

## Devalued Black and Latino Racial Identities: A By-Product of STEM College Culture?

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*At some point most Black and Latino/a college students—even long-term high achievers—question their own abilities because of multiple forms of racial bias. The 38 high-achieving Black and Latino/a STEM study participants, who attended institutions with racially hostile academic spaces, deployed an arsenal of strategies (e.g., stereotype management) to deflect stereotyping and other racial assaults (e.g., racial microaggressions), which are particularly prevalent in STEM fields. These students rely heavily on coping strategies that alter their authentic racial identities but create internal turmoil. Institutions of higher education, including minority-serving schools, need to examine institutional racism and other structural barriers that damage the racial identities of Black and Latino/a students in STEM and cause lasting psychological strain.*

**KEYWORDS:** stereotype management, STEM students of color, racial hostility in academia, STEM racial gap, cultural bias

They [Rodney's White supervisors at a prestigious physics lab where he did a summer internship] didn't generally disvalue me, they questioned. . . . They were like, "Oh, okay, I didn't know there was any Black physicists," and then they would kind of lower their standards a little bit. And then after I told them I'm also Hispanic, they were like, "Oh, I didn't know there was any Hispanic physicists." So then they lowered their expectations a little bit more. So I strategically . . . started talking about my research, and then they went, "Oh, okay,

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you know your stuff,” and I’m like, yeah, I thought y’all knew. [He pauses.] On second thought, I guess I was undervalued.

—Rodney,<sup>1</sup> college senior, physics major, future astrophysicist

Rodney’s observation, above, came from one of 38 interviews I conducted with high-achieving Black and Latino/a science, technology, engineering, and mathematics (STEM) college students who were attending three types of postsecondary institutions: historically Black, historically White, and Hispanic-serving. Rodney was attending a historically Black university. He self-identified ethnically as both African American and Panamanian and racially as Black and Hispanic. Rodney felt that his supervisors doubted his intellectual abilities in physics, which triggered a response focused on proving his intellectual capacity by employing an evidencing tactic (“I strategically . . . started talking about my research”). His experience of being stereotyped was representative of the experiences of many students in this study. When students’ employers, peers, teachers, and important others (e.g., administrators, campus police) showed racial bias in judging their capabilities, these participants responded with strategies that depended on a number of factors, including who delivered the racist assault; the classroom dynamics (STEM versus non-STEM courses); where the event took place; the number of Black, White, Asian, and Latino/a peers present; if it was a first racial offense; anticipated stress of a racially charged retort; and whether other racialized events occurred that week. These racialized events did not deter these Students of Color<sup>2</sup> from succeeding in a STEM field, contrary to what the research on stereotype threat would suggest (Aronson, Fried, & Good, 2002; Steele & Aronson, 1998). Instead, racial stereotypes served as a distressing motivation for the students to achieve in their chosen fields. However, racial stereotypes did have other consequences—heightened anxiety, increased bouts of anger, feelings of being an impostor, and compulsive work—as Students of Color were forced to prove they were fully capable of achieving in STEM (McGee, 2015).

This study investigated the experiences of STEM Students of Color who did not succumb to identity-related threats in ways that lower their academic performance or their likelihood of earning a STEM degree, as the theory of stereotype threat implies. My research shows that some high-achieving students know they are being stereotyped and can rearticulate the stereotypes and manage them to minimize their impact, at least to some degree (McGee & Martin, 2011). This method, which I call *stereotype management*, is both a process and a learned competency that enables students to recognize and negotiate social and psychological threats to their identities (McGee & Martin, 2011). It is an indispensable but unnerving practice for those who employ it, because the racial climate on many campuses—rather than favoring the elimination of racial stereotypes—reifies deficit ideologies about

Students of Color as unqualified, incompetent, and undeserving of opportunities in the STEM arena. I expand on stereotype management by investigating the experiences of Latino/a STEM college students, in addition to Black students, to better explore the circumstances of the underrepresented in STEM while attending to the differences in how Latino/a and Black students manage stereotypes. Additionally, I expand the concept of stereotype management by introducing a primary strategy for negotiating stereotypes that the students themselves call *frontin'*, which is an imitation of stereotypical forms of Whiteness or anti-Whiteness—polarized opposites—to either defuse or further agitate the racialized situation.

I begin by examining how marginalization in education—and in STEM in particular—limits the opportunities of Students of Color. I characterize STEM departmental cultures, including STEM departments in institutions designed to be affirming to Students of Color. Some theorists have made intense efforts to increase the academic performance of Students of Color through “grit” and other higher-order personality traits (e.g., personal agency, self-efficacy, self-control; Duckworth & Gross, 2014). Given that schooling is systemically inequitable and racially discriminatory, however, Students of Color endure unique obstacles as they pursue advanced learning opportunities (Mickelson, 2003). The “Implications and Conclusion” section illuminates the role of institutions in systematically ostracizing Students of Color while advocating that these very students create their own defensive mechanisms, coping strategies, and techniques.

### **“Colored” Identities and Marginalized Experiences for Black and Brown College Students**

Although institutions of higher education are characterized as places where ethical and moral issues are considered highly significant and philosophical differences are welcomed, they fail to provide a complete and critical education for interrogating the nation’s racial history, including the historical and contemporary realities of racial prejudice, stereotyping, and discrimination (Picca & Feagin, 2007). Racism in the educational experiences of marginalized college students has been illuminated through the lens of *racial microaggressions* (McCabe, 2009; Smith, Hung, & Franklin, 2011; Solórzano, Ceja, & Yosso, 2000). As Pierce (1995) and Pierce, Carew, Pierce-Gonzalez, and Wills (1978) argue, racism has transformed over time from overt, blatant forms of discrimination and prejudice to more covert, indirect, restrained, and ambiguous demonstrations, which they call racial microaggressions. Both racial microaggressions and racial stereotypes serve as racial stressors and products of racism, but neither term has been thoroughly operationalized in relation to each other, and so the terms are frequently used as synonyms. Sue and colleagues’ (2007) research on microaggressions does allude to the notion that racial microaggressions

are one way in which racial stereotypes are operationalized, but we need further constructions of the relationships and hierarchy of these two terms.

In the United States, racial stereotypes were fabricated in response to the need to provide evidence of the inhumanity of Black and Native American peoples so as to justify brutality against them. Racial stereotypes can exist in individual psyches. For example, Thomas Jefferson expressed fiercely racist stereotypes about enslaved Black Americans: They smell funny, are natural slaves, are less intelligent, are ugly in skin color, are lazy, are oversexed, are not as sophisticated in serious music, cannot learn advanced knowledge, and can never be integrated into White America (Marable, 2011). In current times, racial microaggressions (and other forms of bias) project an evolving form of racial stereotypes into the culture, policies, systems, and practices of U.S. society. *Racial microaggressions* produce “subtle, stunning, often automatic, and non-verbal exchanges which are ‘put downs’ of blacks by offenders” (Pierce et al., 1978, p. 66).

The findings of Pierce and colleagues prompted researchers to look not for the gross and obvious but for the subtle snubs, dismissive looks, and insulting tones when unpacking the racialized experiences of Students of Color. Microaggressions, both within and beyond the classroom, can leave Students of Color feeling disheartened and discouraged as their experiences are omitted, distorted, and stereotyped. In university settings, *racial microaggressions* grounded in racial stereotypes create assumptions about admission policies (e.g., being referred to as an “affirmative action student”), myths about the academic abilities of certain groups of students, segregation of in-class groups, and feeling personally diminished by White teachers and peers (Solórzano et al., 2000; Yosso, Smith, Ceja, & Solórzano, 2009). Racial stereotyping (e.g., assumptions of intellectual inferiority and criminality, pathologizing cultural values) systematically marginalizes Students of Color by endorsing negative expectations in a variety of educational situations (Sue et al., 2007). Racial stereotypes, enacted in part through racial microaggressions, are subtle yet persistent forms of racism that have pronounced adverse effects on the experiences (and not just the academic outcomes) of Students of Color in STEM, such as racial anxiety, minority status stress, and thoughts and actions of leaving STEM altogether (Cvencek, Nasir, O’Connor, Wischnia, & Meltzoff, 2014; Perna, Gasman, Gary, Lundy-Wagner, & Drezner, 2010).

In the course of their schooling, Students of Color have been taught in myriad ways that their identities—their very bodies—do not fit those of exemplary STEM students (Fries-Britt & Griffin, 2007; Malone & Barabino, 2009). Furthermore, successful minoritized students often find an identity that is an amalgam of their STEM and “colored” identities; however, this comes at the cost of altering their self-defined authentic (though evolving and fluid) identities and an overuse of personal grit, defined as perseverance and a passion for long-term goals (Golden, 2015; McGee & Stovall, 2015).

Grit and resilience researchers who advocate habitually for Students of Color to “toughen up” and wear their survival calluses as badges of honor do not address the structural restraints perpetuated by everyday forms of racism and discrimination. This leaves many Students of Color exhausted and thinking twice about their place in STEM (McGee, 2015).

### STEM College Values: Born of Whiteness

STEM higher education was born from White male supremacy. Scientific racism, including eugenics, which flourished in the late 19th and early 20th centuries, reflected socially constructed ideas of Black and Brown genetic inferiority that socially, materially, and scientifically advanced White hegemony (Roberts, 2013). Eugenics was created for White middle- to upper-class men and originated in military occupations (Riley, 2008). U.S. institutions of higher education acted on eugenic principles when they explicitly excluded underrepresented ethnic groups from participation in the production of scientific knowledge (Swartz, 2009). More than a century after eugenics was introduced in the United States, the typical STEM college student remains White, male, and middle class, along with some students of Asian descent (e.g., Chinese and Indian; National Science Board, 2012).

STEM higher education remains stratified by race, so that Blacks, Latinos/as, and Native Americans are on the bottom of a racialized STEM hierarchy (Martin, 2009; Nelson & Brammer, 2010). A host of historical and contemporary practices have negatively affected Black and Latino/a students, including lack of a critical mass of STEM Faculty of Color, impostor syndrome, unwelcoming institutional climates, institutional and social barriers in their departments, racial/ethnic stereotyping, a lack of role models or mentors, and high numbers of Black and Latino peers dropping out of college STEM fields (Cole & Espinoza, 2008; Malone & Barabino, 2009; Robinson, McGee, Bentley, Houston, & Botchway, 2016). Black students have been found to be among those most likely to report finding it hard to position themselves—and to be seen by others—as “properly” scientific (Carlone & Johnson, 2007). Similarly, Latino/a students’ experiences point to a tradition of stereotypes that create low expectations, bias, and race discrimination as a primary cause of the loss of talent in STEM fields (Sevo, 2009). In a national analysis of tenure and tenure-underrepresented minorities in science and engineering faculties at research universities, in 2010, astronomy had no Black or Native American assistant professors. Moreover, the only Native American assistant professor in the top 50 physical sciences and engineering disciplines is in electrical engineering, which indicates a 7-year hiring lapse in the other disciplines (Nelson & Brammer, 2010).

Despite this well-documented stratification, the field has not mobilized against the trend. For instance, an influential report (Cullinane, 2009) raised concern about the lack of support from STEM faculty and senior leadership

for the goal of increasing access and success in STEM education for under-represented Students of Color and low-income students. A White engineering professor pulled me aside after my presentation on racist and sexist experiences of Black female engineering doctoral students at a national conference on engineering education and provided commentary that exposed racism and sexism within his engineering college:

Look, I'm going to tell you what they [his fellow White engineering professors] won't say. We are competitive with each other. We will cut each other's throat in a heartbeat if it benefits our research. We don't care about failing half of our students, and they are most likely White or foreigners, so why would we care about failing Black students? Honestly, we just call them [Black students] quota kids anyway. Besides, we already got diversity 'cause we got a few women [engineering faculty]. But they are both bitches... [laughs out loud]. (White engineering professor, August 14, 2015)

In line with this White professor's claim, research has shown that STEM college departments are cutthroat environments, and often members of disfavored groups are included as an annoying afterthought (Fabert, Cabay, Rivers, Smith, & Bernstein, 2011; Wyer, Schneider, Nassar-McMillan, & Oliver-Hoyo, 2010).

With this backdrop, the historical legitimization of race-based stereotypes, biases, and other forms of legalized social stratification (e.g., policies, laws, and commonplace practices) strongly communicate to Students of Color that they are underqualified and incapable of STEM intellectual endeavor (Martin, 2009). The stereotypes and assumptions about groups that are or are not competent in STEM can dictate differential treatment based on racial classification. This construction has perpetuated a lengthy, documented history of the suppression of STEM access and opportunities for college Students of Color (Allen, 2015; González, 2009). This reality was qualified in December 2015, when the U.S. Supreme Court Chief Justice Roberts challenged the notion that a Student of Color is inherently valuable as he posed the following question during *Fisher v. University of Texas*: "What unique perspective does a minority student bring a physics class?" An open-letter response to the Supreme Court from the Equity & Inclusion in Physics & Astronomy Group (2016), comprising more than 2,400 physicists, astrophysicists, and supporters, powerfully rebuts theories that place Students of Color in deficit frameworks (Herrnstein & Murray, 2010; Jencks & Phillips, 2011) by rejecting the premise that racial segregation in STEM should be normalized as acceptable. In asking why physics education routinely fails brilliant minority students, the letter's authors cited the manuscript on stereotype management to allude to the harmful culture that exists in many STEM college environments (McGee & Martin, 2011).

## A Strategy for Managing Stereotypes: High STEM Achievement, Racial Battle Fatigue

Emergent research explores the ways students cope with racial stereotypes and other forms of bias while maintaining high achievement in STEM fields (Cole & Espinoza, 2008; Museus, Palmer, Davis, & Maramba, 2011). A considerable proportion of the research on the academic outcomes of African Americans in STEM fields has focused on stereotype threat. Through a series of experiments with college students, Steele and Aronson (1998) discovered that when race was underscored in pretest guidelines, Black college students performed more poorly on standardized tests than White students. When race was perceived as neutral, however, Black students performed more equally with White students, thereby giving rise to the notion of “stereotype threat” as a common social experience (Steele & Aronson, 1998). This work provided evidence that test achievement outcomes in academic contexts can be impaired by the recognition that one’s perceived performance might be viewed through the lens of racial stereotypes (Aronson & Steele, 2005; Taylor & Walton, 2011).

College Students of Color give a wide array of responses when prompted about how they react to being stereotyped, but the pathways and outcomes that do not lead to academic disengagement have been given far too little attention (Block, Koch, Liberman, Merriweather, & Roberson, 2011). One outcome, racial battle fatigue, was brought to the forefront by Smith and colleagues to describe the stress associated with being Black in predominantly White educational environments (Smith, 2004; Smith et al., 2011). Racial battle fatigue refers to race-related stressors and the time and energy African American, Latina/o, and Native American students expend to function among stereotypes; it can lead to detrimental psychological and physiological stress (Nelson & Brammer, 2010; Yosso et al., 2009). However, some Students of Color have developed strategies to help protect themselves from *some* of the damage that racial battle fatigue inflicts; thus, despite being frequently stereotyped, they can maintain their academic success (Fries-Britt & Griffin, 2007; Maton, Pollard, McDougall Weise, & Hrabowski, 2012). These strategies are detailed in the next section.

### How Do College Students of Color Cope With Stereotypes in STEM?

As a result of the persistent racism manifested in the form of racial stereotypes and microaggressions, some minoritized STEM students have learned how to succeed academically even while weathering various forms of oppression in racially challenging STEM environments (Maton, Hrabowski, & Schmitt, 2000; Reddick, Welton, Alsandor, Denyszyn, & Platt, 2011). My previous work demonstrates that, as a tactical response to the ongoing presence of racial threats, stereotype management emerged

along overlapping paths of racial, gender, and STEM identity development (McGee & Martin, 2011). Although stereotype management allowed for STEM success, these students maintained an intense and perpetual state of awareness that their racial identities were undervalued and negatively conceptualized, and they continually sought to substantiate their intellectual and academic credibility to teachers, peers, administrators, and the larger STEM educational community. STEM success for these students was tempered when important figures (e.g., STEM professors, peers, employers) presumed these students were inferior, based largely on the color of their skin and sometimes in concert with their gender.

### **Learning to Manage Stereotypes**

In previous work, I have documented how high-achieving African American students in STEM majors react to racial stereotypes (see McGee, 2015; McGee & Martin, 2011 for more detailed descriptions). All students ( $N = 23$ ) were interviewed in college and asked about their first recollections of managing stereotypes. For some students, the process began early in life, when they noticed certain oddities. For example, their first mathematics teachers never called on them or assumed they did not know the difficult mathematics problems, frequently giving preference to White and Asian students. Students who attended predominantly Black and Latino/a elementary and middle schools were frequently paraded as the “smart minority kids,” whereas their same-race peers with worse performance in mathematics and science were berated or ignored. For some students, working against stereotypes began in high school, when tracking placed them in classes in which their racial groups were underrepresented and racial stereotypes persisted. A few students claimed they were not aware they were managing stereotypes until college. Their realization was usually precipitated by a jarring college experience such as going from the top high school mathematics classes to remedial mathematics in college. For some students, one racist act was all it took for them to initiate strategies to circumvent stereotypes. Other students acted only after a series of racialized events in which their silence or verbal backlash proved to be inefficient in deflecting stereotypes and created or exacerbated stress. The students learned how to transform their shame, anger, and feelings of hopelessness and despair into strategies that minimized or deflated the blow of the stereotype. However, many of these students still felt disheartened in spite of having stellar grades and other achievement-based accolades, and they questioned their future in STEM.

### **Reactions to Racial Stereotypes While Maintaining STEM Success**

Students who engage in stereotype management employ an array of strategies to either preempt or lessen the likelihood of being stereotyped, based on prior STEM classroom experiences. These include coming to class

prepared to be challenged on their intellectual capacity because of the perception of always having to know more than their peers, being hypervigilant about negative perceptions of Black behavior and being preemptive (e.g., getting to class early to circumvent the stereotype of Black people always being late), and excelling in STEM to show others that they are worthy of their STEM GPA (McGee, 2015; McGee & Martin, 2011). The present study expands on the stereotype management strategy of *frontin'*, or the performance of acts that are socially acceptable to the dominant culture but demand the sacrifice of aspects of one's racial, cultural, and/or ethnic identity. Students in my earlier work often used the term *frontin'* to describe minimizing, overemphasizing, or altering their racial or cultural identity as a strategy to prove themselves in their STEM majors (McGee & Martin, 2011). Unlike biculturalism or code switching (Toomey, Dorjee, & Ting-Toomey, 2013), which are often described as moving seamlessly between the dominant culture and one's own home culture, *frontin'* engenders a fair amount of personal agony and the devaluation of parts of one's racial or ethnic identity. Whereas previous research has outlined the pressures for talented Black collegians to avoid the exhibition of stereotypically Black behaviors (Fries-Britt & Griffin, 2007), *frontin'* encompasses instances of students who demonstrate stereotypical traits of Blackness as an act of defiance of being stereotyped. Thus, *frontin'* includes altering the characteristics and mannerisms they associate with being their authentic Black selves. For example, a recurrent coping response was to act stereotypically Black to prove that one could be ostensibly Black yet successful. Students repeatedly reported not being true to their authentic selves, as they were playing into negative stereotypes about what it means to be Black (McGee & Martin, 2011). *Frontin'* therefore encompasses purposeful functioning in various ways that perpetuate scripted standards of Whiteness and Blackness.

The act of performing Blackness also makes *frontin'* different from code switching or performing biculturally, because students react to racialized situations by performing identities that work to either confirm or negate the stereotype. Even when behavior considered appropriate in a Black cultural context was not acceptable in mainstream settings, proving Blackness appeared to be just as important as proving smartness through White posturing. Research supports the finding that some African American students actively reject the opportunity to move fluidly between cultural contexts, such as the culture of origin and the mainstream (White middle-class) culture (Klingner et al., 2005). However, some students who perform stereotypical notions of Blackness that will not be accepted by their institutions (whether traditionally White or not) still purposefully choose to do this as an act of resistance (Johnson, 2003). Consequently, students sometimes exhibit a resistance to code switching even when it may be the optimal response strategy because it often emulates White norms and behaviors. Nonetheless, the need

to engage in frontin' can result in emotional and psychological injury despite academic success.

This description of stereotype management comes out of a body of work that focuses on one minoritized STEM population, Black students. To better understand it as a social strategy for navigating postsecondary education, I expand my investigation of this phenomenon through a comparison of successful Black and Latino/a STEM students in a range of institutional settings. By looking at both Black and Latino/a students, I can better understand the shared and unique ways that they cope with being racialized within and beyond STEM contexts. In addition, by looking at both historically minority-serving institutions (MSIs) as well as predominantly White institutions, this research illuminates the operationalization of stereotype management found in institutions that traditionally serve Students of Color. To that end, this study asked the following questions:

1. What, if any, are the similarities among high-achieving Black and Latino/a STEM college students in identifying and responding to being stereotyped?
2. How does the process of managing and coping with stereotypes differ between Black and Latino/a students, if at all?

The third question emerged through the analytic process, as is common in qualitative research. Additional theoretical insights emerged from my team's recognition of patterns of stereotype management in all institutional contexts. To that end, I asked:

3. How, if at all, does the process of managing and coping with stereotypes differ at universities serving predominantly Students of Color versus those serving predominantly White students?

This study sought to add to the approaches other researchers advanced and to promote an appreciation of what it means to be academically successful in contexts where these historically marginalized students are few and where negative racialized beliefs about their abilities and motivations maintain credibility (Berry, Thunder, & McClain, 2011; Conchas, 2006; Perry, Steele, & Hilliard, 2004). The study also affirms the pursuit of education by Black and Latino/a students in spite of institutional and structural obstacles and reveals the tenuous pathways that Students of Color must navigate in STEM college disciplines.

## **Methods**

### **Research Context**

This study was part of a larger study conducted at six postsecondary institutions across the country during the 2010–2014 academic years; it

investigated the experiences and career trajectories of 61 high-achieving Asian, Black, and Latino/a STEM college students. I interviewed 38 high-achieving sophomores, juniors, and seniors who self-identified as Black and Latino/a on their campuses between 2010 and 2012; 19 of the 38 students were interviewed for a second time by telephone in 2013 and 2014. Surprisingly, the telephone interviews were more impersonal and revealed much less about students' racialized experiences than I had anticipated. Although I have insider status as a former practicing electrical engineer with bachelor's and master's degrees in engineering, the rapport I had developed in person did not seem to transfer to telephone conversation. This experience emphasized the importance of in-person interviews for unearthing narratives associated with being stereotyped. I interpret the difference between the in-person and telephone interviews as a sign that although my identification (Black, former engineer) would aid their willingness to communicate, face-to-face interviews were more conducive to revealing racially sensitive topics. Thus, the majority of the data analyzed come from the original interviews. Of the six institutions in the larger study, five institutions were included: One is a historically White institution (HWI), two are Hispanic-serving institutions (HSIs), and two are historically Black institutions (HBIs). Table 1 shows the student racial and ethnic breakdown and identifies the five universities they were attending.

### Data Collection

I recruited students through engineering diversity/minority program directors who agreed to distribute flyers to students who fit the following criteria: high-achieving within a STEM major (a minimum of a 2.8 on a 4.0 scale in STEM courses), at least a second-semester sophomore, and self-identified as Black, African American, Latino/a, or Hispanic. I wrote interview protocols that focused on their interactions with administrators, teachers, and peers in a variety of contexts (e.g., labs, internships, classroom, conferences) and how they reflected and responded to these encounters. Additionally, I used an augmented life-story approach (McAdams, 2013) to understand their subjective narratives throughout their schooling and gain a glimpse into their future trajectories. The interviews were audiotaped and transcribed. To standardize my inquiry into their demographic backgrounds, I also administered a two-page questionnaire completed prior to the interview. Semistructured life-story interviews were conducted with all 38 participants (average interview time: 79 minutes).

### Data Reduction and Analysis

I and a research team composed of three doctoral students and one master's student went through the transcribed interviews and corrected minor errors in the transcripts. Following Saldaña's (2015) coding manual for

Table 1  
**Characteristics of the 38 Student Participants**

| Pseudonym   | ♀<br>♂ | Institute Type | GPA in Major | Major or Graduate Program                 | College Level | Greatest scientific discovery? | Career Aspirations  |
|---|--------|----------------|--------------|---|---------------|--------------------------------|---|
| Black or African American, not Hispanic or Latino/a [further ethnic identity in brackets] |        |                |              |   |               |                                |   |
| ANNETTA   | ♀      | HBI            | —            | Biomedical engineering/chemistry and math | (F)(S)(J)(S)  | “Nothing stands out”           | Medical career, helping community                         |
| BRANDY  | ♀      | HBI            | 3.06         | Biochemistry/biology                      | (F)(S)(J)(S)  | Open heart surgery             | MD/PhD in nanotechnology                                  |
| CHARLOTTE   | ♀      | HBI            | 3.7          | Computer science/security                 | (F)(S)(J)(S)  | Internet                       | Computer programming, computer forensics, mentor          |
| CIARA [Creole]  | ♀      | HBI            | 3.1          | Chemistry/math                            | (F)(S)(J)(S)  | Medication                     | Research scientist  |
| DAMON   | ♂      | HBI            | —            | Chemistry                                 | (F)(S)(J)(S)  | —                              | Pediatrician and researcher                               |
| ELISE   | ♀      | HBI            | 3.6          | Electrical engineering                    | (F)(S)(J)(S)  | Light bulb                     | MS in engineering, PhD in education                       |
| JAMILLA   | ♀      | HBI            | —            | Applied math/computer science             | (F)(S)(J)(S)  | Microscope                     | PhD, government   |
| JANET   | ♀      | HBI            | 4.0          | Chemistry                                 | (F)(S)(J)(S)  | Airplanes                      | MD—pediatrics or cardiology                               |
| JOHARI [Jamaican]   | ♂      | HBI            | 4.0          | Chemistry                                 | (F)(S)(J)(S)  | Chromatography                 | Pharmacognosist   |
| JOY   | ♀      | HBI            | —            | Chemistry/biology ( <i>minor</i> )        | (F)(S)(J)(S)  | Chemotherapy                   | Pharmaceutical scientist                                  |
| KAMI  | ♀      | HBI            | 3.1          | Chemistry/math                            | (F)(S)(J)(S)  | Blackbody radiation            | Cosmetic chemist  |
| LATASHA   | ♀      | HBI            | 3.85         | Chemistry                                 | (F)(S)(J)(S)  | Microscope                     | PhD in public health or public health policy              |
| LATOYA  | ♀      | HBI            | —            | Biochemistry                              | (F)(S)(J)(S)  | The hot comb                   | MD/PhD—cancer biology, molecular biology, or biochemistry |
| TIMOTHY   | ♂      | HBI            | 3.48         | Secondary math education                  | (F)(S)(J)(S)  | —                              | Math teacher  |

(continued)

Table 1 (continued)

| Pseudonym  | ♀♂ | Institute Type | GPA in Major | Major or Graduate Program        | College Level | Greatest scientific discovery?     | Career Aspirations   |
|--|----|----------------|--------------|----------------------------------|---------------|------------------------------------|--|
| VITA<br>[Haitian]  | ♀  | HBI            | 3.75         | Physics                          | (F)(S)(J)(S)  | X-ray                              | Research—nanoscience/<br>biomaterial, international<br>healthcare policy<br>Pharmaceuticals of drug design |
| JASON  | ♂  | HSI            | 3.2          | Chemistry/biology                | (F)(S)(J)(S)  | Nuclear magnetic<br>resonance      | Working in research and<br>development in aerospace<br>Clinical health administrator                       |
| CHRIS  | ♂  | HWI            | 3.1          | Aerospace engineering            | (F)(S)(J)(S)  | Electricity                        |  |
| JEENA  | ♀  | HWI            | 2.9          | Chemistry/biology                | (F)(S)(J)(S)  | Light bulb                         |  |
| JERROD   | ♂  | HWI            | 2.86         | Nuclear engineering              | (F)(S)(J)(S)  | E = mc <sup>2</sup>                | Career revolving around self-<br>help and inspiring others   |
| NNAKEME<br>[Nigerian]  | ♂  | HWI            | 3.0          | Aerospace engineering            | (F)(S)(J)(S)  | Flying a plane                     | —  |
| Black or African American and Hispanic or Latino/a [further ethnic identity in brackets]                 |    |                |              |                                  |               |                                    |  |
| KAREN<br>[Mexican]   | ♀  | HBI            | 3.0          | Chemistry/math                   | (F)(S)(J)(S)  | Einstein and Newton                | Environmental chemist  |
| RODNEY<br>[Panamanian]   | ♂  | HWI            | —            | Physics/visual arts              | (F)(S)(J)(S)  | Integrated circuits                | Astrophysician   |
| Black or African American, no response on Hispanic ethnic identity [further ethnic identity in brackets] |    |                |              |                                  |               |                                    |  |
| GRANT  | ♂  | HBI            | 3.5          | Computer engineering             | (F)(S)(J)(S)  | Microprocessor/micro<br>controller | PhD, CEO of a robotics<br>company<br>Chemical engineer   |
| MATTHEW  | ♂  | HWI            | 2.9          | Chemical engineering             | (F)(S)(J)(S)  | iPad                               |  |
| White and Hispanic or Latino/a [further ethnic identity in brackets]                                     |    |                |              |                                  |               |                                    |  |
| BEL  | ♀  | HSI            | 3.23         | Biology/chemistry                | (F)(S)(J)(S)  | —                                  | PhD research scientist   |
| CAITLYN<br>[Columbian/<br>Guatemalan]  | ♀  | HSI            | 2.89         | Biology/chemistry                | (F)(S)(J)(S)  | DNA manipulation                   | Pediatric oncologist   |
| EARLENA  | ♀  | HSI            | 2.8          | Physics/international<br>studies | (F)(S)(J)(S)  | —                                  | Pilot, international diplomacy,<br>or related field  |

(continued)

Table 1 (continued)

| Pseudonym   | Institute Type | GPA in Major | Major or Graduate Program                       | College Level    | Greatest scientific discovery?     | Career Aspirations   |
|---|----------------|--------------|---|------------------|------------------------------------|--|
| GILBERTO  | HSI            | 3.5          | Computer science                                | Master's student | Internet                           | PhD in society and technology, professor                       |
| HECTOR  | HSI            | 2.8          | Mathematics                                     | (F)(S)(J)(S)     | Integral and differential calculus | Scientist, mathematician, or a combination of the two          |
| RICARDO   | HSI            | 3.5          | Math  | (F)(S)(J)(S)     | Music recording                    | PhD in mathematics education                                   |
| JAVIER  | HWI            | 3.4          | Aerospace engineering                           | (F)(S)(J)(S)     | F <sub>net</sub> = ma              | MBA in consulting, supply chain management, aerospace          |
| More than one race; Hispanic or Latino/a [further ethnic identity in brackets]                                  |                |              |   |                  |                                    |  |
| JOSE  | HSI            | 3.7          | Physics   | (F)(S)(J)(S)     | Internet                           | Industry/research  |
| No response to race identity; identify ethnically as Hispanic or Latino/a [further ethnic identity in brackets] |                |              |   |                  |                                    |  |
| ALICIA  | HSI            | 3.6          | Biology and math/chemistry and computer science | (F)(S)(J)(S)     | —                                  | MD/PhD; "love" research  |
| ANTONIO   | HSI            | 4.0          | Aerospace engineering                           | (F)(S)(J)(S)     | The pencil                         | Research manager or electric propulsion developer              |
| EDUARDO   | HSI            | 4.0          | Biology/chemistry                               | (F)(S)(J)(S)     | —                                  | Biomedical researcher, bioengineer, or pharmaceutical research |
| GERALDO [Mexican American]  | HSI            | 3.6          | Mathematics                                     | (F)(S)(J)(S)     | Software like Microsoft            | Math teacher or actuary  |
| JUAN  | HSI            | 3.1          | Electrical engineering                          | (F)(S)(J)(S)     | Hubble's deep field picture        | Research lab—space propulsion laboratory                       |
| MIGUEL  | HWI            | 3.6          | Biology/physics                                 | (F)(S)(J)(S)     | Quantum mechanics                  | PhD, physicist   |

Note. HBI = historically Black institution; HSI = Hispanic-serving institution; HWI = historically White institution.

qualitative researchers, we developed two sets of codes to address the first two research questions, after the open coding phase. First, to understand the students' narratives of their *responses to structural and social challenges* they encountered in higher education institutions, we coded to label these strategies relative to each student's perceptions based on his or her experiences rather than on prescribed traditional definitions of stereotypes and student agency (Miles, Huberman, & Saldaña, 2013). For example, we developed codes around the theme of structural barriers: (a) lack of same-race students being recruited and retained in participants' STEM department (student response: work twice as hard, become the ideal "token" student), (b) professors who doubt the STEM abilities of Black and Latino/a students (student response: prove themselves, at times studying to the point of exhaustion), and (c) administration that is unresponsive to or that minimizes participants' complaints about microaggressions (student response: "tough it out" or share their concerns with confidants outside the institution). Next, we developed codes to document *racial stereotypes* students encountered. Although some of these codes were built on the interviews, we also drew on prior work on Black students' experiences with stereotypes on predominantly White campuses and on Students of Color in STEM to link our codes with the literature (we could not find many articles detailing racial stereotypes on campuses primarily serving Students of Color; exceptions include Harper & Gasman, 2008; Kynard & Eddy, 2009). This gave us language to label and aggregate students' mostly descriptive accounts of their experiences (e.g., Aronson & Steele, 2005; Beasley & Fischer, 2012; Block et al., 2011; Cokley, 2014; Fries-Britt & Griffin, 2007; Harris-Perry, 2011; Malone & Barabino, 2009). We investigated the first research question by scrutinizing the students' transcripts for the shared ways both racial groups experience stereotypes, including how the students might respond to and develop from these racialized depictions. Table 2 lists some of the codes relevant to the theme of being racially stereotyped as a college Student of Color.

Coding took place in two stages. The first stage involved creating a preliminary code list, creating operational definitions for each code, and coding 10 interviews (five students who self-identify as Black/African American and five students who self-identify as Hispanic or Latino/a) using the existing code list until all codes were identified. Two doctoral students and I separately coded the same six interviews. In the second stage of coding, we validated the usefulness of the code list by checking the codes' reliability at meetings held after each interview was individually coded, during which codes were negotiated (Miles et al., 2013). After the 12th interview, we had established about 85% of all the codes, at which time saturation was nearly achieved; that is, the number of people who had to be interviewed or observed before no new data emerged had been met, which indicated that we had reached the boundaries of the phenomenon. My team coded the remaining 25 interviews, adding only 14 new codes to our established

*Table 2*  
**Partial Schema of Racial Stereotyping Codes**

| 7.0   | Codes under the theme of racial stereotype  |
|-------|---|
| 7.1   | Reflections/perceptions of racial stereotypes (general)   |
| 7.2   | Perceptions of a particular ethnicity/racial/gender group being stereotyped   |
| 7.3   | Difficulties/pressure of being racially/ethnically stereotyped or how being stereotyped negatively affected the respondent  |
| 7.4   | Stereotypes, racialized remarks, perceptions about race and/or gender groups outside of the respondent's race and/or gender |
| 7.5   | Perceptions of university-based programs that cater to underrepresented groups  |
| 7.6.1 | Reactions/responses to racialized experiences that produce temporary academic setbacks                                      |
| 7.6.2 | Reactions to racialized experiences that produce negative emotional wear and tear   |
| 7.8   | Coping strategies specifically related to racial bias in STEM fields  |
| 7.9   | Reflections about racial stereotyping in their future STEM careers  |
| 7.10  | Perceptions of the long-term damage of being stereotyped in STEM  |

set of 113. The coding team achieved consensus, and the cross-checking and auditing process improved the trustworthiness of the data analysis (Richards, 2014).

In attending to the second research question, we differentiated the strategies employed by Black and Latino/a students in responding to and reflecting on the stereotype. For the Latino/a students in particular, but not exclusively, there was much discussion of ethnicity and their migration to the United States (or perceived migration, as some students were born in the United States but were often assumed to be born elsewhere). Therefore, the ethnicity codes proved to be relevant to understanding the role racial stereotypes played for several Latino/a students and the two Black students who were born and raised outside the United States (Table 3).

Through our analysis, we unearthed an unanticipated aspect of racial stereotyping: Institutions described as culturally affirming overall had a microculture in the STEM departments that appeared to be almost identical to that of HWIs. Thus, to better assess the institutions' role, a third research question emerged as we looked at the institution (department, faculty members, campus climate) for clues about how the environment might contribute to perpetuating stereotypes. For example, Black and Latino/a students at both MSIs and HWIs desired courses with professors who matched their racial background, but this proved difficult due to the lack of Black or Latino/a professors.

Among the 38 participants, there were three disconfirming cases. One Latino male student exclaimed that he was lucky to never have been

*Table 3*  
**Partial Schema of Ethnicity Codes**

| 4.0  | Codes Under the Theme of Ethnicity  |
|------|---|
| 4.1  | Non-U.S. cultural context (first or second generation)  |
| 4.2  | Family traditions/customs/ideologies related to ethnicity                                       |
| 4.3  | Reconciling ethnicity/race identity with an Americanized identity                               |
| 4.4  | Thoughts/reflections about being Black or Latino/a with immigrant or presumed immigrant status  |
| 4.5  | Responses to being treated like a Black or Latino/a with immigrant or presumed immigrant status |
| 4.6  | International communities as resources/assets   |
| 4.7  | Definitions, perceptions, and descriptions of racial/ethnic identity                            |
| 4.8  | Ethnic language of family/community/household   |
| 4.9  | Skin color dynamics/skin color stratification (colorism)  |
| 4.10 | Ethnic and cultural practices that were purposefully minimized as a coping strategy             |
| 4.11 | Thoughts/reflections about being perceived as a “White” American                                |

stereotyped and said he did not see stereotypes playing any role in his future as a STEM professional. The other two students, one Black female and one Black male, reported training themselves to become detached and anesthetized from being stereotyped. Johari (all names are pseudonyms) said, “I get stereotyped every day, but I’m so used to it. It’s like I go numb.” Although a total of nine students in this study mentioned numbness as one of their coping strategies, only these two students claimed it as their sole strategy for disregarding stereotypes.

**Researcher Role**

Although my bachelor’s degree in electrical engineering is about 20 years old and much has changed since then, studying people whose experience was so much like mine (i.e., processing racial experiences while pursuing a STEM undergraduate degree) required me to acknowledge and discuss my own position and subjectivity. I attended an HBI for my undergraduate electrical engineering degree, where at least half my professors were of African descent, but I had no Black female STEM professors. I recognize that my research has been influenced by how and why race and racism operate in STEM higher education, which has contributed to my understanding that power, privilege, race, class, and sexual oppression are at the root of many of the academic experiences minoritized students withstand. Thus, I am committed to carrying out this research from a race-conscious perspective and to problematizing the success of STEM Students of Color by giving voice to these students through their counternarratives. At the same time, I acknowledge the position of Henry and Generett

(2005) that “all scholarship is veiled autobiography” (p. 1). As a researcher, my empirical commitments lead me to seek disconfirming evidence for emerging conjectures and to engage with atypical cases in reporting my findings.

### **Limitations**

This study had several limitations. Participants were selected based on their self-identification of race/racial identity, but they included students whose ethnicities within their races were culturally distinctive. For example, the Latino/a students were from different countries and regions of the world (e.g., Colombia, Mexico, and Guatemala). Teasing out the complexities within and between these ethnicities would have added another layer of identity to this study. In addition, although I had developed rapport with the participants during the in-person campus interviews, the follow-up phone interviews did not yield robust findings about the ongoing role of managing stereotypes and other forms of bias. Another limitation is the variance in MSIs. In 2009, HBIs graduated 80% of all Black STEM undergraduates, whereas only 6% of the STEM undergraduate degrees from HSIs went to Latino/as and Hispanics. Thus, the institutional impact of MSIs on Students of Color in STEM is greater for Black college students (Stage, Lundy-Wagner, & John, 2013). The unique roles HBIs and HSIs play in the production of degrees and experiences of STEM Students of Color warrant more attention.

### **Findings**

The successful STEM Students of Color used a range of stereotype management strategies that enabled them to maneuver and in some cases subdue the full impact of racial stereotypes; however, protection was short lived, as the variety and frequency of stereotyping served as an unrelenting competitor. The central research question examines the shared approaches that Black and Latino/a STEM students exercised to manage racial stereotypes and that enabled them to thrive academically while becoming emotionally fatigued as a result of defending themselves against multiple forms of racial bias in and around their STEM settings. Managing stereotypes necessitated the students' adoption of defensive strategies to protect their academic identities yet often resulted in disrupting their racial identities. Attending to the question that explores the differences in three institutional types (HWI, HBI, and HSI), we found that stereotypes were rampant in the STEM departments of both HWIs and MSIs, and students responded to those stereotypes in similar ways. Thus, the results are organized to show the similarities of managing stereotypes by institution. The final section of these findings explores the unique ways each racial group contended with stereotypes, with some Latinos/as adopting White racial schemas that advantage Whites to minimize the effects of racialized bias. Although this article primarily discusses the role of stereotypes, students shared perspectives on how

they balanced stereotypes with forms of endorsement received from organizations and institutional programming such as the National Society of Black Engineers, Society of Hispanic Engineers, Minority Engineering Program Directors, national conferences that affirmed the identities of Black and Latino/a students, and faculty who encouraged these students' brilliance and provided a sense of belongingness (see McGee & Martin [2011] for a more detailed discussion of these sources of support).

### Shared Strategies Among STEM Students of Color

The first research question investigated and compared how participants identified and then responded to being stereotyped, in which 35 of the 38 students are represented. As these Students of Color shared details on the ways in which stereotypes were enacted and their responses, another micro-group emerged: students of lower socioeconomic class, who encounter an additional layer of negative categorization due to stereotypes associated with both their class and race. Thirty-one of the 35 students purposely gave up parts of their racial/cultural identity to perform mainstream mannerisms, behaviors, and ideologies as a defensive strategy to minimize the effects of racism. Global strategies to manage racial stereotypes are based on students' knowledge of their race being devalued in STEM contexts, which required them to disconnect from parts of their racial/cultural identity.

*Participants raised in same-race low-income neighborhoods.* Students of Color said that racial stereotypes caused emotional injury and harmed their overall college STEM experience, but students coming from low-income families revealed an additional layer of inequity. Coming from racially homogeneous, low-income neighborhoods was associated with adding class-based insults to racial injury. Eleven of the 38 participants (6 Black, 5 Latino/a) attested to being raised in ethnically and racially homogeneous neighborhoods and admitted to minimal prior experiences operating in predominantly White spaces. Among these students was Miguel (biology/physics), who explained that he was always scared that "my *barrio* [the Spanish word for 'hood, slang for neighborhood] culture might slip out." He was raised in a neighborhood he described as "Hispanic, economically depressed, but culturally and spiritually rich," a fact he was proud of until he arrived at his HWI. His mentors and professors told him how lucky he was to fulfill the "American Dream" of being the first person in his family to attend college. One of Miguel's professors said he should quickly forget where he came from and embrace his more "respectable lifestyle." In other words, when Miguel revealed his roots, he learned that the department considered him only marginally acceptable. Miguel managed the stereotype associated with "barrio life" by obtaining a new address to avoid assumptions about his home neighborhood:

I was sort of, kinda, somewhat accepted, until they [White peers and professors] asked me about the crib [his home neighborhood]. Then they backed off big time and started treating me like a statistic. So now I say I'm from the 'burbs. I even got a PO box address, so they don't have to know where I'm really from.

Miguel was surprised at the number of times he had to tell university people his home address: for scholarships, awards, internships, and financial aid. He preferred that these individuals retain the impression that he was from a middle-class community instead of a low-income, mostly Latino/a community—and he went to great lengths to maintain the façade.

Jeena (chemistry/biology) exclaimed that she was the pride of her densely populated, low-income, predominantly Black community after being awarded a full scholarship to attend a prominent university associated with prestige and success. Despite being, in her words, “academically unstoppable,” Jeena felt it was impossible to succeed at her HWI without frontin’, or adopting traits and behaviors that her college community deemed appropriate. She described this process as happening over the course of her first two years in college. When Jeena first arrived at the HWI, she strutted proudly across campus with her curly red weave and the bright, tight-fitting clothes she was accustomed to wearing, which was revered as “bussing gear” (appealing dress style) in her community. In the second semester of her freshman year, she replaced her long, red, kinky-curl weave with a straight, brown, “Whitish-looking” hair weave. She explained that she did this after “the White and some uppity Black girls teased me about my hair and outfits, basically my whole body, being too ghetto and too trashy.” Jeena’s White female freshman roommate bluntly clarified this point: “I know you are smart, but nobody is going to believe you are smart with that fake red hair and your boobs hanging out all the time.” The professor who taught Jeena’s freshman mathematics for computer science class was very rude to her; he frequently walked in another direction to avoid coming into close contact with her. Jeena was horrified by the myriad strategies he took to avoid her and blamed it on her colorful self-expression, which she later defined as her “too-Black street style.”

In her sophomore year, Jeena felt compelled to appear less sexy and opted to dress more like the “smart kids do.” She got rid of her favorite outfits, which were mostly short and multicolored, and replaced them with plain-colored, “neat” clothes. After several months of Jeena’s new, more assimilated look, this same mathematics professor eagerly approached Jeena, telling her, “Now you actually look presentable. I bet you are making better grades too.” Jeena was consistently an A student—including the A she earned in this professor’s class—but her racialized and gendered experiences at this HWI made her feel increasingly insecure about expressing herself. The less she looked like herself, the more her teachers and peers valued her

intellect, likely because she looked more assimilated and, I would argue, less culturally defiant and expressive. Jeena's story also illustrates how Black and Latina women have been framed and misrepresented by stereotypes about their sexuality and presumed promiscuity (Flores & Garcia, 2009; Harris-Perry, 2011).

Of the 11 students raised in low-income, predominantly Black and Latino/a neighborhoods, seven attended MSIs and yet three of the seven students also spoke of race and class oppression. The denial of racial and class privilege creates a tendency in the middle class, or among those who wish to have middle-class status, to see lower-income Blacks and Latino/as as personally failing and to judge those who defy White cultural values as undeserving (McFarlane, 2009; Wiggins, 2001). The social construction of classism embraces prejudicial attitudes and stereotypes that denigrate the culture of the very poor and of working-class people, including students. Ironically, the Black and Latino/a middle classes are fragile, because, despite having some class privileges, they are never fully free from concern over how they might be perceived because of the stereotypes associated with their racial group (Omi & Winant, 2014).

HBIs, for example, have a legacy of attendance by generations of elite Black families, which copy the ideologies of the White middle class and take part in organizations and activities that distinguish them from other classes in the Black community; this class segregation is imitated on those campuses (Frazier, 1997; Harper & Gasman, 2008). MSIs host racial stereotypes of low-income Blacks and Latino/as (e.g., laziness, sexual promiscuity, irresponsible parenting, disinterest in education, and disregard for the law). Thus, those who are entrenched or holding on to their middle-class status can be some of the biggest critics of low-income individuals within their own racial group (Banner-Haley, 2010). Thus, some of the students in this section were further marginalized because of their low-income cultural status at institutions that are classified as racially affirming.

*Sacrificing one's cultural identity as a tactic to elude stereotyping.* Nineteen students discussed the ways in which Blackness and Brownness were devalued or Whiteness was aligned with being privileged. Eduardo attended an HSI, where he felt the main purpose of the institution was to "take us in Brown and turn us out White." Eduardo's success in biology and chemistry included associating with a different class of friends: He was "advised" to stop hanging out with his friends from his hometown, teased and told to tone down his accent, and told in class, by the professor, that if he stayed out of the Latino Caucus (a progressive campus-based organization), he would have a better chance of securing employment. Eduardo regretfully admitted that as a result of this advice, he limited public contact with his hometown Latino/a friends, which ultimately strained those friendships. He also became an inactive member of the Latino Caucus and eliminated all forms of activism from his college life.

Jerrod (nuclear engineering) was frontin' when he pretended that he had not studied for a test in order to create "maximum shock value" when he scored in the high 90s. In his words, "no matter how many A's I get in physics, he [Jerrod's European physics professor] always seems surprised." As a result, Jerrod just pretended that he was "their definition of Black and gifted," which he described this way:

[A] Black dude who can just do physics without studying. But that's not really me. I study my butt off, but my professor thinks that the only conceivable way I could actually score that high is that I must be a semi-genius. I really don't think he believes that Black males can really be successful any other way. It pains me, but I just go along with the program. And it's better than him accusing me of cheating.

One semester, Jerrod made excellent grades in chemistry and his professor accused him of cheating. To avoid repeating that painful experience, he fronted and played into the genius label that his physics professor bestowed on him. For Jerrod's professor, being Black and in STEM was operationalized to denote that if Jerrod made excellent grades, he must be a prodigy.

Jose was a member of a chemical engineering lab at an HSI, but the majority of the lab members were of Asian descent, except for two White males. In this lab, each student took turns playing the music of his/her choice. When Jose's turn arrived, he brought in his favorite salsa CD and turned up the music. The first 30 seconds of the song was met with stunned silence. Then, as if someone had told a joke, his lab members busted out in unabashed laughter. They started very badly imitating salsa dancing and somehow this led to calling each other *ese* (or, "Hey bro," in slang) and then to pantomiming a gang gun battle. Jose was horrified, grabbed his CD, and left the lab. Although satisfied with the research in the lab, he realized after three long weeks of constant teasing that he had to leave. His new lab welcomed him, but only after his new principal investigator warned Jose about "being too sensitive about jokes and good-natured fun." Before that incident, Jose had felt sheltered from stereotypes; afterward, however, he actively avoided conversations about his Latino culture. Jose's frontin' included not playing his music when he was riding with his engineering classmates and hiding his girlfriend's pregnancy to avoid being subjected to stereotypes about young unmarried Latinas bearing children. Jose's distress over the experience continued partly because he had finally felt accepted in his original lab group, only to discover that his culture was ripe for racial insult. Jose was one of 12 study participants who were considering opting out of a STEM career entirely.

*Black and Brown universities: White and Asian STEM faculty.* Regarding the third research question on the differences in managing and coping with stereotypes at universities serving predominantly Students of Color versus

those serving predominantly White students, more than half the participants who attended MSIs had similar racialized experiences in their STEM departments as the students who attended HWIs. Students of Color have long said they have to prove their academic competence while attending HWIs (Moore, Madison-Colmore, & Smith, 2003). Thirty of the 38 Black and Latino/a students who attended HBIs and HSIs attested to having college experiences similar to what research reports about MSIs: Their college experiences fostered cultural, spiritual, and intellectual affirmations of themselves, including racial pride and a sense of community (Bettez & Suggs, 2012; Cokley, 2014). This section details how half the Black and Latino/a students who attended HBIs or HSIs witnessed contemporary forms of older ideologies borrowed from HWIs that were based on racial subservience, assimilation of mainstream ideologies, and obedience to White ideals within their STEM departments.

William H. Watkins (2001), in *The White Architects of Black Education: Ideology and Power in America, 1865–1945*, provides detailed historical archive analysis maintaining that HBIs were created and continue to be maintained as a reflection of the dominant class. Indeed, Booker T. Washington's advocacy of Black acceptance of segregation in exchange for economic advancement was fundamental to the development of HBIs (Harper & Gasman, 2008). Watkins contended that this "mis-education" persists at MSIs, where the philosophical and ideological orientation continues to reinforce White privilege and supremacy.

Brandy (biochemistry) attended an HBI but was disappointed that most of her STEM professors were of Asian descent. She felt that her Asian professors had low expectations for their Black students. Brandy extended her schooling for an extra semester by securing a cooperative internship so that she could avoid taking an advanced statistics class from an Asian professor who had a reputation for openly berating his Black students.

Geraldo (mathematics), who attended an HSI, was also dissatisfied that he could not see himself in his professors:

I chose to come here because I really wanted to be taught by Latino professors. I did get that as a freshman, but now as a junior I'm heavy in my chemistry and engineering classes [and] I have no Latino professors. It's true. I mean, no Hispanic professors. From now until the time I will graduate, none of my teachers will look like me.

According to just under half of the students in this study who attended HBIs and HSIs, which have an institutional reputation for being culturally and racially affirming, these places fell short of achieving a sense of warmth and affinity in their STEM departments. It emerged that the STEM departments in some HSIs and HBIs were eerily similar to those at HWIs. Kynard and Eddy (2009) examined university power structures to explain why institutional racism can and does occur at colleges and universities

designed to serve the needs of Students of Color. Asian and European STEM faculty members were a dominant presence, and many subscribed to negative racial stereotypes and biased ideologies against Students of Color, as revealed by subtle and not-so-subtle acts of discrimination (McGee, 2014). Students complained about the increasing number of Asian students in their STEM classes, whom the Asian professors seemed to favor as research and teaching assistants and for other mentoring opportunities. In short, almost half the students at MSIs described the tension between the overall racial warmth and solidarity of the HBI or HSI and the sense of being stereotyped or undervalued by STEM department faculty; this tension contributed to feelings of intellectual inferiority among Students of Color.

### **Latino/a Students Negotiating American Whiteness**

In addressing the second question of this study—whether Black and Latino/a students manage stereotypes differently—I found that the two groups employed strategies similar to those detailed above, with one exception: Of the 16 students who identified (partly or fully) as Latino/a in this study, 8 espoused negotiating forms of Whiteness as a strategy for minimizing bias, and sometimes merely for convenience, in ways that the students who identified (partly or fully) as African American/Black did not. These same eight students identified their racial identity as exclusively White, or as White and, for example, Colombian, Mexican, or Costa Rican, along with their ethnic identity of Hispanic and Latino/a.<sup>3</sup>

While both racial groups were involved with embodying White practices and behaviors, Latino/a students were able to switch into “being White” in certain situations to eliminate the chance of being stereotyped. Eight of the Latino/a students in this study used the frontin’ strategy, mostly by using their light complexions and European features to gain entry into contexts that are privileged by skin color and to avoid being subject to discriminatory practices. Some Latino/a students across skin shades negotiated their identities by eliminating markers that once showcased their racial pride and identity. For example, one student had a Cinco de Mayo tattoo removed, and another stopped wearing a pendant her grandmother had given her that displayed the Puerto Rican map. Other strategies involved checking the “White only” race/ethnicity category on a college application but claiming Hispanic race/ethnicity for minority scholarship applications; being less than honest about their family’s employment status and job titles, particularly if they were in the cleaning and landscaping industries, even if their family members were entrepreneurs living a middle-class lifestyle; pretending not to speak Spanish; and straightening their naturally curly hair. These reactions appear to be a response to the persistence of discrimination (e.g., attacks on immigrants, the United States’ racialized classification system, and continued racism against middle-class, college-educated Latino/as) and not an

acceptance of assimilation or acculturation (Flores & Garcia, 2009; Sanchez, 2008).

Javier (aerospace engineering), a Colombian male who racially identifies as White and Latino, described how he struggled with “always” being identified as Mexican:

I really feel like Hispanics are stereotyped, except, you know, people always say jokes they think represent the Mexican culture. It's like a Mexican gangster. They're the ones that shave their heads, California, tattoos, mustache. And it's always, [people say] like, “Do you speak Mexican?” That's like the one and only thing that really makes me mad is, “Hey, are you Mexican? Oh, you speak Mexican?” So that, you know, kind of like that American focus just on themselves sometimes makes me mad.

Javier revealed that he sometimes tells people he is White, in part to distance himself from stereotypes associated with being Mexican. Javier attended an HSI, but he strategically associated with his non-Mexican peers. Javier manages this stereotype by actively avoiding Mexican students to minimize the potential associations his peers and teachers might make with Mexican culture, thereby reducing his chances of being the victim of Mexican ethnic stereotypes. Javier said he was proud of being Latino but resented being a target of Mexican-based stereotypes and other bias. Javier blamed U.S.-born citizens, particularly his White college peers and professors, for being ignorant of other Latino/a ethnicities and cultures.

Caitlyn (biology/chemistry) is a Colombian and Guatemalan woman who racially identifies as White and Hispanic. She emphasized her White identity as a strategy to avoid being negatively stereotyped. Caitlyn added gender to her analysis:

You constantly have to prove yourself as a Hispanic woman. You have to prove yourself to someone who just doesn't know. I mean, how's an old White guy [referring to her White male chemistry professor] going to know what it's like to be a Hispanic young adult, young female? First of all, he never got raised Hispanic, so there's presumptions he doesn't know, not because he's ignorant, but just because he doesn't know what it's like to be a young Hispanic woman because he's an old man, and you can't expect them to just know. It still feels super awkward.

Caitlyn said that in response to those awkward situations, she decided to conceal the Hispanic part of her identity:

Being White helps me to avoid so many uncomfortable conversations . . . like, about where my family is from and what kind of domestic work my mother does, and what type of gardener is my father, how many of my relatives live in my house, how many brothers do I have in gangs, do I have a U.S. passport, am I worried about getting

deported, or do I have a baby yet and all those other stupid asinine questions.

Caitlyn confirmed that her science major also helped her to maintain her White identity, as it was difficult for others to believe that a Hispanic woman could even aspire to become a doctor.

Ricardo (mathematics), a Mexican American male who racially identifies as Latino, revealed that he often gets mistaken for a non-Latino White. After a series of experiences in which he was mistaken for White, he thought it was sometimes best to, in his words, “just keep quiet, not revealing nor denying my race.” Ricardo felt culturally and racially safe at his HSI but added that unhealthy reminders of his second-class status were “everywhere.” Ricardo was having a conversation with his elderly White mathematics professor about the increased numbers of “undesirables” on the professor’s block:

It was that feeling . . . I’ll never forget when I realized that the racism would never end, when I spoke to my [White] professor about the history of her block. She was telling me how great the neighborhood was and how everything was great and you knew everybody, but then the Mexicans moved in. I don’t think she realized I was Mexican. So, I was, “Oh, okay.”

Ricardo wondered whether she forgot that he was Latino, although his name was “authentically” ethnic-sounding. His frontin’ involved actively avoiding any further conversations with her and with others who revealed similar ideologies about Mexicans because he was afraid they might find out that he was Mexican and apply their negative stereotypes to him. In the case of his mathematics professor, her assumptions about Mexican people could pose a threat to his A– grade in her class.

Earlena (physics/international studies), whose name is ethnically Latina, said she could not help but notice that once her name was revealed, some conversations would take unexpectedly negative, uncomfortable, or awkward turns. Thus, when talking to professors, speaking with potential employers, or engaging in similar activities, Earlena put her “White-girl voice on.” She said that most situations “unfortunately go easier that way.” Hector, Gilberto, and Javier disclosed similar strategies of deflecting stereotypes with their phenotypically White or light skin and European facial features. They described it as another layer of protection against being stereotyped.

None of the students were comfortable with negotiating Whiteness as though they were thoroughly assimilated. They seemed highly conflicted, as Eduardo (biology/chemistry) revealed:

I wish I could just be myself. But in this country being yourself can get you hurt, ignored, and feeling like a nuisance just because you

are Latino. So, if White kids can benefit from the privilege of being White, then why can't I?

Eduardo's ultimate goal was to diversify the chemistry field by opening pathways and opportunities for Latino/as. The Latino/a students featured in this section appeared to feel conflicted but obligated to play into the ways American culture rewards Whiteness in order to deflect potential stereotyping and to capture a small sense of belonging in social and academic spaces.

## Discussion

The principal research question explored the role and impact of racial stereotypes in experiences and lives of Black and Latino STEM students attending universities that are predominantly Black, Latino, or White. The findings indicate that these students have to wrestle, prioritize, and respond to negative assumptions, biases, and derogatory, often toxic, stereotypes and microaggressions about their intellectual aptitude and STEM identity. Stereotypes helped to shape their academic worlds, and their response strategies allowed them to ensure high levels of STEM achievement, but at the cost of limiting their racial/cultural, and in some cases socioeconomic class or gender identities. These findings suggest that racial stereotyping and other biases were functions of STEM education at the university level and that academic success for Students of Color included learning how to navigate racism cleverly and with a set of tools that soften the blow of stereotyping but never eliminate it.

The participants reported frequently feeling deflated and exhausted by the effort of trying to manage the quantity and variety (from subtle to blatant) of racial bias they endured. Along the way, they learned and manipulated White ways of knowing and doing by performing the social and racial practices that are commonplace in postsecondary institutions. The students attempted to deflect the force of ever-present stereotypes by shifting their identities—for example, by *frontin'*—while remaining keenly aware of Americanized notions of race and capitalizing on strategies that gave them an advantage or that purposefully challenged the notion of being disadvantaged. Although *frontin'* by definition includes both acts of assimilation of White norms and acts of resistance that accentuate stereotypical demonstrations of Blackness, I found that these students did not use the latter aspect of *frontin'*. Perhaps they did not need additional trumped-up presentations of Blackness or Brownness because their own authentic racial identities were viewed as sufficiently deviant from mainstream White values and behaviors. Recall that Jeena's tight and bright fashion and hair style were deemed "ghetto" enough without any additional markers of Blackness. Therefore, *frontin'* could be reconceptualized such that the very bodies of Black and Brown people are viewed by their STEM departments, and to some extent

by their universities and colleges, as acts of resistance, mediated by the extent to which they enact their own racialized identities. Low socioeconomic class status further complicates the way students are viewed: Stereotypes often thrive on the identities of lower socioeconomic class within a particular racial group (Kirschenman & Neckerman, 1991). To sum up, the students in this study negotiated racial stereotypes through the choices they made about their appearance, spoken dialect, and behavior that sought to mimic White ways of knowing and doing. For the majority of the participants, this was characterized as a type of social performance, an attempt to situate themselves as socially and academically acceptable.

Stereotype management focuses on responding to stereotypes rather than ending them; the majority of the participants in this study attested to suffering psychological strain, despite their academic success. Once the stereotype has been activated and the recipients perceive it as a racialized threat, its effects persist long after the situation in which the student was stereotyped (McGee & Martin, 2011). These findings therefore demonstrate the value of stereotype management for affirming academic competency, but the tactic does not keep students from enduring racialized stress and anxiety. Most, but not all, students had long given up on the goal of ending stereotypes. In fact, most of the students viewed the stereotypes as inescapable and concluded that they will always be burdened by having to prove they are intellectually capable in their STEM fields.

The racial composition of their STEM departments' faculty offered little help to Black and Latino/a students who attended MSIs, although their overall university experience was culturally affirming. The strategies they used to circumvent racial stereotypes were similar to those of students in HWI settings because the MSI STEM departments' microculture had similar characteristics: high numbers of Asian students and faculty; a competitive, even cutthroat environment; overburdening of the few Black and Latino/a STEM faculty with serving and mentoring Students of Color; and racially segregated study and laboratory groups. The practices and policies of STEM departments help to control structural possibilities, and so the departments marginalize Students of Color and regulate how they should behave and what behavior is deemed misbehaving. Issues of conservatism at HBIs and HSIs are often invisible in literature that situates these institutions as universally supportive and nurturing (notable exceptions include Gasman, 2012; Harper & Gasman, 2008; Watkins, 2001). More research on sociocultural norms at MSIs that endorse the values and ideologies of the dominant culture at the expense of low-income Blacks and Latino/as will complicate the cultural affirmation that MSIs are assumed to possess. There appears to be a microculture in STEM departments at MSIs that is, a set of values, beliefs, and behaviors based on a common history of racial stereotyping and discrimination that varies systematically from the larger, often affirming cultural milieu of the MSI (Lynch, 2001). Some participants did not find

nurturing STEM environments or access to Black and Latino/a STEM faculty, which affected their satisfaction with their college experience. Instead, they encountered non-Black STEM faculty and middle-class Asian, White, and non-U.S.-born students and faculty who appeared to hold biases against the Students of Color, particularly those of lower socioeconomic status. The MSIs, as Juan suggested, “turn White and Asian” in the upper level STEM courses, referring to the White and Asian students and faculty that dominated his advanced STEM courses. Some MSIs espoused mainstream behaviors, such as a business-class dress code, corporate and industrial funding (e.g., in 2014, the billionaire industrialist Koch brothers, known for funding conservative causes and candidates, gave \$25 million to the United Negro College Fund), and restrictive institutional policies. Thus, even students at institutions that are traditionally racially affirming sometimes experience the power of racial stereotypes through racialized experiences in their STEM programming. Black and Latino/a STEM students at MSIs therefore might require different forms of negotiation and support in their STEM programs to maintain the feelings of cultural affirmation that characterize their MSIs as a whole.

Students did not share their on-campus experiences of being racially stereotyped with campus leaders. A couple of students who did speak out said they were told to stay strong and continue to be resilient, or they were shamed into silence. Institutional leaders appeared to be advocating for constructs like grit, perseverance, and mental toughness without properly acknowledging the multiple forms of suffering Black and Latino/a students continue to experience. I contend that current research on grit and resilience, at least as these concepts are sometimes defined and operationalized, does not explore the toll societal racism takes on Students of Color, particularly those who may be viewed as successful (McGee & Stovall, 2015). The majority of this research refers to static definitions of resilience, such as the innate ability to bounce back from obstacles, without properly acknowledging how structural racism breeds the racial practices, policies, and ideologies that force Black and Latino/a students to adopt unhealthy levels of racial mental toughness in order to pursue traditional forms of STEM educational advancement.

The second research question concerns the differences in how Black and Latino/a students manage stereotypes; that is, some Latino/a students utilized the tactic of passing as White while the Black students did not. Historians tend to think of passing for White as an individualistic and opportunistic practice, a tool for getting ahead, an instrument for survival; however, the Latino/a students in this study negotiated American Whiteness with a heavily conflicted conscience. Hobbs (2014) suggests that researchers should not concentrate on what is gained by passing for White but on what is lost by partial or full rejection of one’s racial and cultural identity. Thus, investigations should be undertaken into these students’ social and academic

worlds and how negotiating Whiteness affects their decision-making and their STEM career trajectories. Furthermore, the feeling of being obligated to limit parts of one's cultural and racial identity illuminates enduring societal issues of race and White privilege. For these students, managing their ability to gain White privilege is not simply an individual choice; it is a socially constructed act with significant emotional, social, and academic consequences. Colorism, or discrimination based on skin color, in the lives and educational experiences of Latino/a and Black students also needs further inquiry (Gans, 2013; Monroe, 2013), particularly since some of the Latino/a students reported they could negotiate Whiteness in ways the Black students either could not or did not. However, it is important to note that, in response to slavery and as reinforced by Jim Crow, light-skinned African Americans with phenotypically White features chose to present themselves as White. Thus, the practice of passing for White has occurred in both Black and Latino/a racial groups (Hobbs, 2014). Since Whiteness is the cultural, historical, and sociological default identity associated with having a positive educational and social life, future research should focus on how colorism affects Students of Color who could exploit Whiteness and how some Students of Color use their phenotypically White features to manipulate concepts of Whiteness while others resist conforming to it. Lastly, as the debate on immigration intensifies, particularly the rhetoric positioning immigration from Mexico and Latin America as a threat to American national identity, Latino/a identity in America becomes complicated, which can increase the pressure to assimilate. Thus, students can use the fact that forms of Whiteness are beneficial and, simultaneously, be distraught over the obligation of performing Whiteness. There is evidence of a relationship between frontin' and passing for White. Exploring why STEM Students of Color cannot be their fully authentic racial selves and the long-term consequences of frontin' in STEM (e.g., racial battle fatigue [Smith, 2004]) could reveal an underexplored influence on STEM retention issues in educational and career trajectories of Students of Color.

Black and Latino/a students in STEM should have educational settings that affirm rather than problematize their identities. If these Students of Color continue to succeed in STEM at the expense of their own cultures, often as a far-from-ideal compulsory accommodation, we will need to rethink the way STEM college programs are complicit in the structural practices that marginalize underrepresented students in STEM.

### **Implications and Conclusion**

Based on the findings from this study, I offer several implications for practice and research. College faculties and administrators can benefit from gaining a better understanding of underrepresented students' experiences on campus and from working with these groups, individually and

collectively, to find ways to reduce the burden of stereotyping they confront. Extensive examination of the impact of stereotyping is needed to fully understand its impediments to a STEM college and career trajectory for marginalized students. Stereotyping can create structural and institutional shortcomings that permanently damage the career paths of Students of Color, particularly those pursuing STEM degrees (McGee, 2013). Since racial bias is omnipresent in the STEM arena, racial stereotyping may be the reason Black and Latino/a recipients of STEM bachelor's degrees are disproportionately leaving their STEM careers 10 years after receiving their degrees, in contrast to their White and Asian counterparts (National Science Board, 2012).

Some college faculty members perpetuate a climate that is conducive to the endurance of racial stereotypes. Students reported that their STEM faculty overheard or witnessed racial microaggressions and stereotyping but did nothing in response. Indifferent faculty can be just as disturbing as unsupportive faculty. Institutional leaders should commit to minimizing racial bias, which includes faculty speaking up against various forms of marginalization, even when they are not the direct perpetrators. STEM colleges and departments could benefit from presenting evidence that “diversity trumps ability” (Page, 2008, p. xiv) in studies that showcase examples of different races, cultures, religions, genders, and other identity traits engaging in award-winning STEM innovation. Page’s (2008) research provides strong support for developing an antistereotyping STEM college culture, wherein authentic racial and ethnic identities can be openly incorporated and embraced as being critical to accomplishing creative technological innovation. Positioning the power of difference as an asset for the development of more innovative STEM technologies can improve the overall performance of STEM programs.

Additionally, encouraging Black and Latino/a students to share their racial or gendered experiences can help them realize they are not alone in contending with negative stereotypes. Only two students in this study spoke of forming partnerships with Black, Latino/a, and other minority students in an effort to change assumptions and stereotypes about race (Sanchez, 2008). Further research could explore the outcomes of Black and Latino/a student organizations merging strategies and sharing tactics to build collective agency and to unravel the complex forms of discrimination found on college campuses.

Stereotype management is not ideal; it is a pragmatic strategy to combat the persistent, complex barrier of being perceived as a problem. It is a temporary resolution for the persistent structural framing that positions Students of Color at the bottom of STEM educational and career hierarchies. STEM leaders, researchers, educators, and politicians in the United States seek to enhance the postsecondary-to-career STEM pipeline by inviting marginalized students to rise above their challenges and roadblocks, but they do this without recognizing the stresses associated with surviving the racism

endemic to this branch of academia. At present, an equitable, holistic, and culturally affirming experience in STEM, in which the activation of stereotype management is no longer needed, does not appear to be attainable. While we fight for the structural changes in policies, practices, and ideologies to remove the deficit paradigms that allow racial stereotyping to prosper in STEM education, my fear is that if Black and Latino/a students do not learn how to manage stereotypes in ways that reduce the distress over being unfairly judged, their experiences and possibly their long-term outcomes in STEM will remain in jeopardy.

### Notes

<sup>1</sup>The names of the participants and universities are pseudonyms. Names have been changed to ensure confidentiality.

<sup>2</sup>*Students of Color* is primarily used to describe students who are not White, but in this article, the term is limited to Students of Color who have been historically marginalized in STEM education and attainment (e.g., African Americans, Latino/as, Native Americans). This term is ideal because it unites disparate racial and ethnic groups into a larger collective in solidarity and in shared forms of marginalization.

<sup>3</sup>*Colorism*, the skin color stratification that associates light skin with societal privilege, is found throughout the world. In Black and Latino/a cultures, a color caste system exists in which lighter skin is perceived as ideal and privileged and darker skin seen as deficit and inferior (Johnson, 2003). Thus, historically there are gains associated with individuals of any racial background who can pass for White and, to a lesser extent, those who are considered fair in skin color (Montalvo, 2005). While colorism is a worldwide phenomenon, in the United States skin color stratification has its roots in slavery. When the first Africans arrived in Virginia in 1619, however, there was no “White” racial classification (Allen, 2012). Racial classification came 60 years later, when America’s ruling classes created the category of the “white race” as a means of social control. Since that early invention, the privileged Whites enforced the myth of racial superiority and thus began the preferential treatment of enslaved people with lighter complexions. Other racial features, such as hair texture and eye color, further complicate the phenotype game, particularly in U.S. society, where guesses are habitually formed about the social, economic, and educational status of persons based on phenotype, in addition to style of dress and mannerisms.

More than 18 million Latino/as checked the “other” racial box in the 2010 census, up from 14.9 million in 2000. Reasons for the increase are said to be the result of the sharp disconnect between how Latino/as view themselves and how the government insists on counting this ethnically and racially diverse group (Lee, Batalova, & Leach, 2004). Around the world, including countries where descendants of the Latin and African diasporas reside, Latino/as identify themselves as White, often because of colorist dynamics at play in their countries of birth (Vidal-Ortiz, 2004). White racial identification is a widely accepted self-designation throughout Latin America and the United States, but skin color bias and discrimination greatly affect Latino/as who live in the United States (Golash-Boza & Darity, 2008).

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