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## Young, Black, Mathematically Gifted, and Stereotyped

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*In this paper, I describe the academic dilemma experienced by Tamara (pseudonym), a mathematically high-achieving high school sophomore. Raised in an economically strapped neighborhood, Tamara had the opportunity to attend a prestigious private high school, tuition free. Confronted by being viewed as an affirmative action student Tamara uses this negative stereotype as an extra source of motivation to achieve high marks on the admissions test. A new framework explains Tamara's reaction to this situation that I call stereotype management (McGee & Martin, 2011b). Stereotype management describes the range of strategies and various forms of individual agency that high-achieving Black students employ to reduce the academic impact of demeaning stereotypes while maintaining high standards of achievement. For Tamara, however, her high test score and ability to achieve in the face of being stereotyped was bittersweet, as she examined the potency and permanence of being perceived as less than.*

Keywords: mathematics education, Black students, high achievement, racial stereotypes

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Tamara, a mathematically high-achieving sophomore, who happens to be Black, entered a testing site. At stake were five junior- and senior-level slots to attend a prestigious private high school. She arrived about 10 minutes early and began the stress-reducing breathing exercises her calculus teacher taught her. Two Asian students entered. They looked at each other and snickered shamelessly, particularly as they eyed Tamara's flaming red, tight stretch pants. Tamara thought to herself, "They better not be trippin' on my pants," and pondered what assumptions they were making about her intellectual abilities. She shook it off. A Black male entered the testing site and sat as far away from Tamara as possible. Tamara had two thoughts about his action: "Either he thinks I'm too fine and my fineness will be too much of a distraction or he is embarrassed of me." Tamara concluded, "I hope he ain't one of those uppity Black dudes that don't mess with Black people. Whatever!" A few minutes later, two White female students entered, chattering away. One of the girls asked Tamara about the test time. Tamara thought that they seemed sort of friendly; then they started up a conversation.

White female student #1: I heard that this test was really hard.

Tamara: Yeah.

White female student #2: But don't worry [speaking directly at Tamara], even if you score low you will still get in because of affirmative action. There are hardly no Black students at [private high school].

White female student #1: You are so lucky [speaking directly to Tamara].

Tamara: Oh yeah, well let's see who is standing in front of [private school] with a full scholarship come this fall!

Tamara immediately realized that her comment did not fully address their assumptions of her being an affirmative action student. She honestly felt that she could not confirm or deny their perceptions of being there partly because of affirmative action. But there was one thought that Tamara had that was unquestionable: "I am the smartest person in this room." So, to top it off, she gave the girls the longest eye roll of her life. The entire testing room was silent, everyone afraid to move. Tamara wondered if the other test takers could see her heart popping out of her shirt. She broke the stillness in the classroom by popping her gum loudly and boldly. The White girls glanced at each other and sighed with relief.

Although Tamara's outward expression was one of satisfied defiance, she was silently and *invisibly* upset and humiliated by those girls, their assumptions about her intellectual ability, and the possibility of others in the room perceiving her as *less than*. Now Tamara's number one mission was to get the highest score possible. During the test, Tamara used her anxiety over feeling negatively stereotyped as a source of motivation to achieve her best. And she did. Tamara scored in the 93rd percentile on this private high school entrance test. Her performance signified how the low expectations of the other testers and of society in general actually gave her the "fuel" she needed to "knock the test out the box." The mainstream literature on stereotypes, including stereotype threat, cannot explain Tamara's response and, thus, her high achievement on this exam. However, what Tamara experienced—success in the face of stereotypes—I call *stereotype management*.

Tamara's narrative emerged from a study that investigated the lives and academic experiences of 24 mathematically high-achieving sophomore, junior, and senior high school students from four urban charter high schools in a large Midwestern city (McGee, in revision; Terry & McGee, 2012). In this article, I begin with a concise synopsis of the extant research on young students from predominantly Black, low-income neighborhoods and schools. Then, I narrow the focus to high-achieving Black students in high school mathematics from these same neighborhoods and schools. Finally, I present an emerging framework called stereotype management, which offers a perspective on the role of stereotypes in the lives of highly-able Black students who have particular talents in mathematics. The research on stereotype management emanated from several qualitative studies with high-achieving Black students that concentrated on the highly competitive and socially valued STEM disciplines (McGee, 2009, in press; McGee & Martin, 2011a, 2011b; McGee & Spencer, 2012, in press).

### **Young and Black in Poor Neighborhoods and Schools**

"Being Poor, Black, and American," an article by Julius Wilson (2011) in the *American Educator*, detailed an array of familiar statistics that are often highlighted when analyzing low-income, Black populations: a high infant mortality rate for Black mothers; a 34% poverty rate for Black children under the age of 18; Black males 18 and older being 5% of the college population but 36% of the prison population; and the ever-growing "achievement gap". In particular, a statistic that stood out was a comparison between 4<sup>th</sup> grade White males and their Black male counterparts, specifically in large cities. In 2009, the percentage of young Black males in large cities scoring at or above proficiency level was 11% in reading and 14% in mathematics. The percentage of young White males in public schools across the nation scoring at or above proficiency level was 38% in reading and 53% in math. These statistics follow and haunt young Black students who learn within poor, Black, and American

environments. Thus, for Black students who come from those environments and emerge academically victorious (part of the 11% in reading and 14% in mathematics), who tells their stories?

### **Highly Able Black Students in Mathematics Education: Gatekeeper to Mobility**

The field of mathematics has a privileged role and intellectual significance as a critical filter controlling entry into higher education and many higher-paid occupations (Ellington & Prime, 2011; Ellis, 2008; Martin, Gholson, & Leonard, 2010). Mathematics serves as the foundation and critical point of entry for science, technology, and engineering (STE) fields. Those who gain mathematical competency most often overcome the academic barriers to higher education and employment and, thereby, are able to increase their academic, social, and economic self-determination. Considering the preponderance of research highlighting Black students' failure (Ferguson 2005; Jencks & Phillips, 1998; Lamont & Small, 2008; Orr, 2003), there is a significant gap in understanding success among Black students in the academically competitive and socially valued areas of mathematics and STE.

Even in the context of well-known intervention programs that increase the participation of Black college students in mathematics and STE (e.g., University of California at Berkeley's Mathematics Workshop Program, The Meyerhoff Scholars Program of the University of Baltimore-Maryland) and in high school (Bob Moses' The Algebra Project), little is known about what happens at the individual student level or, by way of comparison, about Black students who succeed in mathematics without the benefit of a structured program (McGee, 2009; Nasir, 2011; Wright, 2011). Moreover, seemingly absent from the larger discourse on achievement and persistence outcomes are the voices of Black learners themselves, particularly those who are negotiating the mathematics pipeline (Ellington, 2006; Martin, 2006a, 2006b; Moody, 2003; Stinson, 2009).

Martin (2009b) recognized that Black students have characterized their experiences in mathematics as highly racialized, with racial stereotypes and other subtle and covert forms of bias and discrimination. His research has focused on mathematics education for African American learners and argues that mathematics education is not responsive to the needs of all learners (Martin, 2000, 2009a, 2009b, 2012). Through an exhaustive critical analysis of mathematics education policy, Martin (2009b) concluded that there is a socially constructed hierarchy of mathematics "ability" where Blacks, Latinos, and Native Americans are placed squarely at the bottom. Other critical scholars in the mathematics education community have focused on understanding the salience of race, gender, and identity in the African American struggle for mathematics literacy. This research takes into account the legacies of schooling, community, and educational policy, and draws from theories outside of the typical mathematics education paradigm, such as psychological cultural-ecological theory (McGee & Spencer, 2012; Warikoo & Carter, 2009), critical theories of race (Frierson & Tate, 2011; Martin 2009b; Stinson, 2010), and racial identity development theory (Berry, Thunder, & McClain, 2011; Nasir, 2002; Spencer, 2009). Thus, understanding how highly capable students not only handle the rigor of mathematics but also the additional stress of being stereotyped provides a counter-narrative to the underachievement focus so prevalent in much of present-day mathematics education research.

High-achieving students attending poor, predominantly Black high schools rarely have the same access to high level mathematics courses as do their White and Asian counterparts in suburban schools (Martin, 2009a). Advanced Placement (AP) and International Baccalaureate (IB) mathematics dominate classrooms in higher income,

majority high schools (Hart, Carman, Luisier, & Vasavad, 2011). Scholars who are critical of reform efforts suggest that those responsible for reforming mathematics curricula have supported improvements for the students most capable of going to college based on grades and standardized test scores (Martin, 2009b; Rousseau & Tate, 2003). However, mathematically-talented students in poor, predominantly Black environments might not have the same standardized test scores as higher achieving students from higher-income, higher-resourced schools due to the accumulation of inequities that Black students in under-resourced schools (neighborhoods, cities) endure and the bias of standardized testing itself, which favors White and higher income groups (Ford, 2011; Gutiérrez, 2012). These inequities ensure that only students from select backgrounds will be provided with maximum and sustained access and opportunity for mathematics or mathematics-based fields.

The role that race plays in mathematics and STE is under-studied and, when it is presented, it is systematically devalued. Historically, mathematics education research, curriculum design, and assessment have largely reflected a White, male, middle-class orientation. This limited perspective grossly misrepresents the realities of race and racism in the lives and mathematical experiences of otherwise highly able and capable Black students from low-income backgrounds. Looking at cognitive or “intellectual” ability in isolation distorts the socially constructed operations and views that foster and reinforce learning and assessment inequities in mathematics and related fields. A growing group of researchers within mathematics education have challenged the simplistic one-size-fits-all characterizations of Black high school students from low-income environments, providing much needed *counter-narratives* to the deficit narratives that remain so pervasive today (Berry, 2008; Gutiérrez, 2010; Jackson, & Wilson, 2012; Leonard & Martin, in press; Martin, 2012; Martin & Gholson, 2012; Stinson, 2009).

Recent movements in mathematics education have focused on (a) the socially-constructed role of race and racism in the education of disenfranchised students (Martin, 2009b), (b) the appropriateness of opportunity-to-learn standards as an equity framework for supporting Black students’ mathematical achievement, (c) improving the mathematical outcomes and experiences of Black and other disenfranchised, culturally-different students, and (d) providing narratives of students who are successful despite being marginalized. Within this subset of research, specific attention has been given to mathematically high-achieving Black students in order to gain a better understanding of how they cope with the relentless assaults on their intellectual credibility.

### **From Stereotype Threat to Stereotype Management**

The experience of negative stereotyping is all too familiar in the educational experiences of Black students in urban and other areas (Evans, Copping, Rowley, & Kurtz-Costes, 2011; Johnson-Ahorlu, 2012). Numerous studies have documented stereotyping in a variety of ways including subtle microaggressions (Nadal, 2011; Solorzano, Ceja, & Yosso, 2000; Sue, 2010; Sue, Capodilupo, Torino, Bucceri, Holder, Nadal, & Esquilin, 2007), practices, and policies (DeCuir-Gunby, 2009; Skiba, Horner, Chung, Karega Rausch, May, & Tobin, 2011; Thomas & Stevenson, 2009) that systematically marginalize Black and other racially-different students, particularly regarding negative- or deficit-labeling in a variety of situations—classrooms, summer internships, teacher interactions and relationships, and curricular content (Solorzano, 1998, 2009; Sue, Bucceri, Lin, Nadal, & Torino, 2009). Stereotype threat is defined as a type of confirmation bias in which the risk 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, even among high achieving Black students. There is a great deal of evidence that stereotype threat can negatively affect intellectual performance (see Nguyen & Ryan, 2008 for a meta analysis), and much has been written about the phenomenon of stereotype threat and its effect on the academic performance of Black students (e.g., Steele, 1992, 1997, 2010; Steele & Aronson, 1995; Steele, Spencer, & Aronson, 2002). In the context of standardized mathematics tests, Black and/or female students who are aware of racial or gender stereotypes related to mathematics and STE ability and skills may experience heightened anxiety related to the confirmation of those stereotypes and, as a result, their test performance is compromised and, accordingly, suffers (Steele & Aronson, 1995, 1998).

High-achieving students are the most affected by stereotype threat and fare the worst when the condition of being stereotyped is presented. That is, students who are high-achievement oriented, in terms of skill, motivation, and confidence, are the most impaired by stereotype threat. This threat is related to their efforts and frequent attempts to disconfirm these negative stereotypes and the academically harmful stress they cause. Stereotype threat literature has overwhelmingly suggested that when high-achieving Black students are confronted with a host of stereotyped and racialized obstacles, a loss of motivation and racial pride, coupled with an increase of test anxiety and stress, typically leads to a modest yet measureable decrease in test performance. What does this mean for so many promising students such as Tamara? Tamara had an increase in test anxiety and stress due to the racialized stereotyping she experienced prior to and during the high school entrance examination. However, upon further reflection, Tamara concluded that her anxiety and motivation emanated from a number of sources.

When I heard about the opportunity to apply, in my mind I had already claimed my acceptance [to the prestigious private high school]. But then, I started to really think about it. I already knew I would only [be] one of few a Black students there. And those Blacks [at the private high school] are mostly uppity. So, I was already trying to pump myself up to take the joint [entrance examination test]. So, I had to let them all know that I deserved to be there, cause I'm highly favored and academically stunning!

Tamara's quote above expressed both a historical narrative that implicates racial and class divisions grounded within the private high schools' demographics and undoubtedly its social dynamics, as well as the specific context of the testing site that made Tamara feel racially vulnerable. That racially vulnerable state, according to the stereotype threat framework, should have lead to a marked decrease in her testing abilities. What is noteworthy in Tamara's case, however, is that instead of significantly lowered achievement she was even more motivated and driven to achieve test success. How would stereotype threat researchers explain Tamara's success? One possible explanation is that Tamara used the anxiety and stress from being negatively stereotyped as a source of motivation to achieve, challenge, and, ultimately attempt to disprove negative stereotypes about Blacks. In other words, she exemplified stereotype management.

According to the concept of stereotype management, there are incentives and strategies that high-achieving mathematics and STE students perform in order to substantiate their intellectual and academic value or credibility to their teachers, families, peers, and the larger educational community (McGee & Martin, 2011b; McGee, in revision). Stereotype management incorporates critical understandings of social and cultural psychology theory and research to provide holistic approaches in understanding the role of academic resiliency (e.g., being resilient and achieving in school in the face of persistent racial stereotypes and inequities and other life challenges associated with being marginalized). Specifically, the concept of stereotype management draws from the

*Phenomenological Variant of Ecological Systems Theory (PVEST)*, which considers identity development processes and context-specific settings (Spencer, 2008; Spencer, Harpalani, Cassidy, Jacobs, Donde, Goss, Miller, Charles, & Wilson, 2006). PVEST examines the interaction of environmental context and identity development and starts from the assumption that an individual's perceptions of his or her environment and experiences are crucial to gaining an understanding of experiences and responses (Spencer, 2008). PVEST also acknowledges the specific challenges high-achieving Black students face as a result of individual, school or institution, and larger societal stereotypes regarding their perceived potential, as well as underachievement and resilience in mathematics and STE fields.

Stereotype management has been investigated using data collected from more than 80 high-achieving African American, Latino, and Asian undergraduate and graduate students across two qualitative studies and 24 African American mathematically high-achieving students from four urban charter high schools and a summer camp for students talented in mathematics and science (McGee, 2009, in press, in revision; McGee & Martin, 2011a, 2011b; Terry & McGee, 2012; McGee & Spencer, 2012). Many of the mathematics and STE high-achieving students in these research studies achieved their academic success based, in part, on different motivations and responses to both perceived and real racism. The students in these three studies employed a range of strategies that characterize stereotype management, which students used to invoke their agency and reduce the impact of demeaning stereotypes. There were unique group differences at the individual and racial/ethnic group levels, reflecting variations in the impact and frequency of experiencing demeaning stereotypes, although the high school participants appeared to be more emotionally wounded than college students (possibly a indication of maturity or human development). Types of college and employment trajectories were additional factors that influenced the students' perspectives on racialized stereotypes. Stereotype management has emerged along overlapping paths of racial, gender, and mathematics identity development as a tactical response to the ongoing presence of stereotype threat and discrimination. These students further demonstrated that, although stereotype management allows for mathematics and STE-based success, they maintained an intense and perpetual state of awareness that their racial group is devalued and/or undervalued in such contexts.

With development over time and maturity, the students progressed from a more extrinsic or external form of success, characterized by an attempt to prove stereotypes wrong, to a more robust and intrinsic or internal form, characterized by a desire to learn and to serve as a role model. External motivators drive the first form of success, where the stereotypes remain central and controlling. The second form is due to internal motivations, where the stereotypes are transcended and, although they persist, are not deterministic of failure or positioned as a reason to succeed. The teachers and administration from Tamara's urban high school caused her some emotional confusion. Tamara was both praised for her academic and mathematics achievements and subtly underestimated for being Black (e.g., "Tamara, you are so smart, I can hardly believe it!"). Tamara and her fellow high-achieving peers discussed the duality of being touted as smart, only to be told that they would "always" have to work twice as hard as their White peers to challenge the perception of being less talented. Hence, Tamara's description of her thoughts and actions at the testing site were akin to those of the other 23 high school students in the study.

Although race can shape inequitable educational outcomes, stereotype management provides evidence that students like Tamara can and do resist these narrow

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and confining framings by emphasizing and drawing upon cultural competencies embedded within the norms that exist within our society.

I like my colors. My friends tease me that my closet looks like a rainbow but I like being bright. I just tell them that my bright colors match my intellect. I like my fake eyelashes. I like the way I talk. I'm down with getting down [dancing and partying] and at my school we [are] always flaming on each other [a modern version of good-natured and clever signifying] and cracking up [laughing]. I would have to give up all of that... basically giving up myself to be smart in a place that is boring and cold.

In the milieu of negative racial stereotypes, motivation to succeed, along with complex renderings of social and cultural capital, are present in her narrative.

Tamara and the other students who avail themselves from stereotype management often utilize and defy traditional social norms with street wisdom and other cultural assets or resources that create motivations and strategies for academic excellence. Tamara received a full scholarship to attend the private school, but she did not go. In inquiring about her rationale to stay at her urban, predominately Black high school, Tamara expressed that she could summon up the energy to achieve academically for one test but did not believe she could do it “day in and day out” for the next two years (her junior and senior high school years). So, her academic and school trajectories and decision making is not without heavy reflection about her emotional and psychological well-being and its impact on her long-term academic implications. Thus, it is possible that Tamara could have been operating within the frameworks of stereotype threat and stereotype management, when ultimately deciding to stay at her urban high school. Although it is presumed that this private school would have prepared her well for a college major and career in STEM, Tamara felt greater overall value in “staying put” at a racially-affirming high school instead of attending one that was potentially hostile. However, even at her urban high school she does not escape stereotypes about her future as the savior for her low-income Black family members.

My teachers tell me I have to major in a STEM field in college because that is the only way to achieve success. Cause I'm good in math they assume that my college major would be that. They have said it so much, they actually got me believing it [snickers then frowns]. Then, my White mathematics teacher said that by getting a scholarship from a fancy college for engineering, I can help myself and my family get out of their [made the quotes gesture] “not so good situation.” Then I go, “What situation? You mean because we live in the hood?” Cause, other than living poor, I have a strong, close-knit, and loving family. And, why do I have to be responsible for moving my entire family out of the Neighborhood? They ain't expressed no desire to leave, so why should that even be my mission in life? The point is, nobody there [current high school] really asked me what I want to do.

Tamara said that she would like to own her own disabilities supply business in her low-income community, which would also house a community center for disabled youth. Tamara insisted that her majoring in bioengineering in college is only to gain enough money and skills to go back into her community and help disabled youth and their families through her entrepreneurial pursuits. Thus, bioengineering is currently not Tamara's passion, just a means to a greater, civic-inspired purpose.

The constant attention to responding to racialized social practices and educational policies that allow for the unmarked, invisible, and unacknowledged forms of bias

places an undue burden on students like Tamara to “deal with” these multiple forms of discrimination and prejudice, while school and social institutions perpetuate White privilege (Akorn, 2006; Lynn & Parker, 2006; Sue, Lin, Torino, Capodilupo, & Rivera, 2009). The explicit racial practices that permeate the U. S. educational system are coded as cultural differences, leaving little attention to the power of structural and institutional inequities. Educators and educational researchers should incorporate broader understandings of the social, psychological, and emotional damage of stereotypes along with the academic ramifications of being constantly perceived as intellectually inferior as a Black student.

### **Conclusion: Remembering Tamara**

Tamara’s thoughts, reflections, ideology, and actions demonstrate a racially-vulnerable student with an internal gauge focused on believing in her abilities and succeeding in school. Tamara wondered if the two Asian students ever have to worry about people perceiving them as inferior, particularly given that many Asian students face the “model minority” stereotype in which Asians are perceived as academically successful and as the cultural prototype that all other minorities should admire and emulate. However, they too face a complicated mix of interpreting and negotiating racialized representations that essentializes and distorts the identities of Asian and Asian American students (Ng, Lee, & Pak, 2007). As for the Black male student noted earlier, did he feel that he had to distance himself from Tamara because she did not “look” smart or that she fit a negative stereotype regarding urban Blacks as being “ghetto”? Does he wish he could have engaged in a welcoming conversation with her but was afraid of what others at the testing site may have thought about him and their relationship? Could he too, be protecting the projection of his academic identity by purposely distancing himself from Tamara? If so, his reaction could also be seen as a form of stereotype management, as a small portion of students from the larger studies did employ a lack of association with certain types of Black students as a strategy to maintain a more assimilated academic identity (McGee, in press; McGee & Martin, 2011b). Additionally, for this Black young male student a raced and gendered dynamic may be considered, as Black males have been portrayed as both dangerous and endangered and face a host of additional stereotypes because of the toxic ways Black males have been portrayed (Milner, 2007). As for the White females, were they just repeating something they had been systemically told about Blacks and affirmative action? Although they certainly did not exhibit proper etiquette, are they to blame for the misconception of Blacks being allowed in the academic club only by affirmative action and not academic excellence? In spite of Tamara’s excellent score, she too is unsure of the school’s intentions. However, Tamara, though shaken and anxious, did not lose motivation or her belief in her abilities and maintained her high-achievement outcome. Tamara, regardless of the school setting, is young, Black, and gifted, and she will likely succeed. She should feel supported and affirmed in both schools and not have to choose an under-resourced high school because of her perceived and real fears about how she will be treated at the predominately White private school. Tamara and other mathematically talented Black high school students deserve better, and it is our obligation as educators and researchers to give all students the education and opportunity they deserve.

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