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# When Giftedness and Poverty Collide and Why it Matters: Gifted, Poor, Black Males Majoring in Engineering

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*This article empirically contributes to the growing body of literature focusing on the experiences of gifted Black males, particularly those who are from low socioeconomic backgrounds and majoring in engineering, by examining their perspective of academic successes. More specifically, this article examines the experiences of gifted, poor, Black male engineering majors as they navigate the terrain where their giftedness and poverty intersect. For this qualitative study, semi-structured interviews were used to gather in-depth information about the participants' self-identities and academic experiences. Based on participants' responses, four categories emerged to identify aspects of their experiences in college: (a) self-perceptions, (b) financial obstacles, (c) engineering as a major, and (d) the students' perceptions of the institution. Based on the findings, institutions of higher education must understand the various factors (e.g., students' perceptions of achievement, financial issues, and institutional congruence) that influence the academic and social integration of academically gifted, poor, Black male college students.*

*Keywords: Black males; STEM success; navigating stereotypes, high achievers*

A significant amount of literature chronicles the influences of racial and ethnic inequality in the U.S. educational system, particularly in regards to equal representation of Black males in gifted and engineering programs (Benner & Graham, 2009; Berends & Peñaloza, 2008; Hughes, 2003). Unfortunately, who is deemed as either a “gifted” or “smart” within the context of our educational system remains a narrow prescription. Black males have been identified as underachievers throughout their educational trajectory “based on negative attitude[s] to themselves, characterized by an unfavorable self-image, negative self-esteem and a low level of the sense of self-worth” (Dyrda, 2009, p. 133). Literature, in other words, overwhelmingly and

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consistently depicts the experiences of Black males as low achievers and educationally at risk. This perspective, thus, thwarts any attempts to move away from deficit perspectives to embrace asset-based approaches.

Viewing these males as scholars (Whiting, 2006a) or as capable of possessing academic prowess is at best overlooked and at worst ignored (Bernal, 2002; Burt, Williams, & Smith, 2018; Ford, Harris, Tyson, & Trotman, 2002; Harper, 2004). Whiting (2006) further noted that students who perceive themselves as higher achievers are compelled to perform at a higher level. For instance, Whiting maintained that an African American male student's performance in school is connected to his perception of his academic self-worth. The challenge involved in examining the term *giftedness* is extremely complex because the term holds social value. In fact, conceptualizations of giftedness are dynamic in nature as it remains; a reflection of what society believes it to be (Sternberg & Davidson, 2003; Whiting, 2006b). Upon completion of a 15 year analysis, Goings and Ford (2018) similarly argued that further studies that examine the intersectionality of race and socioeconomic status are warranted. As a result, educators and administrators must cogently advocate that inequalities still exist in our educational system for Black males. With this in mind, culturally responsive pedagogy becomes a vital component to the teaching process. Emdin (2007) emphasized the focused culturally responsive need that purposely creates opportunities for students and teachers alike to discuss the inequities that transcend the classroom. Culturally responsive discussions, in other words, facilitate an identity tied to a positive sense of self for Black males.

Over the past decade, research (Bailey & Moore, 2004; Bonner, 2010b; Moore, 2006) focusing on the academic and the social experiences shared among gifted, poor, Black male students has failed to capture the nuances of their unique perception. Burt, Williams, and Smith (2018) assert that nuances of Black male students experience in college reside with racialized gendered experiences. Recent findings (Shealey & Lue, 2006; Whiting 2006b) on college student success stress the integral role that institutions play in providing educational opportunities for all students; however, the research on gifted Black males indicates otherwise (Barr, 2000; Bonner 2010a; Flowers, 2011; Ford, 2006, 2011; Graham & Gisi, 2000). A review of the literature (Harper, 2004; Moore, Ford, & Milner, 2005; Noguera, 2003) identifies substantial gaps in capturing the essence and depth of the gifted poor Black male college student experience, particularly those who are enrolled in science, technology, engineering, and mathematics (STEM) disciplines. Furthermore, the PK-12 educational process fails to recognize how it contributes to the deficiencies in STEM knowledge for Black males (Bonner, 2010b; Harper, 2004; Moore, 2006; Whiting, 2006a). Continuously, different intervention strategies for Black males are proposed throughout the educational context.

While various intervention strategies to help aid in Black male achievement, such programs are designed in isolation of each other rather than on a continuum. This might contribute to why few gifted black males matriculate through engineering programs. Kannapel and Clements (2005) posited that intervention strategies along the continual pipeline necessitate a culturally relevant discussion in order to influence the academic success of Black males. More specifically, the Black male educational experience is often viewed as a homogenous process and lacks an in-depth investigation of the individual as well as the collective influence and intersection of their giftedness, poverty, and academic achievement (Bonner, 2010b). According to Hancock, Allen, and Lewis, (2015) high school dropout rates are higher for students from low-income backgrounds, and black male students who drop out are 5 to 20 times more likely to be incarcerated than men who attend college. It has been noted that disparities in Black male

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experiences in STEM disciplines can be attributed to factors that include, but are not limited to, low expectations, inadequate academic resources, poverty, inadequate parental support, and lack of mentorship (Bonner, 2001, 2010; Hrabowski, 2003b; Hrabowski 2012; Hrabowski, Maton, Greene, & Greif, 2002; Noguera, 2003). Thus, the focal point of this manuscript discusses the findings of a study where participants conceptualize self-identity as it relates to being gifted, poor, and majoring in engineering.

### **Gifted Black Males in Poverty**

Poverty, like all social interaction, is defined in terms of the society in which it takes place; “the essence of poverty is inequality and the basic meaning of poverty is relative deprivation” (Valentine, 1968, p. 14). According to the U.S. Census Bureau (2010), poverty is often designated with income cutoffs in relation to “family size, sex of the family head, number of children under 18 years old, and farm-nonfarm residence” (para. 4). Chambers (2006), however, offers a more comprehensive definition of poverty to include: 1) Income poverty; 2) Material lack or want; 3) Capability deprivation; and 4). Multidimensional deprivation. We posit that Chambers (2006) conceptualization of poverty, specifically multidimensional deprivation best situates poverty within the context of this study. In other words, there are several layers of intersection that impact one’s perception of poverty. Borlandet, Schnur, and Wright (2000) further asserted that, “Poverty and racism, although they diminish us all as a society, do singular damage to the most vulnerable, especially children, who are their direct victims. To believe otherwise is to ignore the evidence of our most appalling failure” (p. 28). The framing of poverty tends to focus on “social forces, cultural groups, social systems, and the values, beliefs, and aspirations of individuals” (Lehning, 2006, p. 3). Milner (2013) indicated that poverty is a socially constructed ideology that varies by the lived experiences of individuals. That being said, it still remains extremely difficult to definitively categorize the notions of poverty that is representative of a collective lived experience. As a result, focusing on overcoming the limitations of poverty is more productive in influencing the lives of students than any other social policy (Burney & Beilke, 2008). Students from low-income minority groups are often underidentified and underrepresented in rigorous academic programs (Newberg, 2006). Thus, few children from high-poverty schools receive quality education in their early years needed for the advanced curriculum necessary for college preparation (Kozol, 1991; 2005; 2012; Newberg, 2006). Unfortunately, many Black males’ notions of giftedness are completely unrecognized during their formal K-12 schooling (Bonner, 2010; Conchas, 2001; Noguera, 2003). As a result, this issue is extremely important for K-12 educators to be cognizant of the nuances pertinent to Black male development and their conceptualization of giftedness. Braxton, Milem, and Sullivan (2000) advocate for more research-based programming in developmental services to help Black males thrive in collegiate settings.

According to Bonner (2001b; 2010b), there is an increased importance for researchers to focus on gifted Black male and how the multiple statuses of poverty and giftedness intersect. Important to note is that participants’ experiences are situational and their notions of poverty, giftedness, and being an engineering major does not operate in isolation but rather are integral components of the multifaceted nature of their daily life experiences. Poverty, as an intersecting factor, further contributes to the at-risk label that is assigned to Black males. Fashola (2005) noted that “the effects of poverty can be so debilitating that a child’s life chances can literally be determined by a number of environmental and cultural factors such as the quality of prenatal

care, housing, and food available to their mothers” (p. 59). Moreover, poverty is considered to be an important factor in school failure (Orfield & Lee, 2005; Rothstein, 2004).

Recent concern about STEM education in the United States has prompted a discussion about the relationship between STEM education, national prosperity and the need to increase access to equitable educational opportunities (Lowell & Salzman, 2007). Lowell and Salzman further assert that the economic and social benefits of STEM education are widely believed to have broad applications for workers in both STEM and non-STEM occupations. Glascock (2012) noted state funds and tuition do not cover the entire costs of an engineering program for the average student. Glascock suggested that funding issues at major universities significantly impact engineering majors. For instance, he cited that undergraduate; in-state tuition at the University of Washington increased 20% last year, to \$10,575 in tuition and fees. This is problematic because the cost of tuition has nearly doubled in the last five years. In engineering departments, funding issues have caused a decline in the number of teaching assistants and the elimination of different electives the students could select (Flowers, 2011; Moore, 2006).

As a result, budget deficits continue to hinder public colleges and universities’ ability to expand access to STEM degrees programs to diverse student populations. Dean O’Donnell (Glascock, 2012) asserted that “with the right fee, we could accept more students, but access has two A’s – *Affordability and Availability*. Affordability will require a substantial increase in financial aid to ensure that all qualified students can become Washington Engineers” (p. 2). In many states the funding cuts over the last seven years have impacted the affordability of the college degree, specifically engineering degrees (Johnson, 2012). The United States can no longer afford to exclude segments of its population from educational opportunities. Closing the achievement and funding gaps between Black males and other student populations remains one of the most pressing educational issues in the United States (Bonner, 2010b; Noguera, 2008).

### Method

Exploring the lived experiences of gifted, poor, Black males can potentially provide an understanding of the social, academic, and emotional experiences this student population encounters as they navigate their respective postsecondary journey. This study employed a qualitative, single case study design. According to Denzin and Lincoln (1994), the word qualitative implies an emphasis on processes and meanings that are not rigorously examined or measured in terms of quantity, amount, intensity, or frequency. Two distinct research questions guided this study by Flowers (2011).

- How do academically gifted, poor, Black male college students in engineering disciplines conceptualize their self- identity? Particularly, is there an intersecting identity when it comes to notions of poverty, giftedness, and majoring in engineering?

### Participants and Site Selection

Purposeful sampling was used in the selection of participants and institutions. According to Patton (2002), the aim of purposeful sampling is to select information-rich cases that will illuminate the questions under study. For the purpose of this study, potential participants were identified by key gatekeepers (e.g., engineering administrators and faculty) at each respective

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institution, as well as participant snowball sampling. Table 1 provides a snapshot of the demographic characteristics of each Black male participant.

**Table 1**  
*Characteristics of the Participants*

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<b>Pseudonym</b>	<b>Class</b>	<b>Major</b>	<b>GPA</b>	<b>University</b>
CJ	Junior	Civil Engineering	3.2	P
Jack	Senior	Chemical Engineering	3.3	P
Marcus	Senior	Mechanical Engineering	3.0	P
Ryan	Senior	Aerospace Engineering	3.0	P
Charles	Senior	Chemical Engineering	3.2	H
Chase	Senior	Computer Engineering	3.3	H
Isaiah	Senior	Electrical Engineering	3.2	H
Johnny	Senior	Electrical Engineering	3.1	H

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The two institutions were selected purposefully based on location, institutional type, and STEM program participation. University P and University H (pseudonyms) had similar competitive STEM degree programs and were both located in small towns. University H was the first state-supported college for African Americans and the second oldest public institution in the state. Initially, the curriculum of the university was designed to serve as preparation and training for teachers. Presently, enrollment exceeds 8,500, including more than 2,000 graduate students. At University H, African American men accounted for 24% of undergraduate enrollment. Located 70 miles outside the largest city in Southern region, University P is one of the top-tier research institutions of higher education in the state. Currently, University P is classified as a flagship institution, with more than 38,809 undergraduates and 8,000 graduate students studying in over 250-degree programs in 10 colleges. At University P, African American men accounted for 1% of undergraduate enrollment. Table 2 compares demographic data for the two universities. Moreover, despite the state's growth and diversified economy, the state X has one of the nation's highest percentages of individuals living in poverty, a growing social issue for the state.

Table 2

*Racial Composition at the Study Site Universities*

<u>Race</u>	<u>University P (%)</u>	<u>University H (%)</u>
White	73	4
African American/Black	3	88
Hispanic	11	4
Asian	4	2
American Indian	1	0
Unknown	1	0
<u>Non-United States</u>	<u>8</u>	<u>2</u>

**Data Collection and Analysis**

In qualitative research, data analysis involves the reduction, organization, and interpretation of data in a way that allows the study findings to be shared with others (Bogdan & Biklen, 1998). For this study, 25 semi-structured interview questions were audio recorded and then transcribed. The interviews were designed to gain insight into the perceptions of academically gifted, poor, Black STEM majors. Data from the interviews were unitized and reduced utilizing content analysis. Patton (2002) defined content analysis as “any qualitative data reduction and sense-making effort that takes a volume of qualitative material and attempts to identify core consistencies and meaning” (p. 453). Once data were unitized, the process of coding ensued. Data were labeled and arranged into provisional categories and subcategories. In addition to using content analysis as a method of analyzing data, a conceptual matrix was used to assist in the data analysis process. A conceptual cluster matrix allows for unitization of data and assignment of data into various themes (Miles & Huberman, 1994). The purpose of the conceptual cluster matrix is to explore relationships and to explain the links among the concepts of giftedness and poverty. Throughout data collection and analysis, field notes and memos were also used to record findings.

Trustworthiness was achieved through member checks and peer debriefing. Lincoln and Guba (1985) defined *trustworthiness* as the quality of an investigation and the findings that make it noteworthy to audiences; they further noted that trustworthiness is based on credibility, dependability, transferability, and confirmability. Member checking continuously occurred throughout the interview process and participants were subsequently given an opportunity to review their individual transcriptions. Additionally, participants were asked follow-up questions to clarify or expand upon the findings from the study. Peer debriefing was implemented as a second strategy to establish trustworthiness. Peer debriefing is an external check conducted by an outside peer or expert who can review and provide feedback on the research process (Creswell,

2009). An advantage of ensuring trustworthiness throughout the study was that it allowed the researcher to present an acquired representation of the participants' perspectives.

### Findings

Unarguably, Black males, as a group, experience several difficult and unique challenges that impact their college experience. For some Black students, being labeled "gifted" often comes with challenges from within and outside their cultural groups. The definition of giftedness varied among participants. For each of the participants of this study, defining himself as gifted was not part of his *self-constructed identity*. Cooley et al. (1991) noted that gifted Black students have the challenge of integrating their racial identification into their self-concept and determining what it means to have been identified as gifted. Identity construction amongst the Black males in this study intersected with social, cultural, and financial factors, making the examination of their lived experiences multifaceted.

### Construction of Self-Identity

While the notion of *giftedness* was seen as a positive attribute by all participants, their inclination to self-identify as gifted was absent. The participants' perceptions of giftedness were applicable and vital to their self-identity because their notions of giftedness were set in the context in which they interpreted their academic experiences. One of the participants, Jack, jokingly emphasized that he did not walk around and talk about his abilities, telling people he was gifted in mathematics. Covertly, CJ explained that he understood that giftedness was perceived as making good grades, getting a high GPA, and doing well on tests. Nevertheless, he claimed that it was much more than that. CJ noted that, "giftedness is having the will to succeed even in the face of great challenges." CJ followed up this statement with "while I tend to accomplish most of my academic challenges it can be isolating; being the only Black child in AP science can be lonely at times." It is important to note that the participants' framing of high achieving and their inability to connect this with the premise of giftedness compelled the researcher to use these terms interchangeably because these participants simply did not view themselves as gifted. Isaiah described his idea of giftedness:

Ever since I can remember, learning and gaining new knowledge has always been important to me. I remember being young and watching television and seeing this commercial stating "Knowledge is Power" and I was like, "Wow, . . . I want power! So I must be willing and open to attaining knowledge." To this day, I still seek to gain all the power I can through my attainment of knowledge.

For the participants in this study, giftedness entailed not only the necessary academic skills to academically achieve but also the confidence in their ability to successfully navigate their learning environments. For instance, some of the participants noted that giftedness was a combination of ability and effort. Marcus asserted,

Giftedness is not only one's natural intelligence. Someone can be naturally smart but [if] they don't apply themselves, then their abilities mean nothing. But my ability to achieve comes from not only my brain but also my determination to succeed.

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Isaiah asserted that when his mind is set on a goal “it’s either work hard or work harder. He indicates, there is no such thing as quit, once I decide to do something, I’m invested in it until the task is completed.” For each of the participants, giftedness started with the individual. Each of the participants discussed the importance of recognizing one’s academic capabilities. Jack described the importance of believing in one’s abilities:

You have to work hard to get somewhere in life but you have to believe in your-self and your abilities. So if you have the talent and you’re gifted academically then you should believe you can do it and not let anyone or anything keep you from reaching your goals.

Essentially, the participants agreed that the definition of giftedness should be viewed in practical terms rather than conceptually. For participants, giftedness meant that they knew how to apply the knowledge they knew rather than simply regurgitate the knowledge they possessed. All of the participants maintained that giftedness was an important concept for Black males to comprehend and make part of their self-identity.

### **Construction of STEM-Identity**

For academically gifted Black males, developing a cohesive sense of self is essential to establish a favorable STEM identity. Black males who view themselves as academically strong, studious, and capable are more likely to develop a positive scholar identity (Whiting, 2006a). For some of the other participants, their definition of giftedness was complex and defied a definition of a singular nature. Several of the participants claimed that giftedness is not defined solely by academic abilities only. However, only one of the participants discussed in terms of academic giftedness and giftedness expressed in other ways—namely, athletics Ryan stated,

I have been called gifted mainly because of how I perform academically. But there are other students who have different types of gifted [sic], like dunking a basket-ball. It seems like, as a society, we value the gifted African American students who can dunk the basketball over the academically gifted student.

Another one of the participants, Johnny declared that he conceptualized his STEM identity as *something different* from other aspects of his identity. From his perspective, his STEM identity was a valuable aspect of his sense of identity, primarily because he realized the relevance of a STEM label. He commented, “being in a STEM programs just meant I was put in classes where teachers would give me more work, so I was able to improve on my academic skills.” Johnny noted that, in retrospect, his enrollment in advanced classes in high school kept him out of trouble but they also increased his interest in engineering. Marcus noted that one of his teachers encouraged his curiosity in science and engineering. He recalled a moment in the seventh grade when his science teacher gave him an old computer to repair. While he did not repair the broken computer, his interest in computer technology was stimulated. Similarly, Jack found interest in engineering as a child. He stated that he was one of those children who always had questions. Jack noted,

I remember being six years old and asking my uncle to show me how to fix a car. At the time he laughed, but I wouldn’t stop asking so he decided to teach me about it. I can still remember most of the parts of an engine.



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As noted by the participants, the development of an early interest in engineering, mathematics, or science heightened their interest in pursuing engineering degrees. Further, the participants' early educational experiences suggested that their strong abilities in mathematics influenced their choice of engineering as a career trajectory. Charles related that his participation in a summer STEM bridge program had given him more insight into the field. Charles claimed,

My high school did not have many programs for STEM, so when I got into the summer bridge program, I was really excited. The program not only helped me explore my engineering options but I also got a chance to meet tons of people working in the engineering field. I actually met my current mentor when I was in the 10th grade during one of the informational seminars.

Reflectively, several of the participants noted that being enrolled in advanced placement classes and attending STEM summer programs offered them important educational opportunities not given to their [Black male] friends. The findings suggest that, for the participants, a high sense of confidence was one of the most critical factors to being successful in engineering. For these participants, these increased educational opportunities served as ancillary pipelines to further cultivate their pursuit of a postsecondary STEM education.

### Poverty and Financial Obstacles

The term *poverty* is often defined in specific terms. The participants in the study used the term *financial obstacles* to articulate their conceptualization of poverty. Conversely, poverty cannot be defined based on statistical findings alone; the perceptions and experiences that individuals have about poverty provide critical insight into how educational researchers should seek to understand the multiple dimensions of poverty. More specifically, the participants' conceptualization of poverty was not indicative of their inability to be successful academically but rather they viewed poverty as a challenge that they needed to overcome. Several of the participants noted that poverty was just another "hurdle" in life they had to jump over. Several of the participants expressed concerns about the various financial obstacles that they encountered while majoring in engineering. Isaiah expressed comparable sentiments concerning the cost of college. He claimed:

The biggest obstacle in college was the financial burden. Every dollar that I made working part time went toward paying for college. My dad had to deal with a lot with my mom being sick and my brothers also in college, so I made sure I did everything I could to help my family. Looking back now that I am a senior, I know all the headache was worth it.

Because of financial hardships, some of the participants changed their future goals. In addition to paying college tuition, other financial obstacles included the inability to purchase course books and lab equipment. For some of the participants, the lack of financial means required them to negotiate allocation of certain resources. For example, some of the participants discussed how they chose which books they could afford each semester, based on cost. For instance, Chase and Ryan discussed the issue of purchasing books for engineering classes. Chase claimed,

In some cases where I didn't have the funds, I would sacrifice getting one or two of my engineering books. During those semesters I really had to hustle to make the grades. I

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would have to borrow and beg my classmates to use their books. For the most part, my classmates helped me out.

While Chase's classmates provided him with access to books that he could not afford, Ryan's classmates did not respond as positively, and he relied on the library for the books that he could not afford. Ryan explained,

Some classmates were cutthroat. I would ask them to use their books to make copies and they would flat out say —no. So sometimes I would get lucky and the library would have a copy of the book. But if it was a newer book, I was in trouble.

A majority of the participants reported challenges when wrestling with financial obstacles. However, several of the participants reported that they assumed every college student experienced their financial obstacles. Marcus indicated that he assumed that all college students worried about money all of the time. Each participant noted that his experience with poverty was situational and that engineering as a major was a guarantee that they would not return to those circumstances. Chase stated that poverty had many manifestations, as he maintained, "Man, when you're lacking money, it can hurt at times. I mean, it hurts you physical [sic], mental [sic], and spiritually." As a result of financial hardships, some of the participants had been encouraged to acquire loans to pay for their college education. In particular, Marcus disclosed that his parents informed him about the importance of being awarded scholarships and grants to reduce the amount of loans for his college education. Likewise, Johnny and Charles both indicated that financial issues were their most significant obstacles in college. Charles said, "College is worth the financial hit you have to take. It's like you must give up things now to gain much more in the future. Financial issues are tough but the payoff is so much more." Johnny acknowledged the ridiculous amount of money that he had to pay for books. He commented, "The fees we get charged in engineering are high, not to mention the growing cost of tuition." Currently, two of the major challenges include increasing the college-going rates for Black males and providing more avenues for funding amidst budget cuts.

### **Intersections of Giftedness, Poverty, and STEM**

Black men in college are faced with difficult and unique challenges when compared to their peers that may inhibit their academic success (Bailey & Moore, 2004; Noguera, 2003) and subsequent graduation, particularly in engineering programs. In order for the United States to remain globally competitive and move forward technologically, there must be a continuous production of gifted and talented citizens with new and fresh ideas. As the demands for technological innovation increases and the demographic trends in the workplace change, it is vital that Black male college students have the resources to gain skills to participate in the globalized world (Jackson & Moore, 2006, 2008a).

According to Swail (2000), education has a powerful impact on the individual, the family, and society at large, and it is one of the best ways to overcome poverty. However, poverty remains one of the most influential factors affecting the educational outcomes of students, particularly Black males engineering majors. Specifically, the exploration of the intersection of poverty and race should be examined to understand the academic outcomes of academically gifted, poor, Black males. All participants shared that their families experienced financial hardships throughout their lives. However, none of the participants described themselves as having been impoverished. Jack explained,

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I grew up in a low-income area but at the end of the day I was always full and I never had to sleep outside. Maybe poverty is a mindset. I never thought about what I didn't have until I went off to the college and realized others had so much more.

For Jack, the concept of poverty was not relevant until he was faced with counter-frames of his reality. Such counter-frames surfaced when he was exposed to other college students, which essentially magnified the reality of what little he always had. Isaiah further noted that,

Back where I'm from, some people are just OK with their circumstances. Sometimes it seems like being poor was almost a conscious choice for some. But I have learned that being from poverty does not define your life. Take Oprah Winfrey, for example. She came from nothing, she literally was in potato sacks growing up, but now she is one of the wealthiest women in the world.

This suggests, as Jack and Isaiah noted, that poverty for some is a mindset. If one does not believe he is poor then the mindset of poverty is a non-issue, especially if people live in low-income areas where the environment mirrors similar environments. Realizing that he was poor was evident when he realized how much more others had. CJ similarly commented that money was an issue for his family growing up:

Sometimes I had to make do with what I had as a kid. There were times when I had to study for a big test and the lights were cut off but that didn't change the fact that I had to study for my test. So I made do! Those types of life experiences can either make you or break you; for me, they made me an even stronger person.

For these participants, poverty was seen as a matter of circumstance; they could not control the fact that their families had financial issues but those issues did not prevent them from achieving academic success. All the participants indicated that financial issues were the most significant challenge in their academic experience. Isaiah reflected,

Not having what others have is tough. When I'm in class and out am always thinking about not having money but that's my life and I am the only one who have the power to change it. You better believe I'm in this engineering program to change that so I work hard now for the huge pay off in my future.

For other participants, the conceptualization of poverty was not limited but added a level of personal motivation to succeed. Ryan described poverty as having less money than is needed to live. For Ryan, his construction of poverty focused on one's inability to take care of their family. He contended,

Just because you're not making enough money to live in the nice house or apartment doesn't mean you're in poverty. I believe poverty means that you don't have a job and you have a family to support, bills to pay, and things to take care of. When you are poor, you don't have the means to take care of your business.

Nevertheless, analysis of data indicated that participants who maintained a high self-efficacy and willingness to make sacrifices did not let financial issues derail their academic goals. Burney and Beilke (2008) further contend that "increased education is what will allow students to escape

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poverty and limitations poverty creates for themselves and future generations” (p. 190). With regard to Black males in engineering, it is increasingly important to look at their academic and financial situations holistically (Bonner, 2010b; Flowers, 2011).

The recent research on the intersectionality of socioeconomic factors, environmental climate, and the students’ ability to achieve academically has emerged as a vital area of educational research (Bonner, 2010b). Other researchers (Bombi, 2002; Weinger, 1998) have accepted that any definition of poverty must be understood, at least in part, in relation to particular social, cultural, and historical contexts. Moreover, notions of poverty must be examined based on the situational elements of the participants’ lived experiences. According to Jack, it is important to recognize people for who they are and not for what they lack.

Because someone is not wealthy doesn’t mean they’re are less of a person. It’s important that people look past the surface and see people for who they are on the inside. Because not all poor people are what people perceive them to be.

In contemporary studies on persistence and STEM, there has been an increased emphasis on the importance of examining the multiple levels of influences on academic achievement (Carnevale & Fry, 2000; Gahagan & Hunter, 2006; Graunke & Woosley, 2005). Research has shown that the education system has historically been less responsive to and supportive of the needs of Black males (Harvey, 2008; Moore & Owens, 2008). Therefore it remains critical for researchers to explore the numerous interacting factors that influence the academic success of Black males in STEM degree attainment.

### **Implications and Recommendations**

The findings of this study indicate that the support received by the participants (peers, faculty, family, and financial sources) significantly contributed to their academic achievement. An implication from this study is that dialogue on giftedness, poverty, and STEM must no longer be limited to a parallel perspective but rather highlight the intersection of the aforementioned in relation to the developmental process of Black males pursuing STEM degrees. More specifically, STEM identity development for Black males remains a forefront issue today (e.g., President Obama’s Initiative of *My Brother’s Keeper*, *Educate to Innovate*). The development of identity for gifted Black males--alone without a STEM identity--is complex. A residual implication of the study is that PK-20, along with gifted Black males must be responsible for the cultivation of identity development. While Black males develop their own identity, it is vital for PK-20 educators to recognize that they, too, impose, often inadvertently, a negative frame of reference for how Black males conceptualize their identities. As such, the need for educators to have an acute awareness of culturally responsive perspectives is paramount for gifted Black males’ continued positive development of self. Embracing a culturally responsive pedagogy necessitates the problematization of the schooling experiences of Black males in STEM. As previously noted and explicated throughout this article, the notions of giftedness, poverty and STEM as it pertains to gifted Black male students should no longer be examined in isolation. Rather, educators must begin to understand its’ many intersections as a means to map out a new course where gifted, poor, Black males pursuing STEM degrees no longer collide.

Along with the findings and implications of this study, the following recommendations are offered on how engineering programs can support gifted Black males in the P-20 continuum.

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- *Seek ways to promote being “gifted” or “smart” as a natural part of the Black male experience.* Throughout the educational pipeline, there needs to be a fundamental value placed on the recognition of the academic achievements of Black males. We argue that there needs to be a fundamental shift in how Black males are conceptualized. More often than not, Black males are not perceived as “gifted”. To promote Black males as gifted and smart, there needs to be a paradigmatic shift among teachers, staff, advisors, faculty--all stakeholders in education at all levels--in how Black males are perceived.
- *Be intentional about creating environments that cultivate positive identity development of Black males in education.* Environments remain a critical aspect that can aid or hinder the identity development of any student, particularly gifted Black males in engineering. Their well-documented underrepresentation in gifted and talented programs, AP courses, and engineering suggests that the gifted Black males in STEM are anomalies. Though scarce in numbers, the larger culprit for such underrepresentation is often present in the academic environments in which gifted Black males must navigate.
- *Establish P-20 initiatives to provide academic, social, and financial support to academically gifted, poor, African American males as an institution-based initiative supported by all stakeholders.* The aim of the P-20 initiatives would be to target, as early as preschool, African American male students from low-income backgrounds. Ultimately, PK-20 initiatives must promote collaboration amongst academic institutions and infuse notions of academic and self-development throughout the educational pathway (Moore & Owens, 2008).
- *Create a mandatory mentoring program that focuses on first-year African American male engineering majors.* Mentoring can have a significant impact on the experiences of African American engineering majors. A mandatory mentoring program could enhance development of self-concept, self-esteem, and self-confidence within first-year African American engineering students. The retention of gifted Black males for the first two years in STEM remain pivotal to both retention in the first two years and persistence to degree attainment (Bonner, 2001a; 2001b). As such, mentoring programs should provide gifted Black males the needed enrichment and space that ultimately sends a message of inclusivity in the larger environment. The latter, we argue, leads to the cultivation of a healthy identity.

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