspectives when problem solving (N. R. Anderson & West, 1998; De Dreu & West, 2001; Nijstad & De Dreu, 2002; West, 2002). Second, the lack of STEM workforce diversity can also create a barrier between client-practitioner relationships. If STEM professionals continue to overwhelmingly identify as non-Hispanic White males, their innate racial and ethnic bias may limit their ability to understand their increasingly diverse customer base. As articulated by Resnik (2005), “by including people with different races and ethnicities in science and engineering, one will introduce different ideas into the marketplace of ideas, which will help to overcome racial and ethnic biases” (p. 90). Chubin, May, and Babco (2005) echoed similar sentiments as they recommended that the field of engineering reflect the racial and ethnic diversity of the nation. To best serve the increasingly diverse American population, Chubin et al. (2005) argued that engineering “must narrow the gap between practitioners on the one hand, and their clientele on the other” (p. 73).

### **Increasing Success in United States STEM Education**

Acknowledging the crucial need to broaden participation in STEM education, many American researchers investigate what they call the “STEM pipeline”, which is a metaphor used to describe how individuals matriculate from elementary school to the STEM professoriate or STEM workforce (Allen-Ramdiel & Campbell, 2014; Metcalf, 2010;

National Academy of Sciences et al., 2007). Expounding on the metaphor, leaks occur at certain points along the pipeline marked by individuals who exit or leave STEM fields before or even after establishing a career in the STEM professoriate or the STEM workforce (Allen-Ramdial & Campbell, 2014; Metcalf, 2010). The transition from secondary to postsecondary education is exceptionally “leaky” for racial and ethnic minorities (Allen-Ramdial & Campbell, 2014; Metcalf, 2010). In particular, Black undergraduates are highly susceptible to this “leaky” transition point. For example, Black first-year undergraduates are equally as interested in STEM majors as their White peers; however, they are less likely than White undergraduates to persist and earn a STEM Bachelor's degree within six years (Anderson & Kim, 2006). The percentage of Black undergraduates that do persist and earn a STEM Bachelor's degree is markedly low compared to other racial and ethnic groups. In 2013, Blacks earned the second lowest percentage of STEM undergraduate degrees conferred to a single race (7.5 percent) followed only by American Indians/Alaska Natives (0.6 percent) (National Center for Education Statistics, 2015). In comparison, Whites earned 67.9 percent, Asians earned 13.3 percent, and Hispanics earned 8.8 percent of STEM undergraduate degrees (National Center for Education Statistics, 2015). These data illustrate that many highly STEM-interested Black undergraduates are not matriculating to an appropriate end point on the STEM pipeline, namely a career in the STEM professoriate or STEM workforce. The inability to retain Black undergraduates in STEM majors provokes a conversation about social justice and inequity. For instance, are Black undergraduates systematically diverted from STEM majors? In other words, are there systems or structures in place that are antagonistic to Black undergraduates exploring STEM majors? Are specific aspects of STEM majors unattractive, unwelcoming, or even hostile to Black undergraduates? With a

focus on broadening participation in STEM education, researchers are interested in remedying the “leaky” points of the STEM pipeline to increase success. As such, the experiences of Black undergraduates in STEM majors warrant investigation.

### **Previous Studies Addressing Black Undergraduates in STEM**

Nearly thirty years of research explores the experiences of Black undergraduates in STEM majors (Hall & Post-Kammer, 1987; Museus et al., 2011; Powell, 1990). Much of the literature identifies individual and environmental influences that facilitate success or challenges for Black undergraduates in STEM majors. Individual influences refer to the pre-collegiate attributes and experiences that Black students acquire throughout their lifetimes and arrive with on their first day of college. These characteristics include students’ academic preparation particularly in science and mathematics courses, as well as non-cognitive traits, or the behaviors, skills, attitudes, and strategies that students develop outside of content knowledge and academic skill (Chang, Sharkness, Hurtado, & Newman, 2014; Maton, Hrabowski, & Schmitt, 2000; Russell & Atwater, 2005). Conversely, environmental influences refer to the postsecondary institutions where Black undergraduates live and learn, and elements of those institutions’ social and physical infrastructures. These elements tend to focus on the climate of the institution, including two popular metaphors: the “weeding out” system and the “chilly climate” hypothesis. The “weeding out” system refers to the phenomenon of undergraduates performing poorly in introductory STEM courses, which leaves them ill-prepared to advance within STEM majors and subsequently “weeded out” of STEM majors (Koenig, Schen, Edwards, & Bao, 2012; Maton et al., 2000). On the other hand, the “chilly climate” hypothesis refers to findings from the seminal works of Seymour and Hewitt (1994; 1997), in which undergraduates described STEM majors as uninviting,

cold, and intimidating. Seymour and Hewitt (1997) found that the “chilly climate” of STEM majors made a “much greater contribution to [STEM] attrition than the individual inadequacies of students or the appeal of other majors (p. 392). In fact, the “chilly climate” discourages many high-achieving undergraduates from pursuing STEM majors (Seymour & Hewitt, 1994; Seymour & Hewitt, 1997). Climate concerns have also been used as a lens to contextualize the experiences of Black undergraduates in STEM majors (A.R. Brown, Morning, & Watkins, 2005; Maton et al., 2000; Slovacek, Whittinghill, Flenoury, & Wiseman, 2012). Sense of belonging, in particular, is a large concern for Black undergraduates in STEM majors, particularly at PWIs (Guiffrida, 2005; Holmes, Ebbers, Robinson, & Mugenda, 2000; Litzler & Samuelson, 2013; Palmer, Maramba, & Holmes, 2011; Williamson, 1999). In engineering majors specifically, Black undergraduates feel their Blackness is “constantly under assault” (McGee & Martin, 2011, p. 1347). When Black engineering majors perceive racism and discrimination, they are more likely to have decreased GPA and graduation rates (A.R. Brown et al., 2005). In addition, Black male engineering majors become consumed with proving their critics wrong, which can be emotionally taxing (Moore, Madison-Colmore, & Smith, 2003).

Finally, historically Black colleges and universities (HBCUs), the top producers of Black STEM degrees, are consistently praised as models of inclusive spaces that promote Black student persistence in STEM majors (Fries-Britt, Younger, & Hall, 2010; Owens, Shelton, Bloom, & Cavil, 2012; Palmer, Davis, & Thompson, 2010; Perna et al., 2009).

### **Deficiencies in Previous Studies**

Several deficiencies are present in the existing literature. First, many studies on Black undergraduates in STEM majors take a holistic look at the Black student population,

including both females and males (E. L. Anderson & Kim, 2006; A.R. Brown et al., 2005; Hurtado, Cabrera, Lin, Arellano, & Espinosa, 2009). Albeit widely used, this approach of aggregating Black undergraduate experiences in STEM majors can be controversial due to the group performance differences on academic success metrics (Cuyjet, 1997; Kim, 2011). For example, according to the National Center for Education Statistics (2015), Black male undergraduates earned between 6.1 and 6.5 percent of all STEM Bachelor's degrees from 2009-2013. For each year between 2009-2013, the annual percentage of Black male STEM Bachelor's degrees was consistently lower than White males and White females as well as other minority populations such as Black females, Hispanic males, and Hispanic females (National Center for Education Statistics, 2015). These data demonstrate a need to disaggregate the experiences of racial and ethnic minorities and to consider within-group differences. In particular, there is a need for a heightened understanding of the individual and environmental influences that lead to academic success for Black male undergraduates in STEM majors. Cain (2012) expressed this idea as follows,

Post secondary participation and graduation rates of Black males within STEM disciplines are declining rapidly [...] There is no lack of data supporting these claims. However, what is lacking is sufficient research to analyze and understand the problem, and provide the basis for interventions that could lead to the reversal of the trend (p. 97).

Furthermore, the majority of previous studies about Black undergraduates in STEM majors focus on mathematics and science majors (Hall & Post-Kammer, 1987; Powell, 1990; Russell & Atwater, 2005). Accordingly, few studies have explored the experiences of Black undergraduates in engineering majors (Burrell, Fleming, Fredericks, & Moore, 2015; Moore

et al., 2003). The lack of attention toward the experiences of Black undergraduates in engineering majors is troublesome for two main reasons. First, while STEM is used as an inclusive term to discuss the collective experiences of science, technology, engineering, and mathematics fields, it is important to recognize that all STEM fields are not the same. Each field has distinctive characteristics that make it unique. In order to better understand and support students within specific STEM majors, we need to better understand disciplinary differences and not treat all STEM as a monolithic group of majors. Su and Rounds (2015) succinctly articulated this rationale as follows:

[...] [P]ast research on [gender participation in STEM fields] typically treated all STEM fields as a whole and ignored the differences among sub-disciplines of STEM. It is important to note that all STEM fields are not identical. Sub-disciplines of STEM vary in their culture and climate, training and preparation required, and the type of work activities involved (p. 1).

Next, data reveal startling trends among Black engineers, specifically. While once ascending, the percentage of Black engineers has now plateaued (National Science Foundation, 2013). Moreover, in recent years fewer than five percent of domestic (i.e., United States born) Black undergraduates have earned engineering Bachelor's degrees, which is the lowest percentage of engineering Bachelor's degrees awarded to a racial group (Aud, Fox, & KewalRamani, 2010; National Science Foundation, 2013). From a human capital perspective, the stark underrepresentation of domestic Black engineers is problematic because it further limits the talent and worldview of American engineering, a field that is already inadequate in comparison with international competitors (Long & Mejia, 2016). For example, among the top-performing countries on the Program for International Student



Assessment (PISA), the United States produces the lowest percentage of engineering degrees (Center on International Education Benchmarking, 2014). Black Americans can offer new and significant contributions to engineering processes and products; the underutilization of this group's skills and experiences is a large missed opportunity for the American economy. Thus, it is in the nation's best interest to develop evidence-based strategies for recruiting and retaining domestic Black engineering undergraduates (Burrell et al., 2015).

### **Purpose Statement**

This study explored the experiences of a population that is often overlooked: high-achieving Black male undergraduates in engineering majors at a predominantly White institution (PWI). The purpose of this counternarrative study was to understand how being both Black and male (i.e., Black male intersectionality) shaped the lived experiences and academic success of this population. According to Lynn and Dixson (2013) “[Black male] intersectionality is rarely examined, and as a result, opportunities to authentically capture the breadth and depth of Black males are missed, and efforts to capture their stories and reform schools are misinformed and misguided” (p. 234). Acknowledging this gap, this study's critical analysis of Black male intersectionality is a vital contribution to higher education and broader American society.

Aligned with previous research on the academic success of Black male undergraduates, “high-achieving” was defined as having earned a cumulative grade point average (GPA) at or above 3.0 (Fries-Britt, 1998; Harper, 2012). This definition is also supported by York et al.'s (2015) analytic review of academic success in higher education, which found that academic achievement, measured by grades and GPA, was the most

frequently measured academic success metric overall in higher education research and assessment.

### **Research Question**

This study was guided by the following research question: How does Black male intersectionality shape the lived experiences and academic success of high-achieving Black male undergraduates in engineering majors at a PWI?

### **Overview of Theoretical Frameworks**

Two theoretical frameworks were employed in tandem to ground this study: Critical Race Theory (CRT) and the anti-deficit achievement framework for research on students of color in STEM (ADAF)<sup>1</sup>. CRT is an interdisciplinary theory that emerged in the 1970s out of the critical legal studies movement (Delgado & Stefancic, 2012). CRT has two primary goals: (1) to examine the relationships between race, racism and power in American society, and (2) to disrupt those relationships, thereby establishing social justice (Delgado & Stefancic, 2012; Ladson-Billings, 1998). This study utilized Marable's (1992) definition of racism which is "a system of ignorance, exploitation, and power used to oppress [Blacks], Latinos, Asians, Pacific Americans, American Indians and other people on the basis of ethnicity, culture, mannerisms, and color" (p. 5). CRT has five central tenets, namely, (1) racial realism, (2) differential racialization, (3) interest convergence, (4) intersectionality, and (5) counterstorytelling. Racial realism acknowledges that racism is permanent, ordinary, "widespread and deeply woven into the fabric of [American] society" (Delgado & Stefancic,

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<sup>1</sup>In this dissertation, I use the abbreviation "ADAF" to represent the anti-deficit achievement framework for research on students of color in STEM.

2000, p. 225). Racial realism exposes the unearned benefits that American society grants White people on the basis of their Whiteness (i.e., White privilege) and rejects the notion of a colorblind American society in which race does not matter (McCoy & Rodricks, 2015). Differential racialization identifies race as a social construction, that is, “the dominant society racializes different minority groups at different times, in response to shifting needs such as the labor market” (Delgado & Stefancic, 2012, p. 9). Interest convergence states that racial equity will only be advanced when the interests of people of color align with White interests (Delgado & Stefancic, 2012). Intersectionality contends that social identities can intersect and overlap causing multilayered experiences with racism and oppression (Delgado & Stefancic, 2012). For instance, a Black male may be discriminated against because of his subordinate racial identity (i.e., Black) or experience privilege and oppression at the intersection of his subordinate racial identity and dominant gender identity (i.e., male). Counterstorytelling affirms that the lived, racialized experiences of racial and ethnic minorities can describe race and racism in ways that Whites are unaware (Delgado & Stefancic, 2012). Utilizing CRT as a theoretical framework provoked both a laser focus on the centrality of race at a PWI and a conceptual understanding of Black male intersectionality. In particular, three of the five central tenets (i.e., racial realism, intersectionality, and counterstorytelling) were instrumental in the development of data collection and analysis protocols.

Nearly forty years after the inception of CRT, Harper (2010) developed the anti-deficit achievement framework for research on students of color in STEM (ADAF) to “discover how some students of color have managed to succeed in STEM” (p. 68). The framework advises researchers to reframe their deficit-oriented questions about academic

failure into anti-deficit-oriented questions about academic success. The framework is organized into three distinct domains, namely (1) pre-college socialization and readiness, (2) college achievement, and (3) post-college persistence in STEM. These junctures refer to the experiences students of color acquire before, during, and after college, respectively. Within each of these junctures, there are three researchable dimensions of achievement. Familial factors, K-12 school forces, and out-of-school college preparatory experiences are the researchable dimensions of achievement for pre-college socialization and readiness. Classroom interactions, out-of-class engagement, and experiential/external opportunities are the researchable dimensions of achievement for college achievement. Finally, industry careers, graduate school enrollment, and research careers are the researchable dimensions of achievement for post-college persistence in STEM. This counternarrative study took an anti-deficit approach by seeking to understand the stories of those who achieve academic success in college, despite all that is stacked up against them (Harper, 2010; Harper, 2012).

### **Significance of Research**

This narrative study explored the experiences of high-achieving Black male engineering majors at a PWI, which is a pressing topic of concern for students, parents, faculty, higher education administrators, and researchers alike. Each of the aforementioned stakeholders possesses an invested interest in understanding how Black male undergraduates in engineering majors develop and maintain academic success at PWIs. In other words, understanding the stories of the study participants will benefit these parties personally or professionally. On a personal level, Black male pre-college and undergraduate students that are interested in engineering majors at PWIs can apply what they learn from study participants' stories to augment their own college experiences. Likewise, parents of Black

male pre-college and undergraduate students that are interested in engineering majors at PWIs can utilize what they learn from study participants' stories to assist their children on their college journeys. At a structural level, understanding study participants' stories can influence how faculty and higher education administrators at PWIs design and adapt university curriculum and support programs for this population. Organizational change at the university level may lead to an increase of Black male undergraduates who obtain academic success in engineering majors. This ripple effect may extrapolate to more Black male representation in the engineering profession, which could benefit the United States' economy. Finally, on an even more macro-level, uplifting study participants' stories fulfills several gaps in the current literature base such as the need to examine Black male academic achievement (Harper, 2012), Black male educational experiences in STEM (Harper, 2010; Harper, 2012), and Black male intersectionality (Lynn & Dixson, 2013). Thus, these stories can lead researchers to new, fruitful, and more comprehensive questions about the experiences of Black male undergraduates at PWIs.

### **Definition of Terms**

The following terms are used in this study.

#### **Black**

In this study, Black is a descriptor to identify individuals of African descent living in the United States; this term will be used interchangeably with "African American" and "Black American".

**Black Male Intersectionality**

In this study, Black male intersectionality is a phrase that refers to Black males simultaneously experiencing racial oppression because of their subordinate racial status (i.e., identifying as Black) and gender privilege because of their dominant gender status (i.e., identifying as male).

**Counternarratives**

Counternarratives are accounts that tell the “stories of people whose experiences are not often told (i.e., those on the margins of society)” (Solórzano and Yosso, 2002, p. 32).

**Engineering**

According to the Accreditation Board for Engineering and Technology (ABET) (as cited in Lord, 2000), engineering is defined as “the profession in which a knowledge of the mathematical and natural sciences gained by study, experience, and practice is applied with judgment to develop ways to utilize economically the materials and forces of nature for the benefit of mankind” (p.5).

**High-achieving**

High-achieving is a descriptor to identify students who have earned a cumulative grade point average (GPA) at or above 3.0 (Fries-Britt, 1998; Harper, 2012).

**Males**

In this study, males are defined as individuals who were assigned the sex “male” at birth.

**Master Narratives**

According to Harper (2009) “[m]aster narratives are dominant accounts that are often generally accepted as universal truths about particular groups (e.g., Blacks are hopeless and helpless) – such scripts usually caricature these groups in negative ways” (p. 701).

**Narrative**

In this study, a narrative is defined as a story.

**Oppression**

In this study, oppression is defined as individuals receiving systemic disadvantages that they did not earn (Adams et al., 2000).

**Predominantly White Institution (PWI)**

PWI is descriptor to identify higher education institutions in which Whites account for 50% or greater of the student enrollment (M.C. Brown & Dancy, 2010).

**Privilege**

In this study, privilege is defined as individuals receiving systemic benefits that they did not earn (Adams et al., 2000).

**Racism**

Racism is defined as “a system of ignorance, exploitation, and power used to oppress [Blacks], Latinos, Asians, Pacific Americans, American Indians and other people on the basis of ethnicity, culture, mannerisms, and color” (Marable, 1992, p. 5).

**Science, technology, engineering, and mathematics (STEM)**

This study uses the National Center for Educational Statistics' definition of STEM, which includes “mathematics; natural sciences (including physical sciences and biological/agricultural sciences); engineering/engineering technologies; and computer/information sciences” (Chen, 2009, p. 2).

**Organization of Dissertation**

This dissertation consists of six chapters. Chapter 1 provided an overview of the research problem and discussed the deficiencies of previous studies addressing the research problem. It also explained the current study's purpose, research question, theoretical frameworks, and significance as well as clarified the definitions of key terms. Chapter 2 is a thorough review of literature related to Black undergraduates at PWIs broadly and within three specific subgroups: (1) high achievers, (2) males, and (3) STEM majors. Chapter 2 also describes the study's theoretical frameworks, Critical Race Theory (CRT) and the anti-deficit achievement framework for studying students of color in STEM (ADAF). Chapter 3 outlines the study's methodological approach, including the research design, site and participant selection, and data collection and analysis procedures. Chapter 3 also shares how ethical concerns were mitigated and provides a positionality statement. Chapter 4 presents participants' narratives, while Chapter 5 reports on the study's findings. The closing chapter, Chapter 6, discusses the study findings in relation to prior research and the study's theoretical frameworks. Chapter 6 also discusses study limitations and implications as well as provides recommendations to stakeholders.



## CHAPTER 2: LITERATURE REVIEW

This study sought to understand the lived experiences and academic success of high-achieving Black male engineering undergraduates at a PWI. In this literature review, I discuss previous research that informed the study. Given the importance of educational achievement, race, and gender to the study population, I also describe theories that offer the appropriate language for examining and comparing these constructs. This literature review contains two main sections. In section one, I synthesize prior studies that characterize the study population. First, I share the existing research on Black undergraduates at PWIs. Subsequently, I outline three particular subgroups of Black undergraduates at PWIs: (1) high achievers, (2) males, and (3) STEM majors. In section two, I provide an overview of the two theoretical frameworks that grounded the study: (1) Critical Race Theory (CRT) and (2) the anti-deficit achievement framework for studying students of color in STEM (ADAF). I also demonstrate how these frameworks worked together to inform data collection and analysis.

### **Black Undergraduates at PWIs**

The first major area of research that informed the study centers on the experiences of Black undergraduates at PWIs. Within this area of research, three key issues are present: (1) race, (2) place, and (3) racism. Race is a social construction that categorizes people based on physical differences (Delgado & Stefancic, 2012; Omi & Winant, 1994). Research confirms, “the cultural conception of race is neither a biological reality nor determinant” (Dozier, 2017, p. 15). Place encompasses the built environment, people-made objects and artifacts of material culture, as well as the how people interact with the environment and each other (Strange & Banning, 2015). Moreover, racism is defined as “a system of ignorance, exploitation, and power used to oppress [Blacks], Latinos, Asians, Pacific Americans,

American Indians and other people on the basis of ethnicity, culture, mannerisms, and color” (Marable, 1992, p.5). When scholars study Black undergraduates at PWIs, they are seeking to make sense of race (i.e., identifying as Black) and place (i.e., the PWI environment), but they rarely scrutinize the racism that Black undergraduates encounter at PWIs. In his systematic analysis of 255 peer-reviewed articles published in postsecondary education focused journals, Harper (2012) found that most higher education researchers tend to minimize institutional racism when analyzing the dissimilar experiences of White and non-White students. Instead of appropriately naming institutional practices as racist, scholars “rely on everything but racism in their attempts to explain, theorize about, and discuss findings that emerge in their race-related studies” (Harper, 2012, p. 21-22). Ultimately, by ignoring how racism has impacted non-White students, scholars are neglecting a vital component of the college experience. I acknowledge this limitation in the literature, and to rectify this scholastic gap, later in this chapter I will introduce CRT as one of the study’s theoretical frameworks.

### **A Brief History of PWIs**

Because dominant culture often presents the histories of non-White people in incomplete ways, an examination of history becomes all the more critical for this section (Feagin, Vera, & Imani, 1996). Exploring this concept at length, for example, Feagin et al. (1996) discussed the importance of collective memory. They stated,

Like space and territory, the individual and collective sense of time and memory can be socially and racially colonized. What passes for a society’s history is usually the dominant group’s version of that history. White Americans, particularly [W]hite officials, historians, media commentators, and moviemakers, have long tried to

control and sanitize the collective memories and understandings of the interracial history of the United States (p. 21).

For this reason and to fully appreciate the experiences of Black undergraduates at PWIs, it is essential that I provide a historical account of PWIs and demonstrate why PWIs exist as an education institutional category.

American higher education institutions emerged during the country's colonial era (Thelin, 2011). At their inception, all learning institutions were PWIs, given the legality of African enslavement and the relatively few educational opportunities available for Blacks at that time (Chesler, Lewis, & Crowfoot, 2005; Ladson-Billings, 2006). Given prevailing concerns about Black agency and the possibility of slave rebellions in various areas, colonial laws prohibited reading and writing among enslaved Africans (Chesler et al., 2005; Ladson-Billings, 2006). As such, PWIs were created to educate White students exclusively (Weinberg, 1977). These institutions were overtly White-only environments and were not designed as welcoming spaces for non-White students.

After emancipation, Black Americans began to reach major milestones in education such as gaining admission to PWIs (Thelin, 2011). However, attending PWIs was a taxing process, as racist ideologies about the intellectual inferiority of Black students remained widespread (M. M. Kim, 2002). Moreover, PWIs were openly hostile, discriminatory, and racist to non-White students. As Sears and Lane (2016) observed, many PWIs “promoted segregation, and individuals of color only gained admission because of Supreme court rulings or affirmative action” (p. 38). Some scholars even insist that Historically Black Colleges and Universities (HBCUs) were created as mechanisms to protect PWIs, also called Historically White Colleges and Universities (HWCUs) (M. M. Kim, 2002), from racial

integration. For instance, as Evans, Evans, and Evans (2002) alleged, “HBCUs were not designed to succeed, rather they were established to appease Black people or to serve as “holding institutions” so that Black students would not matriculate in HWCUs” (p.3). In other words, racism is such a large and interconnected system of ignorance, exploitation, and power that the very creation of HBCUs was a strategy to further oppress Blacks. Even at HBCUs, Black students were not exempt from the systemic nature of racism.

Through her historical and qualitative analysis, Williamson (1999) provided a comprehensive overview of the feelings of isolation, alienation, and other racial stressors Black students faced as they helped integrate PWIs. For example, Williamson (1999) interviewed a Black female student who described “being drowned in a sea of Whiteness” (p. 95) at her PWI. The PWI environment was not built to accommodate the needs of Black students or represent their culture, a phenomenon that often added to the defensiveness of Black students, as Williamson (1999) described. With limited institutional support, Black students at PWIs created their own support systems, such as Black student unions and campus-based chapters of national organizations including the National Society of Black Engineers (NSBE) (Williamson, 1999). The formation of these organizations demonstrates the resiliency of students who were determined to survive racist campus climates. Despite the obstacles they faced, by the early 1970s almost two-thirds of all Black college students were enrolled at PWIs (Williamson, 1999). The pattern of Black undergraduates attending PWIs has only increased since then. Today, over 75% of Black college students attend PWIs (Strayhorn, 2009).

### **Black Undergraduates as Minority and Minoritized Students**

Existing literature routinely identifies Black students at PWIs as both minority

students and ‘minoritized’ students. Traditionally, scholars have labeled non-White students as minority students (Eimers, 2001; Swail, 2003). For decades, scholars have investigated the ways in which White and non-White students have navigated PWIs (Astin, 1982; Jones, Castellanos, & Cole, 2002; Y. M. Kim, 2011). Overall, scholars have underscored immense dissimilarity between the White and non-White student PWI experience. For example, in their pivotal work on college student development, Terenzini and Pascarella (1991) delineated the extent to which White and non-White student experiences diverged at PWIs. They affirmed, “[i]t is equally clear that the academic, social, and psychological worlds inhabited by most non-White students on predominantly [W]hite campuses are substantially different in almost every respect from those of their [W]hite peers” (p. 644). More recent scholarship affirms that non-White students experience unique stressors that are a direct consequence of their minority status at PWIs such as racism, discrimination, and cultural insensitivity (McClain et al., 2016). These stressors, also called minority status stress (MSS), amplify feelings of otherness and promote maladjustment to college (McClain et al., 2016; Smedley, Myers, & Harrell, 1993). Data suggests that Black students are more likely to experience MSS than other racial groups (McClain et al., 2016; Wei, Ku, & Liao, 2011).

However, in more contemporary research, scholars have used the term ‘minoritized’ to describe non-White students who attend PWIs (Chase, Dowd, Pazich, & Bensimon, 2014; Harper, 2015; Stewart, 2013). The use of this term is more inclusive of the “social experience of marginalization” (Chase et al., 2014, p. 671) and highlights its systemic nature. For example, Harper (2015) described the deliberate shift from labeling non-White students as minority students to minoritized students as follows:

I use minoritized instead of minority [...] to signify the social construction of underrepresentation and subordination in US social institutions, including colleges and universities. Persons are not born into minority status, nor are they minoritized in every social milieu (e.g., their families, racially homogenous friendship groups, or places of religious worship). Instead, they are rendered minorities in particular situations and institutional environments that sustain an overrepresentation of Whiteness (p.670).

### **Unique Challenges Black Undergraduates Face at PWIs**

In addition to sharing experiences with other minority or minoritized students, Black undergraduates also encounter distinctive challenges at PWIs because they are Black. In their study of 218 Black undergraduates attending PWIs, McClain et al. (2016) succinctly articulate this point as: “[t]he added burden associated with Black collegians’ minority status on PWU [predominantly White university] campuses, in concert with the typical challenges faced by all college students, appears to exert a negative influence on Black students’ psychological functioning” (p.110).

The phenomenon of being a Black undergraduate on a predominantly White college campus is a popular topic of investigation. Over thirty years of research examines the experiences of Black undergraduates at PWIs (Allen, 1992; Allen, 1986; Brooks, 2012; Fleming, 1985; M. M. Kim, 2002). Additionally, most of the research on Black undergraduates has been conducted on PWIs (Harper, 2015) and most Black college students are enrolled at PWIs (Strayhorn, 2009). If current enrollment trends continue, scholars predict that “over half of [B]lack students at PWIs will fail to persist and graduate” (Benton, 2001, p.21). This alarming projection suggests that while PWIs are the institution of choice

for many Black undergraduates, we have a limited understanding of Black student success in these spaces.

In general, much of what we know about Black undergraduates at PWIs focuses on the academic and social obstacles they face (Harper, 2013; Harper, 2015). According to Harper (2013),

[N]early everything published about Black undergraduates at PWIs focuses on factors (including toxic campus racial climates) that undermine academic success and sense of belonging – in other words, a one-sided research focus on deficits and negative forces instead of enablers of achievement (p. 186).

Scholars who conduct research within these deficit-oriented frameworks can be grouped into two main schools of thought: those that investigate deficits in students and those that investigate deficits in environments. From a student-deficit perspective, the challenges Black undergraduates face at PWIs are linked to individual characteristics within the students such as their socioeconomic status, college readiness, and academic motivation (Caldwell & Obasi, 2010; Spenner, Buchmann, & Landerman, 2004). For example, Benton (2001) boldly asserted that Black undergraduates seem “educationally, culturally, and economically incompatible with the PWI model of education” (p. 21). She further cited high GPAs and standardized test scores, cultural assimilation, and financial resources as individual characteristics that are well-suited for PWIs. The trouble with this argument is that it places the onus to be successful on the students, as opposed to the educational institution, which should help facilitate their success. Thus, educational researchers within this paradigm divorce individual outcomes of success and failure from structural constraints (Golden, 2017; Weis & Fine, 2012). However, there is persuasive evidence to consider how structural

constraints impact Black undergraduates. For instance, longitudinal data demonstrates that Black undergraduates achieve great success in the HBCU environment (L. A. Flowers, 2002). The success of Black undergraduates at HBCUs indicates that there is nothing inherently wrong with Black students that needs to be fixed (Kunjufu, 2012). Rather, it suggests that PWIs need to alter their environments to better suit the needs of Black students.

From the environmental-deficit perspective, the challenges Black undergraduates face at PWIs are linked to institutional characteristics such as structural diversity, racial climate and support services (Harper & Hurtado, 2007; Love, 2009; Negga, Applewhite, & Livingston, 2007). For example, Love's (2009) investigation of ninety Black college students who participated in the Culture Attitude and Climate (CACs) survey revealed statistically significant findings that link Black student retention at a PWI to campus climate and, more specifically, racial stereotypes. In the sample, Black students were less likely to persist at their PWI when they had a negative perception of the campus climate and when they encountered racial stereotypes on campus. Relatedly, in their study of Black college students, Negga, Applewhite, & Livingston (2007) suggested that PWIs may need to develop targeted intervention or counseling services to help Black students cope with culturally sensitive issues such as racial discrimination and isolation.

Aligned with an environmental-deficit philosophy, I will now discuss the three major challenges Black undergraduates face at PWIs: (1) racism, (2) stereotypes, and (3) lack of belonging. While ethnic differences within the Black student community may influence how students perceive, and subsequently confront, each of these challenges (K. Griffin, Cunningham, & George Mwangi, 2016), I will share what existing literature describes more generally.



**Racism.** Experiencing and coping with racism is the first major challenge I will discuss. As mentioned previously, Harper (2012) found that the most postsecondary studies do not examine the racism that Black undergraduates encounter at PWIs. However, those that do span several decades (Feagin, 1992; Gusa, 2010; Lo, McCallum, Hughes, Smith, & McKnight, 2017; M. Davis et al., 2004). Therefore, I will begin by providing a historical overview of studies on the topic.

In terms of overt racism, many PWIs have racist cultural artifacts such as statues of confederate war heroes, state songs with references to "massa" and "darkies", and confederate flags (Muschick, 1999). Likewise, "anti-Black graffiti, fraternity parties and parades with racist themes, racist literature passed out on campus, violent attacks on Black students, and interracial brawls" (Feagin, 1992, p. 552) are all visual manifestations of racism at PWIs. In their book, *The Agony of Education: Black Students at White Colleges and Universities*, Feagin et al. (1996) shared findings from focus groups with thirty-six randomly selected Black juniors and seniors at a PWI and forty-one Black parents who reside in the nearby metropolitan area that funnels students to the university. Drawing from the experiences of Black students particularly, Feagin et al. (1996) provided a compelling discussion on the omnipresence of racism on PWIs. They cited the Whiteness of university spaces, interactions with White faculty, and staff barriers as key illustrations. In terms of the Whiteness of university spaces, in their study, Black students received various non-verbal and verbal messages that communicated to them that they were not welcome. For example, students offered examples such as the lack of Black representation in the yearbook, as well as the phenomena of White students gradually leaving campus locations upon their arrival. They also recalled instances of being verbally harassed and referred to as "niggers".

Additionally, when confronting White students for their racist behavior, Black students encountered what Feagin et al. (1996) labeled 'White denial'. In response, White students denied the allegations and insisted that racism did not exist on campus. Meanwhile, interactions with White faculty were also problematic, as Black students faced stereotyping, insensitivity to Black culture, and differential treatment from their professors. Reflecting on her daughter's college experience, one mother even explained how some instructor's preference was to not have Black students. She stated,

I expected discrimination in the classroom, and she had it. [Like what?] Instructors who actually let it be known that their preference was not to have [B]lacks in their classroom or that [B]lacks didn't have the thinking ability to be in those particular classes. And they let them know (p.89).

Another student expressed feeling like the representative for their race because they were the 'only one' in their class. Finally, students shared how the White university staff members, such as academic advisers, supervisors, residence hall staff, and campus police officers, also placed obstacles in their way. In particular, students described the difficulties involved with getting accurate, timely, and appropriate information as well as being racially profiled and harassed by campus police. Feagin et al.'s (1996) findings on covert racism were echoed over a decade later in Gusa's (2010) piece on White institutional presence. As articulated by Gusa (2010),

Today's PWIs do not have to be explicitly racist to create a hostile environment.

Instead, unexamined historically situated White cultural ideology embedded in the language, cultural practices, traditions, and perceptions of knowledge allow these institutions to remain racialized (p. 465).

More recent studies also have investigated how Black students perceive the presence of racism on PWIs (M. Davis et al., 2004; Swim, Hyers, Cohen, Fitzgerald, & Bylsma, 2003). In general, Black students perceive racism as pervasive on PWIs. A Black undergraduate at a large, Southeastern state, predominantly White university described racism as something that “happens every single day” (p.5) on their campus and is “probably never going to go away, not ever” (M. Davis et al., 2004, p.5). Black undergraduates at a Northeastern PWI also reported everyday experiences with campus racism, which fueled their anger and often prompted them to respond in direct and indirect ways (Swim et al., 2003). Directly, Black undergraduates responded by making comments to their racist perpetrators or expressed retaliatory comments or behavior toward their racist perpetrators through someone else. Indirectly, Black undergraduates responded by either making comments to someone other than their racist perpetrators, abruptly ending interaction with their racist perpetrator, avoiding, ignoring or boycotting their racist perpetrators, or displaying nonverbal looks or gestures.

While racism is a constant experience for Black undergraduates at PWIs, it manifests in different ways. For example, in a recent quantitative study of 3,219 Black and White undergraduates at University of Alabama, a PWI in the “heart of the American South” (p.248), Lo & colleagues (2017) investigated student perspectives regarding three sets of racism measures: traditional racism, symbolic racism, and between group social distance, respectively. The authors defined traditional racism as overt prejudice based upon beliefs about the racial inferiority of non-White individuals. They offered racial segregation as an example of traditional racism. On the other hand, symbolic racism refers to covert prejudice that marginalizes non-White individuals and perpetuates racial inequity. They shared an

example of symbolic racism as verbally supporting the idea of racial equity but denying the presence of systemic race-related advantages and disadvantages in American society. In essence, individuals who subscribe to this way of thinking blame the socioeconomic status of racial minorities on their inability to work hard, instead of on the structural realities of privilege and oppression. The third set of racism measures, or between group social distance, refers to interracial social interaction between Blacks and Whites, specifically. The authors provided examples of professional interactions, such as Blacks and Whites attending class together and working cooperatively on class projects, as well as personal interactions such as Blacks-Whites friendships and interracial dating. Through a survey instrument, Lo & colleagues (2017) assessed how Black and White students responded to questions about traditional racism, symbolic racism, and between group social distance on their campus. Not surprisingly, Black students perceived the campus as more racist than their White peers. However, other noteworthy findings did emerge among Black students. For example, while Black students generally supported the idea of eliminating structural constraints from policies and institutions, some doubted if such actions would improve campus race relations. In other words, some Black students felt “current government policies intended to promote racial equality appear[ed] inadequate” (Lo et al., 2017, p. 258) and required improvement. In addition, Black sorority and fraternity members assessed the campus as more racist than Black students who were unaffiliated with Greek-letter organizations, suggesting that Greek-membership might enhance awareness of racism.

While attending PWIs, Black undergraduates also deal with the “new face of racism” (Sue et al., 2008, p.330) – or racial microaggressions. Racial microaggressions are defined as “brief and commonplace daily verbal, behavioral, or environmental indignities, whether

intentional or unintentional, that communicate hostile, derogatory, or negative racial slights and insults toward people of color” (Sue et al., 2007, p.271). Several studies have investigated how Black undergraduates at PWIs experience and cope with racial microaggressions (M. Davis et al., 2004; Grier-Reed, 2010; Harwood, Hunt, Mendenhall, & Lewis, 2012; Solórzano, Ceja, & Yosso, 2000; Swim et al., 2003). Scholars within this area of research frequently discuss how the race-related stress induced by racial microaggressions is harmful to the psychosocial well-being of Black students. Counter spaces are often referred to in the literature to respond to these stressors. Counter spaces “serve as sites where deficit notions of people of color can be challenged and where a positive collegiate racial climate can be established and maintained” (Solórzano et al., 2000, p. 70). Essentially, counter spaces are places of refuge for minoritized students on racist college campuses; they nurture students’ racial identity and provide them with resources and community.

After conducting focus groups at three PWIs, Solórzano and colleagues (2000) found that Black students experienced racial microaggressions within academic and social spaces. In classroom settings, participants felt invisible and ignored by their White faculty and peers. They also shared examples of how those faculty members and peers maintained low expectations of them, which made forming study groups especially difficult. One participant even recalled how a White classmate told her he did not want to work with her because she was Black. Likewise, participants felt as though their experiences as Black Americans were “omitted, distorted, and stereotyped in their course curriculum” (Solórzano et al., 2000, p. 65). In social settings, participants also experienced racism. On the one hand, participants discussed subtle racial microaggressions such as discomfort on campus and feeling as though their presence was unwanted. On the other hand, participants also shared blatantly racist

incidences, including racially-charged interactions with the police. Participants relied on the following common counter spaces for academic and social support: Black student organizations, offices that serviced Black students, Black fraternities and sororities, and Black student-organized academic study halls (Solórzano et al., 2000).

The importance of counter spaces for Black students at PWIs was also highlighted in the Grier-Reed's (2010) article about the African American Student Network (AFAM), which is a weekly networking group that meets during lunchtime at a large Midwestern PWI. Two faculty members facilitate the group, and lunch is provided by the institution's Office for Equity and Diversity and the Office for Student Affairs. Each week, Black undergraduate students attend the meeting to engage with one another intellectually, socially, and personally. The students who participate in AFAM described it as a safe haven. For example, one participant indicated,

AFAM is just important because it gives Black people a voice. It gives us a voice that we aren't scared to be quiet. We can talk about anything, and everybody has a chance of being heard without being judged (Grier-Reed, 2010, p. 184).

In addition, scholars widely use functions of Blackness theory to illustrate how Black students use their Blackness to cope with racism at PWIs (Caldwell & Obasi, 2010; Chavous, 2000; Dahlvig, 2010; Lott, 2008). In a recent study, Payne and Suddler (2014) investigated the degree to which Black students, frontline staff, and faculty negotiated their Blackness to cope at a PWI. Within the student subsample, the authors found Black students were more likely to express bonding. The students created cohesive relationships with each other, and they developed a Black community where "everybody [knew] everybody" (p. 394). The authors also identified the exclusive spaces that existed for Black students on campus as

essential, again supporting previous research about counter spaces (Grier-Reed, 2010; Solórzano et al., 2000). Moreover, all three groups demonstrated great comfort with code switching, or alternating between their professional identity in majority White settings and a more racially Black identity in majority Black settings.

**Stereotypes.** Experiencing and coping with stereotypes is the second major challenge I will discuss. Stereotypes are rigid oversimplified generalizations about a person or group (Steele, 1997). At PWIs, Black undergraduates confront negative stereotypes that they are not academically prepared or capable of doing the work (Fries-Britt & Griffin, 2007). These stereotypes may be intensified by their physical appearance (W. A. Smith, Allen, & Danley, 2007) or by their manner of speech (Dunstan & Jaeger, 2015). For example, W. A. Smith, Allen, & Danley (2007) found that Black males attending PWIs were stereotyped by campus police as gang-like and criminal because of their appearance. One of the Black males described being stereotyped as being guilty of being “Black while in America” (W. A. Smith, Allen, & Danley, 2007, p. 574). Likewise, in Brett & Jaegar’s (2015) study on college student dialect, the Black participant in the study felt that others perceived her as “country” (p.791) and “unprofessional” (p.791) because of her diction. This finding echoes previous work on African American Vernacular English and its historical perception as a deficient language system (Harris & Schroeder, 2013).

As a result of encountering numerous negative stereotypes, Black undergraduates also experience a psychological phenomenon called stereotype threat (Aronson, Fried, & Good, 2002; Steele, 1999; Steele, 2003). Stereotype threat describes feeling at risk of confirming a negative stereotype about one’s social group (Steele & Aronson, 1995). In other words, individuals who suffer from stereotype threat are conscious of the negative stereotypes

associated with their social group and actively seek to contradict those negative stereotypes. In their pivotal piece, Steele & Aronson (1995) examined the role of stereotype threat on Blacks in four different experiments. Together, these experiments demonstrated that awareness of negative stereotypes associated with their racial group's intellectual ability decreased Blacks' standardized test performance relative to Whites. At the same time, researcher efforts to alleviate that awareness improved performance.

It is important to note that not all Black undergraduates at PWIs respond to stereotype threat similarly. What is more, stereotype threats do not all have the same level of severity. Simply put, student characteristics, as well as threat conditions, influence student responses to stereotype threat. For example, in a study of 98 Black undergraduates attending PWIs, Davis, Aronson, & Salinas (2006) found that racial identity moderates stereotype threat in low threat conditions. Students with internalized Black racial identity, measured by the Black Racial Identity Attitudes Scale (BRIAS), demonstrate a "secure sense of belonging and connectedness to their racial group" (Davis, Aronson, & Salinas, 2006, p. 413). Such students performed better on the low threat problem-solving exercise in which their race was not primed. However, this finding did not hold true in the high threat task in which they were advised that an assessment measured their intellectual ability and their race was primed. This conclusion suggests that, in high threat conditions, even students with internalized Black racial identity want to disprove negative stereotypes about the Black race. These results also should be understood in context. According to the authors, most of the daily experiences of Black undergraduates fall within the realm of low threat conditions. They contend,

High threatening situations represent the extreme of high stakes testing situations, with one's group and personal reputation riding on one's performance on a test of



intelligence (or ability). We believe low threat situations speak to the more commonplace experiences of African Americans in the academic environment where social threats are likely to be more ambiguous and thus vary in response to individual differences (Davis, Aronson, & Salinas, 2006, p. 404-405).

Contemporary research also illustrates how Black male and female undergraduates respond differently to stereotypes and stereotype threat. For example, in a recent quantitative study of 190 Black college students, Nadler and Komarraju (2016) found that stereotype threat on test performance varied by both academic identification, or how central academics are to one's self-concept, and gender. Among the Black male undergraduates, those with stronger academic identification performed worse on the assessment than those with weaker academic identification. Conversely, Black women undergraduates with stronger academic identification performed better on the assessment than those with weaker academic identification. This finding is consistent with prior research on racial stereotypes and gender among Black college students at PWIs (Chavous, Harris, Rivas, Helaire, & Green, 2004). Chavous et al. (2004) offered the following as an explanation,

Given that [Black] men are less prevalent on PWI campuses than are [Black] women, they may be more vulnerable to the effects of having stereotype expectations, as there are fewer men like themselves to who to look for social support when these expectations occur (p.12).

A more thorough discussion of the stereotypes Black male undergraduates face will be provided in the Black male subgroup section of this chapter.

In addition to impacting standardized test performance, research also demonstrates that awareness of negative stereotypes about one's racial group can also increase internalized

pressure, also known as performance burden (Fischer, 2010). Students confront performance burden when they feel that others judge their racial group based on their individual academic successes and failures (Fischer, 2010). In the PWI environment, Black undergraduates often feel performance burden, or the intense need to succeed academically to positively represent Black people. In her longitudinal study on the role of stereotype threat among minorities at elite institutions, Fischer (2010) measured performance burden with a nine-item scale that included items such as, “if I excel academically it reflects positively on my group” and “if I do poorly academically it reflects negatively on my group”. Scores on the scale ranged from 0 to 64. Aligned with prior research, Black undergraduates had the highest average score (28.9) on the scale, indicating that they were the most likely to believe that their performance reflected on their racial group. Conversely, White undergraduates had the lowest average score (20.0) on the scale, indicating that they were least likely to believe that their performance reflected on their racial group.

Although most of the existing literature examines how Black undergraduates experience and cope with negative stereotypes, some research suggests that behaving counter to stereotypes in the presence of Whites also can cause anxiety for Black undergraduates (Richeson & Pollydore, 2002). After exposing thirty-three Black undergraduates at a PWI to short video clips from popular television programs, Richeson & Pollydore (2002) found that in the presence of White characters, Black undergraduates reported feeling more anxious about the counterstereotypical interaction. The authors deduced that viewing counterstereotypical fictional interactions may trigger anxiety because these instances remind Black undergraduates of their “everyday experiences as members of a devalued, statistical minority group at the college” (Richeson & Pollydore, 2002, p. 272). This perspective

alludes to the nuanced nature of stereotype threat and the ceaseless marginalization Black undergraduates face on PWIs.

**Lack of sense of belonging.** Thus far, I have discussed how Black undergraduates experience and cope with racism and stereotypes on predominantly White college campuses. The totality of these encounters leads us to the third and final major challenge apparent in scholarship on Black undergraduates at PWIs I will discuss: lack of sense of belonging. In this context, sense of belonging refers to how connected a student feels to the campus community (Strayhorn, 2012). Students with a high sense of belonging feel accepted on their college campuses as valued members (Strayhorn, 2012). Conversely, students with a low sense of belonging do not feel accepted or valued by their community. In their investigation of sense of belonging amongst Black and White first-year undergraduates, Hausmann, Schofield, and Woods (2007) argued that “sense of belonging is most often implied as the result of social and academic integration” (p.806). This finding is well aligned with previous research that demonstrates how Black undergraduates at PWIs experience many academic and social integration challenges and often lack sense of belonging (Cuyjet, 2006; Evans & Bonner, 2004). For example, the underrepresentation of Black undergraduates at PWIs remains a persistent challenge. Scholars note that the quantity of Black students, faculty, and administrators in these environments is considerably lower than that of their White counterparts (Fries-Britt & Turner, 2001). While the literature does not identify an exact numeric threshold for a suitable number of Black students, faculty, and administrators at on a college campus, scholars do discuss what they term a ‘critical mass’. A critical mass is the volume in which Black students “feel comfortable with the sense of connection and unity among Black peers on campus and when those students create their own social and cultural

networks on campus” (Fries-Britt & Turner, 2001, p.420). The absence of a critical mass of same-race peers at many PWIs fosters loneliness and lack of belonging amongst Black undergraduates (Fries-Britt & Turner, 2001; Fries-Britt & Turner, 2002; Sedlacek, 1987). In addition, Black undergraduates at PWIs perceive campus activities as exclusively tailored for White students and develop few relationships with faculty (R. B. Davis, 1991; Fries-Britt & Turner, 2002). In short, Black undergraduates have trouble integrating into the campus community at PWIs, which can leave them feeling like they do not belong. Evans and Bonner (2004) speak to this idea as follows, “All students who seek scholarly success need to be integrated in the fabric of the institution. Like many other minority students, [Black] students enrolled in PWIs often find this process of integration difficult” (p.11). In other words, because of the challenges discussed in this section, Black undergraduates at PWIs seldom feel connected to their campus community.

### **Subgroups of Black Undergraduates at PWIs**

In the previous section, I reviewed existing literature on the broad experiences of Black undergraduates at PWIs. Now, I will examine three subgroups of Black undergraduates at PWIs in more detail: (1) high achievers, (2) males, and (3) STEM majors. The study population, high-achieving Black male engineering undergraduates, identifies with each of these subgroups. As eloquently articulated by Goings & Bonner (2017), “to be [B]lack, high-achieving, and male is to be each one of these identities concomitantly” (p.2). Thus, the experiences of these subgroups may illuminate the study research question: How does Black male intersectionality shape the lived experiences and academic success of high-achieving Black male undergraduates in engineering majors at a PWI?

### **High-achieving Black Undergraduates**

As discussed in the previous section, the literature primarily conceptualizes Black undergraduates at PWIs from a student deficit-oriented perspective by outlining the reasons why they are at an academic or social disadvantage. This student deficit-oriented perspective is a limitation because it does not capture the full breadth of Black undergraduate experiences at PWIs. Instead, this perspective provides a very narrow understanding of the lived experiences of Black undergraduates at PWIs. As stated by Harper (2015), “much remains to be known about how students manage to excel and persist despite these challenges” (p. 647). Thus, the lived experiences of Black undergraduates who thrive at PWIs are often omitted from the literature.

Although most studies on Black undergraduates focus on students who struggle academically, a small collection of studies focuses on students who achieve academic success. This subpopulation of undergraduates is typically called “high-achieving” (Fries-Britt, 1998; Strayhorn, 2009), “successful” (Fries-Britt & Turner, 2001; Fries-Britt & Turner, 2002) or “gifted” (Fries-Britt, 1997; Fries-Britt, 1998) Black collegians in the literature. For purposes of clarity, I will refer to this subgroup as high-achieving Black undergraduates or high achievers. High achievers are defined in numerous ways such as their grade point average (Freeman, 1999), participation in an honors program (Fries-Britt & Griffin, 2007), or performance on a standardized test (Freeman, 1999).

High-achieving Black undergraduates are a diverse subgroup of students that belong to a wide variety of cultural and socioeconomic backgrounds (Fries-Britt, 1997; Fries-Britt, 2002). Although this population identifies as Black, they may be United States or international born (K. Griffin et al., 2016). In addition, they differ on how connected they

feel to the Black community (K. Griffin, 2006). Their families of origin also vary. High achievers come from both one-and-two parent families (Fries-Britt, 2002). Some high achievers are the first in their families to attend college, while others have parents who are college educated (Fries-Britt, 2002). Further, high achievers report different levels of access to resources, including annual incomes at the poverty level and well above \$200,000 (Fries-Britt, 2002).

High achievers can be either traditional college-aged students or nontraditional, adult learners (Goings, 2016). They also attend an array of institutional types, including public and private HBCUs, PWIs, and Hispanic-serving institutions (Bonner, 2003; Fries-Britt & Turner, 2002; Fries-Britt, Younger, & Hall, 2010). Consistent with prior research on Black undergraduates, high achievers find HBCUs more welcoming and supportive than PWIs (Bonner, 2003; Fries-Britt & Turner, 2002; Fries-Britt et al., 2010). When comparing the experiences of high-achieving Black undergraduates at PWIs and HBCUs, Fries-Britt & Turner (2002) found that PWI participants perceived campus activities to be exclusively tailored to White students. Because of their lack of Black peers and faculty, high achievers at PWIs felt like the “token” Black person, which diverted attention away from their studies.

Due to their academic prowess, faculty and staff may overlook high-achieving Black undergraduates for support services, or cluster them with high-achieving White undergraduates (Fries-Britt & Griffin, 2007). These erroneous actions derive from a lack of understanding about the distinct needs of high-achieving Black students (Freeman, 1999; Fries-Britt, 1997). While many of the experiences of high-achieving Black undergraduates reflect those that all Black undergraduates have, their identification as “high-achieving”

differentiates them in unique ways (Fries-Britt, 1997). In particular, high achievers must merge their academic and racial identity, which is a complex endeavor.

**Merging an academic and racial identity.** Academic ability and racial affiliation both influence how high-achieving Black undergraduates interact with their peers and faculty as well as those outside the university context (Fries-Britt, 2000). High achievers must merge their academic self with their racial self to develop their identity (Fries-Britt, 2000). However, most high-achieving Black undergraduates navigate a unique set of social integration challenges at the intersection of their academic and racial identities (Fries-Britt, 2000). Black achiever isolation, an expression coined by Fries-Britt (1998), encompasses the breadth of these challenges.

Black achiever isolation describes the immense social isolation high-achieving Black undergraduates feel from both their Black and White peers on predominantly White campuses. In Fries-Britt's (1998) qualitative study examining high-achieving Black undergraduates enrolled in the Meyerhoff program, a merit-based STEM scholarship program at a PWI, she found that high achievers felt isolated from both White peers because of their race, as well as their same-race average ability peers because of their achievement. As a result, high-achieving Black undergraduates did not feel they truly belonged in either group. She coined this distinct experience as Black achiever isolation. One year later, Freeman (1999) also discussed the dual isolation high-achieving Black students face from their Black and White peers and referred to it as the "double dilemma" (p.16).

Black achiever isolation illustrates the challenging task high achievers attempt: merging academic and racial identities that are often in conflict with one another. For example, when high-achieving Black undergraduates demonstrate their intellect their same-

race peers often label them as “acting White” (Fries-Britt, 1997). “Acting White” is a derogatory label used to alienate high-achieving Black students from the Black community. In their seminal piece, Fordham and Ogbu (1986) explained the origin of this cultural phenomenon as follows:

[Acting White] rose partly because [W]hite Americans traditionally refused to acknowledge that [B]lack Americans are capable of intellectual achievement, and partly because [B]lack Americans subsequently began to doubt their intellectual ability, began to define academic success as [W]hite people’s prerogative, and began to discourage their peers, perhaps unconsciously, from emulating [W]hite people in academic striving, i.e., from acting [W]hite (p.177).

As a result, high-achieving Black undergraduates may choose to mask their intelligence around their same-race peers to avoid rejection from “acting White”. Simultaneously, high achievers also have a contradictory desire to prove their intellect to their White peers who often hold negative stereotypes of Blacks that situate them as academically inferior (Fries-Britt, 2000). In a qualitative investigation at a large public university, high-achieving Black undergraduates reported that “some peers and faculty see their Blackness and begin to attribute negative characteristics based on assumptions and stereotypes about the Black community” (Fries-Britt & K. Griffin, 2007, p. 510). The authors described these assumptions and stereotypes as the Black box, a racial confinement by which the high achievers consistently resisted. Strayhorn (2009) identified similar survey findings and categorized them as “the burden of proof”. Overwhelmingly, high achievers felt laden with the need to prove themselves academically. According to Strayhorn (2009), “approximately 88% of high-achieving black collegians report feeling pressure to prove their



intellectual ability, despite prior achievements and participation in a university scholarship program” (p.375). In other words, even with prior evidence of their academic capability, high achievers still felt a need to further demonstrate their academic capability at their PWI.

Black achiever isolation also echoes Du Bois’ (1903/1989) conceptualization of double consciousness, or the idea that Blacks must manage “two warring ideals” (p.9), their American identity and their Black identity, in a predominantly White American society. In his seminal work, *The Souls of Black Folk*, Du Bois (1903/1989) outlined double consciousness as one of the most pressing challenges facing Black Americans in the twentieth century. He also explained the process of double consciousness as “always looking at one’s self through the eyes of others” (p. 9). In order to survive, Du Bois advised Blacks to live double lives –one life embracing their Black identity and another life embracing their American identity. Over a century later, in Brooks’ (2012) qualitative study of 10 high-achieving Black alumni who attended a PWI, she found all participants successfully managed sociocultural and psychological double consciousness, or the “dualities they experienced as an individual and as an individual part of larger groups, families, or communities” (p.137). Together, these data illustrate that multiple identity management remains important for Black Americans navigating White spaces.

While Black achiever isolation is an intense condition, relationship building among high achievers is a protective factor that can lessen its impact. For example, Fries-Britt’s (1998) study found that participation in the Meyerhoff program mitigated Black achiever isolation as high achievers developed relationships with one another and fostered a sense of community. In a later book chapter, Fries-Britt (2000) expounded on the significance of this community. For most of the students interviewed, the Meyerhoff program was the first peer

group they were a part of that reflected and supported both their academic and racial identities (Fries-Britt, 2000). In this setting they felt comfortable to be their authentic selves and they were accepted and embraced. This finding is consistent with other findings by Bonner (2001) and Strayhorn (2009) on the significance of high-achieving peers. In his phenomenological study of high-achieving Black male undergraduates, Bonner (2001) asserted that relationships with achievement-oriented peers can generate and reinforce higher aspirations and goals. Likewise, Strayhorn (2009) found that high achievers who felt burdened by the pressure to prove themselves also tended to report they rarely, if ever, interacted with other high-achieving Black undergraduates. As Fries-Britt (1998) recommended, “opportunities should be made available for academically talented students to network as early as possible (junior high and high school) so that they can be introduced to the larger community of talented and gifted Blacks” (p. 569). Fries-Britt’s recommendation also reinforces the significance of counter spaces, which was elaborated on earlier in this literature review.

Furthermore, many studies have identified social support from family members, peers, and faculty members as a key success factor for Black undergraduates at PWIs (Bonner & Bailey, 2006; Bonner, 2014). Social support is defined as the perception that one is cared for and loved, esteemed, can receive assistance from others, and is a member of a network of mutual obligations (R. B. Davis, 1991; Sarason & Sarason, 1985). In his investigation of high-achieving and low-achieving Black undergraduates Guiffrida (2005) found the major difference between the two groups was the support they received from their families. These findings echo the work of Hinderlie & Kenny (2002). In their survey of 186 Black college students from six PWIs, the authors found that parental attachment contributed

to college adjustment beyond the effects of on-campus social support. In other words, the Black students' self-reported that academic standing and psychological well-being was associated with the quality of maternal and paternal attachments. Other researchers have found that high-achievers need support from a variety of peers and faculty to be both Black and intellectual (Fries-Britt, 2000). For example, in Fries-Britt and colleagues (2010) five-year study on 110 high-achieving physics majors, high achievers described their physics peers as the "saving grace" essential to their success. Similarly, in a study of Black undergraduates with GPAs ranging from 2.8 to 3.9 with an average GPA of 3.2, Guiffrida (2005) found that faculty members who participated in othermothering, or go beyond traditional mentoring to nurture students, facilitated more meaningful relationships with study participants. As described by Guiffrida (2015), othermothering tasks included:

serving as students' mentors by providing professional contacts, advice, and leading by example; as their academic coaches by providing tutoring, encouragement, and pushing them to reach their full academic potential; as their advocates by pleading their cases and defending them to others on campus and at home; and finally as their counselors by listening to their academic and personal problems, supporting them, and giving them sound advice (p.714-715).

Thus, these faculty members were not only instrumental in students' academic development, but also their psychosocial development as well.

It is important to note here that there has been an increase in research focused exclusively on high-achieving Black male undergraduates at both HBCUs and PWIs over the past twenty years (A. Flowers, 2012; Fries-Britt, 1997; Fries-Britt, Burt, & Franklin, 2012; Gasman & Spencer, 2012; Goings, 2016; Goings, 2017; Goings & Bonner, 2017; Harper,

2004; Harper, 2006; Harper & Quaye, 2007; Harper, 2008; Harper, 2012b). Studies demonstrate this particular subpopulation encounters distinctive challenges at the nexus of their racial identity, gender identity, and academic ability (Bonner, 2001; Bonner, 2010; Bonner, 2014; Bonner, 2003). For example, in his case study analysis of two high-achieving Black male undergraduates – one at a HBCU and the other at a PWI – Bonner (2003) likened the nuanced experience of being a high-achieving Black male undergraduate to solving a Rubics Cube. As Bonner (2003) explained,

The Rubics Cube offers its many faces and permutations, and the ultimate goal of the individual manipulating the Cube is to establish uniformity on each of its six sides. Just like the Rubics Cube, the academically gifted African American male offers a myriad of faces (e.g., identities, developmental levels) and permutations (e.g. combination of “real-world” and socially constructed experiences) that must be manipulated to attain some measure of equilibrium and a sense of congruity with the academic environment—essentially establishing some modicum of uniformity (p. 29-30).

Bonner (2003) recommended that higher education institutions create inclusive environments that promote learning, growth, and development to assist high-achieving Black male undergraduates with navigating their identity. In particular, Bonner (2003) highlights “microsocial groups such as African American Student Unions, minority Greek fraternities and sororities, or special campus interest groups” (p.33), as organizations to foster student identity development. Moreover, Bonner (2003) reiterated how influential relationships with faculty, peers, and family are to Black male student success.

Harper (2005, 2015) has also underscored the importance of out-of-class engagement for high-achieving Black male undergraduates. In one study, Harper (2015) visited thirty PWIs and conducted two-to-three, face-to-face individual interviews with 143 high-achieving Black males to learn how they responded and resisted the internalization of racist stereotypes at their universities. Aligned with previous scholarship on Black undergraduates at PWIs (Fries-Britt & Griffin, 2007), Harper found that high-achieving Black males frequently confronted stereotypes. However, what was particularly interesting is that the Black males also successfully resisted stereotypes through campus leadership roles and student organizations. In a previous study, Harper (2005) interviewed high-achieving Black male undergraduates at PWIs who “made the most of college” (p. 9), or were highly engaged in student organizations, campus leadership positions, public relationships with administrators and faculty, and enriching educational experiences. The high achievers were aware of the unmet needs of the Black student community on their respective campuses and were motivated to pursue leadership positions to facilitate positive change. Their achievements - both within and outside the classroom - were also inspired by their desire to debunk negative stereotypes about Black males and leave a legacy on their campuses.

**The importance of non-cognitive factors.** In addition to merging their academic and racial identity, high achievers are also influenced by non-cognitive factors. While there is no single agreed upon definition for non-cognitive factors, they can be thought of as the skills and attributes outside of what is typically measured in cognitive or achievement tests (Camfield, 2015; Khine & Areepattamannil, 2016). In their comprehensive review of non-cognitive factors in education, Khine & Areepattamannil (2016) found that non-cognitive factors are often characterized as different terms in the literature, such as,

psychosocial factors (likely from Erikson's theory; see Erikson, Paul, Heider, & Gardner, 1959), social-emotional learning skills (Elias et al., 1997), soft skills (e.g., Heckman & Kautz, 2012), 21st century skills (Partnership for 21st Century Learning, 2015), personality (e.g., McDougall, 1932), character skills (e.g., Tough, 2012), and grit (Duckworth, Peterson, Matthews, & Kelly, 2007) (p.14).

A misconception about high achievers is that they are innately academically talented and therefore they do not have to exert effort to succeed academically (Freeman, 1999).

While some high achievers do possess innate talent as measured by superior IQ, noncognitive factors, such as “working hard”, being academically motivated, and demonstrating resilience, also play a significant role in their academic success (Strayhorn, 2009). For instance, in Strayhorn's (2009) quantitative study of 380 high-achieving Black undergraduates, he found that high achievers who attended class regularly and kept up with their academic work earned higher GPAs than high achievers who were less dedicated to their academics. This finding supports the idea that “working hard” is an important skill for high-achieving Black undergraduates to master.

Other studies have examined the concept of high achievers “working hard” in more detail. For example, in a multi-case study analysis at a large public university, Griffin (2006) investigated what motivated high-achieving Black undergraduates to “work so hard and strive for excellence even when times were at their most difficult” (p.384). She found that both internal and external factors motivated high achievers. Internally, high achievers described themselves as self-motivated and were fueled by their desire to succeed. Additionally, high achievers had high self-efficacy, which ignited their determination to

persevere despite challenges; they believed in their ability to achieve with hard work and focus.

Several external factors also motivated high achievers, including their desires to make their parents proud, be positive role models in the Black community, augment the number of Black professionals, and prove their academic abilities. These findings are consistent with previous work that cites the influence of family (Herndon & Hirt, 2004), racial identity (Fries-Britt, 2000), and stereotype threat (Fries-Britt & Griffin, 2007) among this population.

In comparison to the work that has been done on merging academic and racial identities, my review of the literature reveals that less scholarship has concentrated on the importance of non-cognitive factors and their role in the success of high-achieving Black undergraduates. To enhance the literature, I paid close attention to non-cognitive factors in data collection. For example, in the interview I asked students “What has helped you be successful in your major?” One of my probes for that question was “What individual behaviors have helped you be successful?” In addition, when students described non-cognitive factors in their interview or the focus group, I probed them for more information.

### **Black Male Undergraduates**

Now I will discuss a second subgroup of Black undergraduates at PWIs: Black males. In general, we know that the persistence, or lack thereof, of Black male undergraduates is an incessant and pertinent issue within the American higher education system. For the past forty years, Black male college enrollment has consistently lagged behind other racial and ethnic groups in the United States (Anonymous, 2005). Perhaps the most startling instance of sparse advancement was noted in 2002 when Black males comprised only 4.3% of enrolled students at United States’ higher education institutions- the exact same percentage as

in 1976 (Harper, 2006; Strayhorn, 2010). According to the most recent *Minorities in Higher Education* report, Black males (29.6%) have the second lowest college enrollment rates of all racial and ethnic groups followed only by Hispanic males (24.5%) (Y. M. Kim, 2011). Of the Black males that do matriculate into undergraduate education, more than two-thirds (67.6%) do not graduate within six years – which is the lowest college completion rate of both sexes and all racial/ethnic groups in the United States (Harper, 2006; Strayhorn, 2010).

The lived and academic experiences of Black males should not be examined in isolation, but rather examined within the context of socially constructed systems of privilege and oppression whereby they are embedded. Bush and Bush (2013) succinctly illustrate this point as they assert that the “social and educational challenges facing [Black males] stem from socially constructed systems rather than any innate biological or cultural deficiencies” (p.8). This philosophy is also well aligned with the environmental deficit viewpoint I discussed earlier in this chapter. In other words, social forces and institutions that structurally disadvantage Black males from an early age disproportionately impact their educational experiences. This section of the literature review will outline three major social forces and institutions that impact disproportionately Black males in American society: (1) developmental role modeling, (2) the school-to-prison pipeline, and (3) police brutality.

**Developmental role modeling.** Various scholars have identified the weighty influence of role models in shaping young people’s development (Zirkel, 2002). For example, studies have found role modeling beneficial when teaching young people appropriate ways to behave (Bandura, 1986) and demonstrating future possibilities for them as members of specific social identity groups (Sumrall, 1995). Over 20 years of research confirms that Black males are highly likely to lack appropriate role models during the



impressionable years of childhood and adolescence (Cuyjet, 1997; Garibaldi, 1992; Scott, Taylor, & Palmer, 2013). A lack of positive role modeling in childhood and adolescence has numerous derivative effects, many of which are negative. For example, lack of positive role modeling in childhood and adolescence can create feelings of cultural mistrust and lack of belonging in academic settings (Irving & Hudley, 2008). Such feelings may discourage Black males from pursuing higher education (Irving & Hudley, 2008). Additionally, to compensate for the lack of positive role modeling in childhood and adolescence, Black males may rely on the media for guidance on how to be a Black male; however, they will likely receive a one-sided perspective as American culture bombards adolescent Black males with stereotypical depictions of older Black males as incompetent and lazy (Cuyjet, 1997; Irving & Hudley, 2008). Moreover, in their childhood and adolescence, Black males may follow the less-than-stellar role models available to them, which can lead them to adverse life outcomes. This final course of action is especially devastating as the rates of violence and premature death among young Black males are said to be a national tragedy (Cuyjet, 1997; Garibaldi, 1992; Hennekens, Drowos, & Levine, 2013). In particular, homicide is the leading cause of death among college-aged Black males, claiming more lives than car accidents, suicide, and diseases combined (Hennekens et al., 2013).

**The school-to-prison pipeline.** The school-to-prison pipeline is a social institution that encompasses “policies and practices that push our nation's schoolchildren, especially our most at-risk children, out of classrooms and into the juvenile and criminal justice systems” (American Civil Liberties Union, 2016). For example, zero tolerance discipline policies, or policies that automatically enforce severe punishment irrespective of circumstances, disproportionately impact youth that are racially and ethnically minoritized (American Civil

Liberties Union, 2016). Several studies and research reports have demonstrated that the school-to-prison pipeline particularly affects Black males (Ferguson, 2001; Giroux, 2003; J. M. Lee & Ransom, 2011; T. Lee, Cornell, Gregory, & Fan, 2011; Skiba, Michael, Nardo, & Peterson, 2002). To offer a complete discussion of the school-to-prison pipeline's influence on Black males, it is important to clarify a frequently espoused assumption. For decades scholars have echoed the compelling statement that more Black males are in prison than college (Cook, 2012; Garibaldi, 1992). While current data disproves this assumption, the number of Black males in prison is alarming compared to other racial and ethnic groups (Cook, 2012). For instance, a recent report on the American criminal justice system revealed that one in every three Black males will go to prison at some point in their life, compared with one in every six Hispanic males, and one in every 17 White males (Knafo, 2013).

**Police brutality.** Additional scholarship has investigated the excessive and unjust force of law enforcement towards Black males. In *The Causes of Police Brutality: Theory and Evidence on Police Use of Force*, Worden (2015) discussed over 25 years of social science research on police behavior. Of the many striking findings, several relate to the Black community such as Black suspects being more likely to be arrested because they are more likely to be perceived as disrespectful, minorities being more likely to be shot (or shot at) by the police, and minorities being overrepresented among those whose actions precipitated the use of deadly force (Worden, 2015). Scholars have also examined young Black males' direct and vicarious experiences with police harassment and violence, and their impact on perceptions of police (Brunson & Miller, 2006; Brunson, 2007; Russell-Brown, 2009). In such studies, Black males cited the duality of being perceived as a threat by White Americans overall and feeling fearful of the police (Russell-Brown, 2009).

Most recently, national attention has shifted to unarmed Black male mortalities caused by police officers. The televised deaths of Oscar Grant (2009), Eric Gardner (2014), and Michael Brown (2014), all who were fatally injured (shot or choked) at the hands of police, and others have inspired a contemporary #BlackLivesMatter social media movement (Stephen, 2015). #BlackLivesMatter supporters argue that police brutality against Black males is a byproduct of a disregard for Black lives rooted in racism (Stephen, 2015). As such, #BlackLivesMatter supporters protest these prejudice acts and demand social change (Stephen, 2015). In their book, *Black Lives Matter*, Edwards and Harris (2016) provide an overview of the movement and chronicle the stories of Michael Brown, Oscar Grant, Trayvon Martin, and Renisha McBride. A common element in each of these stories was the presence of racial profiling, which can be understood as a “form of discrimination by which law enforcement uses a person’s race or ethnicity as a key reason to engage in various forms of enforcement” (Legewie, 2016, p. 382). In essence, when a person is racially profiled, they are suspected as guilty of an offense simply on the basis of race. Edwards and Harris (2016) conclude their book with a call for action. The national attention of the #BlackLivesMatter movement has also led to an international media surge, such as the British Broadcasting Corporation (BBC)’s 2015 article, *Why do US police keep killing unarmed black men?* and the Bahamas’ 2016 safety alert for Bahamians traveling to the United States (Ministry of Foreign Affairs and Immigration, 2016).

### **Challenges Black Males Encounter at PWIs**

In addition to the social forces and institutions that impact disproportionately Black males in American society, Black males also encounter challenges within the PWI context. In fact, the vast majority of studies about Black male undergraduates at PWIs communicate

the psychological and social challenges they face such as experiencing racism and race-related stress (White & Cones, 2013), and feeling invisible and excluded (Dowden, Gunby, Warren, & Boston, 2014; Parker, Puig, Johnson, & Anthony Jr, 2016). For example, while investigating the experiences of 56 Black male undergraduates serving as residence assistants at PWIs, Harper et al. (2011) introduced the term “onlyness” to describe “the psychoemotional burden of having to strategically navigate a racially politicized space occupied by few peers, role models, and guardians from one’s same racial or ethnic group” (p.190). The complexities of onlyness exhausted their study participants. Similarly, in focus groups with 36 Black male students at PWIs, Smith, White, and Danely (2007) found that participants experienced racial battle fatigue, or physical and psychological strain, because of anti-Black male stereotyping and hypersurveillance. In other words, these students felt negatively stereotyped and believed they were under increased community policing scrutiny because of their racial and gender identities. Black male students described being categorized –both on and off campus - as “out of place” (p. 551) and “fitting the description” (p. 551) of an outsider. In their article, the authors also acknowledged a key limitation of research on Black males – disregard of “gender and race-gender identity and oppression” (p. 553). They further expound on this point as follows:

Researchers might ask Black males about their racial insights or experiences shared with Black women or how they contribute to their own pathologies, but rarely are African American men asked about their unique race-by-gender oppression in this country. This deeper level of analysis is more meaningful for understanding the true experiences of Black males (p. 558).

Another major limitation of research in this area is its homogenous viewpoint. Although Black male undergraduates are not a monolithic group with a single perspective (Allen, 1987; Harper & Nichols, 2008; E. Kim & Hargrove, 2013; Lundy-Wagner, 2013; Palmer & Gasman, 2008), very few research studies scrutinize and highlight the nuances within the population. Often, the predominant focus on the academic under preparedness and resulting poor performance overshadows, and even silences, the voices of Black male undergraduates who have obtained metrics of academic success (Fries-Britt, 1998; Harper, 2012b). Succinctly put, Black males are “one of the most stereotyped groups on college and university campuses” (Harper & Nichols, 2008, p. 1), which has adverse individual and societal outcomes. Strayhorn (2008) further explained this idea as follows:

Black men are often viewed as an at-risk population in education [...] and tend to be described with words that have negative connotations such as uneducable, endangered, dysfunctional, dangerous, and lazy. [...] [The use of such terms to describe] Black men is troublesome and the problem is exacerbated by the fact that disparaging words can perpetuate negative stereotypes among educators [...] which, in turn, can become self-fulfilling and “self- threatening” to Black men (p. 27).

This dissertation study counterbalanced the detrimental effects described by Strayhorn (2008) by telling the untold stories of high-achieving Black male undergraduates at PWIs.

### **Black Males Achieving Success at PWIs**

Despite the deficit-oriented literature that I have discussed so far, studies do exist, however, that focus exclusively on the conditions that enable Black males to achieve success in college (Harper, 2012b; Strayhorn, 2008). For example, in his landmark study, the largest-ever qualitative research study on Black male undergraduates, Harper (2012b) interviewed

219 high-achieving Black male college students at 42 PWIs and HBCUs across the United States to uncover the personal, familial, and institutional enablers of Black male college achievement. He organized his findings into six major thematic categories: (1) getting to college, (2) choosing colleges, (3) paying for college, (4) transitioning to college, (5) matters of engagement, and (6) responding productively to racism. According to Harper, most participants knew they were going to college at an early age because their parents and other family members affirmed that college was the permissible postsecondary option for them. Nonetheless, several factors influenced participants' ultimate decision to choose a PVI or a HBCU including their ability to pay (i.e., affordability of tuition and financial aid packages), campus climate, and perception of future career opportunities. Reflecting on their freshman year, participants credited their smooth college transition to participation in pre-college programs like summer bridge and mentor-mentee relationships with Black male student leaders. Once acclimated, participants also became involved in a wide variety of high impact practices at their universities, such as student organizations, study abroad programs, service learning initiatives, internships, and undergraduate research. Not surprisingly, participants attending PWIs encountered overt and covert racism associated with being Black on campus. It is interesting, however, that these participants choose to actively resist internalization of racist stereotypes by acknowledging, educating, and subsequently embarrassing their racist peers. This process pivots attention from the Black male student to the problematic behavior of the peer. In a later article, Harper (2015) described participants' three-step resistance strategy and its implications in more detail. As Harper (2015) outlined:

1. A White peer asks a question like, "You got weed?"
2. The achiever responds by calmly asking, "What made you assume I sell, smoke, or

know where to find weed?"

3. The achiever waits patiently for the White peer to reflect and answer the question.

During this reflective period, the stereotyper (or microaggressor) usually comes to understand on her or his own that the question posed or assumption made was racially problematic (p. 666).

In a recent mixed methods study, Strayhorn (2015) investigated the factors that influence preparation for college and success in STEM majors among 140 Black male undergraduates enrolled at large, public HBCUs and PWIs. In this study, he found three key factors that influenced their preparation for and success in college and STEM majors: (1) pre-college STEM self-efficacy, (2) concerted cultivation of initial interests in STEM, and (3) sense of belonging in STEM. The first factor, pre-college STEM self-efficacy, encompassed how confident Black males felt about their abilities to achieve academically. Black males with high beliefs about their intellectual competence tended to succeed in college and in STEM. Their self-efficacy also ignited their intrinsic motivation to follow through and accomplish their academic goals. Moreover, successful Black males in STEM majors believed they could complete academic tasks and overcome obstacles associated with their major such as being “a speck in a sea of Whiteness” (p. 54). The second factor, concerted cultivation of initial interests in STEM, outlined how Black males engage in formal and informal activities that fostered their STEM inclination. Formal activities included STEM workshops, summer camps, and rigorous hands-on classes, as well as co-ops, internships, and externships. Likewise, in-formal activities included playing with computers and video game systems, working on old cars, reading about technology, using social media, and talking with family members about STEM careers. Because of participating in these formal and informal

learning experiences over time, Black males developed a strong STEM identity. For instance, when surveyed, over half (65%) of Black male STEM majors in the study agreed that they had been interested in STEM since early childhood or as long as they could remember. Finally, the third factor, sense of belonging in STEM, described how included or excluded Black males felt in the culture of their STEM major and department. Black males were highly aware of their status as a racial minority in STEM classrooms, which caused many “to feel most vulnerable to racist stereotypes, racial microaggressions, or thoughts of leaving their major or dropping out of college altogether” (p. 59). However, successful Black males in STEM majors had relationships with faculty and peers that satisfied their need to belong and circumvented decisions to leave college or STEM. In summary, Strayhorn’s (2015) research underscores the importance of building self-efficacy among Black males, promoting access to formal and informal STEM learning experiences, and creating an inclusive environment with STEM majors and departments to enhance the success of Black male undergraduates.

In concert with Strayhorn’s (2015) findings, Fries-Britt (2017) published an article that deepens our understanding of high-achieving Black males in STEM majors across time. In “It Takes More Than Academic Preparation: A Nuanced Look at Black Male Success in STEM”, Fries-Britt (2017) used the findings from four studies she conducted with her research team over the past twenty years to examine the experiences of high-achieving Black males in STEM majors. Drawing from that data, Fries-Britt identified three non-academic themes that consistently emerged from the researched population across the two decades: (1) sense of confidence, (2) developing meaningful relationships, and (3) ability to recognize and navigate stereotypes, biases, and racism. These three non-academic themes reiterate the



findings Harper (2012b) and Strayhorn (2015) described earlier in this section. The first theme, sense of confidence, refers to how self-assured Black males felt about their academic abilities. Most of the high-achieving Black males in Fries-Britt's database had a "healthy sense of confidence" (p.10), and they often cited supportive family members, K-12 teachers, or other role models as influencers of that confidence. Even when they encountered barriers – such as unsupportive K-12 teachers or feeling like they must prove their intellect in collegiate settings - these students were able to restore their confidence by turning to their personal histories and family social capital. For example, many high-achieving Black males had early exposure to STEM activities prior to college such as participation in camps and internships. Additionally, many of these students also had college-educated parents and parents that were STEM majors or professionals. In other words, they were connected to STEM from an early age and had a clear understanding of what it takes to be successful in college and in STEM. Moreover, high-achieving Black males' prior success in rigorous courses was especially important to boosting their confidence. As observed by Fries-Britt (2017),

[t]hey understand what it means to work hard and to persist at their work. They have earned high grades and proven they can handle difficult course material [...] Their early academic successes are an important part of their foundation and overall confidence to face new academic challenges (p. 11).

The second theme, developing meaningful relationships, refers to the importance of peer and faculty relationships on campus. Most of the high-achieving Black males in Fries-Britt's database reported "excellent relationships with peers" (p. 11) and relied on their peers for academic and social support. Some high-achievers did, however, experience isolation

from their less academically talented Black peers. In addition, high-achievers on PWI campuses formed relationships with faculty members at a slower rate than those on HBCU campuses. In a forthcoming work, Fries-Britt & Lewis (in preparation, discussed in Fries-Britt, 2017) will discuss the sensing process Black males engage in as they seek to connect with faculty. As Fries-Britt (2017) described,

Essentially they are trying to determine the degree to which a faculty member is committed to their success. This process is nuanced, often subtle and significant to how Black males determine if there is a possibility of a meaningful relationship (p. 13).

In other words, it is a complicated process through which high-achieving Black males make meaning of faculty interactions.

The final theme, ability to recognize and navigate stereotypes, biases, and racism, describes how high-achieving Black males in STEM must encounter systematic oppression, much like all Blacks in American society. This theme explicitly highlights the pervasiveness of racism in the American fabric. For every high-achieving Black male in Fries-Britt's database, stereotypes, bias, and racism were a part of their reality. Compellingly, Fries-Britt asserted:

In 20 years of interviewing high-achieving Black students, especially those born in the United States, I have never had a participant report no encounters with stereotypes, biases and/or racism. Put differently, every Black male born in the United States that I have interviewed has encountered one of these social ills prior to, and/or during college [...] Black males who are successful have been able to

recognize, navigate, and confront these issues to ensure their success in the academy (p.13).

The statement affirms how racism is a pervading influence in the lives of high-achieving Black males.

To summarize, Fries-Britt's (2017) study reiterates findings from Harper (2012b) and Strayhorn (2015) by informing us that self-confidence, developing meaningful relationships, and the ability to recognize and navigate stereotypes, bias, and racism, are three crucial factors for high-achieving Black male undergraduates in STEM.

### **Black Undergraduates in STEM Majors**

The final subgroup of Black undergraduates at PWIs I will discuss are those who are STEM majors. Researchers who investigate the experiences of Black undergraduates in STEM majors typically describe the personal and environmental influences that facilitate success or challenges for this population. Personal influences refer to the pre-collegiate attributes and experiences that Black students acquire throughout their lifetimes and arrive with on their first day of college. These characteristics include their academic preparation and non-cognitive factors. Environmental influences refer to the elements of the social and physical infrastructure of the postsecondary institution where Black students live and learn. These elements include the "weeding out" system and campus climate. In this section of the literature review, I will summarize and critique the personal and environmental influences that facilitate success or challenges for Black undergraduates in STEM majors. Furthermore, I will highlight findings exclusive to Black male undergraduates and engineering majors. It is important to note that the literature in this area does a poor job of differentiating the distinct experiences of Black undergraduates in STEM majors by gender and discipline of

study. In other words, most studies include both females and males (Anderson & Kim, 2006; A.R. Brown et al., 2005; Hurtado, Cabrera, Lin, Arellano, & Espinosa, 2009) and focus on mathematics and science majors (Hall & Post-Kammer, 1987; Powell, 1990; Russell & Atwater, 2005). This study enhanced the literature by drawing attention to both the experiences of Black male undergraduates and engineering as a discipline of study.

**Personal influences.**

*Academic preparation.* Scholars repeatedly cite academic preparation, principally at the high school level, as a correlate of Black undergraduate success in STEM majors (Maton, Hrabowski, & Schmitt, 2000). As such, competence in high school science and mathematics courses is repeatedly underscored as a primer for academic success in college-level STEM courses (A.R. Brown et al., 2005; Hall & Post-Kammer, 1987; Palmer, Davis, Moore, & Hilton, 2010; Russell & Atwater, 2005; F. M. Smith & Hausafus, 1998). From this perspective, the issue of Black undergraduates leaving the STEM pipeline may reflect the gross underrepresentation of Black high school students in advanced STEM courses (Russell & Atwater, 2005). Additionally, the lack of Black male undergraduates in STEM majors may reflect the disproportionate number of Black male high school students that score “below basic” on standardized mathematics testing and take few high school mathematics and science courses (J. M. Lee & Ransom, 2011).

The academic preparation argument has two main critiques. To start, this understanding does not elucidate the sizable population of academically prepared Black undergraduates, that is students with “high SAT scores, impressive high school GPAs, and success in high school honors math and science courses” (Maton et al., 2000, p. 630), that leave STEM majors to pursue other majors (Harper, Patton, & Wooden, 2009). In other

words, why do some academically prepared Black undergraduates stay in STEM majors and others leave? More research is necessary to account for this phenomenon. Secondly, this conceptualization has failed to explain how the factors that influence underrepresentation in STEM majors are related to race (Lewis, 2003). For example, “What is it about being [Black] that leads a student to take fewer mathematics and science courses or to be differentially influenced by mathematics and science teachers” (Lewis, 2003, p. 371)? Thus, as Lewis (2003) suggested, an explanatory model for race is needed. This study contributed to the literature by investigating why some academically prepared Black male undergraduates persisted in engineering while others did not. Additionally, this study paid close attention to issues of race and how they impact student decision-making.

*Non-cognitive factors.* As articulated by Chang et al. (2014), “completion of a STEM degree requires not only academic preparation but also resilience and capacity to negotiate a complex academic context” (p. 556). Thus, scholars also investigate the behaviors, skills, attitudes, and strategies outside of content knowledge and academic skill that students must develop to achieve academic success in STEM majors (Chang, Sharkness, Hurtado, & Newman, 2014; Farrington et al., 2012; Kotzé & Niemann, 2013). Such attributes, such as study skills, help-seeking behaviors, and social and academic problem-solving skills, are labeled non-cognitive factors because they extend beyond information typically taught in the curriculum (Farrington et al., 2012). Scholars argue that intellectual competence is a combination of an individual’s cognitive and non-cognitive traits (Chamorro-Premuzic & Furnham, 2006; Chamorro-Premuzic & Furnham, 2005). While innateness is a central concept of cognitive science, research suggests that non-cognitive traits can be learned and developed over time (Farrington et al., 2012; Samuels, 2004).

Over three decades of research explores non-cognitive factors (Tracey & Sedlacek, 1985; Tracey & Sedlacek, 1987) and recent scholarship highlights the role of non-cognitive traits in student success for Black undergraduates in STEM majors (Chang et al., 2014). Many scholars recommend a more nuanced understanding of how non-cognitive factors impact Black male undergraduates in STEM majors (Harper, 2010; Harper, 2012b; Hrabowski & Maton, 1995; Hrabowski & Pearson, 1993). While interest surrounding this concept is widespread, empirical research is promising but limited. For example, as aforementioned, Strayhorn (2015) conducted a mixed methods study to examine factors influencing Black males' college readiness and success in STEM. He first surveyed 140 Black male undergraduates enrolled full-time at large public HBCUs or PWIs - one third of which were STEM majors. Next, he interviewed 38 Black male STEM majors. Surprisingly, two of his three themes were non-cognitive factors: pre-college STEM self-efficacy, and sense of belonging in STEM. Within the pre-college STEM self-efficacy theme, students perceived themselves as academically capable and were confident they could complete academic tasks. On the other hand, sense of belonging was defined as feeling included and a part of the group. Both these pre-college STEM self-efficacy and sense of belonging variables motivated students to persist. The third theme, concerted cultivation of initial interests in STEM, referred to students' longstanding and early interest in STEM that was nurtured through formal and informal experiences. This theme fits under the umbrella of academic preparation.

This study added to the scholarship on this topic. As a part of the interview protocol for this research study, high-achieving Black male undergraduates in engineering majors were asked about the role of non-cognitive factors in their academic success. Because

research supports the idea that non-cognitive factors are malleable, enhancing our understanding of the role of non-cognitive factors in academic success for Black male undergraduates will allow pre-college and college stakeholders to create evidence-based interventions that strengthen the STEM pipeline.

### **Environmental influences.**

*The “weeding out” system.* STEM majors are well known for their large, fast-paced, and academically intensive introductory level courses (Wineke & Certain, 1991). These predominantly lecture-based courses are considered the gatekeepers of STEM college degrees (Gainen & Willemsen, 1995). Many first-year undergraduates enroll in these courses with the intent to major in a STEM discipline but perceive these courses as intimidating (Gainen & Willemsen, 1995; Wineke & Certain, 1991). Almost a third of undergraduates also perform poorly in these courses, which leaves them ill-equipped to move on to more advanced courses within the major (Koenig, Schen, Edwards, & Bao, 2012; Maton et al., 2000). Subsequently, these introductory courses “weed out” undergraduates that were initially interested in a STEM major (Seymour & Hewitt, 1997). Black undergraduates are especially vulnerable to this “weeding out” system (Maton et al., 2000) and this finding, in particular, informed this study’s sample. To better understand the academic success of high-achieving Black male undergraduates in engineering majors, I recruited Black male upperclassmen (i.e., juniors and seniors) that have successfully persisted through these gatekeeper courses and matriculated into their engineering major. By selecting undergraduates who have successfully overcome the challenge of these gatekeeper courses, my goal was to gain an understanding of the cognitive and non-cognitive abilities required

for success in these courses, as well as how the campus environment supported or did not support the development of these abilities.

*Campus climate.* The remaining environmental influences literature falls into the category of campus climate. Here, campus climate refers to the attitudes and behaviors that create a postsecondary institution's sociopolitical atmosphere. Much of the literature in this area builds on the seminal work of Seymour and Hewitt (1994; 1997). In their landmark three-year ethnographic study, Seymour and Hewitt interviewed and conducted focus groups with 355 undergraduates at seven four-year institutions of different type and location. Their goal was to examine undergraduates' decision to persist or leave STEM majors, and they found that both groups (i.e., undergraduates who continued in STEM majors and undergraduates who left STEM majors) were very similar in terms of their academic performance, motivation, and concerns. In other words, individual influences did not fully explain why some undergraduates persisted in the STEM pipeline, and other undergraduates exited the STEM pipeline. In their further investigation of environmental influences, the researchers coined the phrase "chilly climate" to illustrate the uninviting and callous atmosphere of STEM majors, a cultural experience that was described by undergraduates who persisted and exited the STEM pipeline alike (Seymour & Hewitt, 1994; Seymour & Hewitt, 1997). Some examples of this "chilly climate" included unapproachable or unavailable STEM faculty and in-class competition that discouraged collaborative learning. The researchers also found that the "chilly climate" discouraged many high-achieving undergraduates from pursuing STEM majors (Seymour & Hewitt, 1994; Seymour & Hewitt, 1997). Interestingly, engineering was the most stable and selective major within the study; that is, engineering had the most competitive screening procedures for applicants and more



first year undergraduates continued with their engineering majors (53.0 percent), compared with biological sciences (42.0 percent), physical sciences (29.9 percent), and mathematics/statistics (29.2 percent). At the same time, racial and ethnic minority undergraduates had the highest rates of attrition in the study. Considering these two experiences together (i.e., being in engineering, and being a racial and ethnic minority), draws attention to the concept of intersectionality. Although Seymour and Hewitt's work is indeed foundational and useful, it does not address the following question: what are the experiences of racial and ethnic minority undergraduates, particularly Black undergraduates, in engineering majors? It does, however, underscore the importance of belonging on campus which is a large concern for Black undergraduates in STEM majors, particularly at PWIs where Black undergraduates lack a critical mass of same race peers, faculty, and staff (Guiffrida, 2005; Holmes, Ebbers, Robinson, & Mugenda, 2000; Litzler & Samuelson, 2013; Palmer, Maramba, & Holmes, 2011; Williamson, 1999). Moreover, research demonstrates that Black undergraduates in engineering majors feel their Blackness is "constantly under assault" (McGee & Martin, 2011, p. 1347). These students are also more likely to have decreased GPA and graduation rates when they perceive racism and discrimination (A.R. Brown et al., 2005). Furthermore, Black male engineering majors become consumed with proving their critics wrong, which can be emotionally taxing (Moore, Madison-Colmore, & Smith, 2003).

To cultivate more inclusive campus climates, some PWIs create minority support programs (MSPs) for students of color in STEM majors. MSPs coordinate initiatives that foster a close-knit community of same-race peers and advocates for underrepresented undergraduates (Fries-Britt, 1998; Good, Halpin, & Halpin, 2002; Grandy, 1998; Hrabowski

& Maton, 1995; Slovacek, Whittinghill, Flenoury, & Wiseman, 2012). MSPs have been found to significantly impact a student's decision and commitment to persist in their STEM major (Good et al., 2002; Grandy, 1998) as well as their GPAs and time to graduate (Hrabowski & Maton, 1995; Slovacek et al., 2012). Informed by this research, the study utilized a minority engineering program (MEP), or MSP designed specifically for engineering majors, to identify potential participants. As a part of the interview protocol, high-achieving Black male undergraduates in engineering majors at a PWI were asked how campus climate impacted their academic success.

### **Theoretical Frameworks**

A theoretical framework is a set of interrelated concepts that, when considered together, provide a comprehensive lens to inform data collection and analysis. For this study, two theoretical frameworks were used separately to develop data collection protocols, analyze data through a priori coding, and reflect on study findings and subsequent implications: Critical Race Theory (CRT) and anti-deficit achievement framework for studying students of color in STEM (ADAF).

#### **Critical Race Theory (CRT)**

Racism focuses on “institutional power, a form of power, people of color – that is non-Whites – have never possessed” (Solórzano, Ceja, & Yosso, 2000, p. 61). CRT is an interdisciplinary theory that seeks to both unmask and dismantle racism in United States society (Delgado & Stefancic, 2012; Ladson-Billings, 1998). To accomplish its objectives, CRT has five central tenets, which are racial realism, differential racialization, interest convergence, intersectionality, and counterstorytelling, respectively (Delgado & Stefancic,

2012). I will now discuss each tenet in detail. Because CRT emerged out of the critical legal studies movement, I will reference several critical legal studies texts in this section.

**Racial realism.** The first tenet, racial realism, acknowledges the permanence of racism in American society. Racism is ingrained into virtually every aspect of American life, including our history, norms, traditions, practices, and policies. In fact, some scholars have even argued that racism is so commonplace that it is often hidden in plain sight (Myers, 2005). An example of the pervasive yet insidious nature of racism is White privilege. White privilege is the phenomenon in which American society grants White people unearned benefits on the basis of their Whiteness (Harris, 1993). In her analysis of race and the law, Harris (1993) explained how intricately embedded White privilege is in the American legal system. She specified,

The law's construction of [W]hiteness defined and affirmed critical aspects of identity (who is [W]hite); of privilege (what benefits accrue to that status); and, of property (what legal entitlements arise from that status). Whiteness at various times signifies and is deployed as identity, status, and property, sometimes singularly, sometimes in tandem (Harris, 1993, p. 1725).

Harris' comment demonstrates the salience of race and racism; in essence, these elements are the foundation for how American society makes meaning of identity, benefits, and legal rights. Gotanda (1991) echoed similar sentiments in his critique of colorblindness, or the liberal idea that race does not matter. By examining specific legal cases, Gotanda (1991) argued that a "color-blind interpretation of the Constitution legitimizes, and thereby maintains, the social, economic, and political advantages that [W]hites hold over other

Americans” (p. 2-3). To paraphrase, racism is multifaceted, ever-present, and protected by the law. Ignoring how race influences experiences only magnifies the power of racism.

Racial realism contends that removing all traces of racism in America is impossible, so racism will remain a constant element of our civilization. The late Derrick Bell, CRT’s intellectual father figure, examined racial realism at length in his seminal work *Faces at the Bottom of the Well: The Permanence of Racism* (1992). As described by Bell (1992a), “racism is an integral, permanent, and indestructible component of this society” (p. ix). In other words, racism is immutable because it is both widespread and deeply entrenched into American culture. In another scholarly piece, Bell also explained how racism in America particularly impacts Blacks who have struggled to “obtain freedom, justice, and dignity” (Bell, 1992b, p. 363) since the nation began. All Black Americans – regardless of educational status or prestige - will inevitably experience racially motivated exclusion (Bell, 1992b). According to Bell (1992a, 1992b), Blacks will always experience racism in America and must acknowledge their permanent subordinate status to improve their quality of life. Bell (1992b) further elaborated on this idea as follows:

Black people will never gain full equality in this country. Even those herculean efforts we hail as successful will produce no more than temporary “peaks of progress,” short-lived victories that slide into irrelevance as racial patterns adapt in ways that maintain [W]hite dominance. This is a hard-to-accept fact that all history verifies [...] [This] acknowledgment enables us to avoid despair, and frees us to imagine and implement racial strategies that can bring fulfillment and even triumph (p. 373-374).

Simply put, racial equality is an unrealistic goal for American society. Racial realism is intended to liberate Blacks and other racial and ethnic minority groups from the rhetoric of equality. By acknowledging the permanence of racism, oppressed groups can shift their attention to achievable racial strategies.

**Differential racialization.** Although racism is a permanent fixture of American society, race is not. There is no biological or genetic basis to race (Dozier, 2017). Instead, race is a social construction. The second tenet, differential racialization, focuses on how the dominant group (i.e., White people) constructs race over time. Earlier in this chapter, I provided a simplistic definition of race. Here is a more thorough definition. Race is defined as:

[...] a dynamic set of historically derived and institutionalized ideas and practices that (1) sorts people into ethnic groups according to perceived physical and behavioral human characteristics; (2) associates differential value, power, and privilege with these characteristics and establishes a social status ranking among the different groups; and (3) emerges (a) when groups are perceived to pose a threat (political, economic, or cultural) to each other's world view or way of life; and/or(b) to justify the denigration and exploitation (past, current, or future) of, and prejudice toward, other groups (Markus, 2008, p. 654).

While race is not a biological reality, Omi and Winant (1994) offered the theory of racial formation to “explain how and why we “see” race as we do” (p. 9). According to the theory of racial formation, racial categories are formed, transformed, destroyed, and reformed based upon social, economic, and political forces (Omi & Winant, 1994). These forces determine the content and importance of racial categories, which shapes racial

meaning. Put differently, throughout history, the dominant group has used race to sort, ascribe value, and shape perceptions about (i.e., racialize) different racial and ethnic minority groups at different times. This racialization causes different minority groups to be viewed and treated differently to ultimately advantage the dominant group. Delgado and Stefancic (2007) provided the following example of differential racialization as a tactic to respond to shifting needs in the labor market:

In one era, a group of color may appear in popular culture as happy-go-lucky, simple, and content to serve the master's needs, as with Blacks during slavery. A little later, during Reconstruction when conditions changed, that very same group emerged as menacing and brutish, with designs on White women (p. 137).

Building on the insight of racial realism and differential racialization, Whites have a strong incentive to maintain racial injustice because of the advantages they receive (i.e., White privilege).

**Interest convergence.** The third tenet, interest convergence, asserts that the White people will only tolerate advances for racial justice when those advances align with White interests (Delgado & Stefancic, 2012). Hence, interest convergence challenges the idealist notion that racial justice is a product of moral uprightness, and instead affirms that racial justice is a product of strategically uniting the concerns of the dominant and subordinate groups. A prominent example of interest convergence is Bell's reinterpretation of the landmark *Brown v. Board of Education* Supreme Court case. In his book *Silent Covenants: Brown v. Board of Education and the Unfulfilled Hopes for Racial Reform*, Bell (2004) shattered the belief that the *Brown v. Board of Education* decision was the result of the country's moral maturation. Rather, Bell outlined how "[B]lack rights [were] recognized and

protected when and only so long as policymakers perceive[d] that such advances [would] further interests that [...] [were Whites'] primary concern” (p. 49). Interest convergence suggests that Blacks and other racially minoritized groups should align their interests with Whites to see progress.

**Intersectionality.** As articulated previously, race is a social construction that categorizes people. There are many other social constructions that also categorize people, such as gender, sexual orientation, ability, and religion, to name a few. The fourth tenet, intersectionality, advises us that race intersects with other socially constructed identities and accompanying forms of identity-based oppression, which impacts the lived experiences of racial and ethnic minorities. In essence, intersectionality states that identity-based oppression is not a monolithic experience; identity-based oppression is dynamic and can be experienced differently depending on a person’s social identities. Kimberlé Crenshaw first coined the term intersectionality as she investigated the experiences of Black women. Crenshaw (1991) expounded on her work as follows:

My objective there was to illustrate that many of the experiences Black women face are not subsumed within the traditional boundaries of race or gender discrimination as these boundaries are currently understood, and that the intersection of racism and sexism factors into Black women’s lives in ways that cannot be captured wholly by looking at the race or gender dimensions of those experiences separately (p.1244).

In other words, Crenshaw’s (1991) work ascertained that when individuals have two or more marginalized social identities (i.e., identifying as both Black and female), examining their lived experiences from a single marginalized social identity perspective (i.e., as only Black or only female) was inadequate because it failed to exhibit the breadth of their oppression.

Instead, intersectionality encourages us to look for how social identities overlap, and then examine how that overlap may not be considered in practices and policies.

It is important to note that intersectionality has historically been framed to understand the experiences of racial and ethnic minorities with multiple marginalized identities. As such, scholars have typically focused on the intersectional experience of racism and sexism from the Black female perspective (Crenshaw, 1989; Crenshaw, 1991; Carbado & Gulati, 2001; Cole, 2009). The current study extended this line of inquiry to understand how Black males' marginalized and privileged identities overlapped. For example, Blacks are a subdominant group in engineering and males are a dominant group in engineering – what does that mean for individuals who identify as both Black and male in engineering contexts? How are their needs overlooked in practices and policies?

Additionally, how does the intersection of racism and sexism influence Black males' lived experiences? This study examined Black male intersectionality to investigate such queries. In their work low-income heterosexual Black men, Bowleg, Teti, Malebranche, & Tschann (2013) articulated the need for scholarship on Black male intersectionality as follows,

considerable gaps in knowledge exist about how Black men's multiple intersecting social identities (e.g., race, gender, socioeconomic status [SES], and sexual orientation) reveal interlocking systems of privilege and oppression (e.g., racism, sexism, classism, heterosexism) at the social structural level (p.2).

Thus, intersectionality provides a lens for understanding how various socially constructed identities can interconnect and create multilayered experiences with racism and other forms of identity-based oppression (Delgado & Stefancic, 2012).



**Counterstorytelling.** As argued by Delgado (1989) “[r]eality is not fixed [...] [r]ather, we construct it through conversations” (p. 2439). Historically, the narratives of dominant groups, such as Whites, are most repeated and accepted as reality or truth (Delgado, 1989; Delgado & Stefancic, 2012). The fifth and final tenet, counterstorytelling, is a method of telling stories “aim[ed] to cast doubt on the validity of accepted premises or myths, especially ones held by the majority” (Delgado & Stefancic, 2012, p.159). Rather than accepting the dominant narrative as truth, counterstorytelling challenges conventional wisdom and demonstrates that many truths exist. Counterstorytelling shifts how we construct reality by acknowledging the lived experiences of racial and ethnic minorities as legitimate and powerful sources of data.

In his article, *Storytelling for Oppositionists and Others: A Plea For Narrative*, Delgado (1989) described how counterstorytelling is valuable for both marginalized and dominant groups. From the perspective of the marginalized, counterstorytelling is a form of therapy for tellers and listeners. Experiencing persistent oppression can cause marginalized groups to engage in self-condemnation where they believe their disadvantages are their own fault. Instead of blaming themselves, the counterstory teller gains psychic self-preservation as they are able to appropriately name systemic influences on their lived experiences that are out of their locus of control. Likewise, the counterstory listener, who may share similar experiences with the teller but hesitated to voice them, realizes they are not alone. Alternatively, counterstorytelling also enlightens dominant groups because “most oppression [...] does not seem like oppression to those perpetrating it” (Delgado, 1989, p. 2437). Racial and ethnic minorities can communicate about race and racism in ways Whites cannot because of their different histories and experiences with oppression. By listening to counterstories,

Whites are able to construct a new view of reality. As such, racial and ethnic minorities are encouraged to recount their experiences through counterstorytelling to enhance our collective understanding of race and racism (Delgado & Stefancic, 2012).

All the tenets of CRT are important; however, in this study, only racial realism, differential racialization, intersectionality, and counterstorytelling, emerged in participants' narratives. Later in this dissertation, I will provide a throughout discussion of each participant's narrative (Chapter 4) as well as the three themes and six subthemes from participant narratives that were revealed using a priori coding, informed by CRT and ADAF constructs, and open coping (Chapter 5). In the final chapter, Chapter 6, I will also provide Table 6.1, which outlines the themes and subthemes from participants' narratives and connects them to constructs from the study's theoretical frameworks. Additionally, I will discuss theoretical implications in light of the current study findings.

Several studies have utilized CRT as a theoretical lens to examine the experiences of Black male undergraduates. Such studies have employed CRT tenets to deconstruct how systematic racism affects Black male undergraduates (W. A. Smith, Yosso, & Solórzano, 2007; W. A. Smith, Hung, & Franklin, 2011), and how Black male undergraduates resist racial stereotyping (R. A. Griffin & Cummins, 2012; Harper, 2009a; Johnson, 2013). A number of studies have used CRT to probe the experiences of Black male undergraduate student-athletes (Agyemang, Singer, & DeLorme, 2010; Bimper, Harrison, & Clark, 2013; Bimper, 2014; Harper, 2009b). Surprisingly, I only found one study that used CRT to explore the experiences of high-achieving Black male undergraduates (Harper, 2009a). In this study, Harper (2009a) investigated how high-achieving Black male undergraduates

strategically navigated PWIs and resisted being “niggered” (p.698) or marginalized by White people.

### **Anti-deficit Achievement Framework for Studying Students of Color in STEM (ADAF)**

Harper’s (2010) anti-deficit achievement framework for studying students of color in STEM (ADAF) seeks to unearth the behaviors and conditions that lead to minority students achieving success in STEM. Informed by theories from psychology, sociology, and education, this framework is philosophically guided by the belief that existing theories and conceptual models repeatedly examine and amplify minority students’ failures in STEM. Rather than promoting the deficit-oriented status quo, this framework challenges researchers to reframe their research questions into anti-deficit queries within three distinct junctures: pre-college socialization and readiness, college achievement, and post-college persistence in STEM. Each juncture represents achievement at a particular time point within the STEM pipeline: before, during, or after college, respectively. The framework also provides three researchable dimensions of achievement within each juncture. Within the first juncture, pre-college socialization and readiness, familial factors, K-12 school forces, and out-of-school college preparatory experiences are the researchable dimensions of achievement. Within the second juncture, college achievement, classroom interactions, out-of-class engagement, and experiential/external opportunities are the researchable dimensions of achievement. Finally, within the third juncture, post-college persistence in STEM, industry careers, graduate school enrollment, and research careers are the researchable dimensions of achievement. Moreover, within each researchable dimension, Harper provides two to four sample anti-deficit research questions. The ADAF is “not intended to be a prescriptive register of research topics” (Harper, 2010, p. 67). Rather, it is an illustration of anti-deficit research questions at three

different time points on the STEM pipeline and within nine researchable dimensions of achievement. The framework provides some questions that researchers could explore to better understand the success of minority students in STEM. The goal of the framework is to provoke researchers to consider anti-deficit reframing at different time points on the STEM pipeline and within various researchable dimensions of achievement.

In this study, CRT accompanied the ADAF. As noted by Harper (2010) exploring CRT in tandem with the anti-deficit achievement framework “recognizes students of color as experts on their experiential realities and empowers them to offer counternarratives concerning their success in STEM fields” (p. 71). Moreover, this study is situated within the college achievement pipeline point. Together the tenets of racial realism, intersectionality, and counterstorytelling, along with the focus on classroom interactions, out-of-class engagement, and experiential/external opportunities helped answer this study’s research question: How does Black male intersectionality shape the lived experiences and academic success of high-achieving Black male undergraduates in engineering majors at a PWI? Again, to my surprise, I only found one study that has employed CRT with the anti-deficit achievement framework for studying students of color in STEM (Newman, Hardaker, & Hilton, 2016). In this study, Newman et al. (2016) explored the meaning of minority engineering programs (MEPs) at two PWIs.

### **Synthesis of CRT and ADAF**

CRT explains the relationships between race, racism, and power in the United States (Delgado & Stefancic, 2012). Through its tenet racial realism, CRT argues that racism is a permanent fixture within American culture. As the overarching framework, CRT explains how Black males experience racism associated with being Black in society. Because higher

education institutions are a microcosm for society, Black males also experience racism associated with being Black on campus. In addition to having a subordinate racial identity (i.e., Black), this population also has a privileged gender identity (i.e., male). Through its tenet intersectionality, CRT argues that social identities can intersect and overlap causing multilayered experiences with privilege and oppression. Thus, CRT explains that being a Black male is uniquely different from being a Black female. Also, because race is socially constructed, being a Black male can also mean different things depending on the social context, which is explained through CRT's tenet differential racialization. Moreover, throughout the study, participants' were asked to offer their own interpretations of their lived experiences, which is a form of CRT's tenet counterstorytelling.

It was important to include CRT as the overarching framework for this study in order to acknowledge the structural advantages and disadvantages that Black males face that are outside of their locus of control. Subsequently, it was important to hold institutions, organizations, and broader society accountable for creating such conditions. Intrinsicly, using CRT as a theoretical lens drew attention to the unique racialized and gendered experience of being a Black male in an engineering major.

Within the larger context of structural advantages and disadvantages, it was also important to acknowledge that students have some agency in their pathway to success. ADAF explains how students of color “persist and successfully navigate their ways to and through various junctures of the STEM pipeline” (Harper, 2010, p. 67). As a complementary framework, ADAF explains individual attitudes and behaviors students employ to achieve success. More specifically, the ADAF differentiates three distinct time points: before college, during college, and after college, respectively. The ADAF provides an explanation

for how this population, that is high-achieving Black males in engineering majors, utilizes their agency to successfully maneuver through these time points. It is important to note that agency alone does not counter structural constraints and it is extremely difficult to exercise agency when structural constraints are present. Thus, both CRT and the ADAF were essential in this study's design. Using both CRT and the ADAF provided more context for understanding participants' counterstories of academic success. I was able to analyze how participants navigated the permanence of racism (racial realism), the social construction of race (differential racialization), and multilayered experiences with power, privilege, and oppression (intersectionality) before and during college (pre-college socialization and readiness and college achievement), as well as their forecasts of life after college (post-college persistence in STEM). Constructs from each theoretical framework were used to develop data collection protocols (see Tables 3.2 and 3.3), analyze data through a priori coding (see Appendix A), and reflect on study findings (see Table 6.1).

## CHAPTER 3: METHODOLOGY

### Research Design

The study employed a qualitative approach to examine the experiences of high-achieving Black male undergraduates in engineering majors at a PWI. Qualitative methods derive from the constructivist paradigm, which asserts that reality is socially constructed, and multiple realities exist (Mertens, 2014). As such, qualitative methods are best suited for research studies that seek to understand how individuals perceive their experiences because they allow participants to express differences in what they believe and value, as well as how they understand social, cultural, and physical contextual factors that affect causal relationships (Mertens, 2014). Diverse understandings about contextual factors were especially pertinent to answer this study's research question: How does Black male intersectionality shape the lived experiences and academic success of high-achieving Black male undergraduates in engineering majors at a PWI?

### Rationale for Narrative Inquiry

Specifically, I used narrative inquiry to explore the constructed realities of my participants. In narrative inquiry,

researchers collect stories from individuals (and documents, and group conversations) about individuals' lived and told experiences [...]. [These] stories tell of individual experiences, and they may shed light on the identities of individuals and how they see themselves [...] (Creswell, 2013, p. 71).

Narrative inquiry is well situated within the constructivist paradigm because it allows individuals to share their perception of reality. I selected narrative inquiry because I believed the autobiographies of my participants would provide a compelling and insightful account of

Black male intersectionality and how it shaped lived experiences and academic success in engineering majors at a PWI. While my participants spoke from their personal experiences, I choose my methodology because I believed their stories were also representative of the larger “processes, theories, and unique and general features” (Creswell, 2013, p. 190) experienced by the broader population of high-achieving Black male engineering majors at PWIs.

### **Rationale for Counternarrative**

More specifically, I employed a counternarrative approach. Racism is a system that requires the telling of master narratives (Montecinos, 1995; Solórzano & Yosso, 2002). According to Harper (2009) “[m]aster narratives are dominant accounts that are often generally accepted as universal truths about particular groups (e.g., Blacks are hopeless and helpless) – such scripts usually caricature these groups in negative ways” (p. 701). In STEM education, the master narrative places White Americans as superior to individuals from minoritized racial and ethnic backgrounds. One example of this master narrative is discourse about the “achievement gap” in STEM education, which communicates that students from minoritized racial and ethnic backgrounds, such as Black students, experience academic difficulty and low performance in comparison with their White peers (Carr, Bennett, & Strobel, 2012; Norman, Ault, Bentz, & Meskimen, 2001). Counternarrative, on the other hand, is a methodological tool that is often used in CRT to challenge the master narrative by offering alternative interpretations from the perspective of those who are minoritized. Instead of conveying the majoritarian perspective, counternarratives tell the “stories of people whose experiences are not often told (i.e., those on the margins of society)” (Solórzano and Yosso, 2002, p. 32). For this particular subpopulation of students, high-achieving Black male undergraduates in engineering majors, counternarrative is an



appropriate strategy to use because their experiences are rarely included in STEM education literature.

There are three general kinds of counternarratives: personal narratives, other people's narratives, and composite narratives (Solórzano & Yosso, 2002). Personal narratives are autobiographical accounts of an individual's experience with racism and other forms of identity-based oppression (Solórzano & Yosso, 2002). In her book, *The alchemy of race and rights: Diary of a law professor*, Patricia Williams (1991) used personal counterstorytelling to describe her experiences as a Black woman law professor. She intertwined current events and her personal experiences to draw attention to issues of gender, race, class, and justice. Other people's narratives are stories that recount another person's experiences with racism and other forms of identity-based oppression from a third person voice (Solórzano & Yosso, 2002). Harper & Davis (2012) used this second type of counterstorytelling to tell the stories of 304 Black male undergraduates and their educational experiences. The authors' ultimate purpose was to "[disrupt] master narratives concerning [Black males'] responses to inequitable schooling and their supposed disinvestment in education" (p. 107). Composite narratives draw on multiple forms of data to retell the experiences of people of color by creating composite characters and positioning them in social, historical or political situations (Solórzano & Yosso, 2002). Harper (2009) constructed five composite characters to represent his findings from face-to-face interviews with 143 Black male undergraduates at 30 PWIs across the country. In the narrative, these five characters, each college graduates from separate PWIs, were invited to attend a convening in Philadelphia following the release of Harper's book *Black male student success in college*. The characters had not met prior to the convening and were assigned to sit together at the opening luncheon. In this dissertation, I

chose to use the second kind of counternarrative, other people's narratives, to tell the stories of high-achieving Black male undergraduates in engineering majors at a PWI. Given my positionality as a Black female, I was unable to utilize personal counterstorytelling to answer the research question. Other people's narratives provided me with the richest data relative to the research question because they allowed me to hear directly from my population of interest, high-achieving Black male undergraduates in engineering majors at a PWI. Instead of situating them in a fictitious situation, as composite narratives do, I retold their stories using pseudonyms to describe their actual situations. To me, retelling their stories in this manner was more authentic to their lived experiences. Further, this strategy also allowed the study population to freely author their own stories. Throughout the process, I frequently communicated and collaborated with participants to ensure that I accurately represented their stories.

### **Site Selection**

Southeastern University (pseudonym) is a large, public PWI located in an urban city within the Southeastern region of the United States. Recent institutional data shows that Southeastern University has over 30,000 students, and over 24,000 of those students are undergraduates. Southeastern University is a land-grant institution and a premier institution for studying STEM. Among its most notable programs, Southeastern University's College of Engineering attracts national attention. Accordingly, Southeastern University has highly ranked and competitive undergraduate engineering programs. The approximate racial and ethnic demographics for College of Engineering undergraduates are as follows: 72.1% identify as White, 7.1% identify as non-resident alien, 6.7% identify as Asian American, 4.2% identify as Hispanic, 3.7% identify Black, 1.9% identify as two or more majority racial

and ethnic groups (for example, White and Asian American or White and Native Hawaiian), 1.5% identify as two or more underrepresented racial and ethnic minority groups (for example, Black and Hispanic or Black and American Indian), less than 1% identify as American Indian, less than 1% identify as Native Hawaiian or Pacific Islander, and 2.4% did not report their race/ethnicity.

Southeastern University was the ideal site for the study because it is a PWI that has consistently been nationally ranked as a top producer of engineering bachelor's degrees awarded to underrepresented racial and ethnic minority students, in particular Black students. It is important to note that within the field of engineering, American Indians, Blacks, and Hispanics are considered underrepresented racial and ethnic minority groups (Dix, 1987). Underrepresentation in this context is defined by comparing the percentage of students from a racial group in degree programs with the racial group's percentage in the national population (Dix, 1987). As a non-HBCU, Southeastern University has impressively been ranked among the top 5 and top 10 universities nationwide to award engineering bachelor's degrees to Blacks. To compare, Southeastern University has also been ranked among the top 10 universities nationwide to award engineering bachelor's degrees to American Indians, and the top 40 universities nationwide to award engineering bachelor's degrees to Hispanics.

### **Participants**

This study examined the experiences of eight high-achieving Black male undergraduates enrolled in engineering majors at Southeastern University. I employed a purposeful sampling procedure to select participants for this study. In purposeful sampling, researchers "selec[t] participants who will serve a specific purpose consistent with a study's

main objective” (Collingridge & Grantt, 2008, p. 391). Creswell (2013) clearly describes the merit of purposeful sampling in narrative inquiry as follows:

[I]n a narrative study, one needs to find one or more individuals to study, individuals who are accessible, willing to provide information, and distinctive for their accomplishments and ordinariness or who shed light on a specific phenomenon or issue being explored (p. 147).

For this narrative study, I utilized two specific types of purposeful sampling procedures: criterion and snowball sampling. Utilizing both criterion and snowball sampling helped me identify participants who fit my criteria and, as a result, were most likely to give me rich data.

### **Criterion Sampling**

In criterion sampling, participants are selected based on pre-established standards (Patton, 2002). I selected participants who met the following criteria: (1) identified as a Black male, (2) were high-achieving, defined by earning a 3.0 cumulative GPA or higher, and (3) were a junior or senior engineering undergraduate major at a PWI. Each criterion was essential to collecting useful data to answer the research question. Race, gender, achievement status, undergraduate major, and institutional type were all explicitly specified in the study research question (i.e., How does Black male intersectionality shape the lived experiences and academic success of high-achieving Black male undergraduates in engineering majors at a PWI?). I used 3.0 cumulative GPA as an indicator of high academic achievement, which is consistent with previous studies on high-achieving Black male students (Fries-Britt, 1998; Harper, 2012). In addition, junior or senior class standing was also important to ensure participants had sufficient breadth and depth of college experiences

to facilitate storytelling about academic success in college. The literature shows that introductory STEM courses tend to “weed out” undergraduates that are interested in STEM majors (Seymour & Hewitt, 1997). Selecting undergraduates who had successfully overcome the challenge of these gatekeeper courses allowed me to gain mature perspectives about academic success as an engineering major based on prior experience.

I utilized social media to reach participants who met my established criteria. Research demonstrates that social media is a key communication platform utilized by the millennial generation, or those aged 18-29 (Lenhart, Purcell, Smith, & Zickuhr, 2010). Today’s traditional college-aged student is in the millennial generation (Elam, Stratton, & Gibson, 2007); so social media was an ideal participant recruitment platform. Specifically, I shared a promotional flyer on public social media sites such as Facebook, Instagram, and LinkedIn to solicit eligible students. The promotional flyer outlined the (a) study title (b) eligibility criteria, (c) study components, (d) participation incentive, (e) Qualtrics link to an online consent form and the first component of the study (f) the researcher contact information. A copy of the promotional flyer is included in Appendix B.

### **Snowball Sampling**

In snowball sampling, researchers ask key informants that have access to the population of interest to refer potential participants, such as gatekeepers and existing participants (Patton, 2002). My gatekeepers were academic and student affairs administrators at Southeastern University who worked closely with Black male engineering undergraduates, such as the Director of the Minority Engineering Program (MEP) office, the Director of the Engineering Living and Learning Village, the Coordinator of the Black Male Initiative, and the Director of a STEM Scholarship program, as well as representatives from

Southeastern University's chapter of the National Society of Black Engineers (NSBE). Each of these gatekeepers was asked to share an invitation email and attached promotional flyer with eligible students as well as other campus partners who may interact with eligible students. The email included (a) an overview of the research project, (b) eligibility criteria, (c) study components (d) a Qualtrics link to an online consent form and the first component of the study, and (e) a request to share study information with eligible students. Moreover, another gatekeeper, the Assistant Director of an enrichment program for high-achieving students at Southeastern University, sent me a list of eligible students and their contact information. I subsequently sent an invitation email to these eligible students, which consisted of the same five components described above. Finally, once a student elected to join the study, I asked them for referrals of other eligible students as well.

### **Data Collection Procedures**

For this narrative study, I collected data from four sources: an online demographic survey, an online narrative exercise, individual interviews, and a focus group. The remainder of this section will describe my data collection strategies in detail.

Table 3.1: Data collection strategies

<b>Strategy</b>	<b>Description</b>	<b>Connection to Research Design and Theoretical Framework</b>
Online demographic survey	Qualtrics-administered survey that asked participants 25 background questions.	Data collected from the demographic survey provided the researcher with insight for interview and focus group probes and facilitated the retelling of participant narratives and writing Participant Profiles (Chapter 4).

Table 3.1 (continued)

Online narrative exercise	Qualtrics- administered exercise that asked participants to respond to 7 prompts about their upbringing, self-image, perceptions of their close family and friends, and future plans.	This exercise encouraged participants to begin “thinking narratively” (Clandinin & Connelly, 2000, p. 21), an essential skill in narrative inquiry. The use of the affirmation “I am” allowed participants to tell their own stories which is informed by the fifth tenet of CRT, counterstorytelling.
Individual interviews	60-minute semi-structured in-person interviews (8 total) with 12 questions	Each interview question was connected to an aspect of the theoretical framework. Please see table 3.2, “How CRT & ADAF informed the interview protocol” for more specific information.
Focus group	One 60-minute semi-structured in-person focus group with 13 questions	Each focus group question was connected to an aspect of the theoretical framework. Please see table 3.3, “How CRT & ADAF informed the focus group protocol” for more specific information.

### Online Demographic Survey

The online demographic survey was administered through university-sponsored Qualtrics. The survey asked 25 questions to verify that a participant met the eligibility criteria, collect the participant’s email address for future communication, assign the participant a pseudonym, and learn about the participant’s socioeconomic background. Potential participants were invited to participate in the survey beginning mid-July 2017. Only eligible participants were allowed to continue with the data collection process. A copy of the survey instrument is included in Appendix C.

The research design informed the online demographic survey in two ways. First, data collected from the survey provided me as the researcher with insight to ask participants’ relevant probes in the forthcoming individual interview and focus group. Second, this data facilitated the retelling of participant narratives and writing Participant Profiles (Chapter 4).

Additionally, the ADAF, the complementary theoretical framework, also informed the survey because the survey asked specific questions about academic achievement (i.e., GPA on a 4.0 scale, affiliation with scholar programs).

### **Online Narrative Exercise**

As soon as eligible participants completed the online demographic survey, I sent them the online narrative exercise. The online narrative exercise was also administered through university-sponsored Qualtrics Form and was adapted from a cultural sensitivity exercise developed by Dr. Beverly Daniel Tatum (Bowles, 2016b). The exercise asked participants to respond to seven prompts about their upbringing, self-image, perceptions of their close family and friends, and future plans. This exercise fostered meaningful introspection that was necessary to facilitate storytelling in the forthcoming interview and focus group. Further, it encouraged participants to begin “thinking narratively” (Clandinin & Connelly, 2000, p. 21), an essential skill in narrative inquiry. The use of the affirmation “I am” allowed participants to tell their own stories which is informed by the fifth tenet of CRT, counterstorytelling. A copy of the exercise is included in Appendix D.

### **Individual Interviews**

After participants completed the online narrative exercise, I invited them to participate in a 60-minute semi-structured in-person interview. The semi-structured interview provided an opportunity for participants to expound on their narrative exercise responses as well as offer additional information about their lived experiences. Prior to each interview, I printed the participant’s demographic survey and narrative exercise responses and organized them in a three-ring binder. This organization strategy allowed me to easily refer to the participant’s experiences during their interview.



The interview protocol consisted of 12 interview questions and was structured to elicit rich data through storytelling by asking open-ended questions and probing. A copy of the interview protocol is included in Appendix E. Questions 1, 2, and 3 developed a rapport with the participant and invited them to share stories from their childhood and early education years. Questions 4 and 5 were designed to facilitate deeper stories by asking the participant to reflect on their identity as a Black male and how it shaped their reality. Questions 6 and 7 went even deeper, asking the participant to tell stories about their Black male identity within the context of their PWI. After such intensive racial reflection, questions 8 and 9 drew attention to the participant's identity as a high academic achiever, which may not have been explicitly mentioned by the participant until this point of the interview. Here, the participant was asked to share stories about their academic achievement. Question 10 reiterated the focus of the study, Black male identity, and provided another opportunity for the participant to share stories associated with their PWI. This question was especially important for more reserved participants who needed time to open up to the narrative process. Questions 11 and 12 provided the participant with an opportunity to extend and conclude their stories. Each question also had a theoretical basis. Questions 3,4,5, 6, 7, and 10 of the interview all relate to CRT tenets. Questions 2, 8, 9, and 11 of the interview all relate to ADAF concepts. The bookend questions, 1 and 12, relate to the methodological strategy, narrative inquiry. Table 3.2 provides more explanation. Moreover, throughout the interview process, probes were used to gain supplemental insights from participants.

Table 3.2: How CRT &amp; ADAF informed the interview protocol

Question Number	Question Text	Theoretical Basis (e.g., Tenet; Theory)
1	Please tell me a little about yourself.	This first question and accompanying probes are designed to develop rapport and encourage “thinking narratively” (Clandinin & Connelly, 2000, p. 21).
2	When did you know you were academically successful or a high-achieving student?	Pre-college socialization and readiness; ADAF
3	How did you become interested in engineering?	Pre-college socialization and readiness; ADAF
4	Now I would like to learn a little more about your perspective. What does being a Black male mean to you? How did you come to this understanding?	Intersectionality; CRT
5	In your opinion, how does being a Black male shape how you see the world?	Intersectionality; CRT
6	How does being a Black male shape your experience in your major here at [Southeastern University]?	Intersectionality; CRT
7	Fill in the blank, being a Black male engineering major at [Southeastern University] is like _____.	Intersectionality; CRT
8	Now I would like to talk about academic success in college. Here I am defining academic success as earning a 3.0 or higher cumulative GPA. You have been identified as someone who has achieved academic success in your major. What has helped you be successful in your major?	College achievement; ADAF
9	What could make you more successful?	College achievement; ADAF

Table 3.2 (continued)

10	We are nearing the end of our time together. I would like to ask a few concluding questions. As you think back over your time at [Southeastern University], how has your race and gender affected your undergraduate studies?	Intersectionality; CRT
11	What are your future plans?	Post college persistence in STEM; ADAF
12	What else would you like to mention that hasn't been covered?	This final question allowed participants to conclude their narratives.

Each interview took place in a private library study room on the campus of Southeastern University. Interviews were voice-recorded and transcribed by a third party within 48 hours of the interview. I also took field notes during the interviews.

### **Focus Group**

Stories are gifts; narrative researchers should be mindful of reciprocity and be good stewards of the stories (Bowles, 2016a). The eight study participants invested their time, energy, and effort to share their stories with me for my terminal degree requirements. Outside of the advertised gift card incentive, I wanted to provide participants with a lasting benefit of their investment in the study. In light of reciprocity, all participants were invited to participate in one 60-minute semi-structured in-person focus group after semi-structured in-person interviews were complete. Research informs us that Black undergraduates at PWIs often feel isolated due to a lack of same-race peers (Fries-Britt & Turner, 2002; Sedlacek, 1987). To resist isolation and promote sense of belonging, the focus group served as an incubator for new friendships and peer mentor relationships among high-achieving Black male undergraduates in engineering majors at Southeastern University and a gathering place

to enrich existing connections. Such connections represent social capital that may outlast students' time at the university. As stated previously, qualitative methods belong to the constructivist paradigm, which asserts that reality is socially constructed, and multiple realities exist (Mertens, 2014). Aligned with this perspective, I choose to conduct a focus group because I believed my participants could learn from each other, which could inform their future decision making in powerful ways.

The focus group protocol consisted of 13 focus group questions and was structured to elicit further and more detailed storytelling by asking open-ended questions and probing. Participants were asked to elaborate on information shared during individual interviews as well as provide their feedback on preliminary data patterns. A copy of the focus group protocol is included in Appendix F. Question 1 introduced the participants to one another and allowed the third-party transcriber to hear participant voices with their pseudonyms, which facilitated rapport building amongst participants and enhanced the accuracy of the focus group transcription. Question 2 allowed the participants to share their feedback on the research question. Explicitly asking participants for their perspectives regarding the research question demonstrated that I was interested in collaborating and doing research with participants instead of on them. This act was well aligned with the transformative paradigm in which, "researchers position themselves side by side with the less powerful in a joint effort to bring about social transformation" (Mertens, 2014, p. 21). Questions 3, 4, and 5 asked participants to identify and share specific examples of racism, male privilege, and intersectionality from their lived experiences. These questions encouraged participants to provide more complete stories. Questions 6 and 7 asked participants to share how data collected across interviews resonated or did not resonate with them. These questions allowed

participants to be involved in the data analysis process. Questions 8, 9, and 10 asked participants to identify and share specific examples of how their race, gender, and intersectionality has influenced their academic success. Similar to questions 3, 4, and 5, these questions (questions 8, 9, and 10) encouraged participants to provide more complete stories. Question 11 asked participants for their feedback regarding the different factors that lead to their success. Similar to question 2, question 11 demonstrated that this research study was a collaborative endeavor between the participants and me. Question 12 allowed the participants to share their vision for a more inclusive SU. The final question, question 13, provided the participant with an opportunity to extend and conclude their stories. Just like the individual interviews, each focus group question had a theoretical basis. CRT informed questions 2, 3, 4, 5, 6, 7, 8, 9, and 10. The ADAF informed questions 2, 9, 10, 11, and 12. The bookend questions, 1 and 13, relate to the methodological strategy, narrative inquiry. Table 3.3 provides more explanation. Moreover, throughout the interview process, probes were used to gain supplemental insights from participants.

Table 3.3: How CRT & ADAF inform the focus group protocol

<b>Question Number</b>	<b>Question Text</b>	<b>Theoretical Basis (e.g., Tenet; Theory)</b>
1	You each have a nameplate with your pseudonym and major. For the audio recording let's go around and state your pseudonym and major.	Aligned with the methodological strategy, narrative inquiry, this first question facilitated rapport building amongst participants and enhanced the accuracy of the focus group transcription.

Table 3.3 (continued)

2	Okay, now let's start with the research question for this study, which is provided on the PowerPoint screen. How does Black male intersectionality (being both Black and male) shape the lived experiences and academic success of high-achieving Black male undergraduates in engineering majors at a PWI? What are your initial thoughts on this question?	Intersectionality; CRT  College achievement; ADAF
3	Raise your hand if you have experienced racism. [Researcher counts the number of hands raised] Can anyone recall a specific story? Tell us about that experience.	Racial realism; CRT
4	Raise your hand if you have experienced male privilege, or advantages because you are male. [Researcher counts the number of hands raised] Can anyone recall a specific story? Tell us about that experience.	Intersectionality; CRT
5	Can anyone recall a specific instance in which both your race and gender influenced how you experienced a situation? Tell us about that experience.	Intersectionality; CRT
6	On the PowerPoint screen are quotes provided during the individual interviews about being a Black male engineering major at [Southeastern University]. Do any of those ideas resonate with you?	Intersectionality; CRT
7	On the PowerPoint screen are metaphors provided during the individual interview when I asked being a Black male engineering major at [Southeastern University] is like _____. Do any of those ideas resonate with you?	Intersectionality; CRT
8	Raise your hand if your race has influenced your academic success. [Researcher counts the number of hands raised] Can anyone recall a specific story? Tell us about that experience.	Racial realism; CRT
9	Raise your hand if your gender has influenced your academic success. [Researcher counts the number of hands raised] Can anyone recall a specific story? Tell us about that experience.	Intersectionality; CRT  ADAF (overall)

Table 3.3 (continued)

10	Can anyone recall a specific instance in which both your race and gender influenced your academic success? Tell us about that experience.	Intersectionality; CRT ADAF (overall)
11	On the PowerPoint screen I have categorized the different behaviors, programs, people, policies and outside factors that you all described in the individual interviews as helping you be successful in your major. Is anything missing?	ADAF (overall)
12	If there were no limitations what could [Southeastern University] do to better serve high-achieving Black male undergraduates in engineering majors?	College achievement; ADAF
13	What else would you like to mention that hasn't been covered?	This final question allowed participants to conclude their narratives.

The focus group took place in a classroom space on the campus of Southeastern University during the dinner hour. I served pizza, soda, and cookies as refreshments for the participants. The focus group was voice-recorded and transcribed by a third party within 48 hours of the focus group. Additionally, I took field notes during the focus group. At the conclusion of the focus group, all participants received a \$25 Amazon eGift card as an incentive for participation.

### **Data Analysis Procedures**

Up until this point, I have shared the steps I took to collect participant stories. While collecting stories is important, the mere collection is not enough to produce research. As stated by Riessman (2005), “[n]arratives do not speak for themselves or have unanalyzed merit; they require interpretation when used as data in social research” (p. 2). Thus, in order

to gather meaning from the collected stories, researchers must use analytic techniques. For this study, I chose to analyze participant stories using paradigmatic analysis or what Polkinghorne (1995) calls “analysis of narratives” (p.13). In this analytic process, researchers identify themes or conceptual groupings across stories (Riessman, 2005; Riessman, 2008). In other words, researchers focus on the content of the stories by emphasizing “what” is said more than “how” it is said, the “told” rather than the “telling” (Riessman, 2005, p.2). While concentrating on the content of stories, researchers identify themes or conceptual groupings across stories and strive to keep stories in tact (Riessman, 2008). The goal of this analytic method is to “[discover] both themes that unify the story and the disparate voices that carry, comment on, and disrupt the main themes” (Josselson, 2011, p. 226). Polkinghorne (1995) further elaborates on paradigmatic analysis as follows:

The paradigmatic analysis of narrative seeks to locate common themes or conceptual manifestations among the stories collected as data. [...] The researcher inspects the different stories to discover which notations appear across them. Two types of paradigmatic search are possible (a) one in which concepts are derived from previous theory or logical possibilities and are applied to the data to determine whether instances of these concepts are to be found; and (b) one in which concepts are inductively derived from the data (p. 13).

In this study, both types of paradigmatic analysis were used. First, a codebook was created using CRT and ADAF constructs. A priori coding allowed me to determine whether specific CRT and ADAF constructs were present in stories. Next, open coding techniques were employed. In-vivo and process coding allowed me to derive concepts inductively from the data. Both types of paradigmatic analysis will be expanded upon later in this



chapter. Paradigmatic analysis was appropriate for this study because it allowed me to find common elements across participant stories, thus answering the research question. I also choose this analytic technique because it allowed me to both restory each participant's individual narrative – thus, keeping their counterstory of academic achievement in tact – while also identifying commonalities across participant experiences. To me, this dual strategy honored the individual narratives and facilitated meaningful cross-case analysis for subsequent recommendations.

I took three main steps to complete paradigmatic analysis: organization, synthesis, and interpretation. Throughout the data analysis process, I reread the study purpose statement and research question to remain grounded with the goal of the study. I also kept a digital research journal in my password protected Dropbox account to reflect on and record emerging themes from the data.

### **Organization**

First, as data were collected, they were systematically organized and reviewed. Demographic survey and narrative exercise responses were downloaded from Qualtrics, while interview and focus group transcripts were downloaded as they were received from Rev.com. Field notes were handwritten during the interviews and focus group and later were typed in Microsoft Word. Each of these data sources was saved into individual participant folders on my password-protected Dropbox account. I read through all the data to develop a general sense of the participant's background, experience at Southeastern University, and what general themes were present in their narrative. In particular, I read through the interview transcripts at least twice while listening to the audio recording. This process allowed me to become familiar with participants and their narratives, ensure the accuracy of

the transcripts, and de-identify the data using pseudonyms and masking the data with descriptors. I created a running list of pseudonyms and masked data in Microsoft Excel.

### **Synthesis**

As soon as a data source was collected, organized, and reviewed, I immediately pre-coded it. Saldaña (2009) describes pre-coding as “circling, highlighting, bolding, underlining, or coloring rich or significant participant quotes or passages that strike you [...] not only [as] expected but even surprising, unusual, or conceptually interesting” (p. 16 - 18). I pre-coded electronic copies of collected de-identified data (i.e., demographic survey responses, narrative exercise responses, interview transcript text, and typed field notes) using the Comments, Underline, Bold, and Highlight functionalities in Microsoft Word. I created one analytic memo document per participant where I typed my overall impressions about individual participants in real time based upon their data. In each analytic memo document, I made note of how the individual participant’s data related to the study research question. I also created a running research jottings document in my digital research journal to make note of and compare participant experiences.

After pre-coding a participant’s demographic survey responses, narrative exercise responses, interview transcript text, and my field notes from their interview, I began to re-story their individual narrative in the form of a participant profile. Creating participant profiles was important because allowed me to keep each participant narrative in tact, which is a key aspect of narrative inquiry. However, the re-storytelling process was also challenging for me as the researcher because it required me to continuously listen to interview recordings and review demographic survey responses, narrative exercise responses, interview transcript text, and my field notes from interviews to find the story that participants were

telling. Riessman (1993) articulates the magnitude of this challenge as follows “no matter how talented the original storyteller [is], a life story told in conversation certainly does not come readymade as [...] an article or a dissertation. The stop-and-go start style of oral stories of personal experience gets pasted together into something different” (p. 14). In each participant profile, informed by the theoretical frameworks, I paid attention to how participants racially identified themselves, the racial and gendered influences in their lives, and their academic achievement. After I wrote a draft participant profile, I sent the de-identified interview transcript and draft participant profile to participants to review, ensure accuracy, and sometimes provide more information with the comments and highlight functionalities in Microsoft Excel. Participants were asked to make modifications within one week using Tracked Changes. This process allowed me to member check the data.

Simultaneously, while restorytelling individual narratives, I also conducted cross-case analysis to identify themes across narratives. Using Excel spreadsheets, I organized striking quotes and experiences identified from pre-coding and participants responses to interview quotes and probes. In my digital research journal, I documented patterns and emergent themes as well as how they might relate to or answer the research question. I also created three tables to determine any trends in participant family background, academics, or co-curricular involvement.

At this point, I began a three-cycle coding process using Dedoose qualitative data analysis and research software. In first cycle coding, a priori coding, I created a codebook using CRT and ADAF constructs, previous literature on the study population, as well as my field notes, pre-coding notes, and preliminary jottings. More specifically, I observed the steps outlined in DeCuir-Gunby, Marshall, and McColloch’s (2011) article “Developing and

Using a Codebook for the Analysis of Interview Data: An Example from a Professional Development Research Project” to create the codebook. Then, I applied the a priori codes to the data. Appendix A provides a brief excerpt of my codebook for illustration.

Next, I employed open and axial coding techniques from grounded theory to complete second cycle coding. In open coding, the researcher organizes data for its major categories of information (Creswell, 2013). Using open coding, I identified in vivo codes and process codes. In vivo codes are exact words or phrases from the participant’s language (Miles, Huberman, & Saldaña, 2014). I choose to use in vivo codes to maintain the participant’s voice throughout the coding process. In contrast, process codes are “gerunds (“-ing” words) [used] exclusively to connotation observable and conceptual action in the data” (Miles, Huberman, and Saldaña, 2014, p. 75). I choose to use process codes to draw attention to specific actions relative to the research question. After I identified my in vivo and process codes using open coding, I began my axial coding. In axial coding, “the researcher identifies one open coding category to focus on (called the “core phenomenon”), and then goes back to the data and creates categories around this core phenomenon” (Creswell, 2013, p. 86). I used axial coding to group my in vivo and process codes into larger categories. Once I created my broad categories, I began third cycle coding. At this stage, I began to identify repeated units (i.e., patterns) from the categories, and then group those patterns into larger themes.

### **Interpretation**

As noted by Polkinghorne (1995), “paradigmatic analysis is employed not simply to discover or describe the categories that identify particular occurrences within the data but also to note relationships among categories” (p.14). To interpret the themes, I continually

reviewed them in relation to the existing literature and the theoretical frameworks (CRT and ADAF). This was an iterative process that included rereading the literature and theoretical frameworks, creating multiple versions of matrices and lists to organize data patterns, and then mapping how data patterns connected to previous research and theoretical constructs. Once the themes were formed, I used direct quotes from participants to name them. In order to ensure I interpreted the data correctly, I provided participants with a copy of my preliminary findings. Participants were asked to review the preliminary findings for accuracy and make modifications within one week using Tracked Changes. This process allowed me to member check the data interpretation. At the conclusion of the interpretation process, I found three themes and six subthemes. It is important to note that my initial methodological plan for this study was to only conduct paradigmatic analysis; however, while interpreting the themes, I noticed a pattern. There was a sequential order that connected the themes: theme one preceded theme two, and theme two preceded theme three. In other words, the themes themselves also told a shared story in addition to the individual participant narratives. Thus, I ultimately conducted a combination of two analyses, analysis of narratives, described previously, and what Polkinghorne (1995) terms as narrative analysis.

Narrative analysis is the procedure through which the researcher organizes the data elements into a coherent developmental account [...] Narrative analysis relates events and actions to one another by configuring them as contributors to the advancement of the plot. [...] The result of a narrative analysis is an explanation that is retrospective, having linked past events together to account for how a final outcome might have come about (Polkinghorne, 1995, p. 15-16).

The chronological order of the themes demonstrates the shared sequence of events participants' described in their counterstories of academic achievement (i.e., background characteristics leading to behaviors, and behaviors leading to emotional effects). I will expound on the findings in Chapter 5.

### **Ethical Concerns**

To protect my participants from any potential harm, I submitted an IRB application before beginning my study. As required by IRB, all participants gave their informed consent to participate in the study. A copy of the informed consent form is included in Appendix G. To ensure trustworthiness, I employed four validation strategies: (1) triangulation, (2) clarifying researcher bias, (3) member checking, and (4) rich, thick descriptions.

Triangulation refers to researcher utilizing “multiple and different sources, methods, investigators, and theories to provide corroborating evidence” (Creswell, 2013, p. 251). I employed triangulation by collecting data from four different sources (i.e., an online demographic survey, an online narrative exercise, semi-structured interviews, and a semi-structured focus group). I asked three CRT methodologists to review these four data collection instruments and provide feedback as an effort to ensure my strategies were reflective of my theoretical framework. Two methodologists provided notes via the Comments and Tracked Changes functionalities to improve data collection strategies; one methodologist was unable to provide feedback due to their busy schedule. Clarifying researcher bias refers to the researcher understanding their positionality at the beginning of the research process (Creswell, 2013). As I planned the dissertation study, I clarified my bias by writing an extended statement examining my subjectivity and how it may impact my research. I provided this positionality statement in the final section of this chapter. Member

checking refers to the researcher sharing findings and interpretations with participants and asking for their feedback (Creswell, 2013). I employed member checking by sharing the interview and focus group transcripts, participant profiles, and preliminary findings with participants and soliciting their feedback. Finally, rich, thick descriptions refer to providing detailed descriptions of participants, settings, and findings that “allows readers to make decisions regarding transferability” (Creswell, 2013, p. 252). Throughout this study, I provided rich, thick descriptions of my data collection and analysis as well as findings.

### **Positionality Statement**

I proudly and unapologetically self-identify as a Black woman. I intentionally define myself as “Black” as opposed to “African American” as a political statement. I believe there is a strength and struggle that comes with being Black in America. While my ancestors from the 16<sup>th</sup>-19<sup>th</sup> centuries were enslaved people from Africa, I have not yet been able to trace my cultural heritage back to a specific country within the African continent. Therefore, my lived experiences and the lived experiences of my close family members are situated within the context of being Black in America. For generations, my maternal and paternal families have self-identified as Black people. As I reflect on my upbringing, I remember hearing my parents, grandparents, aunts, and uncles recounting stories of how they have experienced racism, segregation and discrimination in America because of their Blackness.

Blackness for me encompasses more than just my family of origin and my physicality; it is also the primary lens through which I see the world. I am highly attuned to issues of race. Without prompting, I search for racial implications in news media and in conversations. I am also very sensitive to racial stereotypes, particularly in the field of education. Much of my sensitivity derives from my own experience as a low-income high-

achieving Black student. I graduated from Hillside High School, the oldest operating historically Black high school in North Carolina, with the fifth highest GPA in my senior class and many honors and achievements. While under-resourced in terms of funding, my high school continues to thrive in compassion, mentorship, and legacy – aspects that are habitually overlooked as Durham’s ‘Blackest’ high school.

As a researcher, I am most interested in studying the experiences of Black students across the K-16 educational continuum. In particular, I am interested in learning about Black students’ racialized experiences and pathways to success. My dissertation study centers on high-achieving Black male undergraduates majoring in engineering. I was first introduced to the idea of being a high-achieving Black male in engineering from the experiences of my father. As a child, my father was known as the “smart kid” in his family and community. He graduated from community college with two associates degrees: one in computer engineering and the other in computer programming. As a Black male engineer working in industry, he encountered prejudice and bias. One of his stories has always resonated with me. He applied to an out-of-state job, surpassed the initial phone interview, and the company flew him out for an on-site interview. When he arrived at the interview introduced himself to the receptionist. She looked at him and said, “Oh, you didn’t sound Black on the phone”. In that instance, when my father retold that part of the story to me, I felt shocked, frustrated, and upset. I felt shocked that the receptionist was bold enough to say it to his face. Similarly, I was frustrated that we lived in a world where being Black was perceived negatively. Moreover, I was upset that the receptionist was insinuating that he would be the ideal candidate if he weren’t Black, and further, all of his accomplishments were belittled because of his race. From my perspective, the fact my father had accomplished so much in a world



that was not designed for him, made his success even more amazing. My father's story awoke my inner drive to promote the stories of high-achieving Black males in engineering.

Undoubtedly, my background has influenced what I emphasize in my research. Specifically, my robust pro-Black sentiments accompanied with my own experience as an academically successful Black student allow me to examine Blackness in education from a place of familiarity. I do not view the students I study as 'the other'. Instead, I view them as members of my community because they similar to me in many ways. Although these students have distinct experiences, they remind me of my high school friends, my father, and myself. As such, I evaluate and interpret their experiences differently than I would someone who is vastly different from me in terms of race and class. My familiarity with my participants can be advantageous because it allows me to easily develop rapport and connect with my participants on a more intimate level. On the contrary, my familiarity with my participants can also be disadvantageous because it can skew my ability to take what my participants say at face value. Unfortunately, because of my familiarity, I am more likely to ascribe meanings that reinforce my own background and understanding of the world. Validity measures are always necessary to counterbalance my positionality. As such, in this study employed four different validity measures: (1) triangulation, (2) clarifying researcher bias, (3) member checking, and (4) rich, thick descriptions.

## **CHAPTER 4: PARTICIPANT PROFILES**

The purpose of this counternarrative study was to understand how Black male intersectionality shaped the lived experiences and academic success of high-achieving Black male undergraduates in engineering majors at a PWI. Other people's narratives – or the stories of high-achieving Black male undergraduates in engineering majors at a PWI – were elicited to answer the research question: How does Black male intersectionality shape the lived experiences and academic success of high-achieving Black male undergraduates in engineering majors at a PWI? The study used purposeful sampling to recruit participants (Collingridge & Gantt, 2008; Creswell, 2013). In this study, eight participants were selected. Each participant was a junior or senior engineering undergraduate major at Southeastern University during the time of the study. Data were collected from four sources: an online demographic survey, an online narrative exercise, individual interviews, and a focus group. In this chapter, I provide the participants' family, academic, and co-curricular background as well as a profile for each participant.

### **Participant Demographics**

Eight participants were selected to share their experiences in this study. Tables 4.1, 4.2, and 4.3 present participant's family, academic, and co-curricular information. All participants were between the ages of 20 – 22 years old and were enrolled as full time undergraduate students at SU. Six of the participants were seniors and two of the participants were juniors. There was a good variety of engineering majors represented: two chemical engineering majors, one biomedical engineering major, one electrical engineering major, one textile engineering major, one industrial and systems engineering major, one material science and engineering major, and one civil engineering major. While the study eligibility criteria

required that participants earn at least a 3.0 cumulative GPA, on a whole, participant cumulative GPAs well exceeded that minimum ranging from 3.2 to 4.0. Moreover, five participants earned above a 3.5 cumulative GPA. It is also important to note that participants were involved in several co-curricular activities. Half of the participants (n=4) were employed part time between 8 – 20 hours per week, and the other half was unemployed. In addition, five of the participants were affiliated with scholar programs (i.e., honor's societies, scholarships). One participant was a SU football player.

None of the participants were first-generation college students. For each participant, both his mother and father had earned a bachelor's degree at minimum. Additionally, six of the participants had at least one parent with an advanced degree (i.e., master's degree, doctoral degree, professional degree) and for two of those six; both mother and father earned advanced degrees. In terms of their family structure growing up, all of the participants were raised in two-parent households for some length of time. However, two participants' households shifted to female-led households. The female-led households originated differently. One participant's parents divorced during his childhood, and at that point, his mother became the primary provider. For the other participant, his parents separated relatively recently, and his father is not a large part of his life. For confidentiality purposes, the names of the participants in this study have been replaced with the following pseudonyms: Marcos, Isaiah, Lamar, James, Saadiq, Jermaine, Anthony, and Carter.

Table 4.1: Participant Family Information

<b>Participant Pseudonym</b>	<b>Age</b>	<b>Family Structure Growing Up</b>	<b>Highest Educational Attainment of Mother***</b>	<b>Highest Educational Attainment of Father****</b>	<b>Socioeconomic Status</b>
<b>Marcos*</b>	21	Married-couple or two-parent family	Bachelor's degree	Doctoral degree	Middle Class
<b>Isaiah*</b>	21	Married-couple or two-parent family	Bachelor's degree	Doctoral degree	Working Class
<b>Lamar*</b>	22	Married-couple or two-parent family	Master's degree	Professional degree	Middle Class
<b>James*</b>	22	Married-couple or two-parent family	Professional degree	Master's degree	Middle Class
<b>Saadiq*</b>	20	Married-couple or two-parent family	Bachelor's degree	Bachelor's degree	Working Class
<b>Jermaine*</b>	20	Married-couple or two-parent family	Bachelor's degree	Professional degree	Wealthy/Affluent
<b>Anthony**</b>	20	Married-couple that divorced during childhood	Bachelor's degree	Bachelor's degree	Middle Class
<b>Carter**</b>	22	Married-couple or two-parent family	Master's degree	Bachelor's degree	Middle Class

## Key

\*Participant-selected pseudonym

\*\*Participant did not indicate a pseudonym preference, so pseudonym was selected for participant.

\*\*\*Mother, female guardian, or female head of household

\*\*\*\*Father, male guardian, or male head of household

Table 4.2: Participant Academic Information

<b>Participant Pseudonym</b>	<b>Major</b>	<b>Minor</b>	<b>Undergraduate Classification</b>	<b>Cumulative GPA</b>	<b>Enrollment Status</b>
<b>Marcos*</b>	Chemical Engineering	Spanish	Senior	4.0	Full-Time Student
<b>Isaiah*</b>	Biomedical Engineering	No minor	Senior	3.6	Full-Time Student
<b>Lamar*</b>	Electrical Engineering	Music Performance	Senior	3.2	Full-Time Student
<b>James*</b>	Chemical Engineering	Environmental Science	Senior	3.3	Full-Time Student
<b>Saadiq*</b>	Textile Engineering and International Studies (double major)	No minor	Junior	3.8	Full-Time Student
<b>Jermaine*</b>	Industrial & Systems Engineering	No minor	Senior	3.6	Full-Time Student
<b>Anthony**</b>	Material Science and Engineering	No minor	Junior	3.9	Full-Time Student
<b>Carter**</b>	Civil Engineering	No minor	Senior	3.4	Full-Time Student

## Key

\*Participant-selected pseudonym

\*\*Participant did not indicate a pseudonym preference, so pseudonym was selected for participant.

Table 4.3: Participant Co-Curricular Information

<b>Participant Pseudonym</b>	<b>Scholar Program Affiliations (#)</b>	<b>Employment Status</b>	<b>Employment Hours/Week</b>
<b>Marcos*</b>	4	Not employed	N/A
<b>Isaiah*</b>	2	Teaching Assistant Researcher	10
<b>Lamar*</b>	2	Co-Op at a power company	8
<b>James*</b>	N/A	Not employed	N/A
<b>Saadiq*</b>	6	Resident Advisor	20
<b>Jermaine*</b>	2	Not employed	N/A
<b>Anthony**</b>	N/A	Not employed	N/A
<b>Carter**</b>	N/A	Resident Advisor	12

## Key

\*Participant-selected pseudonym

\*\*Participant did not indicate a pseudonym preference, so pseudonym was selected for participant.

### Participant Narratives

#### Marcos' Story

*“I really try to put a perspective of working hard, having faith, and treating other people as individuals in all situations and really learning about them as a person. That's kind of, the way I approach life” (Marcos, Interview).*

Marcos, 21, is a senior chemical engineering major with a Spanish minor and an outstanding 4.0 cumulative GPA. He is the only child of a two-parent family, and he considers his family as middle class. His father, a SU graduate, is a Ph.D. educated mechanical engineer, and his mother is a stay-at-home mom that earned her bachelor's degree in English. Both his parents are American born, and Marcos describes his parents as a nerdy married couple. “They listen to NPR, read the newspaper and love to talk about investing. Their nerd nature definitely rubbed off on me; I love listening to NPR, reading the newspaper and sometimes talking about investing” (Marcos, Narrative Exercise). Marcos'

mother always prays for him and encourages him to pray. In addition, both his parents have encouraged him to work diligently in school. He reflects on a memory from elementary school,

I think it was maybe, second grade when you have to learn all the math facts. And there's the 1's, 2's, all the way up to the 12's. And I didn't want to learn the 12's. And my parents were, "You're gonna sit down and learn these until, we're gonna sit down with you and you're gonna learn these tonight." And I didn't want to and I kept wanting to get up and run around. They set me back down and they were like, "You're gonna learn these." Then, I think, the next day I went in and got a 100 on the exam (Marcos, Interview).

From an early age, Marcos was introduced to diverse ways of life - including enjoying global cuisine as well as traveling and living internationally during his youth and teen years. To date, he has visited 32 countries. When asked "where is home?", Marcos has numerous answers. He was born in a Midwestern state, but moved to a large metropolis in Texas at age four, moved to the Middle East at age eight, and attended high school in Africa. His exposure to different cultures has a large influence on how he sees himself and the world around him.

[In the Middle East] That's really where I started to develop a perspective of treating people as individuals, not as stereotypes. I went to a school with 150 different nationalities. You go to lunch and there were people with Korean food and Arabic food and British food and just, everything. And I got a sense that my friends were from all over the world, but they were people just like me (Marcos, Interview).

In terms of his academic achievement, Marcos knew he was a high-achieving student “early on”. He recalls an experience in middle school:

I'm sure this happened before, but I do remember in middle school, this is kind of, funny, because every year I would get awards, and I think I just thought it was kind of, normal until I really thought about it I was, I'm probably one in five students maybe, who are getting these awards, like Best Student in the Class, or etc. And I think that's when I realized that maybe, the first time I realized that my peers thought that, as well. They had said that, but I think I got nominated for some Best Student Nominated By Your Peers in 8th grade. I was just like, really? So, I think that was the defining moment there.

At SU, Marcos has continued to earn many prestigious academic accolades such as being awarded a four-year merit-based scholarship, participating in an application-only enrichment program for high-achieving SU students, and being inducted into an engineering honor society. While Marcos identifies as a Black male, his academic achievement is a more salient part of his identity. He explains,

People don't think of me as the black guy in chemical engineering, they think of me as the smart guy in chemical engineering So, I don't think [race] factors in as much to the way people perceive me, and maybe even the way I perceive myself as an engineer in the department (Marcos, Interview).

Marcos acknowledges that many of his Black peers feel ostracized in engineering, but he has never felt that because he was raised in a multicultural community. Additionally, Marcos also actively engages in strategies to remove the barrier between him and his White peers.

I always approach situations as, "How can I take the best advantage of the situation



and learn as much as possible?" So, I sat on the front row and interacted with people and wasn't afraid to go have study groups with my White peers and make friends, etc. But I think that some of my peers had trouble with that, and maybe that was just a fact of kind of, where I grew up, and that I was friends with all these different types of people, so I didn't really have a problem with it (Marcos, Interview).

Outside of the classroom, Marcos has also served in several leadership roles such as being a student ambassador for SU's College of Engineering for 2 years and being a SU President's Aid during his junior year. Perhaps his largest leadership role was serving as the President of SU's National Society of Black Engineers (NSBE) chapter for the 2016-2017 academic year, and he currently advises the 2017-2018 SU NSBE President on how to effectively manage the organization. In addition to his leadership activities, Marcos has participated in research experiences both at SU and at out-of-state colleges. Most notably, during his freshman year, he was one of two students selected to participate in a research experience funded by the National Science Foundation. Community service is also important to Marcos, but his schedule hasn't allowed him to give back as much as he would like. During his freshman and sophomore years, he volunteered at a foreign consulate as well as at a community organization that teaches children how to play classical music. In the community organization, he helped establish a parent network and utilized his Spanish skills to help reach Spanish-speaking parents.

On the bright and sunny August afternoon when Marcos arrived for his interview, we chatted briefly about his busy summer activities, which he elaborated on later in our meeting.

I took an African-American studies class, did a software workshop, went to an investment conference, traveled for a little bit, worked with my senior design team a

little bit, did some advising on NSBE, turned in [two very competitive graduate school scholarship] applications, I'm trying to think what else [...] I was working, yeah, that's the biggest thing I was doing. I was working technically, 40 hours. Yeah, I was working 40 hours for [oil and gas company]. But, 40 hours for [oil and gas company] is really 50 or 60 hours (Marcos, Interview).

At the time of our interview, Marcos was juggling various professional commitments such as working with a research lab, publishing two studies, applying for graduate school, taking his senior level courses, and taking the first graduate course for the Ph.D. series in chemical engineering. In five years, Marcos hopes to become a Ph.D. student at a prestigious research university with a startup providing chemical researchers with technology to accelerate the pace of discovery. After he has kids, he aspires to serve on a local school board.

### **Isaiah's Story**

*"I'm heavily involved in working with underprivileged and underrepresented minorities because I see myself in them. [...] I'm very passionate about working with the community [...] So yes, my heritage, my passions, and then also I guess my education, those are really the things that define me"* (Isaiah, Interview).

Isaiah, 21, is a senior biomedical engineering major with a 3.6 cumulative GPA. He is from a suburban county in the same state as SU. Isaiah is the youngest of three children from a two-parent family, and he considers his family as working class. His father is a Ph.D. educated mechanical engineer that teaches at a local community college, and his mother is a Registered Nurse that earned her bachelor's degree. Isaiah identifies as an African American male and a first-generation American. Both his parents are African immigrants. His family

enjoys traditional cuisines that include “jollof rice, kele wele, mincemeat stew, fufu, and baked chicken” (Isaiah, Narrative Exercise). Growing up, Isaiah encountered numerous clashes between his African heritage and American culture. He reflects,

during elementary school ... there would be clashes. So the teacher, for example, would move my brother away from the rest of the students because the food stank. [...] Of course, we're too little to understand it. So things like that, where we'd just see clashes in music we listened to, the way we dressed. Our parents are very I guess traditional slash conservative in the manner that they dress just because in [Africa] that's how you portray yourself if you're of a certain status. So it's seen as very weird here to always have your shirt tucked in. I remember I would go to track practice and tuck in my shirt just 'cause that was normal to me (Isaiah, Interview).

Regarding his academic achievement, Isaiah knew he was high-achieving in elementary school. He recalls,

Back in elementary school, they would have those awards day, and every year, I would always get like seven plus awards. So from that, everyone would always say, "Oh, you're smart. You're smart." I don't know. Multiple people would say the same thing, and so I started believing it myself, like, "Oh, I'm smart." Then at that moment became like, "Oh, I have to perform at a certain level because people have described me as smart, so I guess I have to be smart (Isaiah, Interview).

Isaiah’s parents were also a driving force in his academic pursuits. Throughout his youth, they encouraged him to think about and prepare for his future often.

[...] it'd be an underlying question, like, "What's the next step for you?" So we have good grades in school, but what are the things you're gonna do for outside of school?

What are the things you want to get involved in? What sports do you want to do?

What extracurricular activities do you want to do? (Isaiah, Interview).

Isaiah's brother and sister are both twins that are three years older than him. His older sister is in the master's of physiology program at SU, and his older brother in a post-baccalaureate program at another in-state college. His siblings have shared important tips and strategies that he has applied in his own high school and now collegiate journey. For example, in high school both his siblings attended a competitive application-only in-state STEM boarding school for juniors and seniors. Isaiah later attended the same school. In addition, both his siblings earned their bachelor's degrees in biomedical engineering from a rigorous out-of-state university, the same major Isaiah is currently pursuing at SU.

Having those two ahead of me I guess was a huge benefit because the things that they struggled with, they warned me about when I was going into it three years later. So I wasn't able to make the same mistakes because I knew what was coming [...] So that's why I really think my GPA has been so successful, because just I sort of knew what was coming, going into it (Isaiah, Interview).

Isaiah earned a prestigious four-year merit-based scholarship awarded by SU. He has maintained his stellar GPA while working two on-campus jobs for approximately 10 hours per week: as a researcher in an engineering lab and as a teaching assistant for a STEM outreach program. From his freshman to junior year, Isaiah was a member of SU's honors program. He decided to leave the program his senior year due to schedule conflicts with required coursework for his major, the honor's program, and pre-medicine prerequisites. In his biomedical engineering classes, Isaiah is the only Black person out of about 60 to 70 students.

In his free time, Isaiah is a part of SU's National Society of Black Engineers (NSBE) chapter. He previously served on the Executive Board for two years, and recently stepped down to enjoy the organization as a general body member. In addition, Isaiah started a student organization for minorities interested in pre-health careers. Off campus, Isaiah tutors with organization that caters to underprivileged youths around the city. At the time of our interview, Isaiah was applying to medical schools both in and out of state. In 5 years, Isaiah hopes to be a physician practicing general surgery.

I want to work in an underserved community as some sort of primary care physician because there's a shortage of primary care physicians currently in our state, especially in underserved communities. So I want to work with underserved communities as a primary care physician, just addressing that need, but also, in those same communities, I want to do educational programs and just give my time and effort to these education programs, similar to [the STEM outreach program I work with], to just sort of teach young children the importance of education and where education can take them, whether it be out of your present situation or just empowering the people around you and things like that (Isaiah, Narrative Exercise).

### **Lamar's Story**

*"I'm usually pretty involved in whatever I kind of latch onto [...] I like really investing in whatever I'm a part of"* (Lamar, Interview).

Lamar, 22, is an electrical engineering major with a music minor and a 3.2 cumulative GPA. He describes himself as a "super senior" (Lamar, Interview) because he participated in a yearlong rotational co-op at a power company that slightly delayed his graduation date. Lamar is the eldest of two children from a two-parent family. His father is

a medical doctor, and his mother is a master's educated counselor and special education teacher. His sister is 20 months younger than him and is a junior Spanish and Management Information Systems major at another in-state college. Lamar considers his family as middle class. Growing up, his parents expected academic excellence from him and his sister.

Mom and dad both definitely drilled it into me. "Do well. What is this grade? You can do better. You can study more. Here, I can help you with this. Here, I can help you with that." Just expecting excellence. That was the norm, right. It wasn't like you get five dollars for getting an A. You get punished if you don't" (Lamar, Interview).

Lamar was born and raised in the American South, and his family often ate "Pigeon Peas and Rice, Collard Greens, Mac and Cheese, Dirty Rice, [and] Banana Pudding" (Lamar, Narrative Exercise). Lamar identifies as both Black and African American, and believes the terms have the same meaning. As he explains,

I know a lot of people don't consider this but Black African American I kind of consider as the same thing. I don't get offended unless the tone is wrong. [...] I'm a Black American. Black American is fine with me. African American is fine with me. I don't care one way or another. I see it as the same thing (Lamar, Interview).

In his early years, most of Lamar's peers were predominantly White, and his teachers were "basically all White ladies" (Lamar, Interview). He also reflects on how his mother was his advocate in those environments, and she made her presence known in his schools. She was "not one to be messed with" (Lamar, Interview).

I loved my friends and things like that but it was very much, I was the minority. And one of the very few minorities in pretty much all of my classes going through elementary and middle school. I guess, I mean, I was pushed just as hard as anybody

else but my mom, looking back, definitely had to step in sometimes for things that just weren't completely right [...] [For example, ] when I took the [accelerated kids test] the teacher tried to say I didn't pass by one point and when we reviewed the test grades I actually passed by like two points or something like that. It was still borderline but trying to defer for some reason (Lamar, Interview).

Lamar moved to different southern cities and states during his childhood. With each move, his school environment became more racially mixed, and he began to embrace his Black culture more. He recalls participating in two Black male leadership programs in high school that influenced how he viewed Black culture:

I've definitely been introduced more to the Black community each move, I've been integrated more and more into it since I was pretty much just used to making White friends [...] [Then in high school,] I was in [an organization], which was like a Black, African-American leadership ... They had a summit every year so going to that was pretty cool. Then at our high school a student a year older than me started this group called the [name of organization], which was a Black male leadership service group at our school. We did a lot of things in the community and on school grounds, just coming together. We did socials and things like that. I think that really kind of pushed me towards embracing African-American culture and owning it, more than just using it for an application or something like that (Lamar, Interview).

Lamar realized he was a high-achieving student in elementary school, and now he expects himself to academically perform at a high level.

I would say second or third grade I just kind of realized I got good grades consistently and that wasn't necessarily the case for other students. As I kept on going forward,

fourth, fifth, sixth grade people would ask me for questions and things like that. "I want to be in [Lamar's] group," and things like that. [...] Or just realizing that I can usually do very well if I study and focus for it. Through high school and through college I just kind of see myself as high achieving so I expect that from myself for the most part.

Lamar earned a prestigious merit-based STEM scholarship awarded by SU. He has given back to his scholarship program in several different ways, such as serving as a student mentor, student retreat leader, and co-presenting with the program staff at conferences. He is also an active member of the SU National Society of Black Engineers (NSBE) chapter, and previously served on the executive board. Additionally, Lamar has participated in volunteer efforts for Habitat for Humanity, established student organizations for African and African American students, and an emerging student organization for minority males. Lamar was apart of the honors program for his first two years but found it "the heavy research-based goals and directives of the program do not align with my interests and goals that I wish to accomplish." Outside of the university, Lamar played the drums at a local church for a while.

Lamar is not certain where his career will lead him after his upcoming graduation this May. Recently, he studied abroad in China. He enjoys traveling to foreign places and meeting new people and wants to work in a job that can allow for him to travel, utilize his technical background, and collaborate. He is considering either going into a rotational program while earning his MBA or going into work full time. He would like to start in the power industry and move his way up to management.



### James' Story

*“I go into class, and I'm showing my tats. I'm like, I'm about to do better than you on this test. That's what I'm thinking in my mind. I'm like, I know you think that it's really weird that I'm in this class, but I'm about to do better than you on this test. That's the way I look at it. I definitely like the challenge.”* (James, Interview).

James, 22, is a senior chemical engineering major with an environmental science minor and a 3.3 cumulative GPA. James is the youngest of five children – one biological sister, one stepsister, and two stepbrothers – from a two-parent blended family. He describes his family as middle class. His late mother was a math teacher and graduate of a historically black college and his father is a master's educated university librarian. His stepmother is also a dentist with her own dental practice, and his older sister is law student. James' comes from a family of college graduates and trailblazers. Beaming with pride, he explains,

My family's pretty amazing, to be honest. My grandmother was the first African-American Vice Provost of Student Affairs at [a college in the Midwest]. Either my aunt or uncle went to [an ivy league school] with one of the Obama's, and my cousin [Jarrett] is a senator, and his wife's a lawyer [...] It's pretty wild. I'm really just trying to measure up, to be honest. My little cousin's at [an ivy league school]. I got some catching up to do, to be honest. My sister's starting her own business called [company name] [...] So yeah, my family's pretty, pretty amazing (James, Interview).

During his childhood, James' then stepfather had a significant influence on how he thought about gender.

... He kind of stressed being some type of ... Or, he kind of stressed masculinity, hyper masculinity a little bit, so got that out of him, because I used to be spoiled

before he came into my life. That's when the "Stop whining," and the "You need to toughen up," came in (James, Interview).

In school, James experienced “two different polarity worlds” (James, Interview). He went to a predominantly White, private catholic school from first to sixth grade, and then went to a racially mixed, magnet college preparatory school. Once school dismissed, James would attend his mother’s after school program in another city, which was predominantly Black environment. James describes himself as having an extraverted and talkative personality, which has sometimes come across as aggressive in social settings. James also did not like authority growing up and clashed with many of his teachers who he felt didn’t understand him. He remembers being smart but not a ‘good student’ due to his personality.

I wasn't a good student. I was good at academics, but I talked a lot in class. I made a lot of jokes. I cracked a lot of jokes that weren't needed. I would sleep in class a lot [...] I don't understand why people don't like you sleeping in class. If you get the material quicker than the rest of the class, I feel like you should be allowed to sleep in class. I'm a very huge advocate for that, but apparently, it's disrespectful, but at the same time not everybody in high school learns on the same level. [Waiting for others to get it] is just really boring. (James, Interview)

James calls himself as an “effort kind of guy” (James, Interview). He attributes much of his success to both perseverance and hard work. James realized he was high-achieving when he switched high schools and tested out of pre-algebra at a college preparatory school. However, it was while taking AP US History in the same school that he learned that he was both smart and diligent.

That class was hard. Know what I'm saying? [...] Then, after that I was like I'm a hard worker. That's when I realized kind of I was a hard worker, and I was a little humbled a little bit. I'm smart, but I'm definitely going to have to work at it (James, Interview)

For James, being a Black male means there is more of a spotlight on him, but he likes the attention and the challenge to perform. On campus he is an active member of SU's National Society of Black Engineers (NSBE) chapter as well as the American Institute of Chemical Engineers. For three semesters he also tutored for the SU TRIO program for chemistry, calculus and physics classes. James is still deciding what is next for him after his upcoming graduation. "I'm not sure where I want to end up in the grand scheme. I just know what I like. I like chemistry, energy, sustainability, and people. My job is to find a job combining these things" (James, Interview).

### **Saadiq's Story**

*"being interdisciplinary, that is something that I really enjoy. Whenever people talk about the crossroads of science and art or humanities or something, I really enjoy that. I'm really interested in that, it's sort of what I want to do with my major or with music. Either way"*

(Saadiq', Interview).

Saadiq, 20, is a junior textile engineering and international studies double major with a 3.8 cumulative GPA. He grew up in a two-parent household, and his parents separated recently. Saadiq explains, "my family structure is mainly just my mom. I see my dad from time to time but he's not a large part of my life" (Saadiq, Interview). Both of Saadiq's parents earned their bachelor's degrees. His mother is a marketing and communications associate, while his father is a supply chain professional and graduate of SU. He was born in a city in

the same state as SU. Saadiq is an only child that describes his family as both working class and “stereotypically not Black” (Saadiq, Interview). Growing up, his extended family ate traditional Southern foods such as collard greens, fried chicken, fried fish, fatback and creamed corn. His mother, however, made healthy and balanced meals that represented different cultures, such as enchiladas, stir fry, cube steak, and homemade soup. These food choices demonstrate that Saadiq has Southern roots; however, his family also exposed him to diverse ways of living. When describing himself, Saadiq identifies as an African American male that is comfortable being his authentic self and expressing that regardless of what others think. He explains,

I think it's understanding just that intersection of [...] how I perceive black males and how society does, and being comfortable doing things that I think society would say is stereotypically Black, while also doing other things that society thinks are not stereotypically Black. Like I'll bump rap in my car on the way to a study session, you know? So I don't know. I want to live life as me, and embrace Black culture as I want to as opposed to the way society or other Black people deem is right [...] (Saadiq, Interview).

Saadiq has attended predominantly White schools all his life. He attended a K-8 Montessori school for his elementary years. Then, his parents moved to another in-state city, and he attended public school starting with sixth grade. He remembers being upset because he had to leave his friends. However, that year he also first realized he was high-achieving. He reflects,

But I remember specifically this one day in sixth grade where we were talking about something science related, and my teacher ... I had answered a question, and then

another question, and *another* question, and my teacher said, "Alright, can someone else other than [Saadiq] raise their hand?" And I was like, "But this isn't, like these aren't challenging questions," these were things I already knew or stuff that seemed like it was basic common sense to me (Saadiq, Interview).

Saadiq went on to attend prestigious STEM boarding school for his junior and senior year of high school. Though the environment was predominantly White – he recalls that it had more diversity than any other school he had been to. He feels the experience he received at that school was great preparation for college. Also, his acceptance to the school came at a critical time in his life. His maternal grandfather was dying from a chronic illness and his parents were separating. He expounded,

There was a lot of personal stuff going on at home that I really didn't want to deal with and I was 16 and really wasn't ready to deal with it, so I left. This was in combination with wanting to be more challenged because I wasn't feeling challenged and my teachers definitely knew that the curriculum at my old high school wasn't cutting it. I was just going through the motions most of the time (Saadiq, Interview).

Saadiq is highly involved on SU's campus. He is affiliated with three scholarship and fellowship programs, and at the time of our interview, he was a TA for a seminar course associated with one of his fellowships. He was also recently inducted into the textile honor society, a general honor society, and a residence hall society. Outside of his scholarly affiliations, Saadiq is a residence advisor, which takes approximately 20 hours per week, and a member of the textiles leadership fraternity. In his free time, Saadiq is a DJ for the campus radio station and DJs live events. Previously, he served as a mentor for the minority

engineering program. In spite of his many curricular responsibilities, Saadiq is very committed to his academics. He explains,

I really don't mind working on school. In terms of the academics I've taken, I'm enrolled in 18 hours every semester to stay on track in both my majors, and I've taken summer classes every summer. Obviously I'm really dedicated to school (Saadiq, Interview).

As he thinks about his time as an undergraduate, Saadiq feels he has “learned more from being male than being Black” (Saadiq, Interview). He has become more aware of different social cues men do, such as interrupting women when they talk, and actively tries to refrain from those behaviors. Saadiq’s short term plans include studying abroad next semester and graduating on time. He is not sure where his career will lead him after graduation, and he is considering graduate school. Ultimately, Saadiq would like to combine his interests in working in the textiles industry, DJing and building successful relationships with people.

“And then ‘what you hope to become in five years?’ Yeah, this is right [referring to his printed narrative exercise], either working at a textile company, DJing part time on the side, and in a healthy relationship. Yeah. I wouldn't mind if it was like DJing and then working at a textiles company part time [...] Being in a healthy relationship. Not even just like romantically, just like with people. [...] down the road. It's a mix of thinking about grad school, thinking of industry and really trying to graduate on time. That's the goal. Everyone asks me, "Are you going to graduate on time?" And I'm like, I will graduate on time until I don't. That's how I think about it (Saadiq, Interview).

### **Jermaine's Story**

*“Having a multi-cultural background, growing up as an American, but then having the African influence in the background, I think it was a good mix, because I've seen Africans a lot more disciplined and structured than Americans and then being able to mix the two, I think have a very successful mix, because at the end of the day I'll get my work done, but I'll also know it doesn't always have to be so, "You have to do this" (Jermaine, Interview).*

Jermaine, 20, is a senior industrial & systems engineering major with a 3.6 cumulative GPA. He is from a large city in the same state as SU. Jermaine is the oldest of three children from a two-parent family; his younger sister is a sophomore at an Ivy League college majoring in Economics/Pre-Med intent, and his younger brother is a high school senior. Jermaine considers his family as wealthy/affluent. His father is an internal medicine doctor, and his mother is a registered nurse that earned her bachelor's degree. Jermaine also identifies as an African American male and a first-generation American. Both his parents are African immigrants. African culture played a large role in Jermaine's household growing up. For example, in his childhood, his family ate meals that consisted of “rice & chicken, plantain, egusi soup and eba” (Jermaine, Narrative Exercise). His household also included extended family and was multigenerational. Jermaine always had at least one grandparent living in the home, and he can remember a time when three out of his four grandparents lived in the home. In addition, two of his older cousins lived in the home until he was in third grade. Those cousins went off to attend college years later and were a source of information for him about college life. Moreover, drawing on their African heritage, Jermaine's parents were very serious about academics. They often reminded him and his siblings of how they were raised and encouraged them to do well in school. Jermaine also recalls that his parents

would, at times, emphasize competition. For example, if he or his siblings earned a B, they would ask if someone else in their class earned an A. He explains, “their biggest thing is if someone else is doing this good, you should be able to do this well in the class” (Jermaine, Interview). The importance his parents placed on academics had a large influence on Jermaine. He reflects,

I've always been pretty much a school-oriented person. The one thing in [Africa] is school is everything to them. They're supposed to be the most educated people, or most educated ethnic group in America. That's just what really forced me to become that kind of person. No matter what, it was like school comes first. Even during the summer, my parents had me working on workbooks and different school related things like that. That's a huge part of how I grew up (Jermaine, Interview).

In addition, religion also played a huge role in Jermaine's childhood. He recalls religion being integral to both his school and home life.

Yeah, I spent a lot of time around I guess church [inaudible 00:04:46] grandparents and my mom are very religious, so they always made sure I was going to vacation Bible school. I went to preschool at a church. I went to [a predominantly White] Catholic school my whole life, K through 12. Yeah, definitely a lot of religious background. We would gather in prayer as a family all the time and different things like that (Jermaine, Interview).

Growing up as a first-generation American, Jermaine often felt caught in between the African way of life, which was focused on working hard academically to earn a high paying job, and the American way of life, which was focused on doing what you love. His parents held on strongly to their traditional values and were not accustomed to American norms. As



such, Jermaine navigated this crossroads by becoming a critical consumer of information and seeing value in both the African perspective as well as the American perspective. He explains,

That also goes back to my whole parents' perspective. Because they're so strict and I saw a bunch of other people doing things different ways, not in the African way, I realized I need to kind of figure things out for my own, and that I don't respect my parents' opinion, but what they know is what they've been told from day one, so that's all they really know, so I was like, "I got to do my best to incorporate as much information as possible and come to my own decisions." That's how I've been approaching things since I was a kid. Yeah, that's when I started realizing not a lot of people think for themselves as much as they should (Jermaine, Interview).

In terms of his academic achievement, Jermaine has always known he was a smart kid – not only 'book smart' but also 'street smart' being able to interact with people. Ever since elementary school, he effortlessly earned As and Bs and each year his teacher's reviews would consistently say "He's a good student, but he could do better if he applied himself" (Jermaine, Interview). Jermaine first realized he was academically successful in high school when he continued to effortlessly earn As and Bs. In college, his perspective changed. He describes this shift as follows,

, from seeing how I would do, I could say, "Oh, I'm not really trying that hard and I'm still getting good grades," so I was like, "Oh, I guess I am pretty smart. I do have the potential." That's when I get to college and I started working a little bit harder in order to keep my GPA up and then I started realizing like, "Yeah, if I really work, it'll pay

off in the end." Now I'm getting scholarship or whatever from the university and different things like that (Jermaine, Narrative).

During his first semester of college, Jermaine became a member of an interfraternity council fraternity. His fraternity is very meaningful to him and his identity. He expounds, The fraternity's almost like a reflection on me. It's a bunch of unique people. It's not your typical whatever you see on TV and stuff like that. It's actually a good group of guys. We have a good amount of diversity. We have people from all different majors, all different walks of life [...] I really value what we represent, I guess, so because of that, I'm really involved on different committees (Jermaine, Interview).

When Jermaine pledged, he was unaware of the Black fraternities. In retrospect, he thinks exploring those options would have been a different but valuable experience. He states,

they seem to have a tight knit group, but if you are not in it, it is hard to meet and interact with those people. I don't know as much of the black community on campus as I would like to, especially after coming from a predominantly White high school (Jermaine, Interview).

On campus, Jermaine is also a member of SU's data analytics club. He has attended campus Bible studies and National Society of Black Engineers (NSBE) events but is not super involved with them due to his time commitment to his fraternity and academics. Jermaine is graduating in the spring. He is leaning towards graduate school and thinking about pursuing either a master's in industrial engineering, master's in business administration, or master's in data analytics. In the future, he wants to gain more business experience. At the time of our interview, Jermaine was not sure whether he wanted to go

straight to graduate school after undergrad, or work for a few years and then come back to graduate school.

### **Anthony's Story**

*“[referring to his autobiography] I said some funny things that my family would call me on that, like I'm a cornball, I'm crazy, but I'm also intelligent and a great example and everyone tries to tells me I'm just a great person overall, I can't remember a day where I haven't been told that”* (Anthony, Interview).

Anthony, 20, is a junior material science and engineering major with a 3.9 cumulative GPA. He was born in another Southern state but was raised in the same city as SU for as long as he can remember. Anthony is from “a household without worry of the next meal” (Anthony, Narrative Exercise), and he describes his family as middle class. Anthony is the youngest of two children from a married couple that divorced during his childhood. Both his parents earned their bachelor's degrees. His mother is not currently working, and his father is a recently retired chief financial officer of a health insurance company. Additionally, his older sister, 33, is also a college graduate working in the finance industry and she is a single mother to two children. Anthony's full name is a namesake; he is named after his father and grandfather.

Anthony identifies as an African American male. Growing up, he was very aware of his race because he was actively involved in two distinct racial environments. He attended predominantly White catholic private schools for his academics and he played sports, particularly football, in predominantly Black co curricular environments. Being in those different environments was transformative for Anthony. He further explains as follows,

So I was basically in two different worlds, so my black friends on the team would ask me about why do you have to wear a uniform to school, and just other things about White people, like why don't you transfer over to the public school, and then White people be asking about why I'm so different. So I'm seeing two sides of the world in a sense, or like seeing two different groups of people and how they interact (Anthony, Interview).

Specifically, the questions Anthony was asked from his White classmates during those formative years impacted his self perception. He elaborates,

they'll be like why is this different from me, or why are we different, or why is your hair this way and yadda yadda yadda [...] I'm gifted but sometimes lack confidence, and I don't know if it's maybe the environment I grew up in, just having questions about who I am based off other questions other students and other people I've been around have asked about me (Anthony, Interview).

Anthony first realized he was a high-achieving student in middle school. He “always tended to be in the group of all As or As and Bs, and it hasn't really stopped up to this point” (Anthony, Interview). In addition to maintaining his grades, football has continued to be an important part of Anthony's life. He is a walk on football player at SU, a sports division 1 school. Although he loves the game, Anthony has decided to “put school first regardless, cause [he] knew in the long run, what was going to happen with football” (Anthony, Interview). While one of his team sayings is “hard, tough, and together”, Anthony admits that because of his commitment to his academics, he doesn't always feel together with his team. For example, he is not on the travel team so he doesn't interact with the travel team often. In addition, Anthony has not encountered any on-campus resources for student athletes that are

also engineering majors at SU. However, he believes this lack of resources is by design. He explains,

I think it's just cause if you want to do well in athletics, you can't have such a big commitment towards school. I mean, they always emphasize school, cause the only way you can be eligible for sports is through school, but they recommend you get an easier major, so you can do well in sports. It's not said, but it's just understood.

A typical day for Anthony consists of attending class, rushing from class to football practice or workouts, and then working on his homework alone. He hardly ever has the opportunity to participate in any on-campus support programs or receive assistance from university administrators or peers. In many ways Anthony feels solely responsible for his academic achievement. He explains,

The most help I get is some classmates; we try to finish some homework assignment at the last minute or something. So usually, I do a lot of homework by myself.

Whatever I put into it is what I'm going to get out of it (Anthony, Interview).

Also, since being at SU, Anthony's perspective on gender has expanded. He explains,

I say it's definitely a culture shock, even though I've been around a bunch of other White people most of my time through school, there's different things, like you said about gender it's ... that's a little bit different for me. I've seen different people, different types of people, and I've seen more things that I'm not used to, so I'd say it's definitely made me more accepting of people, more understanding (Anthony, Interview).

Anthony is not certain where his career will lead him after graduation. He is considering being a teacher and coaching football or working with a sports related company to develop technology for better sports equipment.

### **Carter's Story**

*"I think my type of style is like I want to be ... I don't know, maybe it's just ingrained in me, but I want to be successful. I want to do as much as I can, I want to put as much effort as I can and put the best ability that I have. I think that was just the thing that just came out personality wise"* (Carter, Interview)

Carter, 22, is a civil engineering major with a 3.4 cumulative GPA. He describes himself as a "super senior" (Carter, Interview), and he is graduating this December. Carter is the eldest of two children from a two-parent family. His mother is a Masters' educated HR instructor, and his father is a bachelor's educated campus security officer at another in-state college. His younger brother is 7 years his junior and is in high school. Carter considers his family as middle class. A typical dinner in his household consists of traditional American dishes such as chicken, pork chops, and meatloaf.

Carter identifies as a Black male and a second-generation college student – both of his parents were the first in their families to go to college and graduate. His parents are also from the countryside of another southern state and moved to a city in the same state as SU when he was five years old. Most of Carter's extended family still lives in the countryside of that other southern state. His immediate and extended families are very supportive of one another and enjoy spending time together. He describes their close bond as follows,

Overall, I think one of the things that shaped my identity which I do think is missing a lot of times in other cultures ... Not other cultures, but other families, I think, is the

fact of communication and bonding. My family is huge into supporting each other, they're huge into helping each other, giving ideas and stuff. I think it's kind of funny, I know my cousins, this is one seven years plus [older than me]. Everybody has stories about them partying with each other. They literally would drive to a big city, four or five of them all together, drinking alcohol and having fun with some of their friends, but with their family members too (Carter, Interview).

In addition, being from a country family – as opposed to a city family – is very significant to Carter. He explains,

In terms of my aunts, uncles, and cousins, I would say that they literally just told me a lot of stuff about history, culture, I think a lot about identity and where we come from. It made me kind of understand the importance of my heritage, because most people, I know historically most families stayed in bigger cities. My family, they were more in the countryside [...] It was kind of interesting to see that different type of perspective that you don't see a lot of in media and culture (Carter, Interview).

Carter grew up in a racially mixed community that was “one third White, one third Black, and one third Hispanic and mixed. And a couple Asians” (Carter, Interview). He doesn't remember his parents or family members really talking about academics a lot in his childhood, but he remembers being a self-motivated student. He first realized he was a high-achieving student in fifth grade when it was time to discuss the transition from elementary to middle school and his parents wanted him to go to a magnet middle school. Although the magnet school had more resources than other schools, Carter did not like the school environment. He preferred to go to a school with fewer resources but was more welcoming

to diverse students. His goal of balancing a school's quality with its social environment continued throughout his high school and college years as well. He elaborates,

Something tells me even though a magnet school would be best for me, I just didn't like the student environment, I guess. [...] That was the same thing with high school, I went to [name of high school] from [city name], and that school was just in the middle. [...] We had a few good resources, but there was another nearby high school like five minutes away from my high school called [name of school]. They have a lot more academic resources and a lot more AP classes, a lot more better students and everything. The student body environment wasn't really supportive for me, I would say. It was more of a majority of White culture, which [SU] is too, but it was in a culture that really wasn't as open or as ideal as [SU] (Carter, Interview).

Carter is very involved on SU's campus. For the past three semesters he has been a resident advisor in the international residence hall, which takes about 12 hours /week. He is a SU chapter member of two professional organizations: the American Society of Civil Engineers and the National Society of Black Engineers (NSBE). He is also the treasurer of two co-curricular clubs: a service-based organization and a Sci-Fi fantasy organization. During the spring, Carter plays alto-saxophone in the pep band, and he also runs in SU's club cross country and track team.

Currently, Carter is applying for jobs at civil engineering firms. He is open to moving across the country and globe, so he is looking at both domestic and international positions. Carter has always been interested in art, and he ultimately wants to fuse architecture and civil engineering in his career. He plans to work for a few years and then earn his master's degree. After talking with current graduate students, Carter has decided he doesn't want to



attend SU for graduate school. From his perspective, the department can be unfair to graduate students, and he feels the unfairness would have a greater impact on him because of his race. He describes this as follows:

One of the issues I have faced, because I did talk to a couple people who got their master's that stayed in the department and everything, I might not go ahead and get my master's at [SU] the more I think about it, because of certain aspects of certain things they have done. Talking to graduate students, they told me a lot of inside stuff about it. I don't want to deal with those type of people, or those type of actions. One of the actions I have heard is that if you do research of a certain professor, and one of the professors hate that professor, and you take that professor that hates ... You take that class of that professor, they can fail you just because you're doing research of the other professor. Yeah. I don't want to waste my money and time because you don't like someone. That's not me. The sense of, not only that, but also being a black minority, even more of like ... influence that... (Carter, Interview).

## CHAPTER 5: FINDINGS

This counternarrative study explored the experiences of eight high-achieving Black male undergraduates in engineering majors at a PWI. The purpose of this study was to understand how Black male intersectionality shaped the lived experiences and academic success of high-achieving Black male undergraduates in engineering majors at a PWI. The gaps in the literature base concerning Black male academic achievement (Harper, 2012), Black male educational experiences in STEM (Harper, 2010; Harper, 2012), and Black male intersectionality (Lynn & Dixson, 2013) prompted this study. The following research question guided the study: How does Black male intersectionality shape the lived experiences and academic success of high-achieving Black male undergraduates in engineering majors at a PWI?

Two theoretical frameworks grounded this study: Critical Race Theory (CRT) and the anti-deficit achievement framework for studying students of color in STEM (ADAF). CRT investigates the relationships between race, racism, and power (Delgado & Stefancic, 2012; Ladson-Billings & Tate, 2006), and served as the overarching framework to understand the structural advantages and obstacles that high-achieving Black males in engineering majors at a PWI face. Notwithstanding these structural constraints, high-achieving Black male students have some agency over their individual attitudes and behaviors. This agency, however, does not always result in the same outcomes as people who identify in the majority population because structural constraints are present. The ADAF, the study's complementary theory, acknowledges this limited agency, and was used to describe the individual actions that high-achieving Black males took to obtain success along their educational journeys (Harper, 2010). These theoretical lenses were employed in

tandem to analyze the data and extract themes. The themes capture how the participants made meaning of their experiences as high-achieving Black males in engineering majors at a PWI.

This study used analysis of narratives to construct the primary data, which were collected through an online demographic survey, an online narrative exercise, individual interviews, and a focus group with the eight participants, into themes. This analysis technique enabled the researcher to identify common elements that held across the stories. Three themes and six subthemes emerged using a priori coding, informed by CRT and ADAF constructs, and open coding. This study also used narrative analysis to organize these themes into a sequential order.

This chapter provides an overview of the study findings and is organized into three overarching themes and corresponding subthemes supported by participants' verbatim statements. The overarching themes are "I was extremely privileged", "I was basically in two different worlds", and "It's a lot of pressure from a lot of different areas". These themes are ordered chronologically to demonstrate the shared sequence of events participants described in their counterstories of academic achievement. The first theme, "I was extremely privileged", outlines participants' privileged background characteristics they were granted at birth. The second theme, "I was basically in two different worlds", illustrates salient moments in participants' youth and young adulthood when they began to understand race as a social construct, and then calculatedly behaved in advantageous ways depending on the racial environment they were in, namely majority White environments and majority Black environments. The third theme, "It's a lot of pressure from a lot of different areas", integrates findings from the first two themes and highlights the emotional effects participants

felt at the time of the study as a result of their complex web of privilege and oppression. The titles of the themes are exact quotes from participants to honor participant voices.

Participants' quotes and stories reported in this chapter emerged from primary data sources (online demographic survey, online narrative exercise, individual interviews, and focus group). Table 5.1 summarizes the three themes and their respective subthemes that emerged from participants' narratives.

Table 5.1: Themes and Subthemes

<b>Research Question: How does Black male intersectionality shape the lived experiences and academic success of high-achieving Black male undergraduates in engineering majors at a PWI?</b>	
<b>Themes</b>	<b>Subthemes</b>
“I was extremely privileged”: The Impact of Class and Gender Privilege	A. Class privilege <ul style="list-style-type: none"> <li>• Access to fiscal resources</li> <li>• Built-in communities of college-educated individuals</li> </ul> B. Gender privilege <ul style="list-style-type: none"> <li>• Gendered expectations</li> <li>• Social maneuvering</li> </ul>
“I was basically in two different worlds”: Strategically Navigating Racial Realities	A. The White World <ul style="list-style-type: none"> <li>• Heightened visibility and invisibility</li> <li>• Managing dominant ideology</li> <li>• Encounters with racism</li> </ul> B. The Black World <ul style="list-style-type: none"> <li>• Family influence</li> <li>• Need for support spaces</li> <li>• Lifting and Climbing</li> </ul>
“It’s a lot of pressure from a lot of different areas”: The Emotional Weight of Being Smart, Black, and Male	A. Internal Pressure B. Family Pressure

### **“I was extremely privileged”: The Impact of Class and Gender Privilege**

This first theme, “I was extremely privileged”, highlights the participants’ privileged background characteristics that influenced their lived experiences and academic success. The title of this first theme comes from a passage in Marcos’ interview in which he reflected on his childhood. He stated, “I had a normal, I guess, childhood, maybe you could call that, in a sense. I think I was extremely privileged to go to a good school though, and get a very good education” (Marcos, Interview). Like Marcos, each of the participants was also extremely privileged, and the acknowledgment of one’s own privilege was a recurring theme throughout the study. Not only were participants privileged to go to good schools as Marcos described above, but they were also born into an advantageous social status that provided them with tools and resources to succeed. The first subtheme, class privilege, is how participants’ socioeconomic class granted them access to fiscal resources and built-in communities of college-educated individuals, which prepared them for college success. The second subtheme, gender privilege, is how participants’ gender identity as male enabled them to fit in socially as the majority of their engineering classmates were also males. Together, this first theme and the subthemes describe privileges that participants brought with them to college that positively impacted their experience in their engineering major.

Reflecting on the theoretical frameworks, constructs from both CRT and the ADAF are evident in this first theme. Though participants did have class and gender privileges, they were still aware of the permanence of racism. Further, while they had privileged identities their racially minoritized identity was still salient in their experiences. These realizations are directly aligned with the CRT constructs of racial realism and intersectionality and will be expounded on more in the second theme. Regarding the ADAF, participants’ stories of class

and gender privilege underscore their experiences in the pre-college socialization and readiness juncture. More specifically, participants benefited from familial factors, such as affluent and highly involved parents, and out-of-school prep experiences, such as college preparatory programs, all of which groomed them for success in college. Likewise, participants also described positive interactions with their teachers and peers in the K-12 context (i.e., K-12 school forces) that also readied them for college achievement.

### **Class Privilege**

**Access to fiscal resources.** The overwhelming majority of participants came from families that were well off financially. Most participants (5 out of 8) described themselves as middle class, with the other three participants describing themselves as working class and wealthy/affluent, respectively. Access to fiscal resources connected participants to opportunities in their early years that positively influenced their academic achievement, such as attending private schools and participating in academic and co-curricular enrichment programs that were fee based. Over and above their involvement high-quality academic and co-curricular programs, participants were also cognizant of how their access to fiscal resources contributed to their academic success. For instance, in college participants could fully focus on their academics instead of being burdened with necessity to work and support themselves financially. Instead, participants were able to choose when and if they had time for employment while pursuing their postsecondary education. In his interview, Marcos succinctly explained how a family's socioeconomic class could contribute to a students' success in engineering using his family as an example.

Your family situation often can have a negative effect or a positive effect. For me, in many ways, my family situation has been positive, in the sense that, even though my

parents live in [another state], I'm able to fly back home, and that's not a financial issue. So, I think that really helps. And the other factor is just a financial, having a full-ride scholarship. I don't have to work. And that's a big time commitment for many students, when you're doing engineering and trying to also work. It's definitely difficult. And so I've been able to elect to work when I want to, when I want to do Engineering Ambassadors, but it's not a requirement. So I think that's been a huge factor in my success, is that I can focus my time on academics. I think those are the two factors (Marcos, Interview).

Being able to focus solely on academics was a huge benefit to participants because obtaining success in engineering “takes a lot of effort ... [and] focus” (Marcos, Interview). Participants often described themselves as being “very focused and driven” (Lamar, Interview), as well as “hardworking and ambitious” (Isaiah, Interview). However, their internal motivation to succeed was further amplified by their families’ socioeconomic status, which allowed them to pursue their ambitions with greater ease. James also clearly echoed the magnitude of this point in the focus group after I asked the participants what helped them become successful.

“Money. I don't know if that's up there. [referring to the PowerPoint screen] Is money up there? Because outside factors, money should be definitely up there, because like I come from a wealthy family and if it wasn't for that, I definitely would not be where I am right now (James, Focus Group).

In short, participants were privileged to have access to fiscal resources through their family, which allowed participants to attend high-quality schools, participate in programs that

nurtured their achiever identity, and dedicate considerable amounts of time and energy towards their studies.

**Built-in communities of college-educated individuals.** Along with financial resources, participants also entered college with communities of college-educated individuals at their disposal. All participants came from families in which both their parents graduated from college, and most participants' parents went on to earn advanced degrees. Additionally, most participants also had older siblings and cousins that they witnessed attend and graduate from college. As such, participants' family members had a familiarity with college, including what it took to gain admission and graduate. Being raised in a college-educated family also created a non-negotiable expectation that all participants would attend and graduate from college as well. This expectation fostered an academic achiever identity in childhood; in other words, successfully completing academic tasks became central to all participants' self-perceptions. Throughout their childhood, participants recalled their parents quoting inspirational phrases to them such as "burn the midnight oil" (Marcos, Interview), "you're going to college" (James, Narrative Exercise), and "you can be anything you want to be" (Lamar, Narrative Exercise), phrases that would constantly replay in participants' consciousness for years to come. In his interview, Anthony recalled how important it was for him to live up to his parent's academic expectations.

[My dad] always stressed the importance of just getting my education, like going to college and stuff. At that point I'm thinking ... I'm not even thinking till next week when it's all ... that's really far out of my head. Definitely ... and my mom ... both of my parents definitely stressed and education ... just the importance of just getting it. I didn't know why, but I always knew I need[ed] to listen to my parents, just from what



I've been taught, and I never wanted to fail them in that sense, so that's probably why I work so hard in the classroom and got the grades I got. It wasn't necessarily for me, it was just like to please them ... just to make sure they know I'm trying to be a good kid (Anthony, Interview).

It is important to note that the expectation for all participants to attend and graduate from college was accompanied with support to facilitate their academic success. Parents challenged participants to achieve academically, and then provided them with tangible assistance, such as homework help, to accomplish that goal. The mandate was not just “you’re going to learn this”, but rather, “we're gonna sit down with you and you're gonna learn these” (Marcos, Interview). All participants told stories of how their parents were actively involved in their learning both within and outside the classroom such as advocating for them to be placed in advanced courses and purchasing them educational workbooks to continue their learning during summer break. They described their parents as “proactive” (Marcos, Interview) and “never satisfied” (Isaiah, Interview). Moreover, their parents “expect[ed] excellence” (Lamar, Interview). In essence, parents both motivated and enabled academic achievement. Parents were co-pilots in participants’ educational journeys, assisting them with decision-making and navigating political processes that were out of the participant’s control. Reflecting on the impact of his parents, particularly his mom, Carter stated,

For me, I was like, "I want to be an artist," my mom was like, "But you're a little bit smart. Maybe you can be an architect or engineering major." I was like, "Well, maybe I can be an architect," and my mom was like, "After doing some research, engineering might be better because you're good at math and science." I thought

about it, "I like buildings, I like drawing. Maybe I could go into civil engineering" (Carter, Interview).

Similarly, during his interview, Saadiq described several college preparatory experiences he participated in during his youth because of his mother's prompting.

I did a lot of outside of school activities, but across the board. My mom was a large proponent of "Do this camp". I did the Sheldon leadership camp my sophomore summer, and that was really beneficial to me. Leadership is a thing that I'm interested in. I did US Naval Academy one year just learning about, I don't know, how the military solves problems. I did entrepreneurship camp once. Got nothing out of that. [...] It appeals to me more now but the camp, I did not understand it at all, but yeah I did a couple of student councils. I think in the terms of all this outside things that I did, I just became more well-rounded. I think I did like a medical one once, and I've never shown any interest in medical, and my mom's just like, "Do it." I'm like, "I really, really don't want to," and she's like, "Just do it." And I did it (Saadiq, Interview).

Carter and Saadiq's experiences are illustrative of all participants in the study as parents played an active and instrumental role in each participant's educational and co-curricular decisions.

On top of strong parental influence, having a network of college-educated people to rely on for support and advice also helped half of the participants in their college endeavors. For example, during his interview Jermaine reflected on how his older cousins demystified college for him.

I have two older cousins that I grew up pretty close with. They actually started out living with me in my house probably till I was in third or fourth grade and then they moved out, got their own house in [name of city], and so they've always been around and they're just a couple years older than me. The youngest one was a senior when I was a freshman in college and just talking to them about their best practices as well in college was helpful, just learning how they managed their time, how they were able to balance having fun, but also doing work and whatnot was pretty helpful, just having someone that ha[s] gone through it before (Jermaine, Interview).

The benefits participants received also reached beyond just family. For example, Saadiq's mother's college roommate suggested he attend a public boarding high school for gifted students that specialized in mathematics and science education, a place where he was "really, really challenged" (Saadiq, Interview), but also prepared him for the rigor of college.

I had like toured [the boarding school] in seventh grade, 'cause my parents were like "Oh this would be interesting for you to do." My mom's roommate in college actually went there, and so she was like "Oh this might be something you might be into." So I visited and I said "Yeah, sure why not?" I was already trying to get good grades and you need good grades to get in [...] A lot of the teachers there are former professors, and so they treat high school like college. That's why coming here was super fine (Saadiq, Interview).

In summary, participants entered college already having built-in communities of college-educated individuals they could rely on for encouragement and assistance, which created an environment conducive for academic success.

## Gender Privilege

**Gendered expectations.** The other type of privilege that participants brought with them to college was gender privilege. Unlike class privilege, which manifested throughout participants' educational journeys, participant stories about gender privilege were mainly concentrated in the college context. All participants acknowledged that the engineering industry was both male dominated and male oriented. Overall, most of their classmates, and internship and co-op colleagues were males. In his interview, Lamar expounded on the underrepresentation of female engineers and how that contributes to power dynamics in the workplace:

I would definitely say being a male is just a benefit, just due to the statistics [...]

Women are considered a minority in engineering [...] There's so many males here already. Just not having strong female, whether it be role model or somebody that they can confide in could definitely be an issue just because it's completely different experiences even though it's the same job. Just from the way you dress to the way you interact with people to the way you have to command respect from people. It's just different. It's different (Lamar, Interview).

Being surrounded by other male engineers gave them *some* sense of belonging in the field because of gendered expectations in engineers (i.e., males are believed to be more engineering-minded than females). It is important to note here that participants did not feel a *full* sense of belonging due to the racial imbalance in engineering, which will be expanded on in the second theme, "I was basically in two different worlds". However, for purposes of this theme I only discuss how participants benefited from gendered expectations in engineering.

During his interview, Jermaine elaborated on gendered expectations in engineering as follows:

I think being a male in engineering, I guess, does have its benefits. Kind of going back to what I was saying with my physics partner, sometimes people get looked down on and I feel like that happens a lot with girls in engineering, just because there's not as many of them and they're just not necessarily seen as engineering minded as others or as males are (Jermaine, Interview).

While males were perceived as engineers, their female peers were perceived as being “out-of-place” in engineering environments. During the focus group, Isaiah recalled a specific example of gendered expectations in his research lab and how it created an awkward working environment for his female colleagues.

In the research lab that I work in, in the biomedical engineering department, there's a postdoc in my lab. I've never had any negative experience with this postdoc, but it wasn't until I spoke with the Ph.D. candidates, the female Ph.D. candidates, that I realized his personality is really abrasive when it comes to females and how he talks with females. For example, he's always talking like, "Oh, why are you in lab? You should be having kids at this age." He'll just say things like that, and it's just like, first off, how do you even respond to that? This is technically your boss. If this is something you have to deal with on a day in day out basis ... To me, that never crossed my mind that this man was saying these things to them and they had to deal with this and navigate this in the lab, which is also a tight space. You're talking to this person a day-by-day basis. So I contribute that to my privilege as a male that, it never

crossed my mind that I'd have to navigate this sort of mind field in that manner (Isaiah, Focus Group).

Building on these gendered expectations, several participants also recalled being listened to more often than their female classmates in group projects and sometimes unintentionally silencing the voices of those female students through a process called 'mansplaining.' During his interview, Isaiah offered the following definition for mansplaining:

Well, I would definitely say that being a male, especially an engineering major, I would say that it's a benefit, because seeing my female counterparts and talking with them, I don't understand how they do it or how they go through it, because even I see the discrimination of being a female and an engineering major. Especially in the study groups or whatever, sometimes the female talks softly [...] I just learned what mansplaining was. [...] So mansplaining is when a man, I guess, explains over or tries to explain what a female is trying to explain. So she could be in the process of explaining a certain concept, like someone asked her a question, and she's explaining it, but then the man comes in, cuts her off or something like that, and explains over her the concept that she's explaining. So yeah, just cuttin' her off or something like that (Isaiah, Interview).

Saadiq shared a similar sentiment about mansplaining and how he actively tries to make space for his female colleagues.

I think in my undergraduate studies I think I've learned more from being male than being Black. Just like, and this is also at [my STEM boarding school] too, just learning different non-social cues that men do. Trying to be more aware of those and

not doing certain things because I get that sometimes like men tend to interrupt women way more, and I'm like, I hate doing that. I feel so bad. I'm like wow, stop. What did you say? What I said is probably not that important. And it's just doing that, like definitely learning about interactions between men and women has been something that's been more prevalent to my life (Saadiq, Interview).

Overall, in college, participants benefited from the gendered expectations within the engineering industry. They gained some sense of belonging in their majors and fields due to their gender, and they were listened to more than their female peers. They also described actively making space for their female peers to be heard.

**Social maneuvering.** In addition to gendered expectations, another major gender privilege participants described was being able to maneuver social situations in college more easily than female engineering students broadly, and Black female engineering students specifically. Thus, I created the term social maneuvering. Participants felt as though their gender allowed their White male peers to connect with them easier than female engineering students. In particular, three participants recounted stories of sexist comments made in engineering research labs and industrial environments. In these instances, participants did not have to combat with negative prejudice or discrimination due to their gender. In fact, there were times the participants benefited at the expense of their female peers. In the focus group, Lamar narrated a story where he grew closer to his male colleagues because of their gendered banter.

I've worked in the power industry for the past internships and co-ops, and things like that have been like in the energy. So one of them was working with lineman and things like that at a power company and just the ... I mean the social aspect is almost

as important as the technical aspect when you're first starting out at a job and you're trying to get to know people and see who you can kind of rely on. Just the jokes that were made and the small talk and the banter that would go on, especially between the lineman, just ... There was another intern with me who was a White female, and it just made her very uncomfortable, even though all the linemen were basically White. They joked around with me and were able to talk to me and relate to me more, especially at first. Her and I could see how that could really impact your trajectory and your work placement over a long period of time, especially if you're there full-time. That's something I didn't have to worry about necessarily, that she definitely did (Lamar, Focus Group).

It is important to highlight Lamar's comment that the "social aspect is almost as important as the technical aspect". This concept was further echoed in the interview data. Participants were profoundly aware that how they engaged socially affected their academic and professional success. When asked what could make them more successful, half of the participants described networking and developing relationships with others. Also, in the next theme, I will discuss how participants intentionally engaged across racial lines to augment their success.

Finally, during the focus group, James applied the idea of social maneuvering to college. He reflected,

in conversations that I've had at [SU] with Black females. The party lifestyle ... Just going to parties as a whole is easier to be accepted among the Caucasian fraternity, I guess, niche, being a male. Just because you have that athleticism there's a little more connection they can make with you rather than being like a Black female, it's



definitely tougher from what I've heard to get in to parties and to have fun at those parties as a Black female.

In sum, participants were able to more easily navigate social environments in college due to their gender.

**“I was basically in two different worlds”: Strategically Navigating Racial Realities**

Not only did participants experience privilege because of their class and gender, but participants also experienced oppression because of their race. This second theme, “I was basically in two different worlds”, highlights racial oppression and how it influenced participants’ lived experiences and academic success. In their interviews, both Anthony and James used the word “worlds” to describe racialized environments. The title of this theme derives from a passage in Anthony’s interview in which he reflected on his life growing up. He recalled, “just growing up around a majority of White people. Also, when I was playing sports, like football specifically, I was around by majorly black people. So I was basically in two different worlds” (Anthony, Interview). Similar to Anthony, all participants reported that they strategically navigated both the White world and the Black world. In other words, participants illustrated how they must follow social rules in order to thrive in specific environments, namely, predominantly White spaces and predominantly Black spaces. The first subtheme, the White world, is how participants engaged in predominantly White spaces, namely acknowledging heightened visibility and invisibility, managing dominant ideology, and encountering racism. The second subtheme, the Black world, is how participants engaged with the Black community, namely relying on Black family members for cultural ideals, participating in support spaces, and helping other Black students succeed. Overall,

this second theme describes the racially conscious actions that participants took to obtain success in their PWI.

In retrospect, constructs from both CRT and the ADAF are also evident in this second theme. Structural forces, such as the permanence of racism the social construction of race in different contexts, and overlapping social identities), were woven into participants' understandings of the White and Black worlds. These forces are directly aligned with the CRT constructs of racial realism, differential racialization, and intersectionality, respectively. Participants' stories of racial realities also alternate between the pre-college socialization and readiness and college achievement junctures of ADAF. Similar to the first theme, participants reflect on their families (i.e., ADAF construct of familial factors) and interactions with their K-12 peers and teachers (i.e., ADAF construct of K-12 school forces). However, in this second theme, participants also reflect on how their behaviors in college (i.e., ADAF constructs of classroom interactions, out-of-class engagement, and experiential/external opportunities) impacted their academic achievement.

### **The White World**

Participants' discussion of the White world articulated notions of power and privilege associated with being White. While their narratives did not reflect the full extent of Whiteness as property (Harris, 1993), participants did share how White people were granted immense privileges on the basis of their Whiteness. Further, participants described the necessity of learning how to navigate White spaces in order to avoid being excluded. Participants' understanding of the White world began with their secondary schooling experiences as six out of eight participants attended predominantly White K-12 schools. In

his interview, James shed light on how inescapable Whiteness was in his elementary school, stating,

Growing up, I went to a catholic school in, what's it called? [name of place]. First through sixth I went there, and it was private. There was like five African-American kids, and we were all males, in my grade at least. [...] [the] only [Black] thing we did was Black history month. Everything else was pretty White” (James, Interview).

The pervasiveness of whiteness in their schooling environments was a shared experience for six participants. Unlike the rest of the participants, both Marcos and Carter attended racially mixed schools, internationally and in the American South, respectively. Although his high school was racially diverse, Carter also described being the one of the only Black students in his advanced courses. He explained,

I didn't see that a lot with a lot of Black students. Even though I was in a good population of Black students, very few of them cared about their academics, or academically pushing themselves. I noticed that when, when I was in high school, taking more honors classes and AP's, there would be times where there would be me and another Black person, or I would be the only Black person in the class. This is when I was in high school. Not in college, but in high school (Carter, Interview).

Thus, by the time they became college students at SU seven out of eight participants were accustomed to being in learning environments where their teachers and peers were predominantly White. Still, being a racial minority in a predominantly White space presented daily obstacles for participants. In his interview, Marcos offered the following metaphor for illustration,

Being in the college of engineering is like being in a pool and having to swim with

waves constantly, or with someone constantly dumping water on you [Being a black male engineering major] is like being in a pool with water dumped on you with some ankle weights (Marcos, Interview).

More specifically, participants continually discussed three ‘ankle weights’ or burdens they carried while navigating the White world: heightened visibility and invisibility, a need to manage dominant ideology, and encounters with racism.

**Heightened visibility and invisibility.** The first pivotal experience that participants recalled in the White world was recognizing their racial minority status. Interestingly, this realization resulted in participants feeling a heightened sense of both visibility and invisibility. On one hand, participants felt like people from other races were always watching them (i.e., heightened visibility) because participants were not members of the racial majority population. In his interview, Lamar reflected on his study abroad trip to China. His provocative quote about feeling like a “zoo animal” highlights the essence of the heightened visibility subtheme. Lamar stated,

They’re excited to see you but ... I don’t know what to call that either. It’s fine taking pictures and stuff, but at the same time, it’s just ... I don’t know. [...] I don’t know if it’s even racism. In China people [wanted] to take a picture all the time. I was basically a zoo animal (Lamar, Interview).

Participants were not just cognizant that engineering was a male-dominated and male-oriented field, as described in the first theme, but they also knew the field was *White* male-dominated and *White* male-oriented. As such, participants were highly attuned to their racial marginalization in predominantly White spaces, such as their high schools, current university, and companies where they had internship and co-op experiences. In fact,

participants used phrases like, “you stand out” (James, Interview), “there’s like six of us [...] it’s kind of uncommon” (Saadiq, Interview), “there’s not many of us” (Jermaine, Interview), and “it’s like being a needle in a haystack” (Anthony, Interview), to describe how outnumbered they felt. In the focus group, Marcos offered the following example to summarize this experience:

It's kind of funny like when you look at the company, like [name of company], like their commercials, you're like, “Man, they must have 100% Black people at [this company].” You show up and you're like, “Damn. Nope. [...] It’s predominantly White older, males. A lot of the times they don't even understand how they interact with Black people (Marcos, Focus Group).

Also in the focus group, James further illustrated this point when he stated,

Kind of everything that you do is highlighted, because you're such a small percentage of your major, so people are kind of keyed in, whether you're successful or high achieving, or not. People, that you don't expect to be watching, are watching you, so being academically successful, it's kind of highlighted a little bit more, so it's kind of like you stand out (James, Focus Group).

Contrarily, even though participants experienced a heightened sense visibility because of their racial minority status, they also described feeling overlooked or even dismissed (i.e., heightened invisibility) due to the same characteristic. For example, in his interview, Isaiah discussed how his White group members often ignored his ideas, and once a White peer restated Isaiah’s ideas, the White peer was acknowledged and affirmed by the group. This process mirrored ‘mansplaining’, a term that Isaiah defined in the first theme. However, what is noteworthy about this illustration is the role reversal. In the first theme, Isaiah was

the privileged party overpowering the voices of his marginalized female peers. Here, Isaiah was the marginalized party, and his White peers were privileged and overpowering his voice.

He shared,

These engineering classes are hard, [so hard] that you can't do this, like the homework assignments or the projects, alone or anything. So I have to sort of befriend these people [White people]. In the group works and everything, you notice that sometimes the ideas that you have, you communicate them, but then no one hears them. So you communicate them again, and still, no one acknowledges them. It's like, "Am I not talking loud enough, or is it honestly just the way that I look that's automatically pegging it as, oh, his ideas are invalid?" So those things come up. You don't want to ask outright, like, "Oh, what's up?" So usually, at that moment, that question comes up, and it's like, "I don't know. It's not a big deal. Let's just get this work done." Then of course, someone else says the idea that you just had, and it's like, ugh, that's annoying [...] (Isaiah, Interview).

Later in his interview, Isaiah explained how he coped with this difficult working environment by staying focused on his career goals. Instead of letting his invisibility frustrate him, Isaiah compartmentalized the experience as temporary and not reflective of his intellect; it was merely a stepping-stone towards his destiny. He expressed,

So you just get your work done, and you just say that, "I'm here for this. I don't have to be close acquaintances with these people. Let's just get this work done and then move onto the next thing (Isaiah, Interview).

Additionally, Marcos also illuminated how exclusive college group work can be for Black male engineering students in his interview. However, Marcos advised a different coping strategy: actively making an effort to be included. He suggested,

That's kind of, the advice I try to give to people about that, is, from both perspectives, if you're not Black or whatever, include the people who don't feel included. And if you don't feel included, make an effort to try and get in, even if it is difficult, and maybe they don't treat you right. I look at it like, *Hidden Figures*, Katherine Johnson, she was not treated right, but she kept going. And it's hard. I think there's no doubt that the mental turmoil that that takes on you shouldn't be diminished. It's definitely difficult, and you need people to talk about it with. But, you shouldn't let that discourage you (Marcos, Interview).

Isaiah and Marcos' stories provide a glimpse into how participants engaged across racial lines to augment their success. All participants acknowledged the necessity of working with White peers, as they were the majority population. When confronted with the barrier of invisibility, they responded differently. At times, some participants – like Isaiah – chose to disregard how their White peers ignored them. They did not attempt to make friends with their White peers and redirected their focus to working together on the academic task at hand. Other times, some participants – like Marcos – chose to take notice of how their White peers ignored them and then exerted effort to be included by their White peers. They attempted to build positive working relationships with their White peers. Though different tactics, both strategies were racially conscious actions to mitigate the emotional impact of invisibility and increase participant success in the White world.

In summary, while participants were able to relate to their White male colleagues from a gender perspective, they were aware that race was still significant. Participants recognized they were racial minorities in both the classroom and workplace, which heightened their sense of visibility and invisibility.

**Managing dominant ideology.** Being racially minoritized in predominantly White spaces caused participants to have an enhanced sense of attentiveness and caution. Participants were aware of the dominant ideology that erroneously characterized them as low academic achievers, athletes, and criminals. They expressed keen alertness to the perceptions of others, using phrases such as “you have to understand how people perceive you” (Isaiah, Interview), “when they see me, they always think of the stereotypes” (Carter, Interview), and “some people don’t like you right away” (Jermaine, Interview). In his interview, Anthony shared extensively on how he has been stereotyped in predominantly White spaces.

Stereotypes, that's the first thing that comes to my mind. There's always assumptions about you before people even come and get to know you. Just being a student athlete, that just adds even more to it, cause if they see me wearing all this gear and stuff it's like, oh he's a student athlete, he's this and that. [...] Just seeing me before they get to know me is just kinda puts me at a disadvantage. They see this kid with nappy hair, he doesn't know what he's doing. It's kind of bizarre that people have these assumptions and I'm like, no, that's not me. This is actually me, so oh I didn't know that, and I'm like, you should ask [...] That's my description of a Black male, is just being stereotyped just right out the gate (Anthony, Interview).



In light of the negative perceptions of others, participants were thoughtful about how they interacted with others, in other words they were “cautious of people” (Saadiq, Interview) and “always [had their] guard up” (Anthony, Interview). In particular, participants were sensitive to the perceptions of White people. They understood the negative stereotypes Whites may hold regarding Black males and purposefully sought to behave in ways that negated those stereotypes. One way they negated stereotypes was through their appearance. For example, in his interview, Jermaine shared how he intentionally dressed in a manner that was socially accepted by Whites.

You're more careful. I feel like I can tell when people are looking at me different, like again, growing up in a predominantly White school, there's some parents you talk to, like I felt like I almost have to prove that I'm ... They'll be like, "Oh, he's a good Black kid," or something like that, "for my child to be hanging out with," and whatnot. That's the biggest perspective I have as being a Black person in society is that some people do genuinely look down at you at first and you almost have to prove yourself and prove yourself to them in their eyes. I guess that's a big way that I always like to present myself in a way that is acceptable. If I go out, I know plenty of kids that I hang out, like White kids, that can go out dressing all bummy, wearing whatever they want, and it's just oh, they're dressing how they feel comfortable. But if I go out dressing like that, people would think, "Oh, he doesn't know how to dress. He doesn't know how to hold himself." That's one big my parents always stressed me is ... I was going to school. We had a school uniform. She would make sure my shirt was tucked all the way in. I was always wearing a belt, always looking clean and put together (Jermaine, Interview).

Lamar echoed similar sentiments about appearance. In his interview, he told a story about a Black male leadership program he participated in in high school, and how they stressed the importance of “professional appearance”, which was coded language for White professional appearance.

he was talking about really professional appearance, so how there is only two or three set appearances that are still acceptable, even though they don't take our culture to affect at all. If you have hair that's longer than like an inch or two then people are going to think that it's really out there and crazy, like an Afro or something like that or even like corn rows or braids or anything like that, really. It's just not accepted in the business world and you won't be taken seriously [...] It's just those little things that are important to you or that are fine in your own social circle will not be acceptable in the corporate circle, and then that can ... Just from a look at you they can make an assumption that's completely incorrect and that just goes back to ... It goes for everybody but it goes even more for Black males, right? Because they're looking for even more reason to discard you. I think that's something that really kind of stuck with me. Your appearance definitely matters when you're trying to be respected (Lamar, Interview).

Lamar's point that “it goes for everybody but it goes even more for Black males” is a clear example of how participants felt they were held to a different standard because of the intersection of their race and gender. Put differently, Jermaine articulated, “I can't get away with some of the same things that other people can”. This leads us to the second way participants negated stereotypes, through their interactions with others. Participants purposefully chose to engage, or not engage, with others based on how Whites might

perceive them. In his interview, Isaiah also explained the different social rules he had to follow as a Black male.

So you getting rowdy is different than someone who's smaller or someone who looks differently than you getting rowdy. People are gonna notice that off the bat. So the way you talk has to be in order, the way you walk has to be in order, the way you dress has to be in order. How you perform in your classroom ... because people come in with the idea that, "Oh, you may not know as much." So you don't necessarily have to prove yourself, but it's just understanding the perceptions of that and juggling that along with the responsibilities of being that Black male [...] Even the close relationships, like how you interact with people of the opposite sex, people automatically have these perceptions of you. So you really have to communicate your intentions way before you actually do anything. So the more obvious things like how you walk and talk, I would say was communicated to me by parents, by my teachers, by the people, by even peer mentors who've been ahead of me. Like how do you hold yourself in an interview? What type of haircut do you have? Which is actually something that no one necessarily says, and I'm still trying to figure it out, like, oh, what hair is appropriate for job interviews? But the other things, just I guess like what level of excitement to have, like in certain areas, that's something that I've had to figure out myself, because me getting a little bit excited, like jumping around, people start getting a little nervous, and you notice that people are getting nervous, and you're like, "Oh, well, that's not what I wanted to happen," so you have to tell yourself, "Oh, calm down," in certain areas. When people play certain music, you can't just be doin' whatever in public (Isaiah, Interview).

Additionally, in his interview, Saadiq also shared how he was cognizant of personal space boundaries between him and White people. He explained,

if I'm walking behind a person, I don't want to make them feel uncomfortable. But at the same time, I'm like [why?] would they feel uncomfortable? Do they feel uncomfortable? So like I just ... A lot of the time it is a lot of going back and forth in my head and understanding like, "Okay this is how I want to feel and I want them to make anyone else uncomfortable." But I also still want to be myself, and so I think finding that balance is a challenge that I'm currently facing. Especially being in a PWI. Sometimes I think people see me as threatening, but I'm like, I'm wearing skinny shorts and stuff from Old Navy. So I don't know (Saadiq, Interview).

The third way participants negated stereotypes was through their academic achievement. Participants felt that their academic success demonstrated the inaccuracy of stereotypes, exhibiting what Moore and colleagues (2003) coined as the 'prove-them-wrong syndrome'. Carter offered the following illustration of how he enjoyed refuting stereotypes.

There's still some people who just don't believe Black people can do well, and I'm kind of happy to be one, several or many people, who kind of prove that myth wrong. That we can do well, we can do excellent, we can even go above and beyond. You just got to let us do our thing and we can do good. Don't hold us back, let us do what everyone else is doing. In terms of views, I think being how people view me as a black man, I think I have proved a lot of people wrong, because yet again, not only am I Black and male, but I'm also tall and skinny. The stereotype comes up every single time. "Did you play basketball?" No. "Do you play sports?" Well, I do track, but I don't do it as a sport. I do it as just a hobby (Carter, Interview).

Using academics to contradict stereotypes also resonated with Jermaine. In his interview, he explained,

Definitely means I'm a part of something bigger than myself. I represent a group of people that are underrepresented in America. Whenever I'm doing something, I'm ... I have a lot of White friends, but when I'm doing things, I always think ... Not that I have a chip on my shoulder, but I almost got to prove myself a little bit more. I've met people and they're like, "Oh, I don't know, you talk well for a Black person," or something like that and different things like that and I feel like some people are probably surprised when I'm that smart and different things like that, so just it honestly makes me want to work harder to disprove stereotypes (Jermaine, Interview).

Largely, participants were mindful of negative stereotypes and sought to manage the dominant ideology through their appearance, interactions with White people, and academic success. When asked where they learned about the negative stereotype held against Black men, participants identified the media as well as their parents and mentors as sources of knowledge. Describing the impact of the media, Isaiah offered,

I guess that's one of those things you pick up on, especially from media and how African Americans are portrayed. So just watching television, you see, oh ... even in the movies, whatever, the African American male is trying to do something for himself. So he goes to college, he enters the navy or something like that, and he's trying to learn for himself. I guess they exaggerate it in Hollywood, but it's obvious that the teachers don't want to help him, and it's just like clearly, the theme of the movie is that him being an African American is putting him at a deficit in this arena.

Then you just pick up, like, oh, that's a stereotype (Isaiah, Interview).

Finally, while participants were aware that they would likely be judged by dominant ideology in the White world, participants also discussed how they did not want the added burden of representing their same race-gender peers. For example, in his interview, James shared a story about how he has experienced heightened visibility (subtheme one) at his co-op.

I [was] actually asked one time at my co-op, and it was definitely a weird time. One of my co-workers who was a new intern, not an intern, but a new hire at the company took me and this Muslim girl out for dinner, and he was asking us about what it's like to be a minority. It's just interesting because it came from a place of wanting to understand. It was weird because it's like, I'm not ... I didn't say this to him, but in the back of my mind it was like, I can't be a spokesperson for my race, because my experiences don't align with not even the average African American male (James, Interview).

Although he did not explain exactly what he meant by the “average African American male”, it is clear from his story that James desired to be viewed as an individual at his co-op and not just a member of his race. However, because of the underrepresentation of Blacks and other minorities in his workspace, his racial identity was highlighted, which caused him to be viewed as the Black spokesperson. Later, in the focus group, James also articulated his regularity and again reiterated how he wanted to be viewed as an individual. James stated,

I'm not specifically or necessarily special. I'm not some golden child case of like, "This guy. This guy right here is a genius", you know? I felt that way a lot throughout school. Like "That guy", you know what I'm saying? I remember being in high school and people ... Like I had even my cousin call me out Ivy league, told me I was going

to Harvard. I was like, "No. I'm not. I'm not going to Harvard". I'm really normal. I'm really just like all the other students at [Southeast]. It's just, I like really don't like really don't like to not do well. That's really all it is. I'm not some special case person (James, Focus Group).

Saadiq discussed a similar perspective about being viewed as an individual and not just as a member of his race in his interview when he stated, "I want to live life as me, and embrace Black culture I want to as opposed to the way society or other Black people deem is right" (Saadiq, Interview). In short, participants battled the responsibility to represent other Black males while maintaining their individuality.

**Encounters with racism.** Participants agreed that "racism is really a system and it still exists. It's still pervasive" (Marcos, Focus Group). Not surprisingly, all participants experienced racism at some point in their lives. Yet, the manner in which two participants described their experiences with racism was surprising and truly underscores the omnipresence of racism. When explicitly asked in their interviews if they had experienced racism, six participants had immediate examples to share; however, two participants initially felt as though the racism was too common to recall a specific instance. They stated "I definitely feel like I have. I don't know if I can name a specific time" (Jermaine, Interview) and "Oh, yes. Yes. I don't know. I thought it was so frequent now I can't... I don't keep track like that" (Lamar, Interview). After "going back through the memory banks" (Cater, Interview), all eight participants recalled instances of covert racism and five participants recalled instances of overt racism.

Participants' first recollections of covert racism began in middle school when they witnessed their White student peers telling derogatory jokes about Black people. Saadiq explained,

It wasn't like overt like you're an N word. It was like Black jokes, and people really get a kick out of Black jokes, and I think like in sixth grade I just thought it was fine, and then I realized later that's not really okay [...] Yeah, like in middle school and high school people were like, "I don't like you're." It felt weird that people were telling me Black people are dumb, or making dumb Black jokes, but I'm like, "I have better grades than you." That was a really big disconnect for me. I just couldn't understand what it was, but they're like, "But you're you." It was always their thing, and I was like, "What?" I don't get it. Yeah, you can't just pick and choose when you want to be racist (Saadiq, Interview).

Four other participants also recalled racially offensive jokes, including being called an "Oreo" (Marcos, Interview). These jokes continued throughout high school. Additionally, participants described covert racism as acts where it was "very hard to decipher somebody's true intentions" (James, Interview). For example, Carter shared how his White female high school advisor did not register him for the pre-college classes he requested. Though it was never explicitly stated to him, both Carter and his mother believed the advisor's actions were rooted in a racist desire to prevent him from succeeding academically. He explained,

I would sign up for my classes, and she'd like, "Okay, you're good to go." I'd tell my mom, "I'm taking this, this, this class." "Okay, that's good." Then next year when we have open house, I would get half of my classes that I wanted, then she would put me in these little mediocre or poor classes. [She's like] "I'm going to put you in a sports



marketing class with all these other students. " I'm like, what? Why did you choose that as a class?" [She's like] "I think it fits your idea." I'm like, "No, it doesn't. What happened to da, da, da class?" [...] She ended up saying, "Well, you can't get all these classes that you want." Out of nowhere, it was like four weeks into the semester [...] She's like, "Yeah, you can change around your schedule and you can take all the classes that you wanted originally." I'm like, "It's too late now," because I kind of had the sense that she wanted me to be behind and fail, almost (Carter, Interview).

Also in high school, participants experienced racial microaggressions or brief indignities that expressed racial slights and insults (Sue et al., 2007). Jermaine recalled how he commonly received the insulting message that his success was due to quota programs and not his ability. He elaborated,

One of the biggest things that I hated when I was applying for colleges, people were like, "Oh, you're fine. You're getting into the school because you're Black, whatever, whatever." I'm like, "Naw, I'm getting into the school because I have better grades. I worked hard. I did a lot of the actually schoolwork." My parents would give me workbooks like every summer that I would have to work on. While all these kids are having fun, I'm sitting there doing math problems and stuff like that on my own. That was the one thing I really hated the most when applying for schools was people would always try and discredit I guess the work that I did, saying that, "Oh, you'll be totally fine. They have minority quotas and stuff. That's why you're getting into schools." I got into every school I applied to [...] People would try and downplay it and I'm like, "No, I worked hard to do that" (Jermaine, Interview).

Stories of covert racism also continued in college. In particular, participants shared how they were often misidentified as athletes instead of engineers, even in their engineering classes.

Participants were continuously asked what sport or position they played and were sometimes called the name SU's prominent Black male point guard. In his interview, James explained,

Then, there's the [...] prejudice that somebody has in their mind about you because of your skin color. It's just not necessarily true. That's the stuff I get a lot. Are you an athlete? Are you on a team?" [...] "What sport do you play?" I remember one girl was like, "I didn't even think you went here when I first met you." I'm like, "No. I'm a chemical engineer here." I'm just, you know, I'm just here. Then, I had one girl ask me if I was on the basketball team, but I'm 5'9, you know? I'm definitely 5'9. I had an Asian guy come up to me and ask me if I was [name of SU athlete] [...] There's definitely a lot of different types of racism that I experienced, but most of it's very indirect (James, Interview).

Racial microaggressions were not limited to peer-to-peer engagement; educators and administrators also conveyed racial microaggressions. In fact, the first time Carter met his engineering advisor the advisor asked him if he played basketball. This was a transformative moment in Carter's educational journey. As the relationship continued, Carter felt that the advisor did not give him adequate support, which may have been because of his preconceived notions about Black males. Carter expounded,

One of my advisors in the [civil engineering] department, he even asked the basketball question the first time he met me. I was literally one second away from changing advisors, which I should have. I wish I could go back and change advisors [...] I felt like my advisor was just, "Eh," about it, and it was kind of upsetting. I was

trying to get information from him [...] last year, around fall, I was trying to ask him about graduate school. I was trying to ask him any questions, but it felt like it was kind of like he gave me little details, but not full on details what to do. I was telling him, "I'm thinking about getting a Master's, can you tell me more about it?" He's like, "You can do thesis or non thesis." I'm like, "Okay, can you go into detail about those?" He's like, "Well, this is two years and this is two years." I'm like, "Okay, give me more information" (Carter, Interview).

Participants less frequently experienced overt racism. Stories of overt racism began even earlier than covert racism, starting in elementary school. Marcos shared the following story from his childhood:

I also experienced some racism in elementary school. And I understood, when people call you the "N" word, how do you respond to that? [...] Yeah, I think, I mean, it wasn't significant. I got called the "N" word, and probably the only time that I've slammed somebody against the wall. [...] Yeah, I don't actually really remember it because I didn't really consider it to be that crazy. There was some kid who probably had heard it from his parents, and he thought it was okay and I was like, "That's not okay." [...] I hadn't learned about nonviolence at that point. I was a little more violent than I am now (Marcos, Interview).

Like Marcos, three other participants also recalled being called a 'nigga' at some point in their lives. Similarly, Isaiah told a story of how he experienced overt racism in high school while attempting to court a White female student.

During high school, I remember I was talking to this one girl. I was very into her and I was trying to talk her. She was a Caucasian female, and we were just standing in

line or whatever. Yeah, I was like, "Oh yeah, what would happen if you brought a Black guy home?" Like clearly referencing myself, and she said, "Oh, me and the guy would die." I was like, "Oh, well, what do you mean?" My friend was there, too. He was like ... and she was like, "Oh, nothing." My friend was like, "No. What do you mean?" She was like, "Oh, nothing." Like she was just poking fun. He was like, "Does it involve a rope?" She was like, "Yeah." I was like, "Oh, my gosh." I was like, "Oh, wow. This conversation just took a huge turn." I guess that was my first moment where someone directly referenced my skin tone, like who I was, in such a negative way to involve, I guess, death. I was completely shaken to my core. I was 16, and I'd never seen that. I wasn't ready for it (Isaiah, Interview).

Overt racism also permeated the campus' social scene as participants had trouble gaining admission to White fraternity parties because of their race. In his interview, Lamar shed light on this phenomenon,

My friend said they were going [a frat party] and then I wanted to go and when the older friend realized that I wanted to go he was like, "Oh, hold on, hold on, hold on. Let me ask first. Let me make sure." He didn't ask for any of my other friends. It wasn't like a, "You're not on the list," kind of thing. It's, "Oh, you're Black. Let me ask them," kind of thing. He had to smooth it over somewhat, first. I still ended up going. I had nothing else to do. But at the same time it's definitely concerning to see that blatant discrimination like that occurs in school-associated organizations. [...] so definitely the frat party just made me rethink the whole ... Greek system as a whole. This college community as a whole. Just really disrespectful (Lamar, Interview).

In total, racism was pervasive in participants' K-12 and college experiences and extended to both their peer and educator interactions.

### **The Black World**

Up until this point in the chapter I have shared how the participants engaged in predominantly White spaces by acknowledging heightened visibility and invisibility, managing dominant ideology, and encountering racism. While participants spent a great deal of time discussing how they engaged with the White world, they also less frequently discussed the second world they operated in, the Black world. In his interview, Carter concisely verbalized this point when he said, "I get to see the majority of America and then I get to see the Black America (Carter, Interview). The Black world comprised participants' Black family members and peers, social settings with majority Black people such as sports and other extracurricular activities, and more broadly, their sociocultural heritage. Participants used phrases such as "my community" (Isaiah, Interview), "my ancestors and my culture" (Carter, Interview), and "our people" (Marcos, Interview) to describe the Black world.

When reviewing participants' stories of the Black world a pattern became apparent; participants varied in how connected they felt to the Black world. To Isaiah and Lamar, they felt very connected to the Black world, and most of their closest bonds were with other Black people. Isaiah described,

I think I came into freshman year a little close-minded. So I had a lot of my friends from high school come, and so I didn't necessarily look for more friend groups to be a part of. So all my friends were African American males in engineering. So we're all doing the same thing, and so we're all of course interested in the same thing. So we

didn't necessarily want to venture out from our interests. It wasn't until sophomore year where I started talking with people in my major, people in my scholarship program who didn't look like me, who weren't interested in the same things (Isaiah, Interview).

For most participants (i.e., Marcos, James, Saadiq, Jermaine, and Anthony) they had no problem connecting with the Black world, but it did not make up the majority of their social network. In other words, their closest bonds were not just with Black people, but instead included people of all racial backgrounds. Anthony explained,

It's just [Anthony]. It's who I am. I don't have to be restricted to a certain group of people, that's why I don't mind talking to anybody, I don't mind getting to know anybody. No, absolutely not. I don't see why ... I'm kind of confused why people feel more comfortable around those that are like them, cause at the end of the day we're all humans, we're all the same at least one way. I don't get how skin, or the way you talk, or the music you like makes ... there's some sort of separation. I really don't get it (Anthony, Interview).

Finally, Carter was the only participant who expressed trouble connecting with the Black world. He described himself as an outcast in his race. Reflecting on his experience in middle school, he shared,

I did not exactly fit with the Black students, I fit more with the misfits, more with the geeks and the sci-fi fantasy, but sometimes I'm the only Black person in the group. There were times where just like they would say some explicit stuff about my appearance. Sometimes my skin tone, sometimes other things. I just didn't like that, so there was no one there to really ... again, I don't know if it was just being

silly, I don't know if it was being serious, but there was no one who backed me up (Carter, Interview).

Regardless of how connected they felt to the Black world, all participants demonstrated some level of engagement with predominantly Black spaces. I will now describe how participants engaged with the Black community by relying on Black family members for cultural ideals, participating in support spaces, and helping other Black students succeed.

**Family influence.** Participants' understanding of the Black world began early in their childhood as they interacted with their families. Families modeled positive attributes of Black culture, and in doing so, they also dispelled the negative stereotypes perpetuated in the White world. For example, in his interview, Saadiq discussed how his family did not ascribe to negative stereotypes about Black people. He explained,

I think my family [...] shaped how I think of [...] being Black, just because they were stereotypically not Black, but I think that helped me like so know in the back of my mind that's okay. But it's like hard when the rest of the world is telling you you're supposed to be some type of way. But yeah I think family's been an important part of my life indirectly [...] My mom caught me sagging one time, she's like, "What are you doing?" I was like 14 and I was just trying to be cool, and she was like, "No." (Saadiq, Interview).

Similarly, in his interview, James shared how his Black female family members both influenced his identity and demonstrated achievement to him. He reflected,

My life was definitely more influential from black women. My grandmother and my stepmother ... My stepmother is top five wisest people I've spoken to in my life. She's

just like way too wise. I really can't even argue with her. It really makes me mad sometimes. She really makes me mad how wise she is. She just knows exactly where she's coming from, but I know where I'm coming from too, so we clash sometimes because of it, but I know she's just really, really wise. Then, my grandmother is just 100% on her game. You can't really ... She's just on it. She's just a GOAT in life. She a life GOAT. She's written in the history of [Midwestern city]. She's got a plaque and everything. Yeah. She's crazy. It's wild. It's crazy how dope she is. Then, my mother of course. At the beginning she was a single mother until she remarried. She was definitely important in shaping my upbringing and the type of person I am. Then my sister, it was just me and her, so she was also a huge importance. She's the only person I'll tell everything about my life to, which I don't know why I do that still, but she just is. Yeah. Definitely black women (James, Interview).

In addition to dispelling negative stereotypes, families also attempted to instill a robust sense of Black pride in participants psyche. Sometimes, this attempt was successful. For instance, in his interview Jermaine expressed the importance of “definitely [being] proud of where you’re from” (Jermaine, Interview). Lamar also recalled a similar sentiment when described how the confidence he received from his family and friends served as a protective factor and prevented him from feeling invalidated by his White peers. He stated, “I wouldn't say invalidated but definitely disrespected. I don't think I've ever felt invalidated [because of my race] just because I think parents and friends were enough to instill a sense of self-confidence.” (Lamar, Interview). Families’ attempt to instill pride, however, was not always efficacious. For instance, Carter shared how his mother planted the initial seeds of Black pride; nonetheless, they did not blossom until he went to SU. Carter shared,



My mom was really into her ancestry and her family heritage [...] Ever since I was little I was like, like okay, I'm a Black person, and then my mom talked about our ancestors. She's like, "Well, you got African, you got English, you got Native American." I wasn't proud of that, [...] I think [SU] did help me [learn to be] proud of [my] heritage, don't be upset, don't be discouraged, it's something that's beautiful, it's something that helps [me] connect with people and tell [my] life story (Carter, Interview).

As Carter further reminisced on his journey, he disclosed that attending a Black student meet up helped him move from merely acknowledging his heritage to truly appreciating it. He explained,

It was me and several other undergrad students, we just talked about what it is to be black, how to be woke, what was your experience? It was a very opening experience to see that I'm not alone, there are people who's just like me and experience similar footsteps. That made me really happy for myself to say I'm not, because there was times when I felt like I was the outcast of my ethnicity (Carter, Interview).

Carter's experience leads us to the second subtheme, the need for support spaces.

**Support spaces.** In light of the aforementioned obstacles that participants faced in the White world, Lamar and Isaiah sought refuge by creating a community of same race peers and mentors. For example, both Lamar and Isaiah created or co-created SU student organizations to help minority students adjust socially and advance professionally. Lamar's organization focused on minority males and Isaiah's organization focused on minority pre-health students. Additionally, both Lamar and Isaiah regularly participated in National Society of Black Engineers (NSBE) and Minority Engineering Programs (MEP) activities.

In his interview, Lamar shed light on how NSBE has been an important support space for him during his time at SU.

You don't see many Black faces in engineering classes the farther up you get, so that's why I love NSBE the way I do. Definitely made a little study group of a couple of different of us, help each other out. That's not to say I don't have other friends, of course. But sometimes it's just nice to know you have people looking like you do in the same thing [...] It can be lonely. I can say that. Unless you go to NSBE (Lamar, Interview).

Aligned with this perspective, Isaiah also described how his family and SU's MEP has provided him with invaluable support. He stated,

[Being in the College of Engineering is like] being in an ecosystem where you have to find your niche [...] It's like being in a large area where you have to find your core group of people, and if you don't find your core group of people, like when an antelope goes away from its herd or something like that, you could be attacked or something. [...] Definitely having a support group or actually having multiple support groups [has helped me be successful in my major]. So the MEP program is a support group, my family's a support group, and just having multiple avenues where I could get support and get it in different ways.

Although the majority of participants did not connect as closely with the Black world as Lamar and Isaiah did, for the most part they all acknowledged the importance of having a community of same race peers and mentors. For instance, seven out of eight participants spoke about comradery developed through NSBE. Marcos was perhaps the most involved NSBE member of all participants. As the former chapter president, he illuminated the

importance of NSBE, stating “NSBE has been very helpful, in terms of success, not only academically, but also culturally and just having the friendship of other black engineers who are going through the same things” (Marcos, Interview). Even Anthony, the participant with the least amount of interaction with NSBE, also spoke of its significance. He declared,

[Being in the college of engineering] is like... I'll say just NSBE [...] cause that's where all the black engineers are. I haven't had the opportunity to really get to hang out with a lot of people in NSBE or just being a part of the activities and stuff but, that's a really cool thing that is accessible to everyone in an engineering major, this is nationwide. That's really powerful that when I came in, that was already established.

That gave me a little bit of comfort

No matter how involved participants were, overall their message was consistent: NSBE was a source of cultural and social support on SU's campus.

Interestingly, Saadiq, who did not connect as closely with the Black world, had a strikingly different perception of single-race support spaces like NSBE. Instead of helping him reach his academic or career goals, he felt like depending on NSBE for support would limit him. He illuminated,

it's strange because I'm like part of NSBE but not really, and like know a lot of people in NSBE, but at [SU], it's challenging because NSBE ... I hate to put it like this, but like it feels like it's a very closed group, like a cult, but in a much better [way] not a cult. Like everyone I know in NSBE is like they are all friends, and they all know each other and that's great because they come from smaller communities that like they didn't have that support network, but I don't know [if] very many people inside of NSBE talk to many other people that are outside of NSBE, and it's hard for me to join

that because I'm like I like the people that I already know I don't want to drop them because none of you all [like them]. Yeah, it's just hard to balance that. But even then, [NSBE does] stuff I'm like, "That's super cool," but I just don't know if I want to be a part of that black experience because it doesn't seem like a really well-rounded experience to me (Saadiq, Interview).

Saadiq also tried to avoid other minority-only programs because he felt as though he was being “discriminated for” (Saadiq, Interview) because of his race. He explained,

It feels strange sometimes because you get a lot of opportunities. So I definitely try to [think from my] White friends' perspective. Like I know [SU] and [the STEM boarding school] as well have a bridge program where you can come and like if you're like a minority student, and just experience [SU], and those opportunities have always been open to me. I've taken less of them as I've gone in further in my education, but it doesn't feel like discriminatory to me, but also in a way it kinda does, because I'm like, "You're giving me because I'm this," but it also. I see more the other side of it, and it's like they're just people too, you know? Like if we are going to say everyone's people, then why are people getting different treatment (Saadiq, Interview).

Isaiah mentioned a similar idea about being discriminated for, but he felt Black-only programs were necessary given the difficulties he faces because of his race. He concluded,

It's been a benefit in that I've met really good people just by being a part of these organizations that I fear that I wouldn't be a part of if I wasn't a Black male. But at the same time, I feel like it was a necessity to be a part of those things because I was a Black male, because it is harder to do engineering as a Black male (Isaiah, Interview).

Altogether, the need for support spaces was a repeated theme in stories about the Black world. Participants varied in how connected and involved they were with support spaces; however, most acknowledged the value of Black-only or minority-only spaces.

**Lifting and climbing.** Besides having a community of same race peers and mentors, three participants also expressed an interest in giving back and bettering the Black community as a whole. These participants were knowledgeable about the disparate conditions facing Blacks that could limit their success in education and engineering. Marcos explained admissions policies as one example of such disparities,

there's a conflict of interest, almost or a trade-off that you have to make, as the University becomes more selective. The population of students they accept change. [...] If you look at graphs and data from the number of Black engineers that have been accepted at [SU] has gone from 7% in 2012 to about 3% today. So, whether that's a factor of being selective, I think it does have an effect, in the sense that maybe, a lot of Black students are often, not coming from the same level of schools as their White peers. You compare our urban county to [the rural county where my family's from], and the school systems are not the same. So, unfortunately, this leads to this disparity in admissions. And so, that's a policy that I've been concerned about (Marcos, Interview).

Additionally, Isaiah described the challenges of being a Black male in engineering as follows,

so yeah, I would say that being a male is a benefit in an engineering major, but being a Black person in an engineering major sort of, I guess, makes it harder because as you go higher in your classes, there's definitely not people that look like you in your

classes. So you feel alienated, and then when you feel alienated, you struggle with your work, you struggle with communicating, and that puts you at a huge deficit to where ... like if being a male puts you at a slight advantage, I would say being Black would sort of negate it to the point where the whole thing is just a struggle (Isaiah, Interview).

Armed with this knowledge, participants were motivated to assist younger Black students (i.e., lift) as they reached their own academic and professional goals (i.e., climb). Thus, lifting and climbing was the second subtheme apparent within stories about the Black world.

Two participants' inspiration for lifting and climbing centered on the idea of role modeling. In his interview, Jermaine discussed importance of being an example for younger generations. He stated,

Like what you're doing [referring to the dissertation study] is great, I feel like, because it'll inspire other Black people. They'll be like, "Oh, if he can do it, why can't I?" I think that's one of the biggest things that we need right now is more inspiration, more motivation for people to get out of the system or whatever (Jermaine, Interview).

Similarly, Marcos, described how being a role model was a central part of his work with NSBE. He asserted,

But the other thing I see is my kind of, responsibility as a Black male is to help other Black males succeed. And I mean, that's part of the reason I'm involved in NSBE, is, I think it's extremely important, the best, probably one of the best ways to influence people is by being friends and by being a role model through the example. And so, that's what I try to do, is humbly approach life and give advice where I can, but

ultimately, be an example of how I would like to live and how I'd like the world to be (Marcos, Interview).

The third participant, Isaiah, decided to lift and climb because he did not want younger Black males to experience the same mistreatment he did. He shared,

Well, when you're a kid, you see it as this bright and wonderful place. But then, I feel like as a black male, it kind of gets, a little, well a lot dimmer because you just see people who look like you, how they're mistreated, and even how their lives are taken from them just for, it seems like, just for being who they are. So in my opinion, the world seems like a very dark place just being as a black male. But I feel like I also have a certain duty and a capability to change that to make sure that it's not as dark a place for the person behind me (Isaiah, Interview).

In short, Marcos, Jermaine, and Isaiah all wanted to improve the Black community and lift others up while they were climbing their way to success.

**“It’s a lot of pressure from a lot of different areas”: The Emotional Weight of Being High-Achieving, Black, and Male**

The totality of experiencing both class and gender privilege (theme one) as well as racial oppression (theme two) overwhelmingly shaped participants’ psyche. This third theme, “It’s a lot of pressure from a lot of different areas”, synthesizes the first two themes, highlights the emotional outcome of converging privilege and oppression, and describes how this convergence influenced participants’ lived experiences and academic success. The title of this theme “It’s a lot of pressure from a lot of different areas”, comes from a passage in the focus group. At the beginning of the focus group, participants were given the research question for the study (i.e., How does Black male intersectionality shape the lived

experiences and academic success of high-achieving Black male undergraduates in engineering majors at a PWI?) After being presented with the research question, participants were asked if they had any thoughts about the research question. Immediately, participants began to discuss the pressure they felt as high-achieving Black males in a snowball-like fashion. The title of this theme comes from a quote within that discussion from Isaiah. In the larger quote, Isaiah stated,

I would also say that along with the pressure, yeah I feel pressure from my family but I also feel pressure from like the people in my class, the people that I'm going through my major with. Sometimes I feel like I have to, I guess, disprove the stereotype. I feel pressure from the people who look up to me. Like, I guess I have to prove to them that it's possible and show that I can be successful despite what society may say. It's a lot of pressure from a lot of different areas (Isaiah, Focus Group).

Isaiah's quote encapsulates the immense emotional stress participants endured because of their intersecting identities. The first subtheme, internal pressure, is how participants felt anxious to meet self-imposed standards. The second subtheme, family pressure, is how participants felt anxious to meet family-held standards. Together, this third theme summarizes the culmination of the participants' privileges and oppression.

In reviewing the third theme, constructs from both CRT and the ADAF are also present. Participants' stories underscore the centrality of race and racism. Moreover, their narratives illuminate the intersection of their racial and gender identities. These actions add support to the CRT constructs of racial realism and intersectionality. In terms of the ADAF, familial factors are highlighted.



## **Internal Pressure**

As high-achieving Black males, participants first felt pressure to meet their own internal standards and expectations. This internal pressure was embedded in participants' personalities, as they were highly ambitious, competitive, and self-critical. Within themselves, participants felt it was not good enough to do well; they wanted to be exemplary. Their internal drive to be number one inspired participants to study for excessive hours on end. This perhaps was best illustrated in Marcos' interview,

I've had this experience multiple times, where I live in an apartment complex right back here. And there's an alcove outside of my apartment, and I usually sit out there and do homework. Sometimes, people will pass by, they'll go out from somewhere, to a party or something, this is on the weekend, and they'll come back at 1 a.m., and I'm still sitting there in the same place. And they're like, "Have you not moved?" I'm, [like] "Yeah, I haven't moved. I've been doing the same thing." Yeah. So, I mean, I've had that experience multiple times where, it takes a lot of effort, it takes a lot of focus (Marcos, Interview).

Most participants also agreed that they were perfectionists; in other words, they strived to perform at a flawless level both academically and professionally. Maintaining their internal measure of academic and professional excellence was an exhausting task for participants. In the focus group, James expounded on the mental anguish he felt to achieve high grades in his college classes. He expressed,

Sometimes I feel like a perfectionist almost. It's like, if I don't do well, I'm like, "Wow, this is bad," you know? And it could be a C, but I'm like, "Nah [...] I got to

be like a standout [...] I can't be regular. I can't be average. So it's definitely nerve-racking (James, Focus Group).

In addition to increasing their stress levels, the pressure to be perfect was also detrimental to participants' academic and professional growth. For example, because James wanted to maintain his perfect image, he did not reach out to academic support services on campus that he could have benefited from. He explained,

If I humbled myself a little bit, I would be more successful. If I went and asked questions. I've been to office hours, maybe three times in my life since I've been at [SU] I won't even do office hours. I'd be so much more successful if I went to office hours. If I would just stop being [such a] perfectionist, [and stop having a] chip on my shoulder, so you know what I'm saying? [My mentality is that] I'm going to get this on my own. I'm about to kill it by myself, you know, type person, and [if I] just would go to office hours like all the other smart people do and ask questions, and pick apart the TA's brain's and try to get the answer the correct way, I would do better, and [if I] scheduled that out of my day, I would definitely do better (James, Interview).

James did not reach out for academic assistance because he had a "chip on his shoulder"; in other words, he had something to prove. James described his actions as motivated by his own standard of perfection; however, his behavior demonstrates that he was also motivated by how others, such as his TAs and student peers, perceived him. James wanted his TAs and student peers to view him as self-sufficient; he wanted to prove that he could achieve academically by himself and he did not need outside help. Similarly, the pressure to be perfect also had a negative impact on Jermaine's academic and professional growth.

Jermaine did not engage in valuable academic and professional development opportunities if

there was a possibility he might make a mistake or fail. In essence, Jermaine maintained his perfect image by choosing to participate in safe activities, or activities in which he was confident he would be successful, rather than stretch activities, or activities in which he had the potential to learn, grow, and fail. He shared,

I took a personality test for work this summer [...] I got the perfectionist trait [...] I'd never really had seen myself in that light, but when I was thinking back, I [realized] I don't really put myself in situation where I could fail. I think one of most beneficial things you can do or that I learned from working this summer is failing [...] You're not really growing if you're not putting yourself out of your comfort zone a little bit and taking on tasks that you're not sure that you'll succeed in. I think that's a huge thing (Jermaine, Interview).

Like James, Jermaine also described his actions as motivated by his own standard of perfection; however, his behavior demonstrates that he too was also motivated by how others, such as his coworkers, perceived him. Jermaine wanted his coworkers to view him as a successful colleague; failing was antithetical to his image. As discussed in theme two, all participants had a thorough knowledge of the pervasive racist beliefs held against them due to the intersection of their race and gender. While not explicitly referenced by participants in this context, James and Jermaine's stories illustrate that this knowledge of the dominant ideology was like an ongoing music soundtrack that played in their subconsciousness; it covertly influenced participants' decision-making even in moments when participants thought they were acting on their own desires. For example, both James and Jermaine reasoned that they were avoiding academic assistance and failure respectively because of their type A personalities. It is true that their character played a role in their decision-

making. Yet, they neglected to mention, and perhaps even recognize, that their actions also disproved the dominant ideology that incorrectly characterized them as low academic achievers and professional failures. Put differently, participants felt pressure to counter the dominant ideology and instead represent Black males well in the White world. Isaiah discussed this idea at length during his interview,

The whole stereotype is you don't want to be that person who's struggling with [a class subject], so sometimes, that comes out negative because, [the mentality is] "Oh, I don't want to ask this question because I don't want to be the only one who doesn't understand, and then I don't want to fit into that stereotype." So if I have that question and I don't want to ask it, and I don't ask it, then I don't understand. So that can kind of accumulate to where it just snowballs for the course, and I end up not understanding the things that I should've understood. So just juggling, or struggling with, I guess, the stereotype threat or whatever, and coming to terms with the fact that if you don't understand something, that it's okay to ask, even if it's amidst the whole class or whatever. But yeah, that would be something that, I guess ... being a black male in my class, I don't want to fit into that stereotype, but at the same time, I don't want me not fitting into that stereotype to affect how I'm doing in this class (Isaiah, Interview).

Unlike Isaiah, most participants did not realize that their understanding of racist stereotypes held against them had an influence on the internal pressure they felt to succeed. When they reflected on where their internal pressure to succeed originated, most participants shared stories from early on in their lives. For Carter, he recalled being academically diligent in elementary school. He recollected,

Academically, I did really well but I [did not] fit in with a lot of other students because a lot of students are just there to have fun. For me, I'm like, "I want to do well in my classes." My mom always talked about how I wanted to get a lot of my homework done before anything else. She's like, "Okay, let's go to the park." "But I want to get my homework done!" I was kind of like that type of student, I'd like to get everything done and organized, make sure everything gets completed [...] My mom said I was more of a go-getter type of personality naturally, it wasn't much of an issue going into academics (Carter, Interview).

Like Carter, Marcos also developed an internal drive for excellence at an early age.

He explained the pressure as follows,

I just read "I Am Malala," by Malal Yousafzai, and the way she describes it is, she always wanted to be the first person in her class. And I think I've kind of, had that mindset from early on. When I wasn't, I was like what's wrong? What do I need to do to be first? (Marcos, Interview).

In the focus group, Saadiq described a similar experience at SU.

They changed [SU's e-learning platform] recently. You can see you rank in your class, so like my textile class now. I was like my class is really small, it's like 40 people. I was in the top 10, but I was like not one (laughs) (Saadiq, Focus Group).

By and large, participants were self-motivated to achieve academically and professionally.

They were under internal pressure to perform at a high level because they wanted to be number one or be first. While participants did not always acknowledge it, the internal pressure they felt was also prompted by their awareness of racist stereotypes held against them (theme two) and their inadvertent desire to prove these stereotypes wrong.

## **Family Pressure**

Outside of their own self-imposed anxiety, participants also felt pressure from their families to succeed academically. As aforementioned in theme one, participants came from highly educated and affluent families. As such, family members cultivated participants' academic achiever identity by setting high academic standards and expecting participants to meet them. Participants did not want to disappoint their families, which magnified the pressure they felt to achieve academic excellence. What is new about this subtheme, however, is how family pressure collided with the nexus of the White and Black worlds. Most participants' family members, who were a part of the Black world, did not only encourage academic success because of they were college graduates or mostly middle class (as described in theme one); they were also driven by their understanding of the White world and their desire to prepare participants for the racial realities of identifying as a Black male in predominantly White spaces. In other words, most participants' family members were aware of the structural barriers that participants would face as Black males in the White world, such as racism, stereotypes, lack of sense of belonging, the school-to-prison pipeline, and police brutality. While family members were unable to prevent the systemic nature of these barriers, most exercised their limited agency by promoting academic excellence as a buffer to alleviate institutionalized adversities. To do this, most families taught participants about the double standard that exists between them and their White peers because of White privilege. Essentially, because they are not White, participants must work harder and be smarter than their White peers just to obtain the same level of respect and success in the White world. Families' taught participants about this double standard as a way of 'leveling the playing field'; participants were able to enter the White world with a clear understanding of the

unfair advantages given to Whites and the extra measures participants would have to take as Black males to both survive and thrive. For instance, reflecting on his upbringing, Jermaine shared,

My family has always put a huge emphasis on school and being academically successful, because I was a Black male, because they know sometimes you're not looked upon the same way as you would as another White male, so you got to work that much harder (Jermaine, Focus Group).

Similarly, Marcos' parents taught him "to be smart and also work hard" (Marcos, Interview).

He explained,

[P]robably somewhere around middle school, in the sense that I really started to understand a couple things. I would have to probably, be 110% better.

You can't just do 100%, you have to do a little bit more. And that was the main thing I learned from my parents (Marcos, Interview).

Along the same lines, Lamar also described the additional steps Black males must take to achieve the same outcomes as their White peers. He illuminated,

there's always a but when you're a Black male. You can succeed but it's going to be harder. You can go out to a, I don't know, social event or anything like that but you will be looked at more by the cops. You can go driving but you might be pulled over more. Just understanding my life, you can't let it hold you back but at the same time you do have to be a bit more careful and you might have to work a little bit harder. Somebody whose dad owns the company can just get a job there while you have to apply, reapply, or work harder. Same with professors or really anything. Stuff like that. Just understanding that you can do as much as you want to do. You can be the

president if you want to be but you might have to work harder for it and you're probably going to get more flack along the way, kind of thing (Lamar, Interview).

When asked how he learned about this double standard, Lamar credited his parents and mentors who shared their lived and professional experiences with him. He boldly affirmed,

Mom, of course, and dad have always ... I mean, they know, of course, being in the fields that they are in and just living. Same with different mentors and just professionals that I've talked with through NSBE or through whatever else.

People know how it is out there. We can sugar coat it however you want, it is what it is (Lamar, Interview).

It is also important to note here that there is a relationship between internal pressure (subtheme one) and family pressure. For example, later in the focus group, Jermaine went into more detail on how his family communicated the double standard between Blacks and Whites to him. In his response, Jermaine also expressed that his perfectionist trait (from subtheme one, internal pressure), actually derived from family pressure. He explained,

I already took a personality trait test for my internship this summer, my main trait that I got was perfectionist. I've kind of thought about it and like, I always, if I get something wrong, somebody else could have gotten that wrong too, but I feel like I take it a lot harder than they would, because I can't...Like my parents have always stressed not being average, always stressed you got to be like one step ahead. You got to be better. You can't just settle for being good enough or just as good (Jermaine, Focus Group).

Overall, participants' families were a second source of pressure; family members pressured participants to perform academically as a safeguard for the racial realities associated with



being a Black male in the White world. Responding to the pressure, participants did not want to disappoint their families so they achieved academic success.

## CHAPTER 6: DISCUSSION

The purpose of this study was to understand how being both Black and male (i.e., Black male intersectionality) shaped the lived experiences and academic success of high-achieving Black male undergraduates in engineering majors at a PWI. Specifically, one research question guided the study: How does Black male intersectionality shape the lived experiences and academic success of high-achieving Black male undergraduates in engineering majors at a PWI? This study employed a counternarrative design to gain insight into the participants' lived and academic experiences. Three overarching themes and six subthemes emerged from participants' counternarratives of academic achievement. These themes and subthemes illustrate what experiences the participants deemed meaningful as high-achieving Black male undergraduates in engineering majors at a PWI. The research design allowed the participants to give power to their voices as Black males and to offer a more complete view of the convergence of racial oppression and gender privilege in their lives.

My findings indicated that for these high-achieving Black male undergraduates in engineering majors, their experiences were shaped by their access to fiscal resources and built-in communities of college-educated individuals (the theme of *"I was extremely privileged"*). Additionally, because they identified as male, participants felt some sense of belonging in the engineering field, and were able to connect with their fellow male peers that identified as White (the theme of *"I was extremely privileged"*). Participants were also highly aware of their racial minority status in predominantly White spaces and often responded by managing negative stereotypes about them; still, every participant encountered racism (the theme of *"I was basically in two different worlds"*). Moreover, participants' families

modeled positive attributes of Black culture, and participants acknowledged the need to build community amongst their same-race peers (the theme of “*I was basically in two different worlds*”). Finally, as participants managed their identities as high-achieving Black males in engineering majors, they felt pressure from themselves and their families to perform academically and professionally (the theme of “*It’s a lot of pressure from a lot of different areas*”).

In summary, the findings of the current study add support to the literature by reinforcing the challenges that Black undergraduates face at PWIs such as racism (Davis et al., 2004; Harwood, Huntt, Mendenhall, & Lewis, 2012; Swim, Hyers, Cohen, Fitzgerald, & Bylsma, 2003), stereotypes (Fischer, 2010; Nadler & Komarraju, 2016), and lack of sense of belonging (Cuyjet, 2006; Evans & Bonner, 2004). Participants also validated literature on the multifaceted challenges faced by high-achieving Black undergraduates (Fries-Britt, 2004; Fries-Britt & Griffin, 2007; Fries-Britt, 2017), Black male undergraduates (Dowden, Gunby, Warren, & Boston, 2014; Parker, Puig, Johnson, & Anthony Jr, 2016; White & Cones, 2013), and Black undergraduates in STEM (Chang, Sharkness, Hurtado, & Newman, 2014; Strayhorn, 2015). Nevertheless, the participants in this study have been successful in persisting in their engineering majors despite the barriers presented in the literature. What is unique about this study is that it brings new information on how this population deals with both privilege and oppression simultaneously in their pursuit of academic success. More specifically, the investigation of gender privilege among Black males presents a new line of inquiry in educational research.

In this chapter, I synthesize key findings and relate them to the existing literature and the study's theoretical frameworks, which included Critical Race Theory (CRT) and the anti-deficit achievement framework for studying students of color in STEM (ADAF).

Table 6.1 outlines the three themes and their respective subthemes that emerged from participants' narratives and connects them to constructs from the study's theoretical frameworks. Next, I also discuss implications for the findings and provide recommendations for stakeholders. Finally, I review the study limitations and offer a brief synopsis to conclude the study.

Table 6.1: Themes, Subthemes, and Key Theoretical Constructs

<b>Research Question:</b> <b>How does Black male intersectionality shape the lived experiences and academic success of high-achieving Black male undergraduates in engineering majors at a PWI?</b>		
<b>Themes</b>	<b>Subthemes</b>	<b>Key Theoretical Constructs</b>
“I was extremely privileged”: The Impact of Class and Gender Privilege	<p>A. Class privilege</p> <ul style="list-style-type: none"> <li>• Access to fiscal resources</li> <li>• Built-in communities of college-educated individuals</li> </ul> <p>B. Gender privilege</p> <ul style="list-style-type: none"> <li>• Gendered expectations</li> <li>• Social maneuvering</li> </ul>	<p>A. CRT</p> <ul style="list-style-type: none"> <li>• Intersectionality</li> </ul> <p>B. ADAF</p> <ul style="list-style-type: none"> <li>• Familial factors</li> <li>• K-12 school forces</li> <li>• Out-of-college prep experiences</li> </ul>
“I was basically in two different worlds”: Strategically Navigating Racial Realities	<p>A. The White World</p> <ul style="list-style-type: none"> <li>• Heightened visibility and invisibility</li> <li>• Managing dominant ideology</li> <li>• Encounters with racism</li> </ul> <p>B. The Black World</p> <ul style="list-style-type: none"> <li>• Family influence</li> <li>• Need for support spaces</li> <li>• Lifting and Climbing</li> </ul>	<p>A. CRT</p> <ul style="list-style-type: none"> <li>• Intersectionality</li> <li>• Racial realism</li> <li>• Differential racialization</li> </ul> <p>B. ADAF</p> <ul style="list-style-type: none"> <li>• Familial factors</li> <li>• K-12 school forces</li> <li>• Classroom interactions</li> <li>• Out-of-class engagement</li> <li>• Experiential/External opportunities</li> </ul>

Table 6.1 (continued)

<p>“It’s a lot of pressure from a lot of different areas”: The Emotional Weight of Being Smart, Black, and Male</p>	<p>A. Internal Pressure B. Family Pressure</p>	<p>A. CRT  <ul style="list-style-type: none"> <li>• Intersectionality</li> <li>• Racial realism</li> </ul> B. ADAF  <ul style="list-style-type: none"> <li>• Familial factors</li> </ul> </p>
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### Discussion of Major Findings

As mentioned previously, the heart of the current study was to understand how having both a subordinate racial identity (i.e., identifying as Black) and dominant gender identity (i.e., identifying as male) manifested in the lived and academic experiences of the study participants. The study’s findings consist of three themes and six subthemes, which together illustrate a complex web of privilege and oppression. In this section, I will discuss these findings in the context of existing literature. I synthesize the study findings by organizing this section around two major lessons learned from participant narratives: the importance of early protective factors and the practice of othering in engineering classrooms and workspaces.

#### Lesson 1: The Importance of Early Protective Factors

In examining the findings holistically, the first major lesson learned from participant narratives is how early protective factors in participants’ lived and academic experiences mitigated the impact of the risk factors they encountered in higher education and the workplace. Protective factors are characteristics of students, their families, and the wider environment that reduce the negative effect of adversity on student outcomes (Masten & Reed, 2002; Vanderbilt-Adriance & Shaw, 2008). Conversely, risk factors can be thought of as the opposite of protective factors, or characteristics of students, their families, and the

wider environment that increase the negative effect of adversity on student outcomes (Vanderbilt-Adriance & Shaw, 2008). Several scholars have explored how exposure to risk factors influences students' decisions to leave engineering major (Geisinger & Raman, 2013; Haag, Hubele, Garcia, & McBeath, 2007; Honken & Ralston, 2013; Meyer & Marx, 2014). Within such analyses, scholars have also identified the salience of race as a moderator, or a variable that affects the strength of the relationship between risk factors and student outcomes. For example, Marra, Rodgers, Shen, & Bogue (2012) found that both White and non-White undergraduates are exposed to academic (e.g., curriculum difficulty and poor teaching and advising) and non-academic (e.g. lack of belonging in engineering) risk factors that lead to their decisions to leave engineering majors; however, curriculum difficulty and lack of sense of belonging had a stronger influence on non-White students decisions to leave their major. Further research also indicates that Black undergraduates are particularly exposed to several risk factors that hinder their success in engineering majors, such as negative stereotypes from peers (Moore III, Flowers, Guion, Zhang, & Staten, 2004) and subsequent stereotype threat (McGee & Martin, 2011), low instructor expectations (Burrell et al., 2015), perceived institutional racism and discrimination (A.R. Brown et al., 2005), and the "weeding out" system of introductory STEM courses (Maton, Hrabowski, & Schmitt, 2000). All these previously mentioned risk factors are at the macro-level, meaning they have a systemic basis and students do not have control over whether they experience these risk factors.

Aligned with the literature, the study participants experienced macro-level academic and non-academic risk factors in their engineering majors at SU. Their peers, instructors, and academic advisors inaccurately stereotyped them as low academic achievers, athletes,

and criminals, and had low expectations of them. Moreover, they were required to take academically intensive “weed out” classes, and they encountered overt and covert racism. However, what is noteworthy about this study is despite the presence of these risk factors, the participants persisted and obtained academic success in their engineering major. What is more, each participant described three distinct ways in which their exposure to protective factors in their childhood and adolescent years (i.e., subthemes of access to fiscal resources, built-in communities of college-educated individuals, family influence, and family pressure), helped lessen the detrimental effect of the risk factors they faced in their young adulthood. I will now discuss each of these three protective-risk factor relationships in detail.

**Academic achiever identity.** Research has shown that negative stereotypes are a serious impediment for Black undergraduates in engineering programs regardless of how much they succeed academically (McGee & Martin, 2011; Moore III et al., 2004; Moore, Madison-Colmore, & Smith, 2003). In their investigation of the experiences of African American males who did not persist in engineering programs, Moore, Flowers, Guion, Zhang, & Stalen (2004) identified sensitivity to negative stereotypes regarding African American intellectual ability as an emergent theme. Similarly, McGee & Martin (2011) and Moore, Madison-Colmore, & Smith (2003) all found that Black engineering students who persist in their majors are also sensitive to the negative stereotypes about intellectual inferiority and desire to prove stereotypes wrong. Concurrent with the research, the participants expressed that they were aware of the negative stereotypes of their White peers, instructors, and academic advisors at SU that characterized them as low academic achievers and wanted to invalidate these clichés (subtheme of managing dominant ideology). However, this study contributes new information on how engagement with their early

schooling and family environments solidified participants' identity as high academic achievers and, consequently, prevented them from internalizing negative stereotypes. Thus, the first early protective factor that I will discuss is participants' academic achiever identity.

All participants entered college strongly self-identifying as academic achievers; in other words, successfully completing academic tasks was central to all participants' self-perceptions. This aspect of their self-concept, which was fostered in their K-12 and family environments, protected participants from internalizing negative stereotypes of their White peers, instructors, and academic advisors at SU. In analyzing their academic achiever identity development, all participants recounted how they first realized they were academically successful because of recognition they received from their K-12 teachers and peers. In school, participants recalled being described as "smart", being enrolled in academically gifted programs, and being praised for their academic performance. They also found that when dividing into academic teams, other students wanted to be in their group, and concepts that were difficult for other students to understand were easy for participants to grasp. Participants typically earned better grades on assignments than their peers and won sought-after peer-selected awards such as "Best Student". Once academic concepts became more challenging, some participants also reflected on teachers that spent extra time with them to help them understand course material. These teachers clearly communicated to participants that they were capable even when they erred and established a growth mindset within participants.

Outside of school, participants' parents further supported their self-identification as academic achievers. Parents were repeatedly cited throughout participant narratives as chief motivators for participants' academic drive. Parents encouraged participants to work hard,



accomplish difficult academic tasks, and persevere in spite of adversity. Not wanting to disappoint their parents, participants heeded their instruction and became focused students and, at times, perfectionists.

Together, the constant messages they received from K-12 teachers, peers, and parents affirmed to participants that they were academic achievers, and as a result, participants adopted this descriptor as a part of their self-concept. Thus, when participants confronted negative stereotypes from their SU peers, instructors, and academic advisors, the self-concept they developed in their formative years served as a protective factor because it shielded them from internalizing negative stereotypes in college. Participants were frustrated by the negative stereotypes others held against them; yet, those stereotypes did not cause participants to question who they were.

**Engineering interest and self-efficacy.** In addition to dealing negative stereotypes, participants were also tasked with facing large, academically intensive introductory level courses, which are a staple in engineering curriculums (Committee on Underrepresented Groups and the Expansion of the Science and Engineering Workforce Pipeline et al., 2011; Sanabria & Penner, 2017; Seymour & Hewitt, 1997). Research has acknowledged that poor performance in these courses leaves students ill-prepared to continue in the major. Hence, these courses “weed out” prospective students that were initially interested in engineering majors (Committee on Underrepresented Groups and the Expansion of the Science and Engineering Workforce Pipeline et al., 2011; Seymour & Hewitt, 1997). Research also suggests that Black undergraduates are especially vulnerable to this “weeding out” system (Kaba, 2013; Maton et al., 2000). Consistent with the literature, the findings illustrate that participants enrolled in challenging “weed out” classes at SU. However, unlike previous

studies (Marra, Rodgers, Shen, & Bogue, 2012; Meyer & Marx, 2014), “weed out” classes were not barriers for participants. Participants’ enrollment in “weed out” classes did not deter participants from completing their major because they had a strong interest and self-efficacy in engineering established by early support of their family (subthemes of access to fiscal resources and built-in communities of college-educated individuals). Therefore, the second early protective factor that I will discuss is participants’ engineering interest and self-efficacy.

All participants entered college with a solid interest and sense of self-efficacy in engineering. Their interest and self-efficacy, which was cultivated by their family support, protected participants from being vulnerable to the “weeding out” system of introductory STEM courses. All participants shared how they enjoyed the problem-solving nature of engineering, were confident in their math and science skills, and visualized themselves working in the field. Moreover, in their narratives, participants referred to themselves not as engineering students, but as engineers. By seeing themselves as engineers already, participants demonstrated their commitment to post-college persistence in STEM. Participants were able to see the “big picture” and were not dismayed by temporary setbacks such as the difficulty of “weed out” classes.

Also regarding engineering interest and self-efficacy, I found it interesting that several participants enrolled in fee-based pre-engineering enrichment programs such as summer camps and NSBE Jr. Although these programs provided participants with experiential learning opportunities, for the most part, participants did not choose engineering because of those experiences. Instead, parents were usually the first people to steer participants’ aspirations towards the engineering profession. Parents noticed participants’

math and science proficiencies and encouraged them to pursue a career in engineering. When participants were exploring colleges, their parents were vocal contributors in the decision-making process. Parents made it clear that engineering was a great major for participants to enroll in, and continually checked in with participants' on their application processes. For example, in his interview, Carter described how his mother made suggestions of future opportunities for him to take advantage of, such as majoring in engineering, and she always followed up with him as deadlines drew near. Likewise, in his interview, Marcos explained how he initially wanted to become a videographer or photographer, until he spoke with his parents about the employability of those fields. These findings are similar to those of Strayhorn (2015) who found that pre-college STEM self-efficacy and concerted cultivation of initial interests in STEM are two factors that influence Black males' preparation for college and their likelihood for success in STEM. Within the interest theme, Strayhorn (2015) expressed that successful Black males participated in informal and formal learning experiences that enhanced their STEM interest. Informal learning experiences included playing with computers, using social media, visiting science museums, and having candid conversations with their parents and guardians about STEM careers. Conversely, formal learning experiences included workshops, summer camps, courses, co-ops, internships, and externships. The current study findings are congruous with Strayhorn (2015) in that participants did highlight self-efficacy and interest in their narratives; however, they also share new information as the participants described how informal learning experiences (i.e., conversations with their parents) had a greater impact on their decisions to pursue engineering majors than formal learning experiences. This new information suggests that

future researchers should further investigate how informal and formal learning experiences shape Black male engineering interests.

In short, participants' parents both inspired and guided participants to academic success in engineering through their positive affirmations and hands-on assistance in planning next steps. Thus, when participants confronted "weed out" classes in college, the engineering interest and self-efficacy they developed in their formative years served as a protective factor because it shielded them from leaving the major due to difficult coursework. At times, participants were challenged by their coursework, but they were also certain that they could be successful in their chosen career path, and leaving the major was not an option for them.

**Family insight.** Outside of negative stereotypes and "weed out" classes, participants also dealt with feeling like the "only one" in their majors. Decades of scholarship document how Black undergraduates are racially underrepresented on PWIs (Strayhorn, 2009; Williamson, 1999). In light of their underrepresentation, previous studies have also found that Black undergraduates experience various forms of racism (Davis et al., 2004; Lo, McCallum, Hughes, Smith, & McKnight, 2017), stereotypes (Nadler & Komarraju, 2016; Smith, Allen, & Danley, 2007), and lack of sense of belonging (Fries-Britt & Turner, 2001; Fries-Britt & Turner, 2002) at PWIs due to their racial affiliation. In engineering majors specifically, McGee & Martin (2011) found that Black undergraduates feel their Blackness is "undervalued and constantly under assault" (p. 1347). Also regarding engineering majors, A.R. Brown et al. (2005) found that Black undergraduates' perceptions of racism and discrimination were associated with their grade point average and graduation rates; that is, those who perceived more racism and discrimination had lower grades and graduated at

slower rates. The current study's findings corroborate the literature in that participants experienced racial underrepresentation (subtheme of heightened visibility and invisibility) and racism (subtheme of encounters with racism) at SU. At the same time, the findings challenge the literature in that participants were able to survive and thrive in racist environments. Insights from participants' families in their formative years provided strategy to help participants deal with race-related challenges (subthemes of family influence and family pressure). Accordingly, the third early protective factor that I will discuss is family insight.

All participants entered college with insight from their families to help them strategically deal with the emotional adversities of underrepresentation and racism. Participants' families communicated frankly with participants about how their race would influence the way others viewed and treated them and, as a result, how participants would need to work harder and achieve more than their White counterparts to obtain the same level of recognition and respect. This family insight protected participants from being naïve of racism and thus blindsided by their racial encounters at SU. Instead, participants were already aware of unfair advantages granted to White people in society (i.e., White privilege). Their thorough understanding of the differences between the White and Black worlds caused participants to be mindful of how racism functioned, which enabled them to make advantageous and racially conscious choices, such as choosing whether or not to react when their White peers ignored them (subtheme of heightened visibility and invisibility) and creating a community of same race-peers (subtheme of support spaces). Therefore, while participants faced race-related challenges revealed in the literature, such as oneliness and racism (Harper et al., 2011; Parker et al., 2016; Smith et al., 2007), to some extent, they

anticipated those challenges. Because they had a forewarning from their families, participants were able to react to race-related challenges in advantageous ways.

**Summary.** This section discussed the first major lesson learned from participant narratives, which was how early protective factors in participants' lived and academic experiences mitigated the impact of the risk factors they encountered in higher education and the workplace. Three early protective factors were identified and explained: academic achiever identity, engineering interest and self-efficacy, and family insight. This study's findings on the importance of early protective factors are similar to McGee and Pearman's 2014 study on mathematically talented Black male secondary students. In their work, the authors identified six protective factors and five risk factors for Black male achievement. Among the protective factors were internal factors, or self-described motivations, and external factors, or resources and supports. The self-described motivations that enabled Black male mathematical success were intrinsic motivation, strategic agency and drive, and internal drive mediated by external influences. Likewise, resources and supports that enabled Black male mathematical success were strong family socialization, community/family supportive education, and early at-home mathematics developments. Like the current study, the findings of McGee and Pearman's study demonstrate how characteristics of students, their families and communities can provide a protective barricade from risk factors that threaten Black male STEM achievement such as fatigue over racial stereotypes.

The study findings on the importance of early protective factors are also similar to findings from Samuelson & Litzler's (2016) study on how students of color employ community cultural wealth to persist in engineering. Community cultural wealth refers to the different forms of capital that are developed in, and nurtured by, families and communities

(Samuelson & Litzler, 2016; Yosso, 2005). There are six different types of community cultural wealth: aspirational, linguistic, familial, social, navigational, and resistant capital. Aspirational capital is the ability to sustain future hopes and dreams despite real or perceived barriers. Linguistic capital refers to intellectual and social skills gained through communication experiences in more than one language or style. Familial capital highlights cultural knowledge nurtured by family. Social capital denotes networks of people and community resources. Navigational capital describes skills to maneuver social institutions; and finally, resistant capital signifies knowledge and skills that challenge inequality. Samuelson & Litzler (2016) found that African American and Latino engineering undergraduates utilized aspirational, familial, navigational, and resistant capitals to persist in their programs. In other words, students brought these cultural resources with them to engineering, which helped them achieve success. Similarly, the participants in the current study also brought cultural resources with them to SU that helped them persist in their engineering majors. Specifically, the participants utilized aspirational and navigational capital, which was illustrated in their academic achiever identities, engineering interest and self-efficacy, and family insight.

Moreover, this first lesson learned demonstrates how influential factors outside of students' locus of control are to their ability to obtain academic success in engineering. Because participants were born into families that were highly educated, financially well off, and information-rich (subthemes of access to fiscal resources and built-in communities of college-educated individuals), participants benefited from several structural advantages that provided access to early protective factors. However, research shows that all students are not as fortunate (Goldrick-Rab, 2006). In particular, Black students are more likely to be first-

generation and low-income (Harvey, 2008; Shapiro, Meschede, & Osoro, 2013). This juxtaposition underscores the need for advanced policies that level the socioeconomic playing field so that marginalized students have a more equitable chance to be successful in engineering. Policies should create access to K-12 programming, such as workshops, camps, and mentorship programs, for first-generation and low-income students of color to support the development of their academic achiever identities and engineering interest and self-efficacy as well as share racial realities with them. By creating avenues for all students to gain aspirational and navigational capital, policymakers would increase students' potential for success in engineering. Participants also directly spoke to the idea of improving policies. For example, in the focus group, when asked what they wished people understood about them, Marcos stated that he wished people understood the systems and structures that helped him be successful. In short, policymakers can take the stories of study participants to inform legislation that benefits first-generation and low-income students in engineering such as providing scholarships for students to attend pre-college programs.

In this section it is also important to offer a caveat for one protective factor, academic achiever identity. While most K-12 environments fostered an academic achiever identity in participants, I would be remiss if I did not also discuss that not all participants had positive relationships with their K-12 teachers. Some participants described having little to no relationship with their teachers outside of basic instruction. On the other hand, other participants even reported negative interactions with their K-12 teachers, such as clashing with their personalities and feeling as though they were being discriminated against racially. Still, participants persisted. These instances demonstrate that unlike parental influence, which was positive for participants, K-12 teacher influence was more complicated. This



finding is also consistent with previous research that has found that teachers can serve as both positive and negative inspirations for Black student success in STEM (Russell & Atwater, 2005). Through in-depth interviews with 11 Black students who were successful in high school science and mathematics programs, and subsequently persisted in the college science pipeline at a PW, Russell & Atwater (2005) discovered four major themes, two of which were parental influence, and teacher influence. Parental influence referred to the high expectations of parents and/or grandparents that stressed education. Remarkably, all participants recounted the clear expectation their family members had for them to attend college. Comparably, teacher influence acknowledged both the encouragement and motivation to succeed most participants received from teachers, as well as the desire others had to succeed in spite of teachers that did not believe in them. Thus, K-12 teachers who aspire to increase the number of Black males pursuing engineering should be mindful of how they interact with this population at the secondary level. K-12 teachers should encourage Black male students to see themselves as academic achievers and provide technical assistance when needed to establish a strong educational foundation. However, both the literature and participant narratives demonstrate that this practice does not always happen. From a CRT perspective, the lack of encouragement and assistance provided to Black male students by their K-12 teachers is a by-product of the dominant narrative that suggests that Black males do not care about education (Harper & Davis, 2012). Still, the current study found that students who do not receive this type of support from their K-12 teachers can also achieve great success, demonstrating academic resiliency.

## **Lesson 2: The Practice of Othering in Engineering Classrooms and Workspaces**

In examining the findings holistically, the second major lesson learned from participant narratives is how ‘others’ are silenced in engineering classrooms and workspaces. Here, I am using the term ‘others’ to refer to individuals who are not a part of the majority population. The literature describes othering as a marginalization process in which dominant groups label individuals thought to be different from them and constructs their own identities in relation to these individuals (Johnson et al., 2004; Weis, 1995). Although sometimes unintentional, othering can reinforce and reproduce positions of privilege and oppression, leaving persons who are othered (i.e., ‘others’) with decreased opportunities and inclusion (Fine, 1994; Johnson et al., 2004). Research shows that in engineering classrooms and workplaces, there are two ‘others’ or groups that are historically minoritized: underrepresented racial and ethnic minorities and women (National Science Foundation, 2013). Much is known about how these two minoritized groups experience lack of belonging in the engineering field (McGee & Martin, 2011; Moore, Madison-Colmore, & Smith, 2003; Rincón & George-Jackson, 2016; Smith & Gayles, 2018). For example, in a case study of 10 women engineering seniors nearing graduation, Smith and Gayles (2018) found that women engineers experience bias in both academic and workplace settings. In academia, all women reported differential treatment in their courses and group projects compared to their male peers. Moreover, the women also felt like “their female identity was even rarer in the workplace”(p. 11), and reported frequent instances of implicit bias, sexism, and sexual harassment. Additionally, in exploring the experiences of Black undergraduates, McGee & Martin (2011) found that “engineering classrooms were breeding grounds for stereotypes” (p.1353). As discussed in the first lesson, McGee & Martin (2011) and Moore, Madison-

Colmore, & Smith (2003) all found that pervasive negative racial stereotypes within academic settings created hostile climates for Black engineering undergraduates.

Concurrent with the literature, participant narratives illustrate the detrimental effect othering had on both of these minoritized groups. In essence, their voices were silenced; the participants described how their contributions and the contributions of their female peers were overlooked and ignored by their White male peers (subthemes of heightened visibility and invisibility and gendered expectations). However, participant narratives also explore how one minoritized group (i.e., Black males) can further marginalize another minoritized group (i.e., women) (subtheme of gendered expectations). I will now discuss how this finding extends what we already know about othering.

As the literature confirms, teamwork is the cornerstone of engineering practice (Brunhaver, Korte, Barley, & Sheppard, Forthcoming; Hirshfield & Koretsky, 2017). Starting in the classroom, engineers are expected to work together to address grand challenges and innovate existing solutions (Joshi, 2014). As they participated in team projects, participants felt they were listened to more often than their female classmates – a phenomenon that is well documented in male-dominated environments such as engineering (Joshi, 2014; Smith and Gayles; 2018). In addition, their gender identity allowed participants to bond with their White male peers in extracurricular activities. Moreover, in research labs and industrial environments participants benefited from sexist attitudes towards women. In other words, while they still experienced challenges because of their race, participants were able to connect with their male peers on a level different from their female peers because of their gender privilege. What this suggests is that gender is an unrecognized privilege that

enables high-achieving Black males to achieve in ways that their Black female peers are not able to.

Additionally, although they did not explicitly state it, class privilege may have also played a role in how participants connected with their White male peers. Most participants came from middle-class families, so they shared similar lived experiences with their White male peers who were also middle class, such as international travel, private school education, and participating in fee-based extracurricular programs. These shared experiences may have made it easier for participants to bond with White males in a way that may have been more difficult for first-generation or low-income Black males. Thus, class privilege may have also enabled this subpopulation of high-achieving Black males to achieve in ways that their first-generation and low-income Black male peers are not able to.

### **Theoretical Implications**

In addition to the two major lessons learned, participant narratives also provide important theoretical implications for the two theoretical frameworks that were employed throughout this study: Critical Race Theory (CRT) and the anti-deficit achievement framework for students of color in STEM (ADAF). Both theoretical frameworks were essential to the study design; constructs from each theoretical framework were used to develop data collection protocols (see Tables 3.2 and 3.3), analyze data through a priori coding (see Appendix A), and reflect on study findings (see Table 6.1). In Chapter 2, I described the theoretical literature. In this section, I will explain how participant narratives add further support for CRT and the ADAF.

### **Critical Race Theory (CRT)**

This research was framed using Critical Race Theory (CRT) as its overarching theoretical lens. CRT seeks to uncover and disrupt racism (Delgado & Stefancic, 2012). Utilizing CRT as the primary theoretical perspective for this study enabled me to analyze the particularities of systematic privilege and oppression, such as how racism and sexism manifest in daily interactions. CRT drew my attention to the use of power in engineering classrooms and workspaces. Through CRT, I was able to see how my participants negotiated their dominant and subordinate identities, exerting power in some instances (subthemes gendered expectations and social maneuvering), while still remaining powerless in others (subthemes of heightened visibility and invisibility and encounters with racism). After mapping the study findings to CRT, it is clear that three out of the five tenets of CRT were present in participant narratives: racial realism, differential racialization, and intersectionality. Racial realism identifies the omnipresence of racism in American history, norms, traditions, practices, and policies (Delgado & Stefancic, 2012). Contrarily, differential racialization explains how race is socially constructed and can change depending on context (Delgado & Stefancic, 2012). Likewise, intersectionality describes how identities can intersect and overlap, causing multilayered experiences with privilege and oppression (Delgado & Stefancic, 2012). Moreover, the act of participants sharing their experiences, via the online demographic survey, online narrative exercise, individual interviews, and focus group, was a form of counterstorytelling, which is another tenet of CRT. The only CRT tenet not directly mapped to this study was interest convergence, which proposes that advances for racial justice will only be successful when they align with White interests (Delgado & Stefancic, 2012).

From a CRT perspective, participants' narratives tell a dynamic story of privilege and oppression. It is true that study participants received privileges because of their socioeconomic class and gender (the theme of *"I was extremely privileged"*). While these privileges indeed shaped the lived experiences and academic success of participants, I would be remiss to not offer a caveat: these privileges did not exist in a bubble. Although the participants reported having relatively privileged socioeconomic backgrounds and gender, they also indicated that as they actually sought to navigate the environment of the PWI, that "privileged" identity intersected with other, more marginalized identities – a phenomenon that is illuminated by the CRT construct intersectionality. In other words, these privileges operated within the CRT construct racial realism, which indicated that participants were still vulnerable to experiencing racism because of their subordinate racial identity (i.e., identifying as Black). Thus, in exploring the research question (i.e., How does Black male intersectionality shape the lived experiences and academic success of high-achieving Black male undergraduates in engineering majors at a PWI?) the construct of racial realism emerged heavily in the themes of *"I was basically in two different worlds"* and *"It's a lot of pressure from a lot of different areas"*.

While telling their counterstories of academic achievement, the CRT constructs of racial realism and differential racialization repeatedly appeared throughout participants' K-12 and college experiences. That is to say, participants described a well-defined awareness of racism and of the different ways that race is socially constructed. For example, both racial realism and differential racialization were particularly striking when participants described their worldview. All eight participants recognized that they were afforded unearned benefits (i.e., privileges) because of their gender; however, their subordinate racial status still

significantly affected their worldview. Out of all the participants, Saadiq described this occurrence the clearest. In his interview, Saadiq succinctly explained the distinctive interplay of experiencing gender privilege within a racial context as still seeing the world as open to him, but more open because of his gender identity as male than his racial identity as Black. Later, the focus group, Saadiq elaborated on this point stating that being Black is a more significant trait for him in engineering because it is an underrepresented identity; most engineers he knows are male. Essentially, Saadiq was describing how he made meaning of his targeted and dominant identities. His understanding is aligned with Tatum's (2000) reflection in *The Complexity of Identity: "Who Am I"*. In her book, Tatum (2000) describes how individuals' dominant identities, or those that are systematically advantaged by the society because of group membership, are rarely examined while their targeted identities, or those that are systematically disadvantaged, hold our attention.

Racial realism and differential racialization also informed how participants identified themselves. For seven of the eight participants, the intersection of identifying as both Black and male (i.e., being a Black male) was a salient aspect of their identity. Lamar illustrated this concept when he described how being a Black man is profoundly different from being a man of any other race. Marcos was the only participant who expressed that being a Black man was not a salient part of his identity, but rather, being a Black person. Marcos also had a sharp consciousness of how race and racism operated in American society, which may have been due to his international upbringing. This analysis demonstrates the major benefit added from using this CRT – the study how of identities can overlap and create new experiences. The participants' narratives are telling because they underscore the idea that identity is not additive but multiplicative. Also, aligned with the CRT construct intersectionality, the

participants' narratives demonstrate that Black male intersectionality is fluid and context-dependent.

### **Anti-deficit Achievement Framework for Studying Students of Color in STEM (ADAF)**

In addition to CRT, this research was also framed using the anti-deficit achievement framework for students of color in STEM (ADAF) as its complimentary theoretical lens. The ADAF examines the success of students of color in STEM at three specific time points: pre-college, during college, and post-college (Harper, 2010). These junctures are labeled as pre-college socialization and readiness, college achievement, and post-college persistence in STEM, respectively (Harper, 2010). Within each juncture, there are three researchable dimensions of achievement. For pre-college socialization and readiness, the researchable dimensions of achievement are familial factors, K-12 school forces, and out-of-school college prep experiences (Harper, 2010). Next, for college achievement, the researchable dimensions of achievement are classroom interactions, out-of-class engagement, and experiential/external opportunities (Harper, 2010). Finally, for post-college persistence in STEM, the researchable dimensions of achievement are industry careers, graduate school enrollment, and research careers (Harper, 2010). Employing the ADAF as the secondary theoretical perspective for this study enabled me to examine the participants' chronological path to academic success in engineering. The ADAF prompted me to consider how participants developed their identities over time and what factors throughout their journey led to their academic success. By focusing on three discrete segments in time via the ADAF, I was able to identify significant events and turning points in participants' narratives. After mapping the study findings to the ADAF, it is evident that all three of the junctures were present in participant narratives. Not surprisingly, participants shared a great deal about their



past (i.e., pre-college socialization and readiness) and current endeavors (i.e., college achievement). This pattern was expected as most of the data collection strategies asked participants to share about their background or life at SU. What was surprising, however, was participants' discussion of their future (i.e., post-college persistence in STEM). In their narratives, participants did not refer to themselves as engineering students; instead they called themselves engineers. Participants act of owning the title of "engineer" prior to graduation demonstrated participants' confidence and commitment to their future in the field.

A closer examination of the narratives revealed that pre-college socialization and readiness played a major role in developing the participants' counterstories of academic achievement. In other words, participants' stories often engaged the pre-college juncture of the ADAF. In particular, participants described how familial factors such as highly involved and vocal parents and K-12 school forces such as encouraging and diligent teachers were especially influential in forming their identity as an academic achiever. The impetus for the most of participant's familial factors and K-12 school forces was rooted in systems of privilege. More specifically, participants benefited from their middle-class upbringing. For example, they were born into financially stable, middle-class families with access to resources. The subtheme of class privilege is particularly interesting because participants voluntarily shared stories of class privilege without prompting. I did not expect this pattern because the literature advises that dominant identities often go unexamined (Tatum, 2000). More specifically, the literature also advises that college students can be resistant to exploring their class privilege (Gilbert, 2008). By contrast to Tatum and Gilbert's assertion, the participants were very mindful of their class privilege and how it shaped their academic success. The common thread through each of these stories was familial factors; in other

words, participants' class privileges were a direct result of their family's educational background, socioeconomic status, and knowledge of pre-college programs.

### **Recommendations for Stakeholders**

The current study was situated within the transformative paradigm, in which I positioned myself alongside study participants in a unified effort to catalyze social transformation (Mertens, 2014). Thus, a key aspect of this study is to inspire action and change. There are three broad audiences that can use participants' narratives as a tool to help them improve their work: (1) Black male students that are interested in engineering majors and their parents, (2) higher education professors and administrators, and (3) educational researchers. I will now describe specific recommendations for each stakeholder group.

#### **Recommendations for Students and Parents**

CRT advises us to examine how systems and policies structurally disadvantage students. Therefore the focus of my discussion places the onus on K-12 and higher education systems and policies to create advantageous conditions for Black male engineering students. However, participants offered several recommendations for future Black male students who endeavor to study engineering at the college level. Here I am defining the term student broadly, including Black male students in K-12 and college settings that aspire to study engineering. Therefore, to honor participant voices I will highlight their recommendations for students. Students also have limited agency outside of their parents, so parents can learn from these recommendations as well.

Participant recommendations for students fell under the umbrella term of non-cognitive factors, a concept that has repeatedly been documented in studies on high-achieving Black undergraduates (Griffin, 2006; Strayhorn, 2009). Participants agreed that

their success in engineering was not only a measure of their math and science competence but also a measure of their competence in skills and attributes outside of what is typically measured in cognitive or achievement tests (Camfield, 2015; Khine & Areepattamannil, 2016). Specifically, participants discussed their abilities to work hard, be persistent in the face of challenges, and collaborate with others as instrumental in their success. When asked what advice they would give a Black male engineering major who is just starting their journey, participants' responses mirrored the idiom "no man is an island." In other words, participants suggested that prospective students be intentional about who they choose to connect with and realize the powerful effect of their peers on their future success. Further, participants also described the importance of joining communities of support or existing networks of like-minded individuals. What is noteworthy about this recommendation is that participants emphasized the point that communities of support "don't necessarily have to be Black" (Lamar, Interview). For example, in his interview, Isaiah encouraged Black male engineering majors who are just starting their journey to connect with MEP while also connecting with other cultures. This idea of being connected with your own culture while still experiencing other cultures is a major implication of the study. As mentioned in the findings, the participants navigated the racial realities of both the White and Black worlds. While they varied in how close they felt to the Black community, all participants recognized the importance of developing both intraracial (i.e., Black) and interracial (i.e., Black-White) partnerships. It is important to note that the depth of these partnerships varied by participants. Some participants, like Marcos, Jermaine, and Saadiq, had long and rich friendships with both Black and White people. Other participants, such as Isaiah and Lamar, had more time-bound, results-driven relationships with White people; for example, since

White people made up the majority of their engineering classes, participants welcomed interracial work groups as opposed to only working with other Black people. Nonetheless, each partnership served a different need to help participants obtain success. For most participants, their Black partnerships represented their comfort zone; Black peers provided emotional support to help participants combat feelings of loneliness and race-related discrimination. On the other hand, their Black-White partnerships represented, in many ways, strategy; White peers had racial privilege and partnering with them enhanced participants' social capital. What prospective Black male students can learn from participants is how to "keep your mind open" (Isaiah, Interview), and strategically align oneself with a racially diverse cadre of acquaintances for future benefit.

In sum, the narratives provided reinforce the connection between social interactions and academic success. It was their relationships with others that propelled participants towards academic excellence. When asked what could make them more successful, participants discussed networking at length. Although they had supportive professional relationships, participants recognized that they could never have too many contacts in their network. As such, participants looked forward to meeting new people as a means of further enhancing their success.

### **Recommendations for Higher Education**

Participant narratives also highlight several major recommendations for college faculty and administrators who desire to augment how they recruit, retain, and graduate Black males in engineering. To begin, the participants' narratives reiterate previous work on the multifaceted integration challenges Black students face in predominantly White college campuses at large, such as racism (Davis et al., 2004; Harwood et al., 2012; Swim et al.,

2003), stereotypes (Fischer, 2010; Nadler & Komarraju, 2016), and lack of sense of belonging (Cuyjet, 2006; Harper et al., 2011; Evans & Bonner, 2004). Racism, in particular, caused participants to feel a range of emotions including anger, hurt, and fear. Participants often felt like they could not respond to racism like they wanted for fear of retaliation or even death. As such, participants mainly accommodated racist behaviors by viewing them as a small roadblock in their larger life plan. Isaiah best illustrated this when he described how he brushed off when White peers ignored him. University administration tend to shy away from calling institutional practices racist (Harper, 2012), however, participant narratives demonstrate that racism is alive and well on our predominantly white college campuses. Further, racist behaviors were not only perpetuated by peers but also student support services staff, indicating a pervasive ignorance. Although CRT advises that racism is permanent aspect of American society (Delgado & Stefancic, 2000; Delgado & Stefancic, 2012), universities can and should intervene by creating more inclusive campus environments. Higher education professionals can use participant narratives to develop anti-racist trainings for their faculty, staff, and students. Individuals at all levels should be made aware of how they contribute to racism, and how they can actively work against the niggering of Black males (Harper, 2009a).

Moreover, participant narratives extend what we know about the importance of counter spaces for Black undergraduates at PWIs (Grier-Reed, 2010; Solórzano, Ceja, & Yosso, 2000). When discussing the significance of the Black world in their lives, participants articulated a need for support spaces and the importance of both lifting and climbing. Participant narratives enlighten higher education administrators on how Black male undergraduates develop community and aspire to establish a pipeline to help other Black

males succeed. Thus, universities can respond by creating more support spaces for Black males to gather and build relationships amongst each other.

Finally, participant narratives underscore how different services are necessary for this population. Participants continuously emphasized how their university's current academic and student affairs structure is not reflective of their intersectional needs. For example, Anthony, a student-athlete, reported that he has hardly ever had the opportunity to participate in any on-campus support programs or receive any assistance from university administrators. He suggested improved support services for students who want to pursue challenging majors and college sports. Similarly, Isaiah, a pre-med student, described how the university's current program for students interested in pre-health careers does not cater to the needs of minorities. He recommended that administrators use the minority engineering program (MEP) as a model to create a similar counter space for minority pre-med students. Moreover, although participants were high-achieving students, they still acknowledged where they had room to grow. Specifically, money management and networking were two areas most participants discussed wanting to learn more about to enhance their professional success in engineering. Unfortunately, participants were not privy to on-campus resources that would facilitate their development in these areas. What is fascinating here is that participants had the tools to get them to and through college; however, money management and networking are two skills necessary for their career after college. Participants' lack of development in these areas demonstrates that higher education administrators should expand their efforts to connect students with soft, employability, and life skills pertinent to the engineering industry. Universities should create pipeline mentorship programs to help Black males students successfully make the transition from student to professional. Additionally,

the emotional stress that participants felt at the intersections of their identities (theme of *It's a lot of pressure*) presents a significant opportunity for engaging mental health awareness and strategies. Their immense mental anguish coupled with the literature that affirms how Black males are not likely to seek help (Duncan, 2003) indicates that enhanced counseling services could help support the development of high-achieving Black males in engineering majors. Simply put, university faculty and administrators should consider the intersections of student's identities when creating and marketing programming efforts. Including students in the decision-making process can also ensure that diverse populations are adequately served.

### **Recommendations for Future Research**

This study points to three main areas of future investigation: the Black middle class, gender privilege among Black males, and more intersectional approaches in engineering education. Previous research has found that the Black middle class is an understudied population in the social sciences (Pattillo, 2013). While participant narratives offer a glimpse into this population, more information is needed in order to fully understand how class privilege and racial oppression coexist. For example, participants were forthright about their class privilege; however, they did not share how they developed this mature understanding of their class privilege. Did their parents, family members, or mentors communicate this to them? Did they have a pivotal moment in their K-12 experience or did they gain this language after participating in social justice programming while in college? As researchers study this phenomenon, I would be interested to know the process of how Black people come to understand their class privilege. Moreover, in what instances, in any, does class privilege limit or enhance relationships between low and high-income Black students? For instance, in their investigation of the National Longitudinal Study of Adolescent Health, Cherng,

Calarco, and Kao (2013) found that having resource-rich best friends impacts adolescents' college completion. Does the same hold true for Black students or does Black achiever isolation (Fries-Britt, 1998) prevent this occurrence? Further, does a middle class upbringing influence the racial salience of high-income Blacks? Such questions evoke the necessity for future research studies.

Additionally, this study continues the important dialogue on gender privilege among Black males. As cited by previous scholars, much remains unknown about the intersectional experiences of Black males (Bowleg, Teti, Malebranche, & Tschann, 2013; Rogers, Sperry, & Levant, 2015). Gender privilege, in particular, is an area we do not fully understand as it relates to this population. While the current study added to the literature base, there is still much to uncover. As such, researchers who strive to advance this line of inquiry should consider the following questions to further problematize this issue. When and how do Black males discover their gender privilege? In what instances is gender privilege apparent in Black or minority spaces? Why do Black men feel the need or desire to mansplain? Furthermore, how can Black males actively exercise their privilege to make space for Black females?

Finally, the study findings raised several questions that I was unable to answer, and thus I offer for future researchers to consider. While conceptually it makes sense that Black and White male engineering students would bond on the basis of their gender or social class, I did not find this idea represented in the literature. Likewise, it also conceptually makes sense that Black male engineering students would benefit from sexist attitudes and environments in engineering given our understanding of gender privilege; however, I did not find this idea represented in the literature either. Thus, after examining participant narratives



and the lack of research in this area, I began to wonder: What other ways do Black engineering students and professionals leverage their privilege or community cultural wealth to navigate hegemonic environments? Is there a cost associated with privilege for racially minoritized groups – for example, do Black engineering students and professionals with privilege miss out on opportunities, resources, and, support afforded to their less-privileged Black peers? Further, how do Black engineering students and professionals with less privilege and community cultural wealth than the current study’s participants navigate hegemonic environments? Taking into account what we have learned from participant narratives, scholars may use these questions as a springboard for future intersectional studies on Blacks in engineering education and industry. I think it is particularly important for future researchers to problematize what benefit means in this context. It is true that participants benefited from gender privilege; however, the overall environment was still hostile for Black males. Even with their class and gender privileges, the participants were still severely underrepresented in engineering.

### **Limitations**

All research studies have limitations that should be considered examining their credibility and trustworthiness (Whittemore, Chase, & Mandle, 2001). One main limitation should be considered when examining the current study: I am an outsider to the study population in many ways. Although the participants and I shared a racial identity and, like the participants, I have also been identified as a high-achieving student as defined by my cumulative GPA, I am not a male nor am I an engineer. Furthermore, I come from a starkly different socioeconomic background as I am a first-generation college student who grew up low-income and working class family, and most participants had college-educated parents

and came from very affluent upbringings. My identity as a female, a non-engineer, a first-generation college student, and low-income, working class individual, may have presented a barrier for participants to feel comfortable sharing stories with me. While I intentionally developed a rapport with my participants as an effort to minimize this limitation, the presence of a Black male engineer as the researcher, for example, may have made the participants feel more comfortable simply on the basis of them sharing both a racial and gender identity. The same is true for a researcher who was also an engineer or came from a similar socioeconomic background as the study participants. Additionally, my gender identity as a female specifically may have also influenced participants to share more or less about their interactions with Black female students. As an effort to maintain trustworthiness, I employed four validation strategies in this study: (1) triangulation, (2) clarifying researcher bias, (3) member checking, and (4) rich, thick descriptions, all of which were described at length in Chapter 3.

Outside of limitations associated with me as the researcher, my data collection strategies also presented limitations. When compiling data from the demographic survey, narrative exercise, interviews, and focus group to restory participant narratives, I noticed that participants often told their stories in incomplete ways. This caused me to request additional information from the participants via the Tracked Changes and Comments functionalities in Microsoft Word as I sent them versions of their restoried narratives. While member checking was helpful, I believe it would have also been effective to restructure interviews in a manner to highlight and fill gaps in participant narratives in real time. In tandem, I noticed that some participants were naturally talkative and openly verbalized their stories in both their individual interviews and the focus group. Other participants were more vocally

reserved and required additional probing to share the level of detail that narrative inquiry requires. For the more reserved participants, I believe adding another individual in-person interview as a data collection strategy would have allowed them adequate time and space to develop rapport with me and become comfortable verbalizing their stories. Increased comfort could have increased the number of stories they chose to share and enriched the details they decided to provide. If I could redo the study, I would add a second in-person interview before the focus group to reflect and elaborate on participant narratives.

A final limitation that I would like bring to the forefront is participant demographics. All participants in the study came from privileged backgrounds; however, this was not in the initial study design. Thus, the themes and subthemes that were meaningful to study participants may not hold true among high-achieving Black male undergraduates in engineering majors who identify as first generation or low income. I think it would be worthwhile to conduct the same study among high-achieving Black male undergraduates in engineering majors with diverse socioeconomic backgrounds.

### **Conclusion**

The current study explored how Black male intersectionality shaped the lived experiences and academic success of eight high-achieving Black male undergraduates in engineering majors at a PWI. In spite of the dominant narrative that frames Black males as low academic performers, particularly in STEM disciplines of study, the study participants illustrated an alternative reality. Not only did they demonstrate stellar cognitive abilities defined their 3.0 or higher GPA, but they also described immense non-cognitive abilities that contributed to their success. Their counterstories of academic achievement provide an astute account of how racial oppression and gender and class privilege converged in their lives.

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**APPENDICES**

### Appendix A: Codebook Excerpt

How CRT and the ADAF informed a priori codes

Primary Code	Secondary Code	Description	Raw Data Example
<i>Racial Realism (CRT construct)</i>	<i>Participants describe how racism is a commonplace experience for them.</i>		
	Racial realism - covert racism	Participants describe experiencing covert racism, such as microaggressions, lack of Black student representation, Whiteness of university spaces, White denial (i.e., racism doesn't exist on campus), staff members placing obstacles in a student's way because of race, or feeling invisible, ignored, or unwanted on campus because of race.	"Basically, sometimes, when you're the one of the couple, whatever, females, Black, whatever marginalized group it is, people treat you as the spokesperson for that group. So, someone came to me and they were like, "What can I do to help Black people, basically, in engineering?" And I'm like, "Well, first of all, I know you, so I know you have good intentions, but, don't be the Savior" (Marcos, Interview).

Primary Code	Secondary Code	Description	Raw Data Example
<i>College achievement</i>  ( <i>ADAF construct</i> )	<i>Participants describe factors, forces, and experiences that influenced their academic achievement and STEM interests in college.</i>		
	College achievement - classroom interactions	Participants describe how they navigate college classrooms to achieve academic success.	"I think one of the things that made me successful in my major, and I remember it ever since I took statics, was stay[ing] organized. I literally [was] just like, "Oh, okay," then the more I thought about it, "Oh my gosh, stay organized, time management!," was [the] best way to do, to achieve things. Pretty much, it helped in a lot of my classes, a lot of my clubs. Also being an RA too, just manag[ing] my time and understanding what's ahead of me" (Carter, Interview).

**Appendix B: Promotional Flyer****INVESTIGATING BLACK MALE INTERSECTIONALITY:**

Counternarratives of High-Achieving Black Male  
Engineering Undergraduates at a PWI

*Participate in this study and earn a \$25 Amazon eGift Card*

**Eligibility**

- Identify as a Black male
- Be a junior or senior undergraduate
- Be enrolled in an engineering major at [Southeastern University]
- Have at least a 3.0 cumulative GPA

**Study Components**

- Online demographic survey
- Online autobiography exercise
- In-person interview
- In-person focus group

*To participate visit*

*<http://go.ncsu.edu/BlackMaleStudy>*

Questions? Please email Callie C. Womble at [ccwomble@ncsu.edu](mailto:ccwomble@ncsu.edu)

### Appendix C: Online Demographic Survey Instrument

Please respond to the following questions about your background.

Name \*

Email Address \*

A pseudonym, or fictitious name, will be used to ensure that your data is anonymous. In the case that one is taken, please indicate two pseudonyms you would like to use. If you do not select a pseudonym one will be selected for you.

Gender \*

Race \*

Age \*

Hometown (i.e., city, state, country of origin) \*

College/University \*

Major(s)\*

Minor(s)

Undergraduate Classification \*

Freshman

Sophomore

Junior

Senior

GPA (on a 4.0 scale) \*

Are you affiliated with any of the following scholar programs (please check all that apply):\*

- [List of Southeastern University-sponsored scholar programs]
- Coca Cola Scholars Program
- Gates Millennium Scholars Program
- Other (Please describe) \_\_\_\_\_
- N/A

Enrollment Status \*

Full-Time Student

Part-Time Student

Do you work? \*

Yes

No

If you work, what do you do?

If you work, how many hours/week do you work?

Please describe your family structure \*

Married-couple or two-parent family

Guardian(s) (i.e., grandparents, foster parents)

Family with female head of household, no spouse present

Family with male head of household, no spouse present

Other (Please describe) :

What is the highest educational attainment of your mother, female guardian, or female head of household? \*

Professional degree (e.g., M.D., D.D.S., J.D., D.V.M.)

Doctoral degree (e.g., Ph.D., Ed.D.)

Master's degree

Bachelor's degree (4-year degree)

Associate's degree (2-year degree)

Some College

High School diploma or GED

no diploma or degree

I don't know

I do not have a mother, female guardian, or female head of household

What is your mother's, female guardian's, or female head of household's occupation? (If you are unaware of their occupation please type "I don't know" If you do not have a mother, female guardian, or female head of household please type "N/A") \*

What is the highest educational attainment of your father, male guardian, or male head of household? \*

Professional degree (e.g., M.D., D.D.S., J.D., D.V.M.)

Doctoral degree (e.g., Ph.D., Ed.D.)

Master's degree

Bachelor's degree (4-year degree)

Associate's degree (2-year degree)

Some College

High School diploma or GED

no diploma or degree

I don't know

I do not have a father, male guardian, or male head of household

What is your father's, male guardian's, or male head of household's occupation? (If you are unaware of their occupation please type "I don't know" If you do not have a father, male guardian, or male head of household, please type "N/A") \*

How would you describe your socioeconomic status growing up? \*

Low-class

Working class

Mid-class

Wealthy/Affluent

\* Required

### Appendix D: Online Narrative Exercise

Adapted from an exercise developed by Beverly Daniel Tatum, Ph.D.

Please respond to the following prompts with the words that first pop into your head after reading them. Some responses may be longer than others. If you are not clear what a prompt means, make your best guess.

Please complete following seven statements with detail.

Pseudonym \*

---

I am from (physical places from your early years) \*

---

---

---

I am from (foods eaten by your family of origin) \*

---

---

---



I am from (people who shaped your personality & character) \*

---

---

---

I am from (family sayings) \*

---

---

---

I am (the words you use to describe yourself) \*

---

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## Appendix E: Semi-Structured In-Person Interview Protocol

Participant's Pseudonym: \_\_\_\_\_ Place: \_\_\_\_\_  
 Researcher/Interviewer: Callie C. Womble Scheduled Time: \_\_\_\_\_  
 Date: \_\_\_\_\_ Start time: \_\_\_\_\_ End time: \_\_\_\_\_

Researcher: *Thank you for taking the time to meet with me! As you know, the purpose of this research study is to understand how being both Black and male shapes the lived experiences and academic success of high-achieving Black male undergraduates in engineering majors at a predominantly white institution (PWI). Here, "High-achieving" will be defined as having earned a cumulative grade point average (GPA) at or above 3.0.*

*Throughout the interview I will ask you questions about your experiences. I may ask you to elaborate or clarify answers or statements. Please feel free to ask me for clarification at any point during the interview if questions are unclear.*

*I would like to start by getting to know you a little better.*

### Opening Background Questions

1. Please tell me a little about yourself.

This first question and accompanying probes are designed to develop rapport and encourage "thinking narratively" (Clandinin & Connelly, 2000, p. 21).

- *Probe: Tell me about your life growing up.*
- *Probe: You completed an autobiography exercise. Here is a print out of your exercise.*
  - *Tell me more about the physical places from your early years*
  - *Tell me more about the foods eaten by your family of origin*
  - *Tell me more about the people who shaped your personality & character*
  - *Tell me more about your family sayings*
  - *Tell me more about how you describe yourself*
  - *Tell me more about how your close family and friends describe you*
  - *Tell me about who you hope to become in five years*

2. When did you know you were academically successful or a high-achieving student?  
 PRE-COLLEGE SOCIALIZATION AND READINESS; ANTI-DEFICIT  
 ACHIEVEMENT FRAMEWORK FOR STUDYING STUDENTS OF COLOR IN  
 STEM

- *Probe: Can you recall a specific instance in which you realized you were academically successful or high-achieving? Tell me about that experience.*
- *Probe: Did your parents or other family members shape your understanding of what it meant to be academically successful? FAMILIAL FACTORS*
- *Probe: What did your parents or other family members communicate to you about academics? FAMILIAL FACTORS*

3. How did you become interested in engineering?  
 PRE-COLLEGE SOCIALIZATION AND READINESS; ANTI-DEFICIT  
 ACHIEVEMENT FRAMEWORK FOR STUDYING STUDENTS OF COLOR IN  
 STEM
- *Probe: Did certain K-12 teachers inspire your engineering interest? K-12 SCHOOL FORCES*
  - *Probe: Did your parents or other family members nurture your engineering interest? FAMILIAL FACTORS*
  - *Probe: Did you participate in any out-of-school activities that cultivated your engineering interest? OUT-OF-SCHOOL COLLEGE PREP EXPERIENCES*
  - *Probe: Now that you are an engineering major, what has been your most memorable experience as an engineering major at [Southeast University]?*

### Lived Experiences Questions

4. Now I would like to learn a little more about your perspective. What does being a Black male mean to you? How did you come to this understanding?  
 INTERSECTIONALITY – CRITICAL RACE THEORY
5. In your opinion, how does being a Black male shape how you see the world?  
 INTERSECTIONALITY – CRITICAL RACE THEORY
- *Probe: Have you experienced racism? Tell me about that experience.*
  - *Probe: Tell me about a time when you felt invalidated, disrespected, or discriminated because your race?*
6. How does being a Black male shape your experience in your major here at [Southeastern University]? INTERSECTIONALITY – CRITICAL RACE THEORY
- *Probe: Have you ever been treated differently than other students because of your race or gender? Tell me about that experience.*
7. Fill in the blank, being a Black male engineering major at [Southeastern University] is like \_\_\_\_\_. INTERSECTIONALITY – CRITICAL RACE THEORY

### Academic Success Questions

8. Now I would like to talk about academic success in college. Here I am defining academic success as earning a 3.0 or higher cumulative GPA. You have been identified as someone who has achieved academic success in your major. What has helped you be successful in your major?  
 COLLEGE ACHIEVEMENT – ANTI-DEFICIT ACHIEVEMENT FRAMEWORK  
 FOR STUDYING STUDENTS OF COLOR IN STEM
- *Probe: What individual behaviors have helped you be successful?*
  - *Probe: What programs on campus have helped you be successful?*
  - *Probe: What people on campus have helped you be successful?*
  - *Probe: What policies on campus have helped you be successful?*
  - *Probe: What factors outside of the university have helped you be successful?*

9. What could make you more successful?  
 COLLEGE ACHIEVEMENT – ANTI-DEFICIT ACHIEVEMENT FRAMEWORK  
 FOR STUDYING STUDENTS OF COLOR IN STEM
- *Probe: What would you do differently if you started as a freshman, again?*
  - *Probe: What programs do you wish were on campus?*
  - *Probe: What policies do you wish were on campus?*
  - *Probe: What advice would you give to another Black male engineering major just starting his journey?*

### Closing Questions

10. We are nearing the end of our time together. I would like to ask a few concluding questions. As you think back over your time at [Southeastern University], how has your race and gender affected your undergraduate studies?  
 INTERSECTIONALITY – CRITICAL RACE THEORY

11. What are your future plans?  
 POST-COLLEGE PERSISTENCE IN STEM - ANTI-DEFICIT ACHIEVEMENT  
 FRAMEWORK FOR STUDYING STUDENTS OF COLOR IN STEM
- *Probe: Do you plan to pursue a career in industry?*
  - *Probe: Do you plan to attend graduate school?*
  - *Probe: Do you plan to pursue a career in research?*

12. What else would you like to mention that hasn't been covered?  
 This final question will allow participants to conclude their narratives.

*Thank you so much for taking the time to share your story! I truly appreciate it!*

The following are additional probes that will be employed as suggested by Bogdan and Biklen (2003):

- *What do you mean?*
- *I am not sure that I am following you.*
- *Would you explain that?*
- *What did you say then?*
- *What were you thinking at that time?*
- *Give me an example.*
- *Tell me about it.*
- *Take me through the experience.*

## Appendix F: Semi-Structured In-Person Focus Group Protocol

Place: \_\_\_\_\_

Researcher/Interviewer: Callie C. Womble

Scheduled Time: \_\_\_\_\_

Date: \_\_\_\_\_

Start time: \_\_\_\_\_ End time: \_\_\_\_\_

### Focus Group Attendees

Participant Pseudonym	Major	Classification
<i>Example: John Doe</i>	<i>Electrical Engineering</i>	<i>Junior</i>
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		

Researcher: *Thank you for taking the time to participate in this focus group! As you know, the purpose of this research study is to understand how being both Black and male shapes the lived experiences and academic success of high-achieving Black male undergraduates in engineering majors at a predominantly white institution (PWI). Here, "High-achieving" will be defined as having earned a cumulative grade point average (GPA) at or above 3.0.*

*Throughout the focus group I will ask you questions about your experiences. I may ask you to elaborate or clarify answers or statements. Please feel free to ask me for clarification at any point during the focus group if questions are unclear. Please feel free to enjoy the refreshments provided throughout the focus group.*

*Audio recorder begins*

### Opening Background Questions

1. You each have a nameplate with your pseudonym and major. For the audio recording let's go around and state your pseudonym and major.
2. Okay, now let's start with the research question for this study, which is provided on the PowerPoint screen. How does Black male intersectionality (being both Black and male) shape the lived experiences and academic success of high-achieving Black male undergraduates in engineering majors at a PWI? What are your initial thoughts on this question?  
*Probe: From your perspective, what is like being a high-achieving Black male?*  
*Probe: What is something you wished others understood about high-achieving Black males?*

### **Lived Experiences Questions**

Now I would like to learn a little more about your lived experiences. Think back on your childhood, K-12 education, and your time here at [Southeastern University].

3. Raise your hand if you have experienced racism. [Researcher counts the number of hands raised] Can anyone recall a specific story? Tell us about that experience.  
*Probe: How did you respond?*
4. Raise your hand if you have experienced male privilege, or advantages because you are male. [Researcher counts the number of hands raised] Can anyone recall a specific story? Tell us about that experience.  
*Probe: How did you respond?*
5. Can anyone recall a specific instance in which both your race and gender influenced how you experienced a situation? Tell us about that experience.  
*Probe: How did you respond?*
6. On the PowerPoint screen are quotes provided during the individual interviews about being a Black male engineering major at [Southeastern University]. Do any of those ideas resonate with you?
7. On the PowerPoint screen are metaphors provided during the individual interview when I asked being a Black male engineering major at [Southeastern University] is like \_\_\_\_\_. Do any of those ideas resonate with you?

### **Academic Success Questions**

Now I would like to talk about academic success. Again, I would like you to think back on your childhood, K-12 education, and your time here at [Southeastern University].

8. Raise your hand if your race has influenced your academic success. [Researcher counts the number of hands raised] Can anyone recall a specific story? Tell us about that experience.  
*Probe: How did you respond?*
9. Raise your hand if your gender has influenced your academic success. [Researcher counts the number of hands raised] Can anyone recall a specific story? Tell us about that experience.  
*Probe: How did you respond?*
10. Can anyone recall a specific instance in which both your race and gender influenced your academic success? Tell us about that experience.  
*Probe: How did you respond?*

11. On the PowerPoint screen I have categorized the different behaviors, programs, people, policies and outside factors that you all described in the individual interviews as helping you be successful in your major. Is anything missing?
12. If there were no limitations what could [Southeastern University] do to better serve high-achieving Black male undergraduates in engineering majors?
13. What else would you like to mention that hasn't been covered?

*Thank you so much for taking the time to participate in this focus group. I truly appreciate it!*

The following are additional probes that will be employed as suggested by Bogdan and Biklen (2003):

- *What do you mean?*
- *I am not sure that I am following you.*
- *Would you explain that?*
- *What did you say then?*
- *What were you thinking at that time?*
- *Give me an example.*
- *Tell me about it.*
- *Take me through the experience.*

## **Appendix G: Electronic Informed Consent**

### **North Carolina State University**

#### **INFORMED CONSENT FOR RESEARCH**

Title: Investigating Black Male Intersectionality: Counternarratives of High-Achieving Black Male Engineering Undergraduates at a Predominantly White Institution

Principal Investigator: Callie C. Womble

Faculty Sponsor (if applicable): Joy Gaston Gayles, Ph.D.

#### **What are some general things you should know about research studies?**

You are asked to take part in a research study. Your participation in this study is voluntary. You have the right to be a part of this study, to choose not to participate or to stop participating at any time without penalty. The purpose of research studies is to gain a better understanding of a certain topic or issue. You are not guaranteed any personal benefits from being in a study. Research studies also may pose risks to those that participate. In this consent form you will find specific details about the research in which you are being asked to participate. If you do not understand something in this form, it is your right to ask the researcher for clarification or more information. If at any time you have questions about your participation, do not hesitate to contact the researcher(s) named above.

#### **What is the purpose of this study?**

The purpose of this research study will be to understand how being both Black and male (i.e. Black male intersectionality) shapes the lived experiences and academic success of high-achieving Black male undergraduates in engineering majors at a predominantly white institution (PWI). “High-achieving” will be defined as having earned a cumulative grade point average (GPA) at or above 3.0.

#### **What will happen if you take part in the study?**

If you agree to participate in this study, you will be asked to

1. Complete one online demographic survey
2. Complete one online autobiography exercise
3. Participate in one in-person approximately 60 minute interview
4. Participate in one in-person approximately 60 minute focus group
5. The interview and focus group will take place on the campus of North Carolina State University (NCSU).



6. The interview and focus group will be voice recorded and transcribed. Both the recordings and the transcriptions will be stored in a password-protected NCSU-sponsored Google Drive account that only the researcher(s) above may access.
7. The study is expected to conclude within one year or less from the date of the interview.

Also, your electronic signature of this consent form means that your responses might be shared in a publication, while keeping confidential any information that could potentially reveal your personal identity.

### **Risks**

There are no major associated risks with participating in this study. However, the process of recalling information from past experiences could potentially produce some level of anxiety. If this happens, you may remove yourself from the study with no negative consequences. Also, you are encouraged to seek counseling support services if you experience any adverse emotional, mental, or psychological responses.

### **Benefits**

A benefit from this research may be revealing information about the experiences of high-achieving Black male undergraduates in engineering majors, thereby potentially enhancing student services and general campus climate at PWIs. Participants might potentially gain self-awareness about internal and external processes of being a high-achieving Black male undergraduate in an engineering major at a PWI.

### **Confidentiality**

The information in the study's records will be kept confidential to the full extent allowed by law. Data will be stored securely in the principal investigators' password protected computers and password-protected files. No reference will be made in oral or written reports that could link you to the study. Pseudonyms will be assigned to all participants.

### **Compensation**

Once you complete all aspects of the study you will receive a \$25 Amazon eGift card. There will be no compensation for participants who withdraw from the study prior to its completion. There will be no compensation if the participant fails to provide updated contact information and cannot be reached.

### **What if you are a NCSU student?**

Participation in this study is not a course requirement and your participation or lack thereof, will not affect your class standing or grades at NCSU. This study is not a course requirement or a requirement of your academic program in the College of Engineering.

**What if you have questions about this study?**

If you have questions at any time about the study or the procedures, you may contact the researcher, Callie C. Womble, at ccwomble@ncsu.edu or 919-667-4042.

**What if you have questions about your rights as a research participant?**

If you feel you have not been treated according to the descriptions in this form, or your rights as a participant in research have been violated during the course of this project, you may contact Deb Paxton, Regulatory Compliance Administrator, Box 7514, NCSU Campus (919-515-4514).

**Consent To Participate**

“I have read and understand the information above. I agree to participate in this study with the understanding that I may choose not to participate or to stop participating at any time without penalty or loss of benefits to which I am otherwise entitled.”

**ELECTRONIC CONSENT: Please select your choice below.**

Clicking on the "agree" button below indicates that:

- you have read the above information
- you voluntarily agree to participate
- you are at least 18 years of age

If you do not wish to participate in the research study, please decline participation by clicking on the "disagree" button.

- AGREE
  
- DISAGREE