

**PURSUIT IS PURPOSE: A CRITICAL AUTOETHNOGRAPHY OF ONE  
BLACK MAN'S JOURNEY THROUGH ENGINEERING EDUCATION**

by

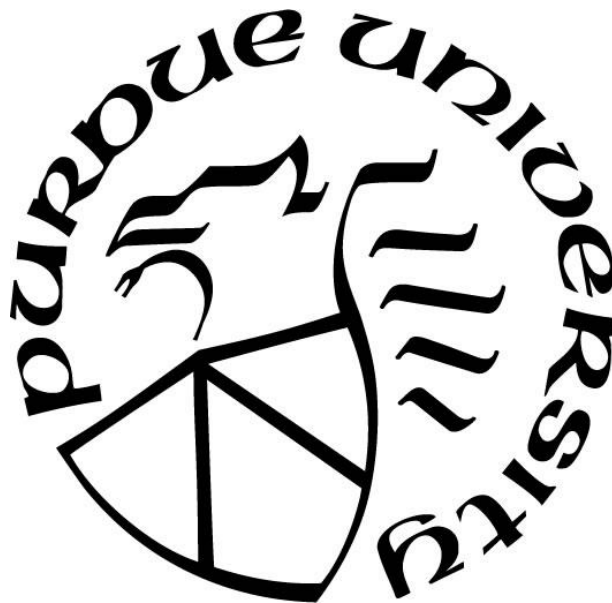
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*Dedicated to my first-born son, Ari Breon Colquitt.*

*The wicked run away when no one is chasing them,*

*but the godly are as bold as lions.*

*(New Living Translation, 1996, Proverbs 28:1)*

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## **ABSTRACT**

Black men experience numerous systemic challenges in pursuit of their education, yet they also possess strength to achieve academic goals. The purpose of this autoethnographic study is to describe the meaning of my experiences at an undergraduate engineering program at a historically White institution to increase awareness of the ways that Black men experience undergraduate engineering programs at historically White institutions. The overarching research question is: How do I make meaning of the formative experiences along my engineering education journey at an historically White institution through the lens of African American Male Theory? To answer this question, I chose critical autoethnography because it enabled me to use my role as the researcher along with my own experiences as part of the topic and group of study. Through this methodology, I described my experiences through the lens of African American Male Theory, which was not available to me at the time the events were occurring. I analyzed personal memory data (e.g., poems, speeches, applications, resumes and interview transcripts) and my researcher journal to provide a thorough personal account of my collegiate experiences and relative perspectives on those experiences. The findings of this study provide an in-depth understanding of how I experienced an engineering program at an HWI in such a way that offers insights to better support Black men in engineering. As such, this study calls for holistic support for Black male students in engineering through interventions such as culturally relevant curriculum, narrative evaluation, standards of inclusion for classrooms, culturally competent counselors, and hiring minoritized faculty. Finally, this study appeals for more research to investigate how Black men experience freedom while pursuing their engineering degree at HWIs.

# **INTRODUCTION**

## **Problem Statement**

Over the span of many years, several reports have been produced calling for actions to increase the number of historically marginalized racial and ethnic groups (i.e., minoritized groups) in science and engineering, yet this continues to be a problem in the engineering community (CEOSE, 2015; NAS, NAE, IM, 2011; President’s Council of Advisors on Science and Technology; 2012). These reports stem from a deficient STEM workforce in which most STEM-trained professionals in the United States are non-Hispanic White males (National Science Board, 2014). There is a need to consider diversity because of the expansion of opportunities within the STEM workforce if it included more people who are Black, Latinx, Indigenous, or other People of Color. Within the United States, minoritized groups, such as Blacks, Latin, American Indians, and Alaskan Natives, are increasing at an “unprecedented rate” (Museus, Palmer, Davis, & Maramba, 2011, p. 2). By 2044, more than 50% of all Americans are projected to belong to a minoritized group, a first in the nation’s history (United States Census Bureau, 2019). Despite the burgeoning population of minoritized groups, this has not manifested in STEM education.

There has been a national emphasis to bolster the global competitiveness of the United States by bringing attention and resources to boost the quality and quantity of STEM professionals (STEM Ed. Coalition, 2019; Task Force, 1989). Furthermore, minoritized groups remain to be a relatively untapped talent reservoir that could be developed to meet the demands of the United States STEM workforce. Black males in STEM accounted for 6% of the population of students who earned a bachelor’s degree in STEM in the 2017-2018 academic year which is one of the lowest percentages amongst the population (aside from Pacific Islanders and American Indian/Alaska Natives) in the United States (NCES, 2020).

However, a larger issue to consider is the issue of racial justice amongst Black people and their historic disenfranchisement throughout U.S. history. Regardless of the statistical facts, reports on broadening participation in engineering conspicuously do not observe the historic exclusion of minoritized groups in STEM, and higher education in general, which caused the marked continuous underrepresentation (Slaton, 2010). Ignoring the complexities of oppression as it relates to race, class, and gender has left the engineering education field striving to recruit and retain Black and Brown women and men with little success (Holly Jr., 2020; Riley, 2003). Black men are particularly challenged by various obstacles at historically White institutions (HWIs), or an institution of higher learning in which Whites account for 50% or greater of the student enrollment, including racism, stereotypes, and lack of belonging (Womble, 2018). Black men must overcome these threats in addition to the already competitive and problematic campus climate as STEM majors (Seymour & Hewitt, 1994, 1997). These factors compound into a severely challenging environment in which Black men are pressured to prevail or perish.

As a Black man who has graduated with an engineering degree and worked as an engineer post-grad, I'll explore the insights from my experience regarding various factors that contributed to my success from an anti-deficit perspective as well as the various costs associated with my persistence. Reflecting on questions like "What helped me? Who supported me? What were my early childhood aspirations? What was key in keeping me motivated?" can help me narrate and inform my own perspective on my journey to and through engineering education. Moreover, I will provide an in-depth, authentic narrative of the experiences that are oft missing in literature as there is a dearth of literature considering the undergraduate experiences of Black men studying engineering. Without considering racism, the social welfare of Black men has been claimed to have been improved at HWIs. However, there are a variety of indicators that challenge that the

notion that the experiences of Black men in STEM are improving. What are the costs associated with pursuing an engineering degree and what are the perceived advantages for Black men? Placing engineering under such scrutiny may elucidate clearer understandings of how systemic racism pervades through the experiences of Black men.

Critical reflections drawn from Black men's experiences in engineering constitute a gap in the literature. Through systemic oppression, experiences such as my own have been stifled or overlooked given the historic exclusion and deficit perspectives of Black men in higher education (Kim & Hargrove, 2013). Though there is literature revolving around the experiences of Black men in engineering, I was unable to find any autoethnographic accounts from a Black man offering his perspective of his own experiences as he navigated an undergraduate engineering program at an HWI. Providing this narrative has the potential to empower other Black men and women to share their stories and speak truth to power.

### **Purpose of the Study**

The purpose of this autoethnography is two-pronged: (a) to provide an in-depth understanding of how I completed my educational goal of attaining my engineering degree at an HWI through constructing a narrative and (b) offer insights from my experiences to engineering educators, researchers, and policymakers on how to better support Black men in engineering. This autoethnography tells my story from an inside perspective. My experiences, my challenges, and my triumphs will be given a voice to shed light on how I navigated to my first engineering degree for others to glean insights to better understand their own experiences. My autoethnography, writing which provokes the reader to reflect, will provide self-narratives about the power of pursuing a long-term goal and the various factors that contribute to the journey along the way.

In this study, I give detailed descriptions of my process using reflection and introspection to scrutinize my persistence in engineering at an HWI. My experiences of constructing knowledge about my persistence and using that knowledge to challenge my own perspectives and role as an engineering student will provide insight to others. This autoethnographic study can serve as a vehicle to engineering students who are in search of methods of examining and improving their sensemaking of their own experiences in an increasing era of vulnerability and authenticity. I invite readers from all disciplines to find facsimiles of their experiences in my narratives about persistence, faith, and overcoming challenges. One of the purposes of autoethnography, which I want my story to fulfill, is for “all people who can benefit from thinking about their lives in terms of other people’s experiences” (Bochner & Ellis, 1996, p. 18).

### **Research Question**

This study is guided by the following research question:

How do I make meaning of the formative experiences along my engineering education journey at an Historically White Institution through the lens of African American Male Theory?

### **Significance of the Study**

My autoethnography is important because I provide detailed descriptions of my experiences relative to my persistence, with emphasis on the factors that influenced the process. This autoethnography explores my experience as a Black male engineering major at an HWI, which is a pressing topic of concern for students, parents, faculty, higher education administrators, and researchers alike. Each of the aforementioned stakeholders have a vested interest in understanding how to support Black male undergraduates in engineering majors progress and uphold academic

success at HWIs because their persistence in engineering would bolster the STEM workforce with diverse talent. My story has the potential to benefit these parties personally and professionally. On a personal level, Black male pre-college and undergraduate students that are interested in majoring in engineering at HWIs can apply what they learn from my story to enhance their own college experiences. Likewise, parents of Black male pre-college and undergraduate students that are interested in majoring in engineering at HWIs can use what they learn from my story to assist their children through their college journeys. At a structural level, faculty and higher education administrations at HWIs can use my story to help them design and adapt curriculum and support programs for Black males. Organizational change at the university level may lead to improved recruitment and retention of Black male undergraduates who obtain engineering degrees. This impact has the potential to increase representation of Black men in the engineering profession. Finally, uplifting my story fulfills gaps in the current literature base such as the need to examine Black male achievement (Harper, 2012a) and Black male educational experiences in STEM (Harper 2010; Harper, 2012a). Henceforth, my story can lead researchers to fresh, wide-ranging questions about the experiences of Black male undergraduates at HWIs.

### **Overview of Theoretical Framework**

The theoretical framework that will ground this study is the African American Male Theory (AAMT) (Bush & Bush, 2013, 2018). AAMT is a strengths-based model that sought to problematize deficit and nondeficit models. The purpose is to characterize the experiences of Black men without comparing or countering dominant narratives from White people. AAMT has the main objective of providing “the necessary space and tools to fully examine and perhaps explain the outcomes, behavior, and experiences of African American boys and men” (Bush & Bush, 2018, p. 6). African American Male Theory has six central tenets: (1) ecological systems theory, (2)

uniqueness of African American males, (3) African culture, consciousness, and biology, (4) resilience and resistance, (5) impact of race and racism, classism, and sexism, and (6) pursuit of social justice. Using African American Male Theory will provoke a focus on the centrality of race at a HWI and a racialized, gendered understanding of the experiences of a Black man.

### **Limitations of the Study**

This study is limited in its scope to the viewpoints and experiences relative my experiences as an undergraduate engineering student. The experiences and personal accounts rendered may evoke unpleasant feelings for readers as the connections made by readers cannot be predicted (Bochner & Ellis, 1996). In addition, this study is centered in one engineering program and my experiences in that program will not be representative of the Black male student experience in other engineering programs. Lastly, this method requires that I rely on my recollections of incident from the past; however, I have accounted for this limitation by checking memories through corroborations by others and journal entries that I kept as a student.

### **Definition of Terms**

I have provided key terms and their respective definitions as a reference for understanding my use of the terms throughout the study. Please refer back to this list if there is a need for contextualizing the experiences captured throughout the following chapters.

**Black:** 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” (Womble, 2018). I am using these three terms interchangeably because the essence of the Black experience within the borders of the United States is unique (Holly Jr., 2020; Warren & Coles, 2020).



**Engineering:** According to the Accreditation Board for Engineering and Technology (ABET), 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” (Lord, 2000, p.5).

**Historically White Institution:** Institutions of higher learning in which Whites account for 50% or greater of the student enrollment. This term will be used interchangeably with “predominately white institutions” (Brown II & Dancy II, 2010).

**Males:** Individuals who were assigned the sex “male” at birth.

**Minoritized:** “different in race, religious creed, nation of origin, sexuality, and gender and as a result of social constructs have less power or representation compared to other members or groups in society” (Smith, 2017, para. 3).

**Narrative:** The way humans describe their lived experiences through a story (Connelly & Clandinin, 1990).

**Oppression:** The systemic disadvantages that individuals received but did not earn (Adams et al., 2000).

**Persistence:** “Students who continue as STEM majors throughout their undergraduate programs” (McGee, 2018, p. 9)

**Privilege:** The benefits that individuals received but did not earn (Adams et al., 2000).

**Racism:** “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):** Includes “mathematics; natural sciences (including physical sciences and biological/agricultural sciences); engineering/engineering technologies; and computer/information sciences” (Chen, 2009, p. 2).

### **Summary**

This chapter discussed the role that the higher education system plays in broadening participation in the STEM workforce and how my autoethnography seeks a more racially just examination of Black men’s persistence in engineering at HWIs. However, as this chapter described, there is limited research on how Black men attain academic success when persisting in undergraduate engineering programs at HWIs. Chapter II will provide a review of literature pertaining to this topic which includes (1) a brief history of African Americans and the United States education system, (2) an in-depth exploration of literature concerning Black men’s experiences at HWIs in STEM, and (3) the proposed theoretical frameworks for interpreting my experiences. Chapter III will detail the methods and techniques employed by this study to answer the provided research questions.

# **REVIEW OF LITERATURE**

## **Introduction**

The goal of this dissertation study is to understand how I navigated systems within higher education which systematically oppress minoritized people, specifically Black men in STEM. To do this, I will be using my own experiences as a Black man in engineering to problematize dominant narratives of undergraduate engineering experiences that are typically centered on white men. In this literature review, I will discuss previous literature related to this topic that informed this study. This literature review contains two main sections: (1) challenges Black male students experience at HWIs, (2) supports for Black male student students at HWIs, and (3) an overview of the theoretical framework, African American Male Theory, which grounded the study. Let us now consider the various challenges that Black men encounter when enrolled at an HWI.

## **Unique Challenges Black Male Undergraduates Face at HWIs**

The majority of Black college students are enrolled in HWIs (Brown, B. R., 2016; Strayhorn, 2009), thus it is imperative to understand the unique obstacles those students face at HWIs due to their race and ethnicity. McClain et al. (2016) articulated the negative effects (e.g., trauma, racial battle fatigue, etc.) that being enrolled at a HWI has on Black students' psychological functioning after interviewing 218 Black undergraduates. Given the unique circumstances that Black students at HWIs face, Benton (2001) suggested that more than half of Black students at those institutions will fail to graduate. With such a steep projection, it is important to contextualize the unique factors that Black students must combat against while attending HWIs. The next section will discuss the following factors: (1) racism, (2) stereotypes, and (3) education debt.

## **Racism**

Black men must navigate overt and covert racism on campus at HWIs. Harper (2012)

defines racism as:

individual actions (both intentional and unconscious) that engender marginalization and inflict varying degrees of harm on minoritized persons; structures that determine and cyclically remanufacture racial inequity; and institutional norms that sustain White privilege and permit the ongoing subordination of minoritized persons. (p. 10)

Studies about Black males within the HWI context typically communicate the psychological and social challenges they experience due to race-related stress (White & Cones, 2013). However, Harper (2012a) found that there are limitations to the way sociologists report findings on racial stratification, often not discussing how racism directly affects the experiences of Black students in postsecondary education. Furthermore, Black students must make sacrifices associated with racial opportunity cost which is defined as a reflection of “the options that are foregone and the losses that result from those foregone options when students of color pursue academic success” (Chambers et al., 2014, p. 191).

There are surviving remnants of past overt racism on HWIs such as statues of confederate war heroes, “Whites only” scholarships, state songs with references to “massa” and “darkies, and Confederate flags (Muschick, 1999). Furthermore, “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) all serve as manifestations of overt racism on the campuses of HWIs. Furthermore, these examples of overt racism are still happening on HWIs today; for example, over 200 students protested racially charged flyers found on campus at my alma mater in 2016 (John, 2016). Given the pervasiveness of overt racism, there are still many ways in which covert racism manifest at HWIs.

Coates (2007) defines covert racism as the “subtle, subversive, and deliberate informal and formal mechanisms that allow differential access to rewards, prestige, sanctions, status, and privileges based on racial hierarchies” (p. 211-212). Gusa’s (2010) piece on White institutional presence articulated the following:

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).

Generally, Black students comprehend racism as prevalent at HWIs. A Black undergraduate at a Southeastern HWI stated that racism “happens every single day” (p. 5) on their campus and is probably never going away (Davis et al., 2004). In the present day, many Black undergraduates are dealing with 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). Smith et al. (2011) examined the experiences of 661 Black men and found that racial microaggressions increased with educational attainment contributing to their mundane stress, particularly in the context of HWIs. Solórzano, Ceja, and Yosso (2000) found that African American students experienced racial microaggressions in the forms of discrimination and segregation which often led to feelings of frustration, self-doubt, and isolation. Furthermore, Black men must cope with negative portrayals in mass media characterizing them as “thugs” or brutes (Smiley & Fakunle, 2016). The pervasiveness of racism fatigues Black men psychologically, physiologically, and emotionally which compounds given the environmental factors.

Racialized experiences of minoritized students are also based on the campus climate for STEM majors. Campus climate refers to “the attitudes and behaviors that create a postsecondary

institution's sociopolitical atmosphere" (Womble, 2018, p. 66). Seymour and Hewitt (1994, 1997) created foundational research on the campus climate for STEM majors. Seymour and Hewitt (1997) found that the "chilly climate" of STEM undergraduate programs had a "much greater contribution to [STEM] attrition than the individual inadequacies of students or the appeal of other majors" (p. 392) after interviewing and conducting focus groups with 355 undergraduates at seven four-year institutions. Seymour and Hewitt (1994, 1997) characterized the "chilly climate" by the lack of collaborative learning, unavailable/unapproachable STEM faculty. In a follow-up study, Seymour & Hunter (2019) found that the campus climate in STEM has changed very little. In addition, Palmer, Maramba, & Dancy (2011) suggested these climates are fostered by complex and rigorous content, competition among students, and pressures to show they belong in the majors they declared. Although Seymour and Hewitt's original work (1994, 1997) is foundational, it does not examine how a lack of critical mass of same-race peers, faculty, and staff impacts minoritized individuals in STEM majors (Guiffrida, 2005a; Holmes, Ebbers, Robinson, & Mugenda, 2000; Litzler & Samuelson, 2013; Palmer, Maramba, & Holmes, 2011; Williamson, 1999).

Given the environmental factors that affect STEM students in general, it is plausible that Black males are critically affected by these same factors in more exaggerated ways (Campbell, Carter-Sowell, & Battle, 2019; Harper & Hurtado, 2007). The various challenges that Black males are faced with are heightened because of the intersection between their race and gender. Furthermore, it has been observed that Black undergraduates in engineering feel that their Blackness is "constantly under assault" (McGee & Martin, 2011, p. 1347). These students are more likely to have lower GPAs and graduation rates due to their experiences with racism and discrimination (Brown et al., 2005).

Black male students deal with feeling invisible and excluded at HWIs (Dowden, Gunby, Warren, & Boston, 2014; Parker, Puig, Johnson, & Anthony Jr., 2016). Harper et al. (2011) conducted focus group interviews with 52 Black male resident assistants at HWIs and discovered 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 left many of the Black males exhausted. The isolation that Black male students face at HWIs is only one of many factors that inhibit their persistence in a majority White space. Black men at HWIs must negotiate their existence with the pressures of expectations of the HWIs, leading them to manage stereotypes.

## **Stereotypes**

As a result of the overt and covert racism, Black men in HWI are forced to manage stereotypes in their educational settings. Stereotypes are generalized oversimplifications about a person or group (Steele, 1997). Du Bois (2015) characterizes the internal conflict experienced by African Americans as double consciousness in which they are measuring themselves in comparison with the standards set by an oppressive, European-dominated society. At HWIs, Black undergraduates are stereotyped as not being academically prepared or capable of doing the work (Fries-Britt & Griffin, 2007). The stereotypes of academic underpreparedness and resulting poor performance have the potential to silence the voices of successful Black male undergraduates (Fries-Britt, 1998). Harper and Nichols (2008) stated that Black males are “one of the most stereotyped groups on college and university campuses” (p. 1) which has adverse effects on individual and societal levels.

Strayhorn (2008) further expounded on this notion:

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).

Scholars have found that Black male college students commonly encounter stereotypes on campus such as being profiled by campus police (Smith, Allen, & Danley, 2007). After interviewing with 36 Black males at 6 HWIs, Smith and colleagues (2007) found that Black males encounter Black misandric acts within academic, social, and public spaces on the campuses at HWIs which can contribute to their racial battle fatigue. The authors found that Black males were often categorized as being “out of place or “fitting the description” of an outsider (p. 551). The authors posited that a key limitation of research on Black males was the disregard for the intersection between their race and gender identities and oppression. They further explain:

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).

Black men internalize the oppression that they encounter in what is known as stereotype threat.

McGee and Martin (2011) define stereotype threat as follows:

[A] type of confirmation bias in which the threat of being viewed through the lens of a negative stereotype or the fear of doing something that would inadvertently confirm that stereotype suppresses academic performance among Black students at all levels. (p. 1348)



African American students may succumb to the pressures of internalized stereotypes which negatively affect their academic abilities (Goings, 2015). Steele and Aronson (1995) found that, when assessing Black students and White students with Graduate Record Examination (GRE), stereotype threat could explain the achievement deficit for African American students in college. In their study, the scholars explained to one group of African American students that the GRE exam was testing their intellectual ability while telling the second group that the exam was just a generic assessment tool. Steele and Aronson (1995) examined the vulnerability to stereotypes that the African American students displayed through their varying performances on the exam. The African American students performed comparatively to the White students when they were told that the exam was a generic assessment tool whereas the African American students performed worse when they were told that the exam measured intellectual ability.

Subsequent studies have garnered similar findings that African American students may be vulnerable to stereotype threat. However, these studies do not fully consider the psychological burdens that Black students must encounter (Strayhorn, 2009). The psychological burdens include the disadvantages that Black students faced when experiencing racism on the college campuses and having to prove that they “fit in” academically (Strayhorn, 2009). Furthermore, there have been further investigations that disprove the findings that Black students surrender to stereotype threat (McGee & Martin, 2011, Strayhorn, 2009).

While previous studies support the notion of stereotype threat in college, other researchers argue that African American students use coping strategies to counter stereotype threat (Fries-Britt & Griffin, 2007; McGee & Martin, 2011; Tuitt & Carter, 2008). It is imperative to understand how African American college students manage stereotypes in order to achieve academically (McGee & Martin, 2011). McGee and Martin (2011) explain stereotype management as “a tactical response

to the ongoing presence of stereotype threat” (p. 1354). In their study, McGee and Martin (2011) discovered that their participants, who were academically resilient Black students in mathematics and engineering, were able to strategize to lessen the threat and effect of stereotypes such as proving the stereotypes wrong, cultural code switching (e.g., smiling to appear friendly), excelling academically, serving as a role model and becoming self-determined. This study confirmed that the high-achieving Black students that stereotype management impacted their racial identity, learning and participation, and achievement despite obstacles. Furthermore, the Black students took pride in their identity despite the persistence of stereotyping by their White counterparts. Moreover, Fries-Britt and Griffin (2007) found that their participants took a deep satisfaction in disproving their White counterparts’ negative perceptions. The internal fulfillment explored by these studies speaks to the power of resistance and how they may improve the persistence of Black male collegians.

As discussed above, Black men in college must develop the necessary strategies to navigate the academic environment successfully. Moore III, Madison-Colmore, and Smith (2003) developed the “prove-them-wrong syndrome” to explain persistence in engineering. Moore III and colleagues interviewed 24 students and found that these Black males exhibited a need to counter the stereotype that they were intellectually inferior by proving “them” (White professors, students, and administrators) wrong despite adversity. The need for Black men to combat against negative perceptions that they observe from their environment compounds with previous educational experiences in which their academic disadvantages are reinforced. The historic education debt that has accumulated over decades places many, if not all, Black men in a difficult position to overcome stereotypes.

## **Education Debt**

Another challenge some Black men face to their degree completion is the academic disadvantages due to education debt. Ladson-Billings (2006) coined the term “education debt” to illustrate the cumulative impact of opportunities and resources withheld from students of color over the decades. Understanding education debt helps abate the inherently racist concept of the achievement gap, which “refers to the observed, persistent disparity of educational measures between the performance of groups of students, especially groups defined by socioeconomic status (SES), race/ethnicity, and gender” (Glavin, 2016, para. 1). The achievement gap is blamed unfairly on African American families as studies attribute failures to various factors including low expectations for students, lack of familial support, and instability in the home (Bensimon & Malcom, 2012; Brooks-Gunn, Guo, & Furstenburg, 1993; Garrett-Lewis, 2012; Quinn, 2020). Research has failed to fully acknowledge the historical context in which African American families were directly impacted by the unequal treatment of education institutions (Garret-Lewis, 2012). Bryant (2015) emphasizes the importance of holding education institutions and schools accountable for their failure to provide sufficient courses, resources, and support instead of fully blaming families, students, and communities. The unequal treatment of education institutions that leads to problems of schools not providing sufficient courses, resources and support also leads to indicators that African American students are not sufficiently prepared for college. SAT and ACT scores, advanced placement course enrollment, high school graduation rates, and high school exit exams all serve as indicators of the lack of college preparation amongst Black students (Camara, 2013; Musoba, 2011), but it is important to interpret this as the ways schools have insufficiently supported Black students, rather than as deficiencies in Black students’ abilities and aptitude. Despite the lack of college preparation that Black students receive in their secondary schooling, these same Black students are admitted into HWIs for their exceptionalism which starkly contrast

with the stereotypes of being innately unable to complete their college coursework. Given the historical context, it is important to note how factors such as racism play a significant role in implicating the systemic challenges that Black students face in the education system. There is a dearth of literature that explores how education debt is implicated in the experiences of Black men for which my study explores its impact on my persistence at a prestigious HWI.

Numerous researchers have pointed to the importance of college preparation as a necessary means for Black men to thrive at prestigious HWIs in STEM (Brown, Morning, & Watkins, 2005; Hall & Post-Kammer, 1987; Palmer, Davis, Moore, & Hilton, 2010; Russell & Atwater, 2005; F. M. Smith & Hausafus, 1998). Many first-year undergraduates enroll in STEM courses that are often viewed as intimidating which also serve as gatekeepers to the STEM college degree (Gainen & Willemsen, 1995; Wineke & Certain, 1991). Maton and colleagues (2000) make note of the “weed out” systems that commonly depress the academic performance of Black undergraduates at HWIs. These “weed out” systems negatively affect the persistence of undergraduates of STEM by preventing them from advancing to higher level classes (Seymour and Hewitt, 1997). It is important for me to examine my own persistence as a Black male undergraduate in engineering because I was able to advance past the “weed out” system despite adversity.

Although the odds of successful degree completion appear to be stacked against Black men, there are many resources and strategies that Black men can take advantage of achieve success at HWIs. In the next section, I will introduce seven unique methods that Black men can use in order to successfully earn their degree at an HWI.

### **Enhancing Black Male Student Persistence for Success at HWIs**

In 1984, Jacqueline Fleming published *Blacks in College*, which compared the experiences of Black students at HWIs with those at HBCUs. In this study, she found that Black students that

persisted best established a sense of belonging by developing relationships with their faculty, advisors, counselors, and peers at their institution. Even though this book was published in 1984, Fleming's findings remain relevant for Black students at HWIs today. In addition to relationships being a focal point of Black male persistence and retention in HWIs, I focus my literature review on a few different strategies to enhance the persistence of Black males. The persistence strategies for Black men at HWIs that I will summarize are the following: (1) pre-college support, (2) faculty involvement, (3) institutional resources, (4) extracurricular activities, (5) social support, (6) the ability to handle racism, and (7) non-cognitive skills.

### **Pre-college support**

In terms of pre-college support, there are several factors that positively affect Black men's persistence. Parents and family support play a significant role in Black male's interest in STEM at an early age (Wright, Counsell, Goings, Freeman, & Peat, 2016). Family does have an impact on how desirable engineering attributes are developed for Black males (Tolbert & Cardella, 2016). Black male achievers leverage capital from family in such ways as gaining early exposure to STEM activities prior to college and having parents who were STEM majors and professionals (Fries-Britt, 2017). Russell & Atwater (2005) found that parents and teachers provided encouragement, high expectations, and career guidance to help their African American students persist in science. Flowers III (2015) interviewed eight Black males that were engineering majors and found that family involvement, encouragement, and reinforced expectations were all crucial to the positive formation of the students' academic identity.

Other researchers have also identified ways that school and out-of-school learning experiences can support identity and interest development amongst Black males. For example, research from Wright (2016) shows that when STEM learning environments are centered on the

lived experiences of Black males, these experiences can help situate Black males' identities as competent STEM learners. Along with identity development, interest development is important too for Black males' participation in STEM. Black males in STEM majors identified an early interest in STEM and expressed that formal and informal experiences helped to nurture their interests in STEM careers (Strayhorn, 2015). Fries-Britt (2017) identified a pattern in which high achieving Black males participating in honors and advanced placement classes may have limited opportunity to interact with a critical mass of other high achieving Black males.

Scholars have cited that academic preparation, particularly at the high school level, is a predictor for Black undergraduate success in STEM majors (Maton, Hrabowski, & Schmitt, 2000). Participation in high school science and mathematics course work is considered to be a major factor in academic success in STEM majors (Brown, Morning, & Watkins, 2005; Hall & Post-Kammer, 1987; Palmer, Davis, Moore, & Hilton, 2010; Russell & Atwater, 2005; F. M. Smith & Hausafus, 1998). The underrepresentation of Black high school students in advanced placement courses may be probable cause for why Black undergraduates are leaving the STEM pipeline (Russell & Atwater, 2005). Scholars have noted the importance of minoritized students having better access to AP coursework (Kolluri, 2018; Whiting & Ford, 2009). In addition, the disproportionate number of Black males that score "below basic" in mathematics courses could attribute to the lack of representation in STEM (Lee & Ransom, 2011).

There are two main critiques against the argument that the academic preparation of Black males is the primary predictor for Black males' participation in STEM. The first critique is that it does not account for the sizable population of Black undergraduates 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 the STEM courses to pursue other majors (Harper, Patton,

& Wooden, 2009). Secondly, few studies have attempted to explain how underrepresentation in STEM is related to race (Lewis, 2003).

Lewis (2003) questions, “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” (p. 371)? Lewis’s (2003) study took race into account when examining the reasons why some Black male engineering students persisted while others did not. In addition, this study examined how race factored into the student’s decision-making and found five limitations of existing literature: (1) “the low numbers of empirical reports”, (2) “the preponderance of poorly defined factors related to career decisions”, (3) “uniformity in theoretical and methodological approaches”, (4) “the tendency to equate career attainment with career choice”, and (5) “the lack of an explanatory model for racial disparity” (Lewis, 2003, p. 361).

### **Faculty involvement**

Black males’ interactions with faculty can be used to develop a stronger sense of academic integration. After conducting a statistical study to test the hypothesis that African American males at HWIs who score higher on scales assessing their self-efficacy, racial identity attitudes, and levels of institutional integration also scored higher in academic achievement, Reid (2013) found that self-efficacious Black males with stable racial identity viewed interactions with faculty more favorably. In addition to these results regarding African American males benefiting from faculty involvement, Santos & Reigadas (2004) found that minoritized students were able to persist when paired with faculty mentors, especially with those that were from a similar ethnic background. There is potential to start student/faculty mentorship programs to facilitate the development of relationships to help Black males persist in academic programs. Furthermore, Brooms and Davis (2017) discovered how Black men at HWIs directly benefitted from having interactions with Black

male faculty members. In this study, 59 Black men from 3 different HWIs noted how critical their relationships with Black faculty were to their development inside and outside of the classroom. However, Burrell, Flemings, and Fredericks (2015) observed a distinct difference between African males and African American males in which international African students valued their relationships with faculty. Therefore, the international students were given higher expectations for their performance by faculty than domestic students at a HBCU causing unequal treatment amongst faculty and Black males.

As explained earlier, faculty have the authority to set the tone for their interactions with Black males through their expectations. Harper and Quaye (2008) recommend that faculty incorporate elements of cultural inclusivity into the classroom environment. Bowen and colleagues (2020) have recommended ways for faculty to incorporate inclusive teaching practices, such as using inclusive language and offering inclusive office hours. Robertson & Mason (2008) found that Black males' interests and academic performance were enhanced when professors integrated examples of successful African Americans into the content of the class. When students can feel seen and heard in the classroom, the environment helps to enhance the students' sense of belonging. It is important for professors to give ample opportunities for students' opinions to be heard and respected during discussions in the class. Burrell, Fleming, and Fredericks (2015) conducted semi-structured focus groups with 15 Black males from HBCUs that were a mixture of domestic and international students. Burrell and colleagues found professor expectations to be critical to their success in the classroom; however, there's an inequity due to professors having higher expectations for international students to perform better.



## **Institutional resources**

Academic, personal support, and financial assistance can all serve to boost Black men's persistence at HWIs by limiting the effects that prohibitive barriers may have on them. Based on interviews with 20 Black males, McGee (2018) suggests that campus administrators provide Black males with access to resources, such as "summer bridge programs, tutoring, mentoring, academic advising, and personal/professional development" (p. 24) to enhance their learning experience. Other forms of academic support could be the implementation of narrative evaluation in coursework and offering one-on-one support via intrusive advisors (Iamarino, 2014; Upcraft & Kramer, 1995; Varney, 2012). In *Being Black, Being Male on Campus*, Brooms (2018) discusses the importance of same-race peer groups and opportunities to engage with other Black males after interviewing 40 students at two HWIs. The use of resources and support services have the ability to enhance the persistence of Black males at HWIs. Simms, Knight Jr. & Dawes (1993) highlight the importance of financial aid availability for Black males in college, especially for those of lower socioeconomic status. For example, Warde (2008) interviewed 11 Black male graduate students and found that having access to the resources (i.e., scholarships, waived college fees, & payment plans) necessary to attend and persist in higher education was a major factor for them to stay in the graduate programs. In another study, McGee (2018) suggested that eliminating the burden of costs and reducing loan debt could help increase the population of Black males at HWIs. In addition, Banks (2014) notes the importance of providing Black men with disabilities access to culturally competent counseling services which can be especially important for minoritized students that experience engineering stress (Jensen & Cross, 2021).

## **Extracurricular activities**

Black men learn (un)healthy coping mechanisms to deal with stress (Goodwill, Watkins, Johnson, and Allen, 2018). Black men's participation in extracurricular activities can bolster their experiences by granting them a social network, improved self-esteem, and other benefits. For instance, athletic participation has been shown to have a positive impact on Black male students' self-esteem which enhances their ability to complete college (Pascarella & Smart, 1991). In addition, membership to a Black Greek fraternal organization has been shown to positively affect the academic and social integration of Black males, which has been shown to improve persistence and grades (McClure, 2006). Participation in the Black fraternities enhances community and political involvement as Black males developed a positive social network that developed their sense of responsibility for community activism and leadership (McClure, 2006). Although athletics and fraternal membership exemplify the benefits of participating in the extracurricular activities, there are many other types of organizations that Black men can contribute to for the purpose of personal and academic growth. For example, spirituality, bolstered through religious organizations, plays a role in providing Black men with a sense of purpose (Herndon, 2003; Wood and Hilton, 2012). Lastly, Anderson and colleagues (2019) found that when students were given the opportunity to do near-peer mentoring with younger students, they're research skills and confidence was enhanced, thus engaging them in STEM longer.

## **Other Supports**

Several scholars have highlighted the underrepresentation of Black students in STEM education and have called for further investigation into their experiences in STEM fields (Bonner II et al., 2009; Palmer, Maramba, & Dancy, 2011; Perna et al., 2009). There have been studies of Black males in STEM that elucidated themes around their experiences. For example, Palmer,

Maramba, and Dancy (2011) found that (a) peer group support, (b) involvement in STEM related activities on and off campus, and (c) strong high school preparation supported minoritized students' persistence at HWIs. Strayhorn (2015) surveyed 140 Black male undergraduate students at both HBCUs and PWIs and conducted 38 interviews which determined that Black males that felt academically self-efficacious believed that their confidence helped them to persist in STEM. Black men expressed that when their sense of belonging was fulfilled, they flourished academically and socially, as opposed to those who did not. Fries-Britt (2017) gathered 20 years' worth of qualitative interviews with Black males in STEM to determine that one of the most important factors that restores the confidence of the achievers was their previous success in rigorous coursework. Peer support inside and outside of their STEM environment helped them academically and socially. She also found that Black males regularly have encounters with stereotypes, biases and/or racism.

### **Black males' ability to handle racism**

On the question of Black men navigating racism, there are a few studies that indicate the benefits that Black male collegians can leverage when faced with racialized obstacles. Harper (2015) interviewed 143 Black male achievers at 30 HWIs and found that Black male achievers who benefit from high expectations and make the most of college acquire the confidence and communication skills necessary to thrive in racist environments. Furthermore, Black male achievers that are in leadership gain the ability to respond productively to stereotypes which corresponded to higher GPAs. Similarly, Harper (2009), using composite counternarratives, highlighted that there are Black male achievers that thrive inside and outside of the classroom, encounter racism and success simultaneously, and resist niggering by taking on campus leadership positions and immediately countering racist stereotyping whenever it occurs on campus.

As previously stated, Black men's ability to navigate racialized experiences can boost their ability to persist. In addition, Strayhorn (2009) found that when Black men interact with peers whose interests differ from one's own and become acquainted with students of a different race, there is a positive influence on Black men's sense of belonging. However, the ability for Black men to combat racism and stereotyping is further challenged as their representation in STEM classrooms dwindles. In another study, Berhane, Secules, and Onuma (2020) found that some of the African American participants in their study at a Minority Serving Institution (MSI) discussed negative experiences as transfer students in engineering but were motivated to persist because they sought to increase representation in the field. One major implication for practice was to provide campus-sponsored programs that allowed students to develop their own affinity spaces that align with their interests, identities, and experiences. The authors saw a need for more racial, ethnic, and/or cultural identity-based scholarship in engineering education research.

### **Non-cognitive factors**

Regarding non-cognitive factors for Black men's persistence, there are many aspects that researchers have investigated to help explain how these students persist in STEM majors. Scholars have attempted to study the skills, behaviors, habits, and personality traits outside of academic skills that students must learn in order to be successful as STEM majors (Chang et al., 2014; Farrington et al., 2012; Kotzé & Niemann, 2013). The ability for students to seek out help, use study habits, and leverage social and academic problem-solving skills all serve as non-cognitive factors that help students to persist in STEM majors (Farrington et al., 2012). Chang and colleagues (2014) studied the non-cognitive factors of Black undergraduates in STEM majors. Chang, Sharkness, Hurtado, and Newman (2014) articulated that "completion of a STEM degree requires not only academic preparation but also resilience and capacity to negotiate a complex

academic context” (p. 556). Furthermore, Tracey and Sedlacek’s (1984) were able to use noncognitive variables such as the ability to deal with racism, community service, and support of others for academic plans to accurately predict the academic success and persistence of African American students.

In 2010, Harper recommended that more studies should be conducted to understand the non-cognitive factors affecting Black undergraduate success in STEM. Since then, the empirical research on this phenomenon has been limited, but promising. For example, Strayhorn’s (2015) study found two out of three themes were non-cognitive factors: pre-college self-efficacy and sense of belonging. The Black male undergraduates used words like “confidence” and “endurance” when describing how their pre-college self-efficacy gave them the ability to persist despite setbacks and major in STEM fields where they feel like “a speck in a sea of Whiteness” (p. 54). On the other hand, sense of belonging promoted positive STEM outcomes amongst the Black males as they felt that they belonged to a part of a group. In addition, the third theme was concerted cultivation of initial interests in STEM which aligns with academic preparation. The exploration into how non-cognitive factors affect success in STEM will help shape how pre-college and college stakeholders develop evidence-based programs to enhance the outcomes for students in STEM.

There are limited studies that focus specifically on Black Male engineering students in undergraduate programs. Moore III (2006) found that "(a) strong interests in science, technology, engineering, and mathematics; (b) strong familial influence and encouragement; (c) strong aptitudes in science and mathematics; (d) meaningful academic experiences and relationships with school personnel; and (e) meaningful enrichment programs, opportunities, and academic experiences" (p. 250) influenced students' decisions to pursue engineering. Long III & Henderson (2017) interviewed 27 Black male students studying engineering or engineering-related majors to

understand how they develop academic traits such as confidence and resilience. The researchers found that Black male's "current confidence and resilience seem to be connected to attributes such as a) childhood adversity, b) a refusal to quit, and c) prior academic success, which ultimately led to their collegiate achievements" (p. 13). In the next section, I will discuss the theoretical frameworks that I will utilize to help understand and interpret the various factors affecting Black men in engineering.

### **Theoretical Frameworks**

In this study, I will employ African American Male Theory (Bush & Bush, 2013, 2018) to interpret my experiences as a Black man in engineering. In the following sections, I will provide an overview of the theoretical framework and offer the goals for the application of the framework in the study.

#### **African American Male Theory: Establishing the Research Paradigm**

African American Male Theory (Bush & Bush, 2013, 2018) was created "to articulate the position and trajectory of African American boys and men in society by drawing on and accounting for pre- and post-enslavement experiences, while capturing their spiritual, psychological, social, and educational development and station" (Bush & Bush, 2013, p. 6). In addition, the authors expounded that the framework is also a response to "recent literature that challenges deficit narratives and posits that nondeficit frameworks, practices, and thinking represent a paradigm shift from the pervasive deficit model" (p. 2). The authors suggest that these nondeficit models are a move in the right direction but are still deficient. Furthermore, the authors critique that these nondeficit models are often paired with Critical Race Theory which they submit is, in many ways, a deficit model. African American Male Theory upholds the following six tenets:

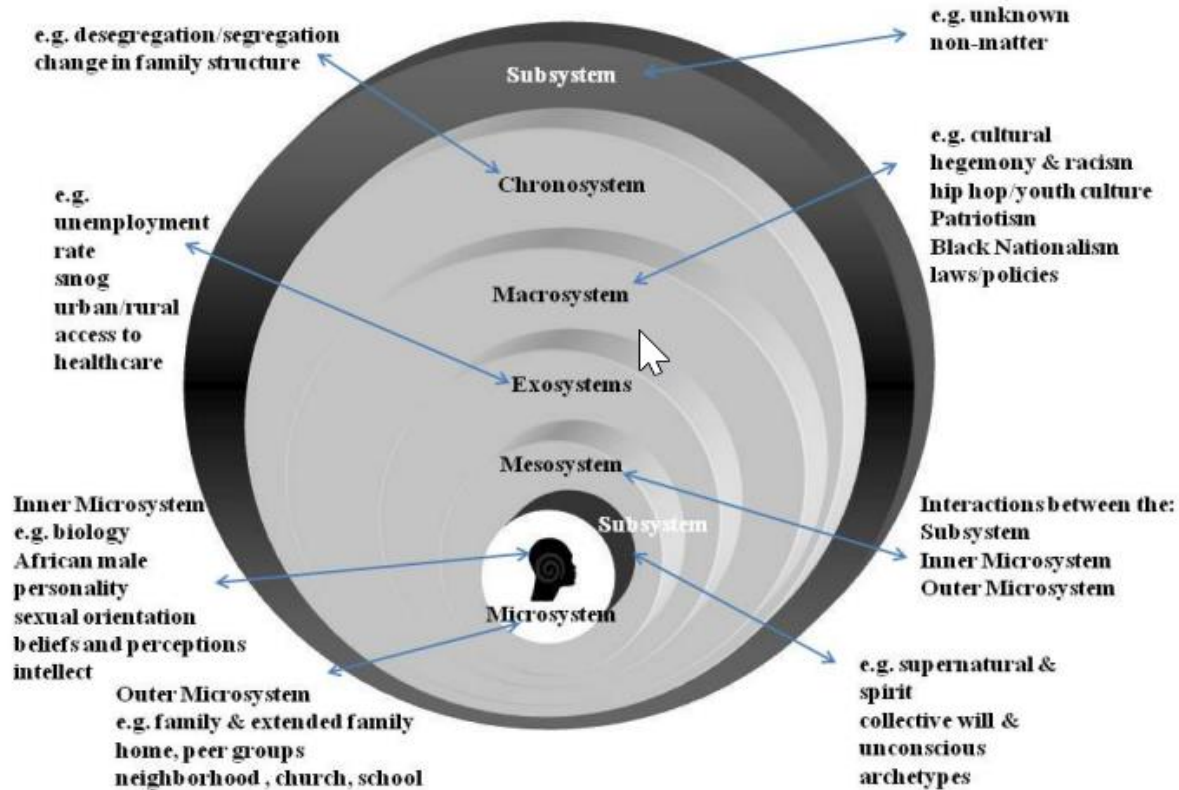


Figure 1. African American Male Ecological Systems Model for African American Male Theory  
*Note.* This figure was first published in Bush and Bush's (2013) introduction of AAMT.  
 Dr. Nana Bush gave me permission to use this image.

1. "The individual and collective experiences, behaviors, outcomes, events, phenomena, and trajectory of African American boys' and men's lives are best analyzed using an ecological systems approach [as shown in Figure 1]" (p. 3).
2. "There is something unique about being male and of African descent" (p. 4).
3. "There is a continuity and continuation of African culture, consciousness, and biology that influence the experiences of African American boys and men" (p. 4)
4. "African American boys and men are resilient and resistant" (p. 5).
5. "Race and racism, coupled with classism and sexism, have a profound impact on every aspect of the lives of African American boys and men" (p. 6).

6. “The focus and purpose of study and programs that concern African American boys and men should be the pursuit of social justice” (p. 6).

AAMT represents a shift away from deficit-laden frames to frameworks that empower individuals to tell their own story. Bush and Bush (2018) call for a paradigm shift, in which they use the following proverb: “Just because the lion is talking doesn’t mean that he isn’t still telling the hunter’s story.” In other words, AAMT challenges researchers to view African American men and boys to elucidate ways to maintain their African spirit and freedom as opposed to framing their success within the hunter’s hegemonic systems (e.g., schooling). Keeping in mind this metaphor, it is important to empower African American males to narrate their own experiences without the fetters placed on them by society.

### ***Experience as Narrative and Race as Narrativized***

The following section will describe narrative and how it pertains to experience and race. Experience can be understood as the ways in which humans describe their lives, collect and tell stories of them, and write narratives (Connelly & Clandinin, 1990). Race can be considered narrativized as race itself is “storied”. For example, Boske (2010) employed narrative inquiry to highlight how aspiring administrators were not afforded enough opportunities to address issues of race and racism in their program of study. Such instances exemplify how experiences can be understood as "narrative" and how race can be understood narratively. The goal of the framework is to provoke researchers to use an anti-deficit framing to further understand the factors that enable Black males.



### ***Positioning My Study Within the Literature on Black Males***

In my dissertation, I sought to explore my experiences as a Black male undergraduate student persisting in an engineering program at an HWI. Although there is an abundance of literature exploring the persistence and academic success of Black male undergraduate students in HWIs (e.g., Kim & Hargrove, 2013; Lewis, 2003), few studies focus on Black men in engineering. Goings (2015) noted that most studies on Black males in STEM have been centered on mathematics education (e.g., Ellington & Frederick, 2010; Jett, 2011, 2013; Stinson, 2006). Hence, there is a need for more studies of Black men in various STEM disciplines, including engineering.

My dissertation offers a more nuanced understanding of how a Black male engineering student may navigate relatively unexplored topics such as spirituality, resistance, and mental health in college. This study aimed to respond to Harper's (2013) call to action: "Necessary is the publication of new scholarship that unmask the personal and institutional enablers of achievement, including more sophisticated examinations of how minoritized students manage to persist through baccalaureate degree attainment" (p. 207). Therefore, this study exploring a Black man's experiences in an undergraduate engineering program at a HWI will provide in-depth information for HWI faculty and administrators to improve the collegiate experience of African American men.

### **Summary**

The review of literature reveals that the challenges that Black men face in higher education and the various supports that facilitate the success of African American male students. The motivation for many studies about African American males in undergraduate programs has tended toward understanding the factors that contribute toward their persistence and retention. The evaluations of these undergraduate programs in STEM indicate that interventions that nurture

sense of belonging and self-efficacy may yield promising results to broaden the participation of Black males in STEM careers. Although there are few studies that conduct an in-depth examination of Black males in engineering, other studies support the importance of contextualizing the experiences of Black males in engineering programs at HWIs.

## METHODOLOGY

This chapter discusses the data collection and analysis methods, the approach to share the research findings and the approach used to establish trustworthiness to be implemented for this study. This section offers critical autoethnography as a methodology for better understanding how to address the underrepresentation of Black male engineering students at historically White institutions. The methods will examine my persistence to and through an undergraduate engineering program through the lens of African American Male Theory Framework (Bush & Bush, 2018). The findings of this study may set the foundation for further investigations into how these experiences can lead to increased retention of Black males in engineering. Accordingly, this chapter explains the context of the study, and qualitative approaches to answer the following research question:

How do I make meaning of the formative experiences along my engineering education journey at an Historically White Institution through the lens of African American Male Theory?

I chose qualitative inquiry to answer this research question because this type of research “provides valuable and trustworthy accounts of educational settings and activities, the contexts in which these are situated, and the meanings that they have for participants” (Maxwell, 2012, p. 655). Qualitative research involves an interpretative, naturalistic approach to understanding local knowledge of a given program, people’s experiences, meaning, relationships, and contextual factors that marginalize a group of people (Mohajan, 2018). Qualitative research can help contextualize the raced and gendered experiences of minoritized people so that norms in schools of engineering, which favor White men, are challenged (Pawley, 2019; Walther et al., 2017). My

epistemology most closely aligns with critical perspectives in which I believe that there are multiple realities situated in power contexts. Through an in-depth analysis of my own experiences, qualitative research affords me the advantage of raising sensitivity to the contextual factors that affected my lived experiences throughout my time in an undergraduate engineering program at an HWI. Qualitative research affords me the opportunity to interpret the meaning of my own experiences through critical autoethnography.

### **Research Approach**

This study employed critical autoethnography as the primary tool for understanding and analyzing my lived experiences. In the context of this study, my narrative account as a minoritized individual shares my lived experiences while navigating an undergraduate engineering program at an HWI. My experience has the potential to cast light on the strengths that minoritized individuals bring to undergraduate engineering programs at HWIs as well as novel interpretations of those experiences. Autoethnography will aid in conveying stories told during the interviews with the me, and these stories have power to inform others in understanding the experiences of a Black man. In addition, an anti-deficit approach must be taken to normalize and affirm the experiences of the minoritized individuals. To do this, I used *African American Male Theory* to contextualize the abilities, ingenuity, and history of me in the study.

I apply autoethnography as critical social research to address the research question (Hughes & Pennington, 2017). Autoethnography “combines cultural analysis and interpretation with narrative details. It follows the anthropological and social scientific inquiry approach” (Chang, 2008, p. 46). In this study, I draw from critical social research and critical autoethnography to make meaning of my formative experiences. When applying autoethnography as critical social research, it is key that the researcher must consider their own role with critical reflexivity in which

they view themselves as complicit in the problems they perceive (Hughes & Pennington, 2017). A researcher applying critical autoethnography “uses data to analyze how structures of power inherent in culture inform some aspect of her or his own story” (Merriam & Tisdell, 2015, p. 60).

Critical autoethnography provides access to private worlds and rich data (Pavlenko, 2002, 2007). The researcher and participant are the same person which provides opportunity for deeper engagement with self-reflection and reflexivity. In addition, the researcher is fully aware of participant, enabling self-disclosure of more information. The critical autoethnography provides the opportunity for readers to reflect and empathize with narratives presented. Lastly, the critical autoethnography serves as emancipatory discourse in which I express my right to tell the truth without waiting for others to express what they want known or understood (Richards, 2008). In doing so, as the researcher and participant, I can fully tell my story in my own words with authenticity. A critical autoethnography of my past experiences as a Black male who has studied engineering brings voice to a perspective that is severely underrepresented in the dominant culture of engineering.

### **Context of the Study**

I conducted the research study through a retrospective analysis of my experiences pertaining to matriculating into and participating in an undergraduate engineering degree program at a historically White institution. These experiences range from my early childhood in the Metro Detroit area of Michigan to the final year of my undergraduate degree program at the University of Michigan which is roughly between 1997-2016. In the following paragraphs, I will characterize Detroit, Southfield, and the University of Michigan.

Detroit is the largest and most populous city in Michigan. It has a population of over 600,000 residents. Roughly two thirds of the population consists of African Americans and Detroit

is one of the most racially segregated cities in the United States. Detroit is known for its major cultural contributions to music, art, architecture, and design, along with its historical automotive background. Detroit is a major port on the Detroit River, connecting the Great Lakes system. Detroit, also recognized as the “Motor City”, is known as the center of the automotive industry in which the “Big Three” (i.e., General Motors, Ford, and Stellantis North America) auto manufacturers are headquartered in the Metro Detroit area. Detroit is home to several institutions of higher learning, including Wayne State University and the University of Detroit Mercy.

Southfield is northern suburb of Detroit, sharing part of its southern border with Detroit. The city has a population of over 70,000 people. Over half of the population consists of African Americans, making Southfield the second largest Black population in Metro Detroit and third-largest in Michigan, as many African Americans moved from Detroit to Southfield. Southfield is home to eight colleges, including Lawrence Technological University and Oakland Community College.

The University of Michigan is a public research university in Ann Arbor, Michigan. The university was first established in Detroit in 1817, making it the oldest university in Michigan, but later moved to Ann Arbor in 1837. The university is known for its prestigious faculty, impressive colleges and schools, and substantial network of notable alumni. The university enrolls over 40,000 students on its campus each year. The Ann Arbor campus is divided into four main areas: the North, Central, Medical, and South campuses. The North Campus houses the College of Engineering, among other schools, and also contains the university’s largest residence hall, Bursley Hall.

## **Life History**

As the sole research participant in this study, I serve as both the researcher and the researched which requires greater depth in disclosing my positionality. My passion for Black male self-actualization is rooted in several factors, including spiritual and intellectual formation experiences, Black history, and the fight I and many of my peers have fought in surviving the undergraduate engineering machine. Acknowledging my journey to and through engineering education highlights my accomplishments and pitfalls which explain contributors to my persistence in engineering. I do not believe that my circumstances are unique, but I have yet to be presented with my story in current literature, making this work essential. I was born in Detroit, MI. I was raised in a single-parent low-income household by my mother until the 3<sup>rd</sup> grade. My family and our income expanded shortly after this time period with the addition of stepfamily and a newborn brother. My family was severely impacted by the Great Recession of 2008 in which many people in the Metro Detroit area lost their jobs, including my parents. My family then transitioned back to low-income status throughout the rest of my time in high school.

I spent my early childhood in Detroit Public Schools in which I have great memories of making friends, excelling in class, and feeling a sense of belonging despite the frequent characterization that Detroit Public Schools were unsafe, underperforming, and poorly maintained. I progressed, despite these conditions, in this system because of teachers like Ms. Gordon (pre-Kindergarten), Ms. Noble (1<sup>st</sup> grade) and Ms. Moore (3<sup>rd</sup> grade). However, my parents transitioned me to Southfield Public Schools so that I could obtain a higher quality education. Throughout my tenure in this school system, I was challenged in advanced coursework by teachers like Ms. Heard (5<sup>th</sup> grade), Mrs. Feldscher (6-8<sup>th</sup> grade), Mr. Raether (10<sup>th</sup> grade), Mrs. Malone (11<sup>th</sup> grade), and Mrs. Valentine (11<sup>th</sup>-12<sup>th</sup> grade) who provided me with many opportunities to grow intellectually as well as build my character. The benefits of these great teachers went beyond my excelling in

math and science to become an engineer. These teachers instructed dynamic classrooms that appropriately propelled marginalized students to succeed in the classroom; however, we were still ill-prepared for a racialized society. Due to my advanced academic ability, my mother was eventually prompted by teachers to place me into private schools in the eighth grade. However, I declined all invitations because I preferred to be amongst my peers. I attended predominately Black schools up until I attended college. Even though I was around students that looked like me, there was still a separation instituted which grouped me in with “gifted” students. Many of my classes, from the 4<sup>th</sup> grade to 12<sup>th</sup> grade, were with peers that were familiar to me. Still, I dealt with feelings of isolation as I grew older due to not “fitting in” and my relatively quiet demeanor. Nonetheless, familiarity with my peers played a key role in my sense of belonging in grade school.

I come from a family of engineers in that my father, his sisters, and my paternal grandfather were all formally trained as mechanical engineers. Though none of these family members had lifelong aspirations to become engineers, they all believed that engineering is more about a way of thinking than a degree or certification. My aspiration to become an engineer began in my early childhood as I watched my father tinker with his computers and his cars. Although I didn’t truly know what an engineer was, as a child I knew that was my father’s title. I longed to become closer to him by becoming an engineer, and the prevalence of the automotive industry in the Motor City made my aspirations to become a mechanical engineer more concrete.

My aspiration to attend the University of Michigan was long held in my early childhood as some of my mother’s friends that were alumni influenced me to want to attend. Growing up, I did not predict the stark contrast from my expectations to the reality of attending this historically White institution. I simply could not see a downside to attending the University of Michigan, so it was the only institution that I applied to as I naively thought that my scholarship guaranteed my entry



into the college. I was fortunate to have a full ride scholarship to attend the university which was a long-term goal that I achieved to prevent my family from worrying about financial debt for my pursuit of higher education. Throughout my experience as an undergraduate engineering student, I did not have a very positive experience as I dealt with feeling isolated, feeling a lack of belongingness, and not performing academically to meet my expectations. I noticed that many of my community of friends, who were members of the National Society of Black Engineers (NSBE), were experiencing similar things that did not align with my own high expectations for a positive college experience. To combat these negative experiences, I served in mentorship roles where I worked with Black and Brown students aspiring to either get an engineering degree or obtain a postsecondary opportunity. Finding a deep sense of fulfillment in this work, I applied to the University of Michigan's Higher Education master's program and gained entry. I dropped the master's program due to an unexpected medical emergency and worked full time as an Applications Engineer in customer education. I felt compelled to apply for Purdue University's Engineering Education doctoral program to discover ways in which I may learn to change the engineering field to make it more acclimatable for Black and Brown professionals.

As a man of Christian faith, spirituality plays an important role in my life. Although I sporadically attended church with my family throughout my childhood, I remained faithful to God and grew stronger in my relationship with Him during my college years. I participated with the University of Michigan's Gospel Chorale beginning in the third year of my engineering program which helped me develop a stronger faith in the Lord. Through my positive experiences interacting with like-minded individuals in the chorale, I went on to take up leadership positions during my remaining time at the University of Michigan. My faith bolstered my desire to guide Black

engineering students toward success. Although many racial issues took place on and off campus, I held an optimistic outlook on life and enjoyed sharing this positivity with my friends.

This summary of significant events in my personal history is relevant to unveil the biases and advantages I contribute to this project. Growing up in a majority Black, highly segregated area offers much insight into various occurrences and cultural practices obscure to people with little-to-no experience in such spaces. I have many cross-cultural experiences which lead me to feel competent in valuing and appreciating cultural differences between other cultures and my own. I have witnessed abundant racial inequalities in America while navigating both predominant and multicultural spaces, which developed my responsiveness to racism in all its forms. I have navigated many levels of the school system and witnessed its presence at every level. Yet, I remain optimistic that Black and Brown students are able to excel in the various societal systems despite the presence of racism. My history motivated my selection of African American Male Theory framework concentrating on an anti-deficit approach to understand my experiences as a Black male in engineering.

## **Research Methods & Interpretation**

### **Data Collection**

The data collection methods employed in this autoethnographic study align with those in general qualitative research (e.g., journaling, interviewing, collecting artifacts); however, I am both the researcher and the participant. The following section describes the data collection process of this study, including descriptions of qualitative data collection procedures. The selected research methods were chosen to elucidate my experiences as a Black male in an undergraduate engineering

degree program at a historically white institution. Additionally, the data collection process was done intentionally to capture of examples within African American Male Theory.

I used my personal memory to link the past to the present to provide wealth to my experiences (Ellis, 1999; Dyson, 2007). As an autoethnographer, my memories provided me with insights of how I navigated a culture of higher education at a HWI that was not designed for the success of Black males. Artifacts from my past (e.g., essays, poems, applications, etc.) were collected as personal memory data (Esterberg, 2002; Hughes, & Pennington, 2017). One aspect of personal memory is “recalling,” and Chang (2016) discussed that memory data offers the opportunity to build a database for the cultural analysis and interpretation. Chang (2016) suggests inventorying self by making a list of thematic categories relevant to the study, selecting relevant bits of information on the themes, and give an order to the thematically collected bits. For this dissertation, I engaged in the process of developing themes and a timeline based on memorable experiences that were analyzed.

I focused on major psychosocial experiences that affected me and highlighted how I endured various aspects of higher education. My goal was to use traces of my memories to make stories that give meaning to my life and alter who I can be in the future (Bochner, 2007). I aspired to make my narratives in such a way that they produce the effect of reality, verisimilitude, as a performance of truth without holding a mirror to the past in a vain attempt to capture all information concerning my history (Bochner & Ellis, 2016). Through my storytelling, I offered a point of view to narrate my experiences from based on facts through imagining instead of inventing new information. As the autoethnographer, I performed memory work to rewrite, revise, remember, and recount the past with the purpose of eliciting meaning for story-making (Bochner, 2007). With this concentrated effort, I selected school experiences and encounters throughout my

academic journey to develop cohesive and coherent narratives. I used my memorable experiences to craft my narratives for each year so that these experiences resonate with and are useful to readers (Bochner & Ellis, 2016).

I collected both self-observation data and self-reflection data for this study. Chang (2016) notes that “self-observation observation collects factual data of what is happening at the time of research whereas self-reflection gathers introspective data representing your present perspectives” (Chang, 2016, p. 89-90). In terms of self-observation data, I systematically recorded behaviors, thoughts, and emotions as they occurred in natural contexts while conducting my study. Self-reflection took the form of reflexive narrative writing that I engaged in after reviewing different pieces of personal memory data and autoethnographic interviews. This self-reflective data resulted from introspection, self-analysis, and self-evaluation of who I am and what I am. My self-reflective data collection strategy was to use a field journal and write my thoughts for at least 30 minutes per day as I participated in my self-study for a span of two months. In addition, I would develop and answer different prompts to myself after reviewing personal memory data for the purpose of doing more in-depth self-exploration.

With respect to external data, autoethnographers can select “a wide range of personal documents to chronicle and examine their lives” (Anderson & Glass-Coffin, 2013, p. 68). Textual artifacts include officially produced documents and personal texts written by me or about me or my cultural contexts (Chang, 2016). Official documents (e.g, transcripts, degree, etc.) helped validated significant moments in my life. Personally-produced texts (e.g., personal letters, essays, and poems) were valuable to my study because they preserved my thoughts, emotions, and perspectives at the time of recording, untainted by my present research agenda (Chang, 2016). In

this study, I took notes on documents from various points in my life as early as my fourth-grade journal as well as other artifacts such as various poems, speeches, and college applications.

Table 1 indicates all the data sources collected as well as the corresponding time frame and critical moments that aligns with each set of documents. In Table 1, I explain critical moments about textual artifacts from as early as the fourth grade to data generated during my time as a PhD student for the autoethnography. Each set of data created before and during college has a critical moment associated with experiences that I was enduring throughout my educational journey. These moments were pivotal in how I made meaning and told my story within each narrative. These experiences were then examined and explored through two autoethnographic interviews.

Table 1. Chronological timeline of data sources and corresponding critical moments

<b>Time Frame</b>	<b>Data Source(s)</b>	<b>Critical Moment</b>
Spring 2003	4 <sup>th</sup> Grade Journal Entries: <ul style="list-style-type: none"> <li>• What Do I Want to Be When I Grow Up?</li> <li>• My Best Day of School</li> </ul>	This is the first recorded instance of my aspiration to become an engineer. I also reference a field trip to a “science place” which indicates my early interest in STEM.
Spring-Summer 2010	<ul style="list-style-type: none"> <li>• SCEEP Application Essay</li> <li>• SCEEP Professional Development Assignments               <ul style="list-style-type: none"> <li>○ What is Success?</li> <li>○ Defining Excellence</li> <li>○ SWOT Analysis</li> </ul> </li> </ul>	This is the first instance in which I was formally exposed to college life at UM. It was also where I began to feel challenged about my worthiness as a student. I earned a scholarship through this program to attend UM.

Table 1 continued

Fall 2010	<ul style="list-style-type: none"> <li>• UM Admission Essays <ul style="list-style-type: none"> <li>○ Common Application Personal Essay</li> <li>○ Diversity Essay</li> <li>○ College of Engineering Essay</li> </ul> </li> <li>• The Come Up (J. Cole, 2007)</li> </ul>	Through these essays, I clearly explain my aspiration to the attend the college and make appeals as to my reasoning for belonging in the school. I make the case for my background of service, contribution to diversity, and how I belonged in the COE.
Spring-Summer 2011	<ul style="list-style-type: none"> <li>• M-STEM Application Essay</li> <li>• 2011-2012 Resume</li> <li>• Email Exchange with Black Male Role Model with Ph.D.</li> </ul>	The M-STEM program that I participated in helped me build relationships and prepare me for college. I met a Black Male speaker in this program which helped me make the decision to aspire to go to graduate school.
Fall 2011	<ul style="list-style-type: none"> <li>• 11 Weekly Journal entries for my introductory engineering class, Design and the Real World</li> <li>• The Warm Up (J. Cole, 2009)</li> </ul>	This was my first exposure to engineering coursework. I struggled with my self-concept as an engineer throughout the course but began to see myself as an engineer toward the end.
Spring 2012	<ul style="list-style-type: none"> <li>• NSBE Junior Executive Board (JEB) Application</li> <li>• M-STEM Research Proposal Draft</li> <li>• 2012-2013 Resume</li> </ul>	After joining the JEB, I began to establish roots in the community of Black engineers at UM which helped nurture my sense of belonging. I also applied to do research during the summer which did not happen but offered new insight into my graduate aspirations.
Summer 2012	N/A	I was hospitalized three times due to disability.
Spring 2013	Cole World: The Sideline Story (J. Cole, 2011)	My girlfriend and I reconciled.

Table 1 continued

Fall 2014	<ul style="list-style-type: none"> <li>• 2013-2014 Resume</li> <li>• “Above the Clouds” Poem</li> <li>• “What Can I Do” Poem</li> <li>• 4 Your Eyez Only (J. Cole, 2016)</li> </ul>	<p>After a slew of police brutality cases including Eric Garner, Michael Brown, and Tamir Rice, I began fueling my angst into poetry. I also began to participate in vigils and protests on campus. “Above the Clouds” was the first poem in which I referenced my disability. My two-year hiatus from poetry was caused by my hospitalizations in the Summer of 2012</p>
Spring 2015	<ul style="list-style-type: none"> <li>• 2014-2015 Resume</li> <li>• “A Teacher’s Hope” Poem</li> <li>• “Embarking on My Journey” Poem</li> <li>• “Founded on Inequity” Poem</li> <li>• “How About Now” Poem</li> <li>• “Echoes of Exhaustion” Poem</li> <li>• “Why God?” Poem</li> <li>• “Rejecting the Cure” Poem</li> <li>• Center for Entrepreneurship Jump Start Grant Deliverable</li> </ul>	<p>In this timeframe, I began serving on the executive board for the Michigan Gospel Chorale as the historian. This is where I began to explore my relationship with God through poetry where I performed my pieces at concerts through Taking Refuge Uttering Spoken Truths (TRUST). I also published my book, The Scholar’s Key, and began doing public speaking to motivate teens to apply for scholarships.</p>
Summer 2015	<ul style="list-style-type: none"> <li>• “Your Education Is a Weapon” Keynote Speech to Kappa League in Detroit</li> <li>• Scholarship Luncheon Speech with Urban Solutions</li> <li>• “A Teacher’s Hope” Poem</li> </ul>	<p>I began working for the Center for Educational Outreach (CEO) where I exposed underserved middle school students to postsecondary opportunities. I also posed challenging concepts about education in speeches to predominately Black students in Detroit.</p>

Table 1 continued

Fall 2015	<ul style="list-style-type: none"> <li>• 2015-2016 Resume</li> <li>• “We Don’t Live” Poem</li> <li>• Project Inspire Speech</li> <li>• Personal Statement for UM School of Education (SOE) M.S. in Higher Education Administration</li> <li>• Academic Statement of Purpose for UM-SOE M.S. in Higher Education Administration</li> </ul>	During this time, I was working for CEO and wrapping up my last year in the COE. I decided to apply for grad school in the UM’s School of Education.
Winter-Spring 2016	<ul style="list-style-type: none"> <li>• “What Motivated Me to Go to College Debt-Free” Blog Post for personal blog</li> <li>• “How I Unlocked My Dreams as a Teen” Blog Post for Gates Millennium Scholarship Alumni Blog</li> <li>• “Oceans” Poem</li> <li>• “Graduation Station” Poem</li> <li>• “We Don’t Live” Poem</li> </ul>	During this time, I was successfully admitted to the UM-SOE and graduated from college shortly after. I began to consider writing a motivational blog to help students with accomplishing their academic goals. Due to interest in my story, I began sharing more about my journey to and through college.
Summer 2016	<ul style="list-style-type: none"> <li>• Letter to Future Academic Facilitators for Summer Engineering Academy (SEA)</li> <li>• Interview about my college experiences with Researcher</li> <li>• Unofficial Transcript</li> <li>• 2014 Forest Hills Drive (J. Cole, 2014)</li> </ul>	After graduation, I worked for the Center for Engineering Diversity & Outreach’s SEA. This is where I solidified my desire to pursue a PhD in Engineering Education due to my passion for educating young engineers. I also participated in an interview with researcher who was investigating the collegiate experiences of Black men.
Winter 2021	<ul style="list-style-type: none"> <li>• 2 Autoethnographic Interview Transcripts</li> </ul>	N/A
Spring 2021	<ul style="list-style-type: none"> <li>• 37 Journal Entries of Self-Observations &amp; Self-Reflections in Researcher Journal</li> </ul>	N/A



Interviews serve as an important method to construct knowledge through social exchange (Creswell & Poth, 2018). Interviews with someone else were important specifically for my autoethnographic study because the interview process allowed me to reflect on my thoughts, feelings, knowledge, and experience in such a way that I left the interviews knowing things about myself that I didn't know before, or at least was not fully aware of (Patton, 2002). The interviewer for this study is someone that I have known for over 3 years. She has been my professor for three courses, and I have thoroughly enjoyed gleaning from her insight and wisdom. I picked her as my interviewer because she is an expert in qualitative research methods and comes from a research background of studying contemporary Indigenous education in the US. She is someone with whom I feel comfortable sharing my story with as we have had many in-depth conversations about my experiences as a Black man in education. I consider the interviewer to be a friend and confidant in which I can share my experiences and receive critical insight. The interviewer reviewed my artifacts before each interview and inquired about my experiences related to the data.

I have pulled from two interview of the transcripts from these interviews using an open-ended approach. These two interviews were revisited repeatedly for analysis. These interviews were transcribed and reviewed for accuracy (Mclellan, Macqueen, & Neidig, 2003). I implemented both reflective and reflexive journaling. When employing reflective journaling, I concentrated on the memories of various experiences that relate to my journey to and through engineering education. I journaled reflectively before each interview and each examination of artifacts in anticipation of the thoughts, interpretations, and conclusions of my own experiences. For reflexive journaling, I centered myself (e.g., my thoughts and attitudes) on the perceived effects of my experiences after interviewing and reviewing artifacts.

## **Data Analysis**

I analyzed the data (i.e., interview transcriptions, journal entries, and documents) through the lens of the primary research question. Analysis of the data followed Braun and Clarke's (2006) six-step process for thematic analysis. To generate themes based off the raw data, I began by reading and re-reading the data to take notes of initial ideas, and what I felt was significant and resonated with me. Next, I generated codes for interesting features presented in the data, giving full and equal attention to each data item, and collating data relevant to each code. I facilitated the overall coding process to identify emergent themes as data is collated. After I coded and collated all data, I reviewed the data extracts to determine whether there was a coherent pattern that forms a thematic map. Then, I examined the relationships between the emergent codes and African American Male Theory. Next, I reviewed the trustworthiness of individual themes in relation to the data set to determine whether the thematic map was an accurate representation of the data set as a whole. I defined and refined the essence of what each theme is about to determine the aspect for which each theme captures. Finally, I extracted vivid, compelling examples to produce a scholarly report of the analysis (Braun & Clarke, 2006). To further enhance the thematic analysis, I conducted a document analysis of personal memory data by skimming, reading, and interpreting the textual artifacts (Bowen, 2009; Esterberg, 2002). In addition, I performed memo writing throughout my analysis of documentation to provide more contextual depth to my data (Birks, Chapman, & Francis, 2008).

Through this process, I sought out to transform autobiographical data into vivid, compelling texts (Chang, 2008). As an autoethnographer, I collected data that allowed me to describe my story in snapshots of various meaningful events that characterized my endurance through challenges I faced. Overall, the data supported my experiences but do not stand alone to tell my story. I have systematically sought meaning throughout the documentation of my academic

journey starting from my earliest journals through the present time. I created narratives for each year of college in a five-step process: (1) collecting textual artifacts from each year, (2) creating a timeline around each year based on data, (3) reading and reviewing each data source, (4) extracting key salient points, (5) writing and rewriting stories around each salient point.

The six specific experiences that are described in more depth in Chapter Four were selected based on the following four criteria: (1) representation in the data, (2) alignment with at least one theme from data analysis, (3) resonance with at least one tenet of African American Male Theory, (4) vividness of recall. First, it was important to use these six experiences because they were referenced in the data sources that I collected. Then, through the thematic analysis, I discovered that my experiences should relate to (1) support systems, (2) engineering self-concept, (3) pursuit of justice, (4) academic sacrifices, and/or (5) defining success. After outlining experiences that characterized at least one of these themes, I then correlated the experiences to each tenet of African American Male Theory to see what resonated most. Upon determining how to accentuate the themes and tenets through my selected experiences, I scoped my experiences based on the most memorable aspects that I could recall. Finally, the narratives were developed as presented in Chapter Four.

African American Male Theory and critical autoethnography inform the presentation of the findings which are presented in Chapter Four as narratives revolving around my experiences as a Black man during my time at the University of Michigan. In Chapter Five, generated themes will explore how tenets of African American Male Theory is exposed to help ground the findings in such a way that resonates with readers. Further discussion of how each theme relates to African American Male Theory will explain the transferable themes that may be applicable to other Black men's experiences in engineering programs at HWIs.

### **Ethical Considerations & Trustworthiness**

Because I was both the primary researcher and research participant, I did not seek Institutional Review Board (IRB) approval for this study. Since the data produced through this project came from myself, I did not believe harm could be caused to anyone else as I am the sole participant engaged in the study.

In addition to the IRB considerations, I must account for the trustworthiness of the study. This study conveyed transparency and authenticity through a thorough explanation of the methods, my story, and context to increase the trustworthiness of the study. I offered reliability by acknowledging my own subjectivity when interpreting and making meaning of the data. I relied on crystallization of the data in which I (a) offered deep, thickly described interpretations of meanings, (b) represented ways of producing knowledge across multiple points, (c) utilized more than one genre of writing. (d) took a significant degree of reflexive considerations of the researcher's self and roles in the research process, and (e) embraced "knowledge as situated partial, constructed, multiple, embodied and enmeshed in power relations" (Ellingson, 2009, p. 10). My general experiences as a Black male engineering student at a historically white institution are not unique; however, my experiences also do not represent the diverse experiences of all Black males in engineering. Nonetheless, readers will be able to interpret the transferability of my conclusions based on evidence I offer and decide if and how my contributions relate to their own practice.

### **Summary**

This chapter discussed the methods and techniques employed by this study to answer the research questions. As this chapter described, this is a qualitative exploratory approach to investigate how I make meaning of my experiences in an undergraduate engineering programs at an historically white institution. Specifically, in this study I interrogate my formative experiences

as a Black male undergraduate engineering student at an HWI using an autoethnographic format. This chapter also provided an overview of context of the study, the participant, and the procedure. The steps for collecting and analyzing data within the study are explained.

# **FINDINGS**

## **Introduction**

The purpose of this study is to understand the meaning making around my experiences in undergraduate engineering programs at an HWI. Through the critical autoethnographic approach, I recount various experiences that I underwent during my time at a HWI as an undergraduate engineering student to make meaning through the lens of African American Male Theory. Through this analysis, I seek to answer the following research question:

How do I make meaning of the formative experiences along my engineering education journey at an Historically White Institution through the lens of African American Male Theory?

All references to people within the following six narratives and their accompanying thematic analyses are pseudonyms to protect and honor the privacy and identity of all involved. Steps were taken to prevent the use of other people's names as this autoethnographic study primarily focuses on my own interpretation of events. As an autoethnographic study is an inherently messy process, my reflections and analyses do not follow a linear fashion even though each narrative builds on one another, often overlapping to offer more context in a chronological order.

## **Overview of Findings**

There are six narratives which will have a corresponding critical analysis in Chapter Five. These findings cover the following five themes: (1) support systems, (2) engineering self-concept, (3) pursuit of justice, (4) academic sacrifices, and (5) defining success. Each narrative is titled after a Hip Hop album or mixtape to capture the aesthetic of the experience that I try to convey. Each

of these themes are correlated with tenets of the African American Male Theory framework in such a way that complicates our understanding of how Black men persist in engineering. By combining my storytelling with corresponding data, these findings aim to expose the complex nature of my experiences in an undergraduate engineering program at an HWI.

## **Findings**

### **The Come Up: Prologue**

J. Cole's "The Come Up" was his debut mixtape. As his first official dive into the rap game, J. Cole proved that he was willing to work hard to make his way to the top through his lyricism and delivery. Although the production on his mixtape wasn't of the highest quality, it was a promising start for the young rapper's career. In the title track of the mixtape, J. Cole reflects on his rise in the rap game and the progress that he's underwent while juxtaposing his current living situations to his upbringing. Similarly, working my way to the "top" (i.e., graduation) of engineering education started at home.

Like many children, I had two homes. In the first home, there was my mom. My mother received her master's degree when I was just three years old. As a single mother who valued education, she would often take me on many adventures to visit zoos, theaters, parks, and museums. My favorite attraction was the Ann Arbor Hands-On Museum which I credit with being the catalyst for sparking my early interest in STEM. My mother also had friends that were alumni of the University of Michigan in Ann Arbor who entranced me into wanting to attend as they had Michigan-themed paraphernalia all around their home.

My second home was with my father. Although my mom inspired me to go to college, I have my father to thank for inspiring me to consider engineering at an early age. One of the most

profound influences in my life regarding my journey to engineering education is my relationship with my dad. Though we were not close as I grew older, throughout my childhood I observed him working on his old school car and fixing the computers around the house when I visited him every other weekend. Through his technical prowess, I was introduced to technology. It was truly a luxury that every bedroom had a computer for us to play with, and I spent countless hours exploring the internet and playing videogames while staying with my father. Dad was a mechanical engineer by trade as he worked in the automotive industry after receiving his certificate in design engineering. I longed to be able to relate to him in a deeper way and thought that becoming an engineer would help solidify a mutual understanding. The reality that I perceived to be possible was that I'd come home from college with my degree and with more experiences to share with my father. I had the misguided belief that if I became an engineer, then we'd be able to bond over it. Unfortunately, this is not what happened.

Initially, I saw engineering as a way to change the world by serving others through creating technical solutions. I believe my mother was the person to introduce me to the possibility of becoming an engineer. In the fourth grade, I wanted to be a chemical engineer because I thought I would get to mix chemicals like how I did with Kool-Aid. Soon after, I wanted to become a mechanical engineer because I thought that they got to play with cars all day. By the sixth grade, I had the idea that I wanted to become a video game developer since I loved playing with video games such as the Game Boy, PlayStation and Nintendo 64. Clearly, I had many engineering interests. However, engineering was solidified as my aspiration when I was enrolled into the Living Intelligently For Ever (LIFE) Academy at the University of Michigan in the 6<sup>th</sup> grade. This experience exposed me to the College of Engineering, and I got to meet Black engineering students for the first time. In addition, from 7<sup>th</sup> to 8<sup>th</sup> grade I went to the Detroit Area Pre-College



Engineering Program, which allowed me to engage in engineering activities every Saturday during the academic year.

High school did not diminish my desire to become an engineer and I continued to explore what engineering meant to me. This meant taking advantage of opportunities to visit the University of Michigan. My cousin, who eventually graduated with a mechanical engineering degree, invited me to hang out with her and her friends one weekend. Although I knew that Michigan was my school, I fell in love with that school, and the people I met, almost instantly. Surrounded by Black people, I felt like I belonged. I could see myself belonging on this campus. There would be other Black people around me, and those people could share in my experiences as a Black man. As future narratives will demonstrate, this did not turn out to be the case.

The summer after my junior year of high school, I participated in the UM's Summer College Engineering Exposure Program (SCEEP). This was a co-ed, 12-day program for incoming high school seniors in which we were challenged to design an amusement park based on what we learned in our classes. We were also tasked with presenting about ourselves and our involvement inside and outside of high school. At the closing ceremony of SCEEP, it was announced that there would be 12 \$40,000 scholarships given to attendees of the program that performed well. I was awarded one of these scholarships which drastically changed my future. It helped confirm that I would attend my dream school and reaffirmed that I should continue to apply for more scholarships because I had tangible evidence that people were willing to invest in my future.

By the time I graduated high school, I had earned \$1.25 million in scholarships including the Gates Millennium Scholarship and the Buick Achievers Scholarship. As a student whose family lost their home during the Great Recession, this was an absolute blessing. That same year I began writing my book, "The Scholar's Key: How You Can Unlock Your Dreams as a Teen", to

motivate other teens to apply for scholarships. With all this financial backing, I was confident that I belonged at the University of Michigan and that I would be able to thrive. It was finally time to leave home.

*“And just think, man, I was raised on ramen*

*Chicken noodle soup, now I'm filet mignon-in'*

*I promised my momma I was coming to make this money*

*And I swear I'm going to kill the \*\*\*\*\* that try to take it from me”*

- J. Cole, “The Come Up”, 2007

### **The Warm Up: Freshman Year (2011-2012)**

J. Cole's second mixtape, “The Warm Up”, talks about how he finally made it to the basketball team (i.e., the rap game), but now he has to prove his worth by showing up in practice. This project was his main claim to fame as it is the very reason why he was signed to Jay-Z's label, Roc Nation. Likewise, I had finally been admitted to the University of Michigan and now I needed to show up in my initial coursework to cement myself as worthy of being in the College of Engineering.

It's a cold, snowy day during the beginning of winter break at Bursley Hall. I'm in my dorm room with my roommate, DJ, with J. Cole playing on my laptop in the background. To me, DJ was the model student as he was both athletic and intelligent. DJ and I have been in classes together since middle school. We grew closer over the years, especially after I worked up the courage to ask him to be my roommate during our senior year of high school. DJ and I were as thick as thieves ever since that point.

“Grades are in DJ!”, I exclaimed in great anticipation. “Check out your scores on your laptop.”

“I’ll check them out later, DC. I don’t know what to expect.” DJ explained shyly. DC was my nickname created and used exclusively by DJ.

“I hear you. Don’t be afraid, brother. I know you did well. After all, M-STEM prepared us for this, right?” I questioned knowing that DJ was one of my main competitors at the level that we were at academically in M-STEM. M-STEM was a pre-freshman 6-week summer transition program that included customized advising, career guidance, learning enrichment activities, and assistance in obtaining a paid research opportunity. In that summer, we saw just how dedicated Michigan students were as they showed up to classes a half hour early to make a good impression. During my freshman year, I had a group of friends from this program to take my classes with, including DJ.

*“You ever prayed for something your whole life?*

*I mean, all you dreamed about was this one thing*

*I mean, you know it’s coming*

*You have faith and all that*

*But sometimes*

*Sometimes you second guess yourself”*

- J. Cole, “Intro (The Warm Up)”, 2009

-

“Bro, I can’t believe this... I got a 3.5, yo!” I said in amazement!

“That’s great, DC! You made the Dean’s List!” DJ said in support of my academic success.

“Really?” I questioned in surprise.

“Absolutely! If anyone was going to do it, it’d be you!” DJ exclaimed.

“That’s crazy! Yo! I got an A- in Calc despite our setbacks in AP! I even got an A- in my engineering 100 class. Y’know, in Engineering Design and the Real World. Some say that was the hardest introductory engineering course so you know I can’t believe I made it this far!” I clamored.

I was in such surprise because my engineering 100 course was the first class that I found supremely intimidating. I suddenly remembered walking to the first class of my introductory engineering course and reading on the wall about the classic engineering story of a professor telling his class to “look to the left, look to the right” and saying “one of you will not make it to graduation.” I was shaken by this. I remembered being visibly nervous and not knowing if I’d be able to pass the class so I could eventually make it to graduation. When the professor spoke, I began to feel a sense of ease. To my surprise, my professor ended up being hilarious, relatable, and kind. This class was one of the few times during my college career where I felt like I could express myself without reprimand. We were required to journal out our thoughts regarding class each week. I journaled all throughout this course and I shared my frustrations with trying to understand what engineering was.

“I don’t know about it being the hardest. Digital Signal Processing had me running for my money. But you know what my grandpa always says: ‘It’s all relative.’” DJ explained.

“Amen to that brother,” I agreed.

Knock! Knock!

I swung the door open. “Hey guys! You know grades are in, right?” Angel, explained. Angel was a friend of ours that we made during M-STEM. He was a short, Latino student from Holly, Michigan with a passion for computer science. We shared a deep appreciation for all things Hip Hop and continuously shared new music with each other.

“Yeah! You won’t believe this, Angel! I got an A- in our engineering 100 class!” I said with great enthusiasm.

“Really? I got a B... Those exams were killer,” Angel explained while looking down on the ground.

“Cheer up, Angel! That’s still a really good grade!” I explained. “After all, it’s much better than our grades in M-STEM. We should definitely be proud of the cell-phone activated dorm room window closer that we created for our class project.” Our major class assignment was to come up with a product that could help our end user. Initially, my team’s creativity was stifled as we couldn’t seem to figure out a good idea to work on.

“True. I’m still surprised that we came up with that idea on that rainy day in Bursley. We all looked out the window and it was like our minds suddenly synced up. I feel bad for our residential facilitator in M-STEM though. He happened to leave his window open on that day and it destroyed his laptop.” Angel explained to DJ.

“We wanted to help prevent something like that from happening again, so we began to work together as a team to solve the problem.” I said with conviction.

In the back of my mind, I remembered that as we worked on developing a prototype, one of the glaring issues I had was my severe lack of technical skills that I could apply to help with the project. I constantly compared my contributions to my teammates and felt that I had to do more to prove myself as worthy, especially as a Black man. I didn’t want to make a bad impression on my teammates to the point where they didn’t want to have another Black teammate again. Unfortunately, this need to prove myself never left me as I had even more team projects in future classes where I was always the only Black person on the team.

“Yeah, we did our thing. How has NSBE been for you all?” Angel inquired.

“It’s been good. We’ve met a few new friends and I feel like I’m starting to hang the of things.” I explained. Thinking back to the beginning of the school year, I immediately joined the National Society of Black Engineers (NSBE) to help get support and expand my group of friends. After all, relating to other Black students was very easy, especially at a predominantly White institution.

How has SHPE been for you?” I asked.

“About the same. My M-STEM mentor has been showing me the ropes, too.” Angel explained.

“Yeah, I really enjoy hanging out with my M-STEM mentor. We have a lot of fun talking and we even accidentally walked through a cemetery.” I said holding back laughter. I was paired with a mentor, a Black woman in mechanical engineering, through M-STEM for extra support. I had never had a formal mentor and lacked role models before college, so this was a new experience for me, but we worked well together.

“No way! That’s hilarious!” DJ said with a huge smile on his face.

“Yeah. Hey guys, I’m about to start packing to leave for home. It was great talking to you Angel,” I explained with a smile.

“See you next semester!” Angel said walking away.

As I packed my clothes, I thought about how much I benefited from having a group of friends in my classes and a mentor. It truly helped me perform well academically during my freshman year. I began the year feeling afraid and even doubting that I could be an engineer. In engineering 100, I underwent a transformation in which I was increasingly comfortable with uncertainty throughout the engineering design process because the class constantly forced me to deal with abstraction. I began to see failure as a learning opportunity and my sense that I could

become a successful engineer had improved because I had made it out of this difficult class with a good grade. Furthermore, making it on the dean's list renewed my sense of confidence. Maybe I would be successful as an engineer after all.

*"See, me, I came a long way*

*Way too far for me to stop now"*

- J. Cole, "Intro (The Warm Up)", 2009

### **The Sideline Story: Sophomore Year (2012-2013)**

Cole World: The Sideline Story, J. Cole's debut album, was one of the most highly anticipated projects in 2011. In line with J. Cole's hooping aspirations, this project is outlined by J. Cole finally getting his shot to get up off the sidelines and make a name for himself in the rap game. Although the project has been critiqued for being relatively safe, J. Cole tackles striking subjects such as abortion and growing up in a fatherless household. J. Cole's rise to fame was sealed due to the heights he was able to reach from his album's success. During my sophomore year, my experiences were similar to J. Cole's initial experience of being on the sidelines; I felt like I had been benched and needed a way to prove my worth.

It was a sunny, cloudless day in April at Stockwell Hall. As the semester was coming to an end, I remembered how my sophomore year had way more downs than ups. For starters, the summer after my freshman year of college, I was diagnosed with a disability after being hospitalized three times. That summer was full of unfortunate and traumatic events that ultimately left me feeling as if I had lost a piece of myself.

*"I put my heart and soul in this game, I'm feelin' drained*

*Unappreciated, unalleviated*

*Tired of comin' up short—\*\*\*\* abbreviated*

*Want my whole name spelt out, my own pain spilt out”*

-J. Cole, “Sideline Story”, 2011

I fell into great despair and entered the following school year as a broken, misunderstood young man. I felt a great sense of shame for all that I had gone through and I fought hard against the diagnosis because I did not trust the healthcare system had my best interest at heart. It took years of therapy to reach a point in which I’m comfortable sharing with others that I talk to a therapist. I have spent a great amount of thought on whether I should disclose that I even have a disability. Part of me wants to be as vulnerable and authentic as possible, yet I want to make sure that I am protected as I do not want my disability to be leveraged as an attack against my credibility. Managing my disability while in school has haunted me with the possibility of rearing its ugly head from that summer up until present-day.

On this sunny day, things were different than most days during my sophomore year. I’d characterize most days this year as a vicious cycle of waking up, going to class, overeating, watching cartoons, and oversleeping. Wash, rinse, and repeat. Instead of gaining the Freshman 15, I had amassed a Sophomore 20. To make matters worse, my girlfriend of 3 years, Myia, decided that she wanted to take a break from our relationship shortly after that summer. I didn’t blame her as it’d become difficult for me to express myself as my shame prevented me from being present with her. Honestly, I blamed myself for things not working out, but I needed time alone to heal.

Today was different because things were finally looking up.

Knock! Knock!

I anxiously walked to the door, trying to keep my cool. This was my moment for change. As I opened the door, Myia was standing there as beautiful as ever.



“Hi Donovan... you ready to go to the Arb?” Myia said with a smile.

“Of course!” I blurted out with my heart racing.

It was our first official date since the beginning of our break in the Fall. We decided we’d walk to Noodles and Company and have a picnic at Nichols Arboretum, locally known as the Arb. As we walked to Noodles and Company, we began to unpack the previous year, catching up on what we missed.

“How have you been, Donovan?” Myia kindly inquired.

“I’ve had a pretty boring year, but I’m doing better now that I’m with you,” I said flirtingly.

“You’re too sweet. But how have you really been? I know things have been different.” Myia engaged with genuine care and concern.

“Well, being that you’re one of the few people that know how last summer went for me, you already know it’s been hard for me to pick up the pieces. In the Fall, I had to take 2 Ws in some of the hardest classes I’ve ever had: Physics II and Calculus 3. Things simply weren’t making sense... I had to use the Services for Students with Disabilities to still be considered full-time so that I could keep my scholarships. I spent a lot of time laying down in bed, especially since I only had one class to go to,” I spoke while looking down at the ground.

“Yeah, my Fall semester wasn’t too great either. I’ve been taking all these different classes trying to figure out what major to choose. It has been kind of rough. I haven’t been very social either...I’ve been in my room keeping to myself mostly. I wish we could’ve spent more time together. I’m sure we would have been less lonely,” Myia said with conviction.

“True. But I’m glad we’re together now. Things haven’t been all bad though. DJ has been looking out for me. We play Call of Duty and eat at MoJo’s dining hall together sometimes. We realized that ever since we went into our specific majors, we’ve all been kind of separated. I’ve

often been the only Black man in my mechanical engineering classes. DJ helped me realize how much we need to stick together. He really wanted us to start talking again.” I confidently spoke, reassuring Myia that I wanted to be with her.

“Thank you for saying that. I’m one of few Black people in my classes too. It really does reinforce this sense of isolation I feel. I’m glad we’re together now too,” Myia agreed.

“Yeah, it seems like a common experience, but I know we will survive this together,” I affirmed.

As we approached Noodles and Company, I opened the door for Myia to enter as I followed behind her. We got our usual orders: Penne Rosa with Parmesan Chicken for me and Pad Thai with shrimp for Myia.

We walked to the Arb with our containers and walked down the flowery hill to sit on a wooden bench facing the Huron River. The wind was a calm breeze that gently kissed our exposed skin. We sat next to each other with the shade of the overlooking trees covering us from the sun. We opened our food containers and began to dig in our meals with our plasticware.

“How do you like it?” I asked, enthusiastically wolfing down my meal in between words.

“It’s good as usual. Hey... earlier you said that you had to drop out of 2 classes. How has this semester been for you?” Myia asked inquisitively.

“Well...I got a C+ in my only class, Design & Manufacturing, last semester, so I knew I needed to make a change. I started to make it a habit to go to office hours to get all my engineering homework done each week. I’m hoping to get a B in Statics and Calc 4... But heaven only knows,” I said doubtfully.

“I’m sure you’ll do great. Speaking of heaven, you should come to the Michigan Gospel Chorale’s Spring Concert. It’s going to be fun! There’s going to be worship, poetry, and praise dancing!” Myia excitedly informed me.

“I’ll be there!” I confirmed in a moment’s notice.

Shortly after finishing our meals, I walked Myia back to her dorm room in Couzens Hall. We hugged each other and said our goodbyes. As I walked back to Stockwell, I began to reminisce about how much of a blessing it was to meet the woman of my dreams in the eighth grade. I had never felt so at peace walking in the dusk. I stopped worrying about my flaws and imperfections because the woman I loved accepted me for who I was. I had full faith that Myia would be there for me for the long haul.

*“I promise baby, you can bet the bank on me*

*Cause can't nobody tell me what I ain't gonna be no more*

*You thinking I'ma fall, don't be so sure*

*I wish somebody made guidelines*

*On how to get up off the sidelines”*

-J. Cole, “Sideline Story”, 2011

### **Born Sinner: Junior Year (2013-2014)**

J. Cole’s second album that he released in 2013, Born Sinner, was a departure from the rapper’s hooping aspirations and an arrival to stardom. As a solidified MC, J. Cole produced most of the album himself with a few minor guest appearances. He felt that this album would be better than his first because he had more creative freedom. J. Cole released various singles, including “Power Trip”, “Crooked Smile”, and “She Knows” which all landed on the US Billboard Hot 100. Although this album performed well on the charts, Born Sinner is considered to be his worst album

by his haters. Although this album is critiqued as being boring and corny, J. Cole covers a range of interesting topics such as rich people selling their soul to make millions, J. Cole's own conflicts with trying to flaunt without losing the respect of his elders, and his mental shift from rags to riches while poetically conveying various emotions throughout the album. During my junior year, my mind began to shift from constantly feeling stuck in my coursework to finally finding a sense of purpose through my relationship with God while overcoming the trials of school.

*Lord, ain't enough time to chase*

*All these dreams, nah mean? I got no time to wait*

-J. Cole, "Runaway", 2013

"I'm not looking forward to this..." I thought to myself.

It's a February afternoon on North campus and I'm walking toward a meeting with my team for Design & Manufacturing 2 on the 3<sup>rd</sup> floor of the library within the Duderstadt Center, locally known as the Dude. I always dreaded meetings for my design classes because I never knew whether I'd be considered an asset to the team given my skillset. I never thought I was able to contribute much technical skill, so I tried to compensate for it by writing the team reports. As I took the elevator up, I remembered how the team leader in my first Design and Manufacturing course, a White male, would never allow me to learn how to operate the mill and lathe in the machine shop because he simply didn't trust that I could work on our project. In the second iteration of Design and Manufacturing, the brains of my team was Rich, another White male, who I fortunately considered to be a friend because we shared the same hallway in Bursley during our freshman year.

"What's up, Rich?" I asked approaching his desk. I was second to arrive to the meeting.

“I’m cool... What’s not cool is all the work they’re making us do for this class.” Rich emphasized while fixing his spectacles. “I have no idea what they’re expecting us to write for this report.”

“I hear ya! I sat in class yesterday dreaming for more clarity. I barely understand how to use Solidworks to make a CAD for this project,” I explained with a hint of embarrassment.

The project we were working on consists of four lasers, a target sensor, a mirror and a four-bar-linkage as shown in Figure 2. The goal of our design was to add a mirror to the four-bar-linkage and reflect the laser signals to the target sensor as efficiently and effectively as possible using an Arduino. This particular team meeting was to develop a preliminary report of our work so far in a Google Document.

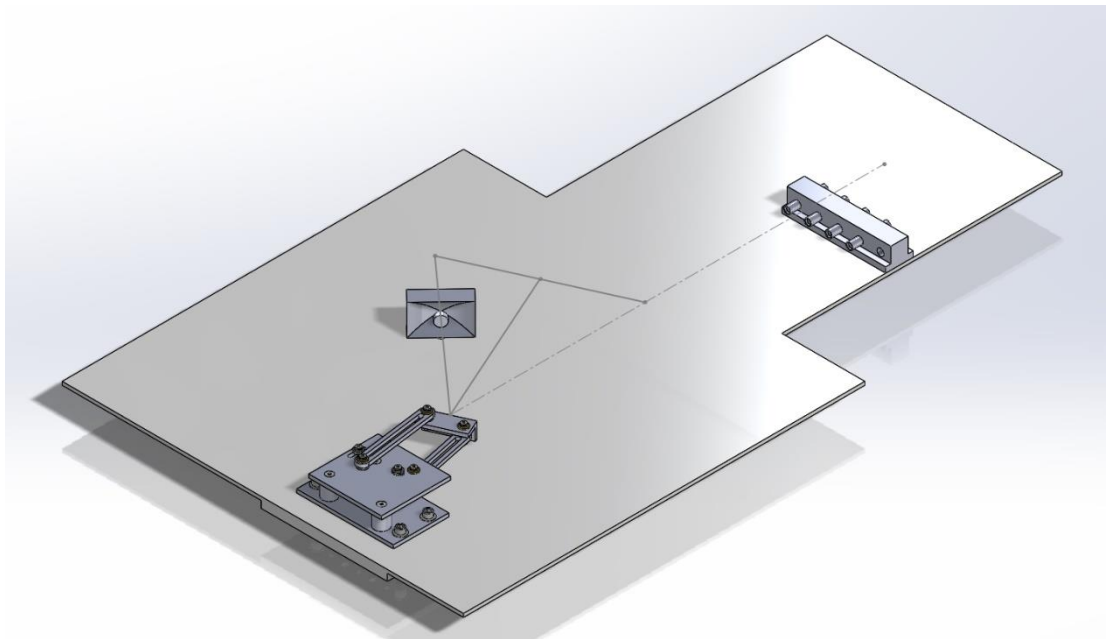


Figure 2. Isometric view of final design in relation to playing field

“Don’t worry about the CAD. I’ve already drafted it. Pretty soon we’ll get this crafted in the machine shop,” Rich assuaged my worries.

“Sweet! It looks like Wong is here!” I said waving at Wong.

“Hey! Sorry, I’m late. I had to grab a bite to eat,” Wong chimed with Panda Express in hand.

Wong was a tall, quiet guy with a good sense of humor. He did his fair share of work, but it was often not quality. This was possibly due to a slight language barrier, but he was professional, nonetheless. We were just waiting on our last member.

“How about we get started now and we’ll get Preet caught up,” Rich suggested.

“Sounds good,” I agreed.

We began outlining our report.

“What do you think they want from us?” Rich asked us.

“I could ask the GSI directly. He might give us a better idea,” Wong said.

“Could you email him?” I asked Wong.

“Even better, I have his number. I’ll shoot him a text,” Wong answered.

“Umm wow... I can’t believe he has the GSI’s number. Maybe it’s because they’ve bonded over their Asian roots,” I pondered to myself. Meanwhile, I remembered how an Asian female GSI in my material science class laughed in my face for asking a question about the homework during office hours a week ago.

“Hey! Sorry I’m late,” Preet entered the desk area.

Preet was a nice guy, but he did not provide as much work and typically needed help with small things. I had nothing against the guy, but it often felt like his head was somewhere else.

“No worries. We’re working on an outline for the report and Donovan’s starting to fill in the blanks,” Rich updated Preet.

A half hour passes by as we dig into writing. Suddenly, Wong interrupts the working session.

“Good news! The GSI just sent me an example report from last year!” Wong expressed with utter happiness.

“That’s great!” Rich beamed. “Now we can start modeling our work to look like the example. Everyone good to stay for an hour?”

“Yeah, let’s get this done!” I expressed.

As we worked for the remaining time, I couldn’t help but feel like we had an unfair advantage. Even more, I couldn’t shake whether I would ever benefit from interacting with any Black GSIs or professors in my department. I had a sinking feeling that Asian students had more advantages because they had much more representation. I couldn’t even fathom what this meant for White students.

As we wrapped up our meeting, I hurried to my car to go to choir rehearsal. Earlier in the school year, I joined the Michigan Gospel Chorale (MGC) to spend more time with Myia. This decision was a significant blessing in disguise as it substantially deepened my relationship with God. I’d learned some time ago that people often view their relationship with God like the relationship they have with their father. I was emotionally disconnected from my Dad and believed that if he knew that I was doing good, then he’d be fine. Similarly, I barely spent time with God until I began to connect with other students at the MGC. The MGC became my family, and I even spent more time with them than with NSBE members.

After joining the organization, I started to do more praise and worship, participated in Bible studies, and went to church more often. My relationship with God played a great role in keeping me optimistic in the pursuit of my degree despite the various challenges that I faced such as lacking a community in the mechanical engineering department. I began to view my academic obstacles as minor in the grand scheme of God's plan for my life.

*Never got to church to worship lord but please be merciful*

*You made me versatile, well-rounded like cursive*

*Know you chose me for a purpose, I put my soul in these verses*

*Born sinner, was never born to be perfect*

- J. Cole, "Born Sinner", 2013

#### **4 Your Eyez Only: Senior Year (2014-2015)**

4 Your Eyez Only was J. Cole's fourth studio album and it was one that I considered to have the best storyline. The album follows a young man as he goes from selling crack, to falling in love and having a family. In the final track, we discover that he has died, and he recorded this album for his daughter to listen to after he's gone. Casey Miller (2015) from the *Daily Emerald* described the album as:

a track-by-track journey of a black man's experience of growing up in our nation, from encountering ghetto violence at a young age, suffering inescapable racial prejudices in real life and in the media and dealing with death and mortality. He also discusses falling in love and having a child, which provides a source of levity for the album because after all, not everything in life is tragic.

The album explores a variety of topics concerning the African American community including mass incarceration, racial discrimination, gang violence and depression. Although I can't directly identify with the dark underbelly of living in the ghetto, I can relate to the Black experience overall.



All throughout grade school, I was generally a straight “A” student. In other words, I was habitually a model student. Whenever I had a homework assignment, I would complete it as soon as I got home. My citizenship scores were always excellent as I was quiet in class. Being the model student carried over into being the model citizen. I did not like to cause trouble and avoided any possibility of disturbing the peace. I grew up in predominately Black neighborhoods around the Metro-Detroit area. I was not warned about the police nor did I have any real conception of what it felt like to be on the receiving end of an overtly racist attack. Although I understood African American history, my awareness of racism was low because I didn’t feel it was essential for my survival in Metro-Detroit.

During my freshman year in 2012, Trayvon Martin was killed. This shocked me as it made headline news. It was the first time that I had been confronted with the possibility that someone that looked like me around my age could get killed for nothing. At one point, my friends and I hypothesized that he could have eventually made it to our university because he was pictured wearing a Michigan jersey on the news. This hurt. A young man’s potential was cut short all because of skittles and an iced tea. It was the first time that I seriously questioned what modern day justice looked like for Black people as George Zimmerman walked away freely.

*“I see the rain*

*Pouring down*

*Before my very eyes*

*Should come as no surprise”*

-J. Cole, “For Whom The Bell Tolls”, 2016

Then it kept happening... Eric Garner's death made national headlines after he was filmed in a chokehold by a police officer on July 17, 2014. It happened again... on August 9, 2014, Michael Brown was shot and killed by a police officer. As a Black man, I no longer felt safe around the police. This particular summer was characterized with great injustice as protests scorched the nation.

*"Some things you can't escape:*

*Death, taxes, and a ra-*

*-cist society that make*

*Every \*\*\*\*\* feel like a candidate*

*For a Trayvon kinda fate"*

- J. Cole, "Neighbors", 2016

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This summer was the same time in which I had my first internship at the General Motors Flint Truck Assembly Plant in Flint, MI. I was tasked with making sure that the water fountains were piped to stormwater drains and that the fire suppression system fully covered the 3+ million sq. ft. plant. This job felt like busy work and I found it rather interesting that I had to worry about water fountains as a manufacturing engineering intern in the facilities department. Nonetheless, I carried out the job and was treated well as a member of the team. However, shortly after the conclusion of my internship, there was a boil water advisory in Flint. The Flint Water Crisis eventually became nationwide news. This affected me deeply because I felt that I had helped GM be less liable in some way due to my work with their water system. The environmental injustice that affected the predominately Black community in Flint led me to add a minor in sustainable engineering. I took classes such as environmental law to help me learn how I could use my

engineering skills to bring environmental justice to the communities that I wanted to protect. It was the various police brutality cases and environmental injustice which lit a fire in me for activism.

I used to think that the United States was getting better, and I rarely questioned the value of my life. In the year before, the social media campaign, #BBUM, began gaining media attention when Black students at the University of Michigan began to share their heart-wrenching experiences about Being Black at the University of Michigan. I decided I wouldn't participate because I felt my experience wasn't worthwhile. I had only been in the school for less than 2 years and felt I couldn't complain. After all, wasn't I supposed to be grateful for getting accepted into the school of my dreams?

However, something in me began to stir. On November 22, 2014, a 12-year-old boy, Tamir Rice, was shot and killed by the police for pointing a toy gun at them. On November 25, 2014, I caught wind of how protests were erupting across the US due to a Missouri grand jury's decision not to charge the White policeman who shot Michael Brown. Frustrated with the lack of a just solution for this repetitive cycle of injustice, I began to write my first poem after my 2-year hiatus since my diagnosis, titled "What Can I Do?".

*As a Black Man*

*I was told that I am created equal*

*After my first diploma,*

*College was the obvious sequel*

*However, I sit here questioning where I head*

*Struggling to come up with a valid reason*

*As to why I could get shot dead*

*For no crimes, no justifications*

*To hell this world is led  
By the nonsense media that we're fed  
I fantasize about changing the world  
But, What Can I Do?  
Live my life, Mentor or Financially Contribute?  
Will there ever be a time when the content of my character  
Overrides my physical attributes?  
Whether it be for jobs, relationships, or other pursuits  
What do we tell our sons and daughters?  
That if they test the oppressive waters of society  
They will undoubtedly drown in the vicious ocean  
That we call the "justice" system  
In a world where people claim to not see color  
Or don't even acknowledge the ever-present racism  
What Can I Do?*

This was a desperate attempt to grapple with my frustrations about all the Black lives lost to police brutality, such as Tamir Rice, Freddie Gray, and Michael Brown Jr., in that two-year time span. In this poem, my consciousness deepened the sorrow that I felt due to racism. It was clear that a college degree would not protect me from a senseless death by the hands of the police. I no longer saw myself as being equal in the eyes of White people. I began to question authority and did not feel safe around the campus police.

*"I'm searching and praying and hoping for something*

*I know I'm gon' see it, I know that it's coming*

*Lord, huh*

*Lord, huh*

*But what do you do when there's no place to turn?"*

-J. Cole, "For Whom The Bell Tolls", 2016

I paid attention to the various activists on my campus and began participating in their protests. On December 14, 2014, I decided to participate in a die-in at UM's Winter Commencement to call for an end to police brutality and racial profiling. I laid on the ground, next to Myia, and felt the coldness of the world on my back. We had about 60 students, including graduates in their cap and gown, participate. Though I felt the sting of White parents walk over my lifeless body as if it were such a huge inconvenience to support that my life mattered, it felt like the first time I stood up for the value of my people's lives.

This semester was definitely an overwhelming one. I was taking 4 classes at once which felt like a full load. My nights were characterized by me doing homework in my apartment, often feeling lost and desperate to go to office hours. I would often go to bed around 2 AM after spending hours trying to figure out the work. My mental health began to decline as my teeth began to wear down. At this point in time, I was not taking medicine because I did not like the side effects. Although I worked with the Office of Services for Students with Disabilities, I felt guilty for using the accommodations provided such as extra time on exams and extensions on assignments. I was resisting the reality of the lifelong impact that this disability would have on my life.

In the next semester I joined a dance class and a kickboxing class to help me with finding a balance between my classwork and having fun. I did the dance class with a friend which was relatively enjoyable even though I had no idea what I was doing. On my first day of the kickboxing class, I was overwhelmed. I couldn't keep up and felt like a fool. My embarrassment, combined with my frustration, boiled over but I kept my composure until I made it back home. After I got off the bus to enter my apartment, I opened my door and burst into tears. I simply couldn't help myself anymore. It truly felt as if I wouldn't be able to finish my schooling due to the heavy weight that I felt from trying to find a balance between school, sleep, and a social life. What may seem innocuous to some, felt like a very big deal to me. I failed at having fun and lost hope that I'd be able to finish my schooling because I didn't have an outlet for all the stress. That weekend, Myia and my mom came to my apartment and took care of me. I could barely get out of bed and desperately needed their support.

*"How long can I survive with this mentality?"*

*How long can I survive with this mentality?*

*Things fall down, but don't stop now*

*Oh, can't stop now*

*Oh, won't stop now"*

- J. Cole, "Ville Mentality", 2016

Shortly after this bout with my disability, I met with a nurse practitioner who prescribed a medication to soothe my symptoms. I made a commitment to take my health more seriously and regularly take the medication despite the side effects. The accommodations became a more approachable option to help me get through my courses. I went to an academic specialist through

the Office of Student Support and Accountability to make sure that I prioritized my scheduling and made time to study. Things did not go perfectly once I began taking the medicine, but I at least had a defense against my disability.

All these struggles seemed to reinforce that I would not be a good engineer. I was averaging C+'s and B-'s in my engineering classes. In addition to being one of very few Black students in my classes, I felt a disconnect between my cultural background and the lack of relevance in the class material. I seemed to be sacrificing my quality of life because the environment was not conducive for me to find a balance due to the various demands of college life. This is what eventually led me to shift my focus from an engineering career to elsewhere.

*“To die a young legend or live a long life unfulfilled*

*'Cause you wanna change the world, but while alive you never will*

*'Cause they only feel you after you gone, or I've been told*

*And now I'm caught between bein' heard and gettin' old”*

- J. Cole, “Immortal”, 2016

### **Forest Hills: Super Senior Year (2015-2016)**

2014 Forest Hills Drive was J. Cole's third studio album, and it was a meteoric success. This album won several awards and eventually went triple platinum. A notable aspect about this album was the lack of marketing before its release and absence of featured artists. The album title is the address of J. Cole's childhood home in Fayetteville, NC where he wrote several of his earliest songs. He did purchase the home in 2014 and rented it out at an extremely low price in hopes that any struggling residents in the area could use it to progress their lives, without having to worry about frequent moving. This album is my favorite project as it uplifted me throughout my days as an upperclassman in college.

*“Life get hard, you ease your soul*  
*It cleanse ya mind, learn to fly*  
*Then reach the stars, you take the time*  
*To look behind and say, "Look where I came*  
*Look how far I done came"*  
*They say that dreams come true*  
*And when they do, that there's a beautiful thing”*  
J. Cole, “Intro (2014 Forest Hills Drive)”, 2014

To help find a balance in my college life, I severely needed an outlet. In 2015, my outlet became mentoring other Black and Brown undergraduate engineering students. I also became a student leader for the Center for Educational Outreach where I educated underserved middle school and high school students about post-secondary opportunities. I found this work to be deeply fulfilling, and I began to make connections to the UM- School of Education (UM-SOE). I had also published my book to motivate teens to apply for scholarships and began receiving more speaking opportunities with youth. This is where I began to consider a career in higher education administration.

I applied and gained entrance to the UM-SOE's higher education administration program in the Fall of 2016. I no longer saw engineering as an ultimate means to get into a career. I retooled it to become a bridge to connect with other Black and Brown engineering students and support them in their academic journey. I wanted to see these students succeed, but what I wanted to see them achieve most was freedom. I eventually aimed to become an executive director of an



organization like the Center for Engineering Diversity & Outreach (CEDO) where I could make a substantial impact on the experiences of Black and Brown engineering students.

*“I keep my head high*

*I got my wings to carry me*

*I don't know freedom*

*I want my dreams to rescue me*

*I keep my faith strong*

*I ask the Lord to follow me*

*I've been unfaithful*

*I don't know why you call on me”*

- J. Cole, “Apparently”, 2014

It was a summer day on North Campus. I opted to work for CEDO's Summer Engineering Academy (SEA) instead of working in a well-paid engineering internship. I was finally beyond the point I'd been dreaming about since I was in elementary school: graduation day. It's a miracle that I made it this far because my super senior year was characterized by a large spectrum of grades. For example, the only way I could pass my controls class with a C- was if I got a 163/300 on my final exam. Fortunately, I got exactly 163 on the test, passing by the skin of my teeth. Otherwise, my graduation would have been delayed and I would have had to pay out of pocket to pay for an additional semester. This academic experience, among many others, beat me down into thinking that I wasn't fit to be an engineer.

The one exception that helped me feel as though I would be a decent engineer was during my senior design and manufacturing course where my team was tasked with designing a solar

powered fruit dehydrator for residents in Shelek, Kazakhstan. Similar to other instances in which I had a team, I felt a deep need to prove myself as a contributor. However, this was one time in which I truly felt like the team worked very well together. We were able to come up with ideas and get assignments done in such an efficient manner that the project felt extremely manageable. In fact, we did so well that this was the first and only instance in which I received an A+ in college. There seemed to be a mysterious mismatch in which my ability as an engineer was always in question in theory, but not in practice. How could I, someone who struggled in most of my courses, actually do well in a design class? It made no sense to me, but it helped shape my outlook as a potentially successful engineer. However, I became less interested in my prospects as an engineer and more engaged with affecting culturally relevant outcomes as a Black man.

“Hey Maximo, do you need any help with the SCEEP students today?” I inquired to fulfill my duties as an academic facilitator.

“They seem to be pretty focused in their teams today on coming up with a solution for their respective grand challenges. I actually wanted to talk about something with you outside,” Maximo motioned me to the hallway.

Maximo was a PhD student in mechanical engineering who worked as an instructor for the SEA. He was a very knowledgeable man who loved to invoke a 5-minute warning on the students to get them to work harder under pressure. He had a great sense of humor and was an amazing storyteller. The students absolutely admired him for his insightful coaching.

“Sure, what did you want to talk about?” I asked with a hint of worry. Since I didn’t necessarily see myself as the best engineer, I was intimidated with the thought of helping these high school seniors with their projects. I thought I might have been doing an unsatisfactory job in Maximo’s eyes.

“I wanted to ask you about your postgraduate plans. What are you planning to do after SEA?” Maximo asked with genuine curiosity.

“Well, I’m planning to stay at Michigan and go into the School of Education’s master’s program for higher education administration,” I explained shyly.

“Really? What do you want to do with that degree?” Maximo questioned.

“I’m not 100% sure. I know I want to work for an organization like CEDO, but I’m not sure if this degree will lead me there. I’m hoping it will be a good fit.” I rationalized.

“Have you considered getting a PhD?” Maximo asked even more inquisitively.

“I never really thought getting a PhD would be a good fit for me. I honestly don’t want to go to school for even longer. I barely survived undergrad,” I mustered a laugh.

Early in my college career, I initially did not have plans to go to graduate school. My career plans were outlined like the stereotypical mechanical engineer from the Motor City in which I would work for one of the Big 3 (i.e., General Motors, Chrysler, or Ford). After realizing that the Gates Millennium Scholarship would pay for graduate school, I began to consider getting a Ph.D. in energy policy because I wanted to change the world by creating the next great innovation. However, as I struggled in my higher-level coursework, I became less enthusiastic about pursuing a graduate degree in engineering.

“Have you heard about Engineering Education?” Maximo queried.

“No, I haven’t heard of that before...sounds interesting. Could you tell me more?” I asked with newfound enthusiasm.

“Engineering Education is a relatively new field that is researching ways to improve how we educate our students. Purdue created the first engineering education school in the US, and it’s been expanding ever since. I think it would be a great fit for you! You work well with the students

and the way we educate them needs to change. You should check out a few videos of Drs. Karl Reid and Norman Fortenberry on YouTube. They are really sharp guys in the field,” Maximo urged me to investigate further.

“Thanks Maximo. I’ll definitely look into it,” I reassured him I was seriously interested.

The next morning, I watched interviews and lectures of Dr. Reid, the executive director of NSBE, and Dr. Fortenberry, the executive director of the American Society for Engineering Education. Observing these Black male leaders in Engineering Education helped me feel that I, perhaps, could belong in the space and make a substantial change to the way that engineering is experienced by Black and Brown students. I began to redefine my career path. I no longer wanted to make the next great innovation to change the world for generations to come. I wanted to change the world by investing in the next generation of young Black and Brown engineers so that they could make the next great innovations. On that day, I deeply sensed that I would pursue my purpose if I continued my journey in engineering education. I chose to continue climbing the forest hills so that I could eventually move mountains in education. Although the trees were blocking my view of what’s ahead, I knew that there were more worthwhile things to explore on the next come up. My pursuit of better solutions for education became my purpose.

*It's beauty in the struggle, ugliness in the success*

*Hear my words and listen to my signal of distress*

*I grew up in the city and know sometimes we had less*

*Compared to some my \*\*\*\*\*s down the block, man, we were blessed*

*And life can't be no fairytale, no once upon a time*

*But I be goddamned if a \*\*\*\*\* don't be tryin'*

- J. Cole, “Truly Yourz”, 2014

### **Why Pursue Purpose?**

There are many points in which I could have given up on my dream of getting my engineering degree, possibly pivoting to a new opportunity that may not have been right for me. After reflecting on these stories, I realize my heartaches and triumphs as an undergraduate engineering student all converged to where I am now. As a qualitative researcher, I have learned there has been nothing I experienced that was meaningless. This powerful revelation answers the many years I spent fixated on my dream, attempting to plan my way out of the unknown, paralyzed by the fear that I may not measure up to my own expectations. That is why pursuit within the journey becomes purposeful, or your purpose. Life is constantly unfolding, unearthing novel insights into your purpose. These experiences highlight the ambiguous, yet precise nature of destiny. As a believer of God, I must trust His process instead of relying solely on my own ambition. *You can make many plans, but the LORD's purpose will prevail.* (New Living Translation, 1996, Proverbs 19:21). This scripture highlights that no matter where I desired to go, God was there with me, guiding me toward His purpose for my life. I will advise my son and my future children to dream beyond his initial ambitions because there is no ultimate outcome that he can achieve without God's plan encompassing so much more for his journey.

# **DISCUSSION**

## **Introduction**

To address persistent inequities in STEM, this study sought to understand how my experiences may be used to bolster and retain Black men in engineering programs. Accordingly, I observed how my experiences provided opportunities for me to endure the negative aspects of college and identified ways in which I strived to complete my engineering degrees. The following sections of this chapter will describe five themes that cut across the six narratives and how the themes can be understood through the lens of African American Male Theory, discuss how the findings relate to existing research, and present implications of this study.

## **Overview of Findings**

The findings were composed of six narratives and corresponding critical analyses of the themes. These findings uncovered the following five themes: (1) spirituality played an unexpected role in my academic survival, (2) understanding myself as an engineer was a complex, messy process, (3) widespread social injustice sparked my passion for racial equity, (4) making academic sacrifices cost me my overall health, and (5) redefining success challenged my initial ambitions. Each of these themes were correlated with tenets of the African American Male Theory framework in such a way that added to our understanding of how Black men may persist in engineering. By combining storytelling with corresponding data, these findings aimed to expose the complex nature of my experiences in an undergraduate engineering program at an HWI.

## **Addressing the Research Question**

In this section, I will address the follow research question:

How do I make meaning of the formative experiences along my engineering education journey at an Historically White Institution through the lens of African American Male Theory?

My stories speak to the ways in which Black men experience engineering programs by showcasing the significance of (a) spirituality, (b) knowledge/evolution of self, (c) the pursuit of justice as a representative of the community, (d) resilience against various burdens (e.g., mental health difficulties), and (e) the search for freedom. The need for relationships during my time in college highlighted how the various gaps that I felt socially due to the lack of role models and supportive friends in my department were filled by the development of my relationship with God. My spirituality became a powerful redirection away from the isolation I experienced and realigned me with a sense of divine purpose. Developing a deeper connection with God helped me persist in engineering by strengthening my resolve to fulfill my calling despite the difficulties.

My self-concept and the development of my engineering abilities were emboldened to varying degrees throughout my undergraduate engineering program. This complicated my experiences as a Black man, because although I had received an immense amount of financial aid, I still struggled to find adequate support due to the racial and class inequities within my program. Furthermore, the disconnect between my cultural background and the class material further lessened my engagement with theory-driven curricula, often making it difficult to feel validated as an engineer. My sense of belonging and classification as an engineer seemed to be in question due to my academic performance and social standing within my courses. Choosing to pursue an engineering degree at a HWI had a disruptive impact on how I saw myself as an engineer due to the consistent feeling of not belonging.

Given the political climate on campus and around the nation due to the slew of police brutality cases throughout my time as an undergraduate student, the pursuit of justice played a significant role in my persistence. Questioning the value of my own life in addition to the lack of social capital and constant invalidating effects of grades compounded into me seeking justice as a representative of my community. The many ills of society had reinvigorated me to support activism on my campus. Although seemingly irrelevant to my academic life, this was impactful in my purpose to continue performing in my classes as a form of resistance to stereotypes, microaggressions, and other forms of subtle racism.

The costs of persistence included me sacrificing my mental health to continue to perform academically. The dire effects of persisting in engineering with a mental illness could have ended up with me not getting my degree or worse. Struggling to find a balance between sleep, academics, and a social life should not be the norm of any college student. This is especially critical for a Black man who must also manage oneliness, racism, and a disability. Enduring an engineering undergraduate program at a HWI is complicated by the sum of the various costs associated with attaining a challenging degree as a Black man.

Defining success, as a Black man, throughout my time in my undergraduate degree program came with instability and challenging self-reflection. In addition to my knowledge of self coming into question, my aspirations morphed from seeking to serve others through technological solutions into serving others through education. My persistence in engineering was sustained by providing mentorship to younger students from a similar background. This complicates how Black men experience engineering because it indicates that attaining a degree can be bolstered through service to one's own community. In retrospect, I came to understand that redefining success meant searching for freedom beyond the shackles of my initial ambitions.



### ***Theme: My Spirituality Played an Unexpected Role in My Academic Survival***

A major theme I identified in the data was my need for a strong support system. Though there were various support systems (e.g., student organizations, academic resources, etc.) that I tried to take full advantage of, there was still a connection missing in my life to help me persist. According to African American Male Theory (Bush & Bush, 2018), from an ecological systems approach, the relationships that I had were a part of the outer microsystem. My outer microsystem was composed of the peers in my social groups, family members, and school.

Family members played an important role in my matriculation in college. I was inspired to become an engineer by observing my father tinker with technology as I wanted to become closer to him. This helped aim my trajectory toward getting my mechanical engineering degree at the University of Michigan. In addition, my cousin helped expose me to campus life which led me to see the college of engineering as a place where I belonged as a Black individual. When I eventually arrived on campus, I made it a point to get to know other Black engineering students and build a sense of community through NSBE.

NSBE was an important support system because it helped abate the sense of isolation that I felt in my department. It gave me a sense of belonging in a school that reinforced that I was not an anomaly. Being able to have a social group like NSBE helped ground me in the fact that I wasn't the only one experiencing problems with the institution. Though I was not alone, it took years for me to truly understand how deeply my Black peers were struggling. While my autoethnography is an analysis of my own journal, because of the relationships I had with others in NSBE, I know my story is not some outlier. Only after years of knowing these individuals, did I realize we were all in a survival mode. To prevent students from dropping out of engineering, we need more institutional support in place for students to receive mental health counseling, career guidance, and

holistic academic provisions so that more of us could thrive in an environment that should not consistently alienate us.

Despite my connections to the Black community at the University of Michigan, I still felt a lack of support in my academics. The phenomena that I was experiencing was a sense of isolation amongst my peers in the mechanical engineering department. There were instances in which I clearly saw how a critical mass of White and Asian American students provided advantages that were not afforded to me (e.g., study groups, friends in and out of the calls to ask questions to, relating to professors and GSIs culturally, etc.).

In this my narrative, I divulge how difficult it was to understand that a critical mass of peers, GSIs, and professors that are of a similar racial background comes with advantages. It became clear to me that the onlyness that I experienced was due to me trying to survive in a sea of Whiteness. There were a few other Black students at different levels in the mechanical engineering department that were also struggling in their coursework. However, without a critical mass of Black students, GSIs, other staff, and faculty in the program, it became difficult to thrive in this environment. In fact, the environment seemed to reinforce a sense that Black people didn't belong in the space by the sheer lack of Black people in the department.

Though my outer microsystem lacked enough peers to support me through my academics, it wasn't until I began to explore my spirituality (i.e., subsystem) when my perceptions of my experiences began to turn around. Joining the Michigan Gospel Chorale in my Junior year of college became a turning point. Participating in the Michigan Gospel Chorale was my way of continuing African culture because I familiarized myself with traditions of the Black church. As a child, I did not regularly attend church until I became closer to my then-girlfriend (now-wife) in my later teenage years. I became more spiritually aware of my position in life which reframed my

academic and social struggles as a part of a larger narrative around God's purpose for my life. Through this paradigm shift, I no longer saw myself as only surviving in the institution, but rather as a fortunate benefactor of God's blessings in my life. This does not mean I didn't struggle or complain; however, the lens through which I saw my struggles was one of submission to God's will for my life.

My need for a support system was an outward expression of desire to feel a sense of belonging. Though I found myself fitting into the Black engineering community, this was not sufficient for me to thrive in my environment at an HWI. In addition, the academic support services were not robust to handle the unique needs that I had as a student. It wasn't enough to get guidance for academic advancement because I needed to be empowered to believe in myself beyond my GPA. This could not replace the gap of having a community of peers that supported my persistence inside of the mechanical engineering department. The deficiencies of the HWI required that I dig deep within to enhance my spiritual relationship with God so that I could reexamine my situation and alter my perception of my experiences as a Black engineering student. This reevaluation requires that I reflect on who I was as an individual navigating the engineering education system.

***Theme: Understanding Myself as an Engineer was a Complex, Messy Process***

There is a particular African American Male Theory tenet that affected my self-concept as a Black, male, engineering student. The tenet is that "race and racism, coupled with classism and sexism, have a profound impact on every aspect of the lives of African American boys and men" (Bush & Bush, 2018, p. 6). Although my perception of my own race was not highlighted in the beginning of my introductory engineering class, the impact of my race was implicated through how I compared my contributions with my non-Black teammates. My teammates were often from a background with higher socioeconomic status than myself. In fact, the campus was full of

students that were able to afford various expensive academic resources (e.g., Macbooks) that set themselves apart from the average student. These advantages, coupled with the fact that students also came from well-funded school systems that adequately prepared them for college, made a considerable gap between my own exposure to necessary skills and my teammates.

The challenges that I faced were not directly due to overt racism, but rather the pervasive systemic racism. There is an educational debt (Ladson-Billings, 2006) that needed to be paid to place Black students like myself on an equitable playing field with my college classmates. Despite my financial aid, there were still gaps in my understanding which limited the effectiveness of my contributions. The environment in which I was supposed to develop severely dampened how I saw myself. The challenging coursework seemed to reinforce that I was not good enough to be an engineer. The coursework coupled with the various instances in which I dealt with mistreatment only complicated how I, a Black man, felt I could communicate with others. Emotional withdrawal became a survival tactic to keep from feeling pain whenever I was the only Black man in my classes or in my teams. In a sense, I was still the person who was always smiling, except the smile was now empty and illusive. I was holding back the sheer feeling of being lost in the academic ocean, desperately seeking a life preserver to prevent myself from drowning from the oppressive, grading waters.

It wasn't until my 5<sup>th</sup> year of college where I began to see myself as a competent engineer. This was only reinforced in my senior design and manufacturing course in which I received an A+. There was an intense confusion about my potential to be successful because I suffered in most of my theory-driven courses, such as in controls, but I prospered in this one practice-based project that required little theoretical application. As a Black man, I still worried about my contributions on the team, but I at least felt that we were making strides. There possibly was more of an equitable

playing field between myself and my teammates due to the amount of experience we shared while being engineering students. However, the ease at which we collaborated made the process much more enjoyable than years before. The level of self-doubt due to the weight of grades deepened my insecurities about being a Black man in my classes.

The mismatch between theory-driven coursework and cultural relevance in my engineering program caused internal turmoil which is still unresolved. My personal problem with how engineering is taught is the dearth of cultural relevance and inclusive engagement in the curriculum. The one true instance in which I felt engaged with an engineering course was during my introductory engineering class. It would take a lot more tangible, inclusive curriculum for a Black male engineering student such as myself to thrive throughout the program, especially when theory-driven courses have purposefully difficult problem sets and exams that don't seem relevant to day-to-day experiences. When the curriculum is not culturally relevant, it reinforces that people who come from a different set of experiences do not belong.

The experiences that shook my self-concept were markedly disturbed by the various, high-profile police brutality cases throughout my college career. In my researcher journal, I talked about how “through the happenings of politics, I began to question the value of my life which projected new racialized insecurities on myself.” In the next theme, I discuss how I questioned the value of my life significantly throughout the impending political climate during my time as an engineering student.

### ***Theme: Widespread Social Injustice Sparked My Passion for Racial Equity***

The theme of questioning and seeking justice expresses three tenets of the African American Male Theory framework. The uniqueness of being Black and male is exposed through this theme in the sense that a majority of highly publicized police brutality cases were instances in

which unarmed Black men were victimized. Historically, the United States has demonized and criminalized Black men, treating them as if they were “thugs” (Smiley & Fakunle, 2016). The negative connotation associated with how traditional mass media posthumously depicts Black men leaves other Black men, like me, questioning the value of our lives based on the ways in which we are (un)acknowledged. It is important to note that the victimization of unarmed Black men is not the only aspect of Black male existence that establishes unique conditions for Black men to navigate. Given the nature in which Black men live a racialized existence, the ways in which we are unique permeates through the positive and negative acknowledgements that we receive within and outside of our communities.

The second African American Male Theory tenet that is elucidated through this theme is that African American boys and men are resilient and resistant. Due to the political nature of the highly publicized killings of unarmed Black men and boys, it would be easy for Black men to become downtrodden and defeated. However, the fact that Black men and boys continue to persist in their lives and strive for more means that they are resilient against defeat. In addition to resilience, Black men and boys that actively protest the various injustices against Black life means that they are resistant. These protests may manifest in various manners. For instance, I wrote “What Can I Do?” as a means of protesting the status quo.

In the narrative for senior year, I actively resisted environmental injustice by seeking knowledge through the pursuit of a minor in sustainable engineering. I sought out ways to leverage my engineering education to serve a community like my own to right the wrongs of governmental failure and corporate greed. I resisted by participating in the die-in as a tangible means of disrupting the flow of a graduation to bring attention to the injustices against Black life.

The final African American Male Theory tenet that relates to this theme is the focus on the pursuit of social justice. Bringing attention to the burden that Black men must face (i.e., questioning the value of their life) while navigating all the other aspects of college life serves as a means to expose the inadequate support that Black people face, especially at HWIs. This study seeks to bring justice to the Black students who must navigate hostile environments both in society and at school. Though I didn't participate in #BBUM early on in my college career, I found myself advocating on behalf of the Black experience in college to help prepare Black and Brown youth.

I steadily built up courageous defiance throughout my time as a college student due to the various injustices that I observed in my personal life and in society. The pursuit of social justice became a considerable component of my trajectory. My experiences as a Black man depended on the outlets that I partook in because withholding the internal turmoil would negatively impact my health and my overall performance.

***Theme: Making Academic Sacrifices Cost Me My Overall Health***

The African American Male Theory tenet that resonates most with this theme is that African American men are both resilient and resistant. Resilience is exposed through the various struggles that I encountered as a Black man with a disability still managing to continue my education despite the lingering effect that the disability had on me. During sophomore year, I wasn't motivated to do anything as I was struggling with health issues. I had to drop two courses, so I was only taking one course for the fall semester. I took two courses during my spring semester. I had to slowly build myself back up, but few people were helping me pick up the pieces.

When weighing my options to endure making sacrifices, I valued my career outlook, financial security, and relationship with my father. There were times in which these favorable outcomes were the main driving force for me to finish my degree. The burden that this places on

me as a Black man meant that my GPA held considerable weight. For instance, a norm that was upheld at UM's career fair was that you needed at least a 3.0 GPA to get a good internship. This automatically placed those with privilege at an advantage because they may have the necessary support system to help them achieve higher marks on their exams as exemplified by my Asian American teammate having direct contact with a GSI. However, for someone like myself who did not have an infrastructure like a peer-to-peer support network within my department, I struggled to maintain the coveted 3.0 GPA. My resilience led me to work hard to maintain a cumulative 3.0 GPA because I valued my career outlook and financial security.

To ensure that I could secure favorable circumstances for my future, I also needed to nurture my physical and emotional health. As my mental health declined in my senior year, I had to grapple with the unfortunate position that I was in to find balance in my life as an engineering student. Seeking an outlet for my stress led me to sign up for classes in dance and kickboxing. Though these classes were meant to be fun, I did not get the expected outcome when it came to my kickboxing class. To put it shortly, I felt demoralized after I couldn't find this activity that I had been looking forward to for so long to be as engaging. Though I left the class feeling defeated, I managed to keep my composure because I didn't want to embarrass myself in public by crying.

The pressures that I felt as a Black man and how I imagined what masculinity was supposed to be was that meant that I couldn't be "soft". The cultural expectation that I grew up with told me that I wasn't allowed to show my emotions, especially in public places. This led me to not complain despite pain and to pride myself on my ability to persevere despite the damaging nature of what I was going through. This denial to my humanity has shown itself as a coping mechanism for dealing with challenges. For example, in the past, I have shared that when I encounter challenges, I see it as an opportunity to learn and overcome; I deny that it will be a burden to me. Though I have



framed challenges in a more positive light, there's a subversion to what a challenge can be understood as. Challenges can be problems that are solvable through learning so that they can be overcome. In addition to not seeing these challenges as burdens, I denied that challenges were even problems. If there's a challenge, then there is bound to be difficulties experienced by the one who must overcome the challenge. This may have been an attempt to further deny my humanity in a sense that I was not allowed to experience or talk about difficulties, especially throughout my time as an engineering student.

When I finally caved into my internal turmoil after I arrived home from kickboxing, I was essentially paralyzed with despair from the lack of hope to finding balance. This despair compounded from the various sacrifices I made to persist in my engineering classes. For instance, in the past, I have ignored my health and well-being while in college; I persevered at my own destruction by ignoring my needs and continuing to work.

As a Black man navigating college life with a disability, I found that the path that I chose took great courage. The resilience that I exhibited in eventually earning my degree despite my disability, the political climate, and the academic challenges, speaks to all that Black men and Black people in general, must overcome to be considered successful. My burden to bear during my time in college was the denial to my own humanity given the various circumstances in which the value of my life was challenged through the representation in media, isolation in my classrooms, and the brokenness caused by my diagnosis. Resilience is a key part of being of African descent and male because we must overcome the many challenges that we face given the historic background of inequities that our people have and continue to face.

### ***Theme: (Re)Defining Success Challenged My Initial Ambitions***

One of the African American Male Theory scholars' top recommendation for research on African American males is to define what success means for Black boys and men. Consistent with the body of literature concerning successful Black men (Brown, Morning, & Watkins, 2005; Burrell, Fleming, & Fredericks, 2015; Fries-Britt, 1998, 2017; Ellington & Frederick, 2010; Hall & Post-Kammer, 1987; Jett, 2011, 2013; Maton, Hrabowski, & Schmitt, 2000; Harper 2009, 2010, 2013, 2015; Harper & Quaye, 2008; Harper and Nichols 2008; Harper, Patton, and Wooden, 2009; Moore III, 2006; Palmer, Davis, Moore, & Hilton, 2010; Russell & Atwater, 2005; F. M. Smith & Hausafus, 1998; Stinson, 2006; Strayhorn, 2008, 2009), it has been observed by Lewis (2003) that making it to college and graduating is seen as success. However, the African American Male Theory scholars argue that success should be "rooted in our history, culture, community, and political realities worldwide. The authors define success as freedom" (Bush & Bush, 2018, p. 12). Given this definition, my final narrative aimed to uncover how I aspired to reach success.

There is an African proverb that says, "It takes a village to raise a child." There is a continuity and continuation of African culture that influenced my experience as an African American boy in which I was given ample opportunity to be raised by a village through the variety of programs that I participated in which exposed me to engineering education. These programs were given to me as my village (i.e., family & school) saw that I held an interest in STEM. The guidance received by the instructors of these programs and the scholarships earned reaffirmed that engineering would be a place in which I could thrive. Though my reality depended on how well I could survive in my college environment, the initial perception was that I belonged. In hindsight, this perception was not sufficient, as I realized that my initial ambition was based on childlike idealism; it was not founded on the reality that I would be a Black student attending a predominantly white organization that historically has not been there for Black people, Black

males, and in a political landscape of the United States which systematically has not been ethical to Black people.

Once I arrived on campus, my plans began to change due to my exposure to new career options. Graduate school didn't seem as unachievable as I learned about the funding through the Gates Millennium Scholarship. However, determining the graduate school program to pursue became difficult as I had lost interest in a career in engineering due to struggling in my coursework. The promises of a lucrative salary were no longer enough to entice me to pursue an engineering career. Resilience and resistance were exercised when I began to envision engineering as a bridge to connect with Black and Brown students that expressed interest in pursuing engineering. Envisioning success meant preventing the replication of my experiences for incoming students. I saw the value in helping minoritized students because I was helped. It took many villages to raise me to be successful. Success to me was no longer monetary. Success was tangible evidence that I gave back to my community because it had invested so much in me.

Through my experience as a student leader exposing youth to postsecondary opportunities, I became more enthralled with the idea of becoming a director of a program like the Center for Engineering Diversity & Outreach. As mentioned in the narrative for my super senior year, I saw this position as an opportunity to enable Black and Brown engineering students to be free. This freedom went beyond making it to college and graduation because there are many sacrifices that these students must make in college that is almost shackling. Upon realizing that being a part of the system and recruiting students into the harmful system was a contradictory way of supporting students, I began to seek a different way.

Furthermore, due to race and racism, I began to see the current educational system as inherently problematic for Black and Brown students. The profound impact that my time at an

HWI had on me necessitated disillusionment about potential career paths in which I could support Black and Brown students. For example, I wrote the following in my research journal:

I find myself unsatisfied with potential career paths such as being a motivational speaker, a career coach, and a professional that connects talent acquisitionists to Black and Brown STEM professionals. As a motivational speaker, I would be encouraging K-college students to follow their dreams down a STEM pathway which means earning a college degree. I don't believe this would be satisfying because I would be leading people down the path where they will find challenges due to racist systems. If anything, I would want to speak about the racial obstacles that they would face pursuing a college degree and then joining the corporate workforce. If I were to become a career coach, it would be quite hypocritical. How could I guide early career engineering professionals to a fulfilling career when I'm not satisfied with my own engineering jobs? If I were to help recruiters get Black and Brown STEM talent, I'd be helping them obtain people that they simply do not deserve because they will likely put these individuals through the ringer due to racism. No matter where they are, there are guaranteed encounters with racists. (Colquitt, 2021)

The many ways in which I could support Black and Brown students seemed to be insufficient because I'd only be supporting them in navigating racist systems. This contradicts the very notion of helping these students achieve freedom. I wanted to circumvent the current higher education system by creating a culturally sustaining educational experience in which Black and Brown students could learn STEM and entrepreneurship skills to build their own businesses to impact their communities.

The conclusion that I arrived at after attending an engineering program at an HWI was that I would have likely had a better experience at an HBCU. I probably would have had an improved

sense of belonging amongst my Black peers and I would have thrived more. Instead of working hard to make the grade in theory-driven coursework, I would have appreciated my experience more if I had more practical experiences where I learned how to leverage my engineering skills for business through a network of Black collaborators. This had led me to want to circumvent the college experience altogether, to create an alternative in which minoritized students can learn STEM and entrepreneurial skills to manifest their own destiny and achieve liberation. I believe that combining business acumen and technological skills would be an ideal way for me to achieve freedom by having agency, ownership, and autonomy over my career trajectory while exploring my passion for making social impact.

## **Discussion**

My narratives uncovered five themes that I connected to the tenets of African American Male Theory: (1) spirituality played an unexpected role in my academic survival, (2) understanding myself as an engineer was a complex, messy process, (3) widespread social injustice sparked my passion for racial equity, (4) making academic sacrifices cost me my overall health, and (5) redefining success challenged my initial ambitions. The first four themes speak to different dimensions of the burdens I experienced and the ways that I needed a multi-dimensional, holistic support system (in contrast to simply needing financial support). The final theme speaks to my process of redefining success and exploring what “freedom” could look like for Black men in undergraduate engineering programs. In the following paragraphs, I describe different burdens I experienced and corresponding dimensions of a more holistic support system, followed by discussion of how success is often considered, and what freedom could look for Black men in undergraduate engineering programs.

### *Burdens and Dimensions of a Holistic Support System*

There were a few ways in which my personal experience complicates the literature. My experiences confirm the unique challenges that Black men faces as undergraduates at HWIs. For example, the education debt that I faced was related to the lack of college preparation I had in my high school which relates to the common funding gap that predominately Black and Latin public schools experience (Meckler, 2020). To save money, my high school moved the AP Calculus class online until we petitioned for it to be in-person. It took a month for the AP Calculus course to be moved back to in-person which put us students at a severe disadvantage when compared to the rest of the U.S. This lack of preparation is only one example in which poorly funded schools, due to an inequitable governing system of how funds are distributed to public schools, can put students, particularly low-income, at a disadvantage (Griffin & Allen, 2006). Although Bryant (2015) emphasized the importance of holding schools accountable for providing sufficient resources, it is important to note that we must hold the government accountable for how it chooses to support these schools.

My lack of academic preparation for college coursework in high school math and science through AP courses offers a contrasting perspective to what scholars have mentioned about how this preparation is considered to be a major factor in academic success for STEM majors (Brown, Morning, & Watkins, 2005; Hall & Post-Kammer, 1987; Palmer, Davis, Moore, & Hilton, 2010; Russell & Atwater, 2005; F. M. Smith & Hausafus, 1998). Despite my high aptitude in math and science, I did not participate in any AP science course and scored “below basic” on the AP Calculus exam. While my low score on the AP Calculus exam was arguably because of my participation in a delayed AP Calculus course, I still was in a position where I did not have the academic foundation associated with what students often learn in an AP course. This interpretation is different from that

of Lee and Ransom (2011); I was still able to persist in a STEM major despite my lack of academic participation in high school. This aspect possibly speaks to the misalignment between AP coursework and its effectiveness for students' college preparation, especially considering that AP curricula may be taught ineffectively to most minoritized students (Kolluri, 2018). Whiting and Ford (2009) recommend the following: (1) early interventions for minoritized students to have access to AP classes, (2) offer counseling and mentoring for these students, (3) examine the root cause of underrepresentation in AP classes, (4) improve family-school partnerships and knowledge base, and (5) increase the cultural competence of educators.

Another challenge consistent with literature was the subtle racism that I faced at my HWI. Though I did not encounter much overt racism (aside from being called the "N" word two times), the lack of empathy that myself and my Black friends received about Black lives mattering left much to be desired. With campaigns such as #BBUM, it was evident that our HWI structurally reinforced racism and did little to educate its students on how to engage with students of diverse cultural backgrounds. The lack of sensitivity I experienced from White students about racial issues often put me at odds with considering them as potential friends and feeling a sense of belonging. Similar to White and Cones' (2013) observation of Black men falling victim to the evils that transpire in modern society (e.g., gang violence, drug addiction, limited educational opportunities) yet triumphing over slavery, Jim Crow, and police brutality, I too experienced psychological and social challenges due to racism and race-related stress but was still set on a path of self-determination.

Another challenge that my experience offers nuance to the literature was my active awareness of stereotypes. I sought to prove others wrong about me being underprepared or unqualified to belong at the HWI by overcompensating when working with my non-Black

teammates. This feeling aligns with a racial opportunity cost, representation costs, in which I feel that I am representing all African American men (Chambers et al., 2014). Furthermore, I feared encounters with campus police due to the heightened fears created through the political climate because of the slew of police brutality cases. Du Bois (2015) speaks to this experience as “double consciousness” in the “sense of always looking at one’s self through the eyes of others, of measuring one’s soul by the tape of a world that looks on in amused contempt and pity” (p. 5). It was difficult to feel safe in academic, social, and public spaces which wore down on my ability to endure. These challenges compounded to me struggling to feel like I ultimately deserved to be at the HWI.

Onlyness, “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” (Harper et al., 2011, p.190), played a significant role in my experiences on campus. I often felt excluded from study groups in majority White classrooms as it became difficult to express my own cultural norms without fear of persecution or further exclusion (Dowden, Gunby, Warren, & Boston, 2014; Parker, Puig, Johnson, & Anthony Jr., 2016). There were few peers, role models, and guardians from the same racial group within my mechanical engineering department which deepened the feelings of isolation. Chambers and her colleagues (2014) observed loneliness and isolation as a racial opportunity cost that is psychosocial. The lack of close friends in my classes meant that I didn’t not have someone to go to who could understand my struggles (Chambers et al., 2014). My White classmates could not understand the additional burdens I shouldered, and because my same-race peers were not in my classes, they could not empathize with my experiences. The burden of loneliness engendered a sense of survival through resistance as I actively sought out ways to prove that my life was valued. My experiences with onlyness confirm that it was difficult



to navigate a racially politicized space with limited access to same-race peers and role models which took a mental and emotional toll on me.

The various enhancers for persistence (i.e., faculty involvement, financial assistance, classroom environment, academic and personal support resources, and extracurricular activities) often cited in the scholarly literature (e.g., Santos & Reigadas, 2004; McGee, 2018) all had varying degrees of effectiveness in improving my collegiate experience. For instance, there were very few times in which I had the direct involvement of faculty member(s) supporting me. Outside of a few instances in which a professor showed up in office hours, I had no further interactions with a faculty member. Furthermore, I did not encounter a professor from the same ethnic background throughout my entire undergraduate career. The lack of a Black faculty member was a noticeable gap in my college experience in which I did not feel that I had the support of a mentor to guide me through myriad academic and social difficulties.

Other studies (e.g., Brooms and Davis, 2017) have discussed the ways that Black male students have benefitted from the support of a Black male professor. In contrast, my autoethnography is an example of when Black male professors are not available to a Black male student. It is unknown how the added support from a Black male professor would have mitigated the struggles I went through. However, based on others' research, it is clear that I would have benefitted from the support. These same race role models offered academic assistance considered invaluable by the Black men. My troublesome experiences at the HWI could have been partially relieved if I had the access to a Black professor for guidance and support, as other studies would suggest (Guiffrida, 2005b; Harper, 2012b; Moore & Toliver, 2010).

For a Black man to persist in an engineering program despite not having strong relationships with faculty means that the oneliness experienced compounds toward a lack of direction for career

outlook. With few examples of same-race faculty members, it becomes difficult to imagine a future in a career as a graduate student or early career engineer. This opacity in possible futures makes it troublesome to understand the purpose and meaning of the struggles experienced while in an engineering program. If a Black man commits to persist in an engineering program with very little guidance from faculty, then they must traverse a landmine field of uncertainty and missed opportunities as it relates to their personal, professional, and career development.

As a Black scholar with \$1.25 million in scholarships, financial assistance was a strong support for my persistence. Financial assistance played a large role in affording my tuition, room and board, and other cost of attendance which lessened the financial burden (e.g., loan debt) for myself and my family (McGee, 2018). However, having this much financial aid did not compensate for the oneliness, subtle racism, and academic difficulties that I encountered. There was no amount of financial aid that would make enduring the various difficulties that I experienced worthwhile. In fact, the financial aid could have better served me if it were packaged with support services such as therapy. Monetary aid should not be perceived as the sole form of support in getting Black and Brown students on campus because it does not account for retaining these students by helping overcome the various difficulties experienced throughout their time in college outside of paying for college costs, such as academic struggles, health crises, and social isolation.

The classroom environment should help affirm the students and instill a sense of belonging to nourish successful behaviors and habits (Harper & Quaye, 2008). One way to create a supportive environment for Black men is to use examples of successful Black men within the classroom (Robertson & Mason, 2008). My experience is that I had only one instance throughout my entire undergraduate career in my introductory engineering course in which Lonnie Johnson was used as an example of a Black engineer. This helped expose me to a new realm of possibility in which I

began to envision my future as a successful Black engineer. The power of this example was so memorable to the point where I was hungry to learn of more examples but noticed the void of minoritized men and women being used as examples in other courses.

Academic and personal support resources, such as summer bridge programs, tutoring, mentoring, academic advising, and personal/professional development, can help support Black men in persisting in their academic programs (McGee, 2018). In addition, there are academic benefits when Black men are given opportunities to engage with same-race peers (Brooms, 2018). My experience complicates that access to these various resources are simply not enough for me to thrive academically and personally. Furthermore, I found that providing support to others in the form of near-peer mentoring helped bolster my persistence which is consistent with Anderson and colleagues' work (2019). The lack of a critical mass of Black men and women within my mechanical engineering department made it difficult to perform at my best due to the lack of access to study groups and other forms of social support.

Counseling and psychological services could serve as a key support resource for Black men in college. There is a dearth of literature discussing the importance for Black men to receive mental health support, especially while they're studying intensive curricula such as those in engineering. Goodwill, Watkins, Johnson, and Allen (2018) found that Black college men coped with stress by handling stress on their own, doing things outside of themselves to manage their stress (e.g., hobbies, substance use, fighting), or doing nothing to cope with stressors (e.g., acceptance, cutting off emotions, hiding emotions). Furthermore, Jensen & Cross (2021) advocate for engineering undergraduates to receive mental health support due to the stress they encounter in their programs. In addition, Black men should get support for any disabilities that they may have which could inhibit them from excelling in their studies. Banks (2014) interviewed three Black men in college

with disabilities about their experiences and observed that these students (a) believed deficit ideologies undermined their self-determination, (b) needed sufficient information prior to transitioning to college, and (c) refused services they were offered due to opposing cultural identities. Such findings indicate the need for Black men to receive early interventions for personal support resources that align with their cultural identities (e.g., receiving support from a Black male therapist).

Helpful extracurricular activities mentioned for supporting Black men included Greek fraternities and athletics (McClure, 2006; Pascarella & Smart, 1991). In addition, my experience supports that religious and academic/professional organizations can have a positive impact on the college-going experience for Black men. Through my time at UM, participating in the Michigan Gospel Chorale deepened my relationship with God which helped support my endurance in engineering despite various challenges. While spirituality has not been considered extensively within engineering education, other studies of Black male college students have similarly recognized the value of faith and spirituality. For example, Asplund (2009) uncovered that a personal faith in Christ served as a primary factor for first-generation, Black male college students to persist and succeed in college because “when you’re called to do something [by God], that makes the process a little easier” (p. 10). Furthermore, Herndon (2003) interviewed 13 African American males at PWIs and found that spirituality enhances student persistence due to it providing a sense of purpose, bolstering resilience, and offering spiritual support. Wood and Hilton (2012) confirm the positive benefits of spirituality as it served as (1) a confidant, (2) inspiration for excellence, (3) a source of purpose, (4) an encouragement to overcome barriers, and (5) a reduction of relational distractions. In addition to a personal relationship with God, my participation in NSBE offered social support in place of the severely lacking community I had within my department.

My ability to handle racism was challenged throughout my time in college. As I began to question the value of my life, I began to participate in protests and vigils as a form of resistance (Harper 2009). Activism became a way to actively persist against stereotypes and other forms of racism within my college community. Having the agency to tell my story as a student leader to minoritized youth also empowered me to help move my community forward through inspiration.

There were a variety of factors that contributed to my experiences as a Black male undergraduate student in a STEM major. For instance, my parents and family played a significant role in nurturing my interests in STEM at an early age. Fries-Britt's (2017) observation that gaining early exposure to STEM activities and having parents that are STEM professionals were both significant factors in my career trajectory. My early exposure to technology and engineering led me to consider STEM as a viable option for my career pathway. In addition, I participated in several informal learning experiences that helped me become a competent learner in STEM, consistent with findings from Wright and his colleagues (2016), where these researchers found that Black males' parents and family support play a significant role in Black male's interest in STEM at an early age.

There were various non-cognitive skills that I learned through STEM interventions such as seeking out help, using study habits, and leveraging social and academic problem-solving skills which is consistent with Farrington and colleagues' study on these skills (2012). Resilience played a significant role in my persisting as well as negotiating a complex academic context which is resonant with Chang, Sharkness, Hurtado, and Newman's study (2014). In accordance with Strayhorn's (2015) study, my pre-college self-efficacy and sense of belonging had a substantial influence on my experiences as a STEM major. My pre-college exposure to STEM helped affirm

my ability to succeed in getting my degree, but my sense of belonging was a difficult aspect of my persistence due to feeling like “a speck in a sea of Whiteness” (Strayhorn, 2015, p. 54).

Although I did not have many difficulties with “weed out” courses (Maton et al., 2000) as a first-year student, the challenges that I experienced were from the upper-level engineering courses. The competitive environment combined with the lack of social capital and cultural relevance made it difficult to engage with the theory-driven curriculum. The chilly climate that I experienced was fostered by complex and rigorous content, competition among students, and pressures to show I belong in mechanical engineering (Palmer et al., 2011). It is imperative to realize that a critical mass of same-race peers, faculty, and staff may have helped improve my own experiences at the HWI (Guiffrida, 2005; Holmes, Ebbers, Robinson, & Mugenda, 2000; Litzler & Samuelson, 2013; Palmer et al., 2011; Williamson, 1999).

As I focus on being a Black man in an undergraduate engineering program at an HWI, my confidence and resilience in the program seemed to be connected to a refusal to quit and prior academic success (Long III & Henderson, 2017). Furthermore, family involvement and encouragement received from peers and staff helped to form my academic identity (Flowers III (2015). In accordance with Moore III and associates’ (2003) “prove-them-wrong syndrome”, I actively sought to counter the stereotype of being intellectually inferior by continuing to overcome the difficulties that arose in my academic endeavor. Lastly, due to my peer support, I was able to share my experiences which was critical to my college adjustment and success (Burrell, Fleming, & Fredericks, 2015).

### *Redefining success as freedom for Black men in undergraduate engineering programs*

This study challenged my definition of success which initially revolved around and was limited to graduating with an engineering degree from the University of Michigan. Through the

lens of AAMT, I realize that my story is ultimately about the pursuit of freedom. Studies have commonly defined success for Black men in higher education as being able to persist and graduate (Kim & Hargrove, 2013). However, there is a need to expand how Black men define success as freedom. True freedom doesn't come from simply fulfilling the American Dream. I have reached the conclusion that my true freedom comes from the ability to live peacefully, authentically, and autonomously in my purpose.

Since Black men are not a monolith, there will be multiple ways in which they define success and freedom for themselves. It is necessary to inquire about the complexities in which Black men in engineering programs arrive to their freedom. They will have to challenge stereotypes of how society sees successful Black men – as an athlete, rapper, drug dealer, or musician. Black men in undergraduate engineering programs may redefine success as freedom in several ways, including but not limited to, (a) moving beyond emotional constraints attributed to toxic masculinity, (b) fully engaging in genuine relationships, (c) expressing themselves creatively and culturally without worrying about standards of professionalism, (d) pursuing unconventional career paths outside of the typical engineering pathways, (e) identifying with and accepting nonheteronormative labels, (f) considering opportunities outside the bounds of their major, (g) investing in personal desires and aspirations without the weight of others' expectations, (h) inserting themselves in a safe space in which they can practice self-care, and (i) exploring the world and connecting culturally beyond the bounds of the United States.

### **Implications**

I shared my experiences, and my analysis of my experiences, with the hopes of changing the ways that researchers and practitioners consider how Black males' experience undergraduate

engineering programs at HWIs. My accounts have implications for research that is done in the future and the ways that engineering students can be supported. The implications are organized around the two core conclusions discussed in the previous section: the need for a more holistic support system, and the need for more consideration of what freedom could look for Black men in undergraduate engineering programs.

#### *More holistic support systems*

The experiences that I had while would have vastly improved if I had more holistic support that went beyond financial support. In the following section, I offer discussion of different ways that HWIs can support their Black men, including (1) understanding how Black men define freedom, (2) implementing culturally relevant curriculum, (3) using narrative evaluation, (4) designing departmental support for minoritized students, (5) creating targeted outreach for therapy services for Black men, (6) engaging Black men in personal and professional advising, (7) enforcing inclusive practices in classrooms, and (8) hiring more minoritized faculty.

Since spirituality played an important role in my academic survival, I recommend that researchers should investigate ways to promote the freedom of Black male students with African American Male Theory (Bush & Bush, 2018). Humanizing the experiences of Black men and questioning the meaning of success for Black men will allow for a more authentic account for how we can holistically support these students when it comes to engineering education. This approach should go beyond the scope of having transitional programs for academic support or other ways to increase academic standing. Having students engage with their strengths can help them to leverage their unique identities for personal and professional success.

Due to the struggles with understanding myself as an engineer which compounded with the lack of examples of successful minoritized engineers in the classroom, I recommend that



engineering educators create a framework that adequately supports creating culturally relevant curriculum for theory-driven coursework. For example, a thermodynamics course could use a problem that highlights the work of Norbert Rillieux, one of the earliest Black chemical engineers, which could investigate the theory behind how his basic design of a multiple-effect evaporator affected how sugar was produced in the 1800s. If faculty members were to renovate existing curriculum in favor of a more culturally relevant curriculum that nurtured inclusive learning experiences, there would be a better bridge built to build students' engineering ability.

Since I, and many of my peers, felt pressured to academically survive with a satisfactory GPA, it may also be of value to implement narrative evaluation (Iamarino, 2014) in engineering curriculum as an alternative to traditional grading. Narrative evaluation is a performance measurement and feedback on a student's individual performance and coursework. This could help shift the level of stress by emphasizing the qualitative assets and contributions of an individual, instead of limiting the characterization of a student's potential to a numeric score, so that students have supplemental materials that prove their competence and employability.

Since I experienced great difficulty with upper-level coursework within my departments which negatively affected my overall health, I recommend that engineering program developers investigate ways to bolster the success of students with access to less academic resources. Although programs like the Minority Engineering Program, the Meyerhoff Scholars Program, and M-ENGIN may offer generalized support for multiple engineering majors, there is a need to unearth ways to holistically support minoritized students in the development of non-cognitive skills, formal faculty/industry mentorship, emergency financial aid, culturally competent counseling, and social activities departmentally. Given that many of my peers experienced difficulty navigating upper-level coursework in their respective departments, there could be a

larger emphasis for each engineering department within schools to have a comprehensive support program specifically for their minoritized students to receive additional specialized assistance. For example, the mechanical engineering department could host a networking event for Black mechanical engineering majors to mingle with Black mechanical engineers leading in the field. These various forms of support could help minoritized students with their academic performance, their sense of belonging, and their overall health so they can be retained in their upper-level coursework.

Since I began to redefine success outside of working as an engineer because of the difficulties I faced in my coursework, it may be necessary for undergraduate engineering programs to create more opportunities for minoritized students to be holistically engaged personally and professionally. Intrusive advisors, a person that assists students in exploring services and programs to improve skills, could preventatively anticipate problems so that the student receives the support necessary to persist in college (Upcraft & Kramer, 1995; Varney, 2012). The benefits would be marked if minoritized students had a same-race advisor for which they could come to for support personally, academically, and professionally. An advisor that holistically served the students could help abate the confusion or lack of connection due to the size of governing structures that HWIs function under.

Given my consistent experiences of feeling onlooker and not contributing enough to teams, I suggest that practitioners seek more equitable approaches to teaching diverse classrooms. From using examples of successful, minoritized engineers to enforcing standards of inclusion for classroom dynamics such as providing ample opportunities for students to share their experiences and perspectives. Bowen and colleagues (2020) offer various measures necessary to ensure that

classrooms are inclusive including ensuring your course reflects a diverse society and world, and ensuring your syllabus sets the tone for diversity and inclusion.

Since I navigated college during a time rife with police brutality against Black men and women while experiencing academic strife and managing my disability, I recommend that college counseling and psychological service professionals take a more targeted approach to encouraging Black men to use therapy. Services could use intentional outreach, marketing, and planning focused on Black male collegians (e.g., a Black male therapist meets with groups like the Black Male Initiative for low-pressure discussions on mental health), then these services could help alleviate the pressures and trauma that the students have experienced before or during their time in college. Creating group therapy sessions for Black males may help to dispel the stigma for counseling services while focusing on a specific group that is in need. Providing services to improve the mental health of Black men is important for their persistence in college.

Since there was a noticeable shortage of Black faculty members in my undergraduate engineering program, I recommend that HWIs make considerable effort in hiring Black and Brown faculty through their diversity, equity, and inclusion efforts. In addition, it would be useful to train current minoritized graduate students to become faculty for the purpose of recruiting and retaining more minoritized faculty. If more Black and Brown students were trained to become faculty members, the likelihood for more minoritized students to engage with the curriculum and feel a sense of belonging would increase. There also could be more funding dedicated to mentorship programs in which minoritized students are paired with same-race faculty members so that they are adequately supported throughout their undergraduate programs. Mentorship can help facilitate the growth necessary for minoritized students to persist and possibly pursue graduate studies or advance in their careers.

*Imagining and Investigating freedom for Black men in undergraduate engineering programs and beyond.*

The process of making meaning of my experiences helped me to conclude that redefining success was a necessity to thrive in my career journey. In future research, I aim to investigate how Black males who attend engineering programs at HWIs define freedom through the lens of AAMT. By understanding these definitions, I would then tell the stories of Black men in engineering from college to career to affirm other Black men about how they may reach freedom in their personal pursuits. I would then create a framework to support the design and evaluation of programs that support minoritized students in engineering and how they contribute to the experiences of Black men at college.

This study placed less emphasis on my persistence as a Black man in engineering and, instead, focused on the various difficulties, pains, and traumas that I endured caused by the systemic power imbalances perpetuated through attending an HWI in the United States. I challenge researchers to place less emphasis on observing characteristics, such as grit, resilience, and persistence, which place the onus of a students' success (i.e., the ability to graduate) on the student and, rather, bring attention to the various obstacles that these students must endure. The purpose for investigating what obstacles minoritized students face creates the opportunity for researchers to bring potential solutions to key decision makers so that these corrections to the education system can be enacted. Past research that emphasized the characteristics of gifted or high-achieving students has contributed to notions of exceptionalism to succeed which can disqualify and disempower students that may not fit the criteria to be considered exceptional. Finally, by highlighting the myriad problems experienced by minoritized students as a collective and posing solutions for key decision makers to prevent these problems from being replicated further, the

responsibility of the students' success no longer concentrates on strategies for students to navigate a hostile environment due to imbalanced power dynamics while simultaneously holding institutions accountable for improving the experiences of their students.

In addition to reconsidering focal points of research on minoritized students in engineering, I urge researchers to encourage and provide support for minoritized students to engage in critical autoethnography. The primary limitation of other forms of research, as opposed to autoethnography, is the power differential between the researcher and the participants. For example, I have participated in a research study led by a White female researcher studying Black men in STEM, which directly contributed to the limited depth and transparency that I was willing to divulge regarding my personal journey in engineering. Studies that focus on recruiting multiple minoritized participants to capture the essence of an entire experience (i.e., persisting in an undergraduate engineering program) are only interpreting a fraction of these experiences which is exacerbated by the lack of representation of minoritized STEM education researchers. By empowering more minoritized students to engage in sound, methodological storytelling, stakeholders within the education system will benefit from the vulnerable accounts offered in such a way that the resonance of these autoethnographic accounts will reverberate in the form of incremental changes to the education system. Finally, the opportunity for minoritized students to interpret their stories using asset-based frameworks necessitate transformative discourse with the potential to decolonize education as a whole and bring forth authentic narratives that complicate previous deficit-oriented literature.

### **Summary**

This chapter connects the findings to African American Male Theory and restated the problem investigated in this study as it pertains to my experiences as a Black male in an

undergraduate engineering program at an HWI. My conclusions exposed how my personal faith, knowledge of self, activism, resilience, and quest for liberation all contributed to my time as an undergraduate student. The topics of challenges, enhancers of persistence, and internal and external influences were discussed. Based on the results, recommendations were provided related to (a) research which included investigating the promotion of cultural assets for intersectional identities, (b) practice which included a framework for culturally relevant theory-driven coursework, the development of a comprehensive studies program practice which included developing culturally inclusive teaching practices, and using same-race intrusive advisors, and (c) policy which included funding low-income school systems, reprioritizing engineering education curriculum, and fiscally supporting hiring initiatives for minoritized faculty through DEI efforts. With these conclusions, discussions, and recommendations, the researcher hopes that there is further critical investigation into the ways in which Black men persist in engineering education programs. The findings from this study are important as they have significant implications for understanding the experiences of Black men. Systems and structures should be changed to successfully nurture, retain, and graduate these men which in turn may help to further diversify and fortify the STEM workforce.

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