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Black Undergraduate Women and Their Sense of Belonging in STEM at Predominantly White Institutions

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Because little work exists on the sense of belonging focusing on just Black undergraduate women in science, technology, engineering, and math (STEM), especially at highly selective predominantly white institutions (PWIs), this study takes a phenomenological approach to understand the lived experiences of Black undergraduate women in STEM by exploring how racial and gendered microaggressions influence how three African American women majoring in the sciences experience sense of belonging at PWIs. A phenomenological inductive analysis was used to compile the research findings, which indicated that racial and gender discrimination, isolation, marginalization, and alienation resulting from microaggressions occurred. Implications for inclusive practices are discussed.

INTRODUCTION

The presence of Black women in higher education has never been higher, with Black women earning almost 66% of all bachelor's degrees awarded to Black¹ students in 2012 (National Science Foundation, 2017). However, this statistic may be less impressive given that Black students made up only about 9.5% of all bachelor's degrees conferred during that same year. In all, Black women earned only 6.3% of all bachelor's degrees awarded in 2012 (National Science Foundation, 2017). Similar disparities exist for Black women in the science, technology, engineering, and mathematics (STEM)² fields.

Black women experience a “double bind” (Ong, Wright, Espinosa, & Orfield, 2011) based on their racial (e.g., Black) and gendered (e.g., woman) categorizations (Carter-Francique, Dortch, & Carter-Phiri, 2017). For decades, the STEM fields have propagated an all-White, all-male exclusive culture (Seymour & Hewitt, 1997) that has pushed Black women, in particular, out of the sciences in large numbers, especially at predominantly White institutions (PWIs). Though

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¹ For the purposes of this study, “Black” will encompass all those students who identify as Black, African American, of African descent, or belonging to the African diaspora.

² For the purposes of this article, “STEM” will predominantly be attributed to highlighting science, health, and medical majors.

Black women enter the STEM majors at higher rates than almost any other group (National Science Foundation, 2009), upon arrival, they are avoided by their fellow peers and faculty members, excluded from insider know-how on how to excel in their fields, often dissuaded from continuing in the sciences by their professors, and face countless types of other discrimination (Johnson, 2001, 2012; Ong, 2005; Seymour & Hewitt, 1997). This causes Black women to experience a lack of sense of belonging in STEM, a disparity that is more pronounced when microaggressions are present. As this study exhibits, microaggressions can have a significant influence on Black women's sense of belonging, especially on a White campus. Furthermore, as research has shown, sense of belonging can impact Black women's sense of self-efficacy and experiences on campus (Dortch, 2016a, 2016b), ultimately affecting their persistence and success in STEM and in college (Hausmann, Shofield, & Woods, 2007). Thus, this study focuses on the impact of microaggressions on sense of belonging for Black undergraduate women who are STEM students at PWIs. We hope this study will help promote more access and inclusion for Black women in STEM fields at PWIs, foster their retention and persistence in STEM, and guide future areas of scholarship in making the overall college experiences of Black undergraduate women more equitable in STEM fields at PWIs.

LITERATURE REVIEW

Scholars have yet to explore the effects of microaggressions on Black undergraduate women's sense of belonging in science. Although Strayhorn (2012) and others have produced scholarship on the sense of belonging and experiences of Black students in general, it is often in comparison to White students (Hausmann, Shofield, & Woods, 2007). Current literature on sense of belonging focuses either on Students of Color in STEM (Hurtado, Newman, Tran, & Chang, 2010; Kendricks, Nedunuri, & Arment, 2013; Wilson et al., 2012), Women of Color in STEM (Espinosa, 2011; Johnson, 2011; Ong et al., 2011; Reyes, 2011), Black students broadly (Benjamin, 1997; Strayhorn & Saddler, 2009), Black male students (Harper, 2013; Harper, Williams, & Blackman, 2013), or Black women in general (Hull, Bell Scott, & Smith, 1982; Kaba, 2008; Rosales & Person, 2003). Very little of it addresses Black students in STEM (Johnson, 2001, 2012; Johnson et al., 2007; Jordan, 1994; Ong, 2005; Seymour & Hewitt, 1997). Furthermore, little work exists on the sense of belonging focusing on Black women in STEM, especially at highly selective PWIs. This study builds on existing work to look specifically at those experiences and what sense of belonging means to Black undergraduate women. This article will therefore address those unique experiences of Black undergraduate women in STEM majors at PWIs, beginning with an examination of women in STEM.

Undergraduate Women in STEM

Women in STEM majors have historically been represented at lower numbers than men, except for a slow and steady rise in numbers over the last decade and a half that has evened their presence (National Science Foundation, 2017). Even with this increase of women in these majors, the culture continues to be dominated by male-centric values (Seymour & Hewitt, 1997). STEM culture breeds competitiveness, a no-room-for-error philosophy, autonomy, and a lack of need for validation from others—attributes that men are exposed to and socialized into

more readily than women in general, leaving women in STEM to feel left out or alienated (Seymour & Hewitt, 1997). These characteristics may contribute to many women being dissuaded from STEM at the outset of their undergraduate education, leaving STEM at higher rates than men, or experiencing greater difficulties in gaining the socialization needed to be successful in these fields (Fassinger, 2002; Seymour & Hewitt, 1997).

Additionally, STEM fields have historically been stacked against Women of Color, especially Black women (Seymour & Hewitt, 1997). Whereas other Women of Color can be favored by the system (e.g., light-skinned women who are perceived as White; Jordan, 1994; Ong, 2005; Smith & Witt, 1990) or, through model minority stereotyping, are perceived as more academically capable (Johnson, 2001; Ong, 2005), Black women find it harder to not only persist in these fields but they also have a more difficult time navigating their experiences in STEM and developing a sense of belonging (Ong, 2005). Some of their belonging needs, especially for Black women in science, are a direct result of negative stereotypes inflicted upon them such as being too much of one trait (such as demanding, bossy, aggressive, assertive, or direct) and not enough of another trait (that is, smart, intellectually curious, and masculine; Dortch, 2016b; Jordan, 1994). Many Black women believe that their education is the key to social and economic advancement, yet in higher education and particularly in the sciences, they are “routinely underestimated” and must be more qualified than their White counterparts to receive equal opportunities (Essed, 1994, p. 237). Therefore, in science disciplines and at PWIs, Black women are subjected to experiences where their racial and gender identity markers are perceived as negative physical, cultural, and intellectual attributes (Guy-Sheftall & Bell-Scott, 1989; Jordan, 1994). Because of racism, sexism, classism, and lack of community, Students of Color, in general, often end up dropping out of STEM (Strayhorn, 2012).

Sense of Belonging

In psychology, sense of belonging is defined as a person’s ability to develop and contribute to their societies (Maslow, 1943), an individual’s sense of social connectedness (Lee & Robbins, 1998), or an individual’s subjective awareness of being in a close relationship with social world around them (Hagerty, Lynch-Sauer, Patusky, Bouwsema, & Collier, 1992; Hagerty, Williams, Coyne, & Early, 1996). In education, sense of belonging is described as a feeling of commitment that individuals have for one another or with groups (Osterman, 2000), being valued and encouraged by others in a classroom setting wherein students feel integral to the classroom environment (Goodenow, 1993), or positioning oneself in relationship to a university community (Tovar & Simon, 2010). Most recently, Strayhorn (2012) expanded on the existing theoretical conception of sense of belonging, defining it as a need to belong that gratifies one’s physiological needs and also drives a student’s behaviors and perceptions. Sense of belonging takes on greater significance for students who feel unwelcomed, marginalized, isolated, alienated, and lonely in learning environments—especially if they are Students of Color, women, low-income, or of another disenfranchised status at institutions that are highly selective or predominantly White (Anderman & Freeman, 2004; Dortch, 2016a; Strayhorn, 2012). Black students in STEM report significantly lower sense of belonging than their White or even Asian peers, but Black women report even lower numbers than their Black male counterparts (Strayhorn, 2011). Thus, for Black women students who experience isolation, alienation, and marginalization at PWIs, belongingness and connectedness can be rather evasive, both in the STEM majors and in the greater campus community. This disparity has been scarcely addressed in literature, further

substantiating the need to examine how Black undergraduate women experience sense of belonging, particularly through their everyday interactions with Whiteness on campus that manifest through racial microaggressions.

Microaggressions

Microaggressions are everyday, deliberate or unintentional slights that demean a person's race, gender, sexual orientation, or other marginalized identity (Sue, 2010). Often, the perpetrator is unaware they have sent an insulting message to the victim, which may seem harmless, but frequent exposure to microaggressions can have a damaging impact on the victim (Sue, 2010). Expanding on Chester Pierce's original proposition on microaggressions, Sue and his colleagues offered a categorization of racial microaggressions that fall into three groups known as *microassaults*, *microinvalidations*, and *microinsults* (Sue, 2010; Sue et al., 2007; Sue & Sue, 2012). Microassaults are often conscious, explicit, and intentional denigrations aimed at verbally or nonverbally degrading someone of a different race, gender, sexual orientation, or other marginalized group with clear intent to harm their feelings (Sue, 2010). Microassaults are also what most people deem as regular "old fashioned racism" (Sue, 2010, p. 30), and therefore, they are less acceptable forms because of their overt nature. These can include the spray painting of a swastika along a building or using the term "niggers" to refer to Black people. Microinvalidations are often unconscious and tend to deprive someone of their psychological existence based on the identities to which the person subscribes (Sue, 2010). Microinvalidations are arguably the most detrimental because of the harmful exclusions and outright disregard of the lived experiences of people of marginalized groups (Sue, 2010). An example of these can include displaying shock to a Black student who performed well in a STEM course. Microinsults are often unconscious interpersonal or environmental messages that rely on stereotypes and demean a person's marginalized identity (Sue, 2010). These can include telling a Black student that they only got in to college because of affirmative action. Microaggressions can be directed toward many identities, but the focus in this article is on racial and gender microaggressions because of the interviewees' identities as Black women. Although Sue and his colleagues have contributed much to the development of understanding microaggressions, very little literature looking at Black women's experiences with microaggressions in STEM exists. Therefore, this article addresses the urgency of contributing to more scholarship in this area.

METHODS

We have chosen hermeneutic phenomenology as the method for this study because it rejects the idea of suspending opinion or researcher bias in favor of recognizing that both researcher and subject are subjective and contextual (Kafle, 2013). As a subset of phenomenology, hermeneutic phenomenology serves as an epistemological stance and research praxis (Kafle, 2013) because its purpose is to unlock meanings "which are not immediately manifest to our intuiting, analyzing, and describing" (Spiegelberg, 1982, p. 712). As an approach that seeks to understand and interpret everyday experiences of people, it is important to discover the meaning of people's experiences that may not be obvious. The goal of hermeneutic phenomenology is to uncover and understand how someone is experiencing the world through story-telling (Van Manen, 1990;

Welman & Krugar, 1999), which gives meaning to the perceptions and experiences of the subjects being studied and provides a descriptive analysis for their lived experiences (Nakkula & Ravitch, 1998; Van Manen, 1990). Descriptions and interpretations are an iterative process throughout this epistemological approach and method.

To understand how Black women in STEM experience sense of belonging at PWIs, this sub-study uses data that were collected from a larger study conducted by the first author exploring how Black doctoral students experience race at PWIs (Dortch, 2016a). The larger study used hermeneutic phenomenology to answer this question and required each participant to undergo three 90-minute interviews. The study was limited to participants who were self-identified Black doctoral students enrolled at Anthony Michael University,³ and 23 students participated. This current study uses the responses from the only three women in the study who majored in science and uses the first of the three interviews, which focused on their academic experiences during their undergraduate years (Dortch, 2016a).

Participants

As a subset of a larger study seeking to understand how Black doctoral students experience race at a PWI, a purposive sample was used. Purposive samples project “why particular people (or groups) feel particular ways” (Palys, 2008, p. 697), and convey the process by “which these attitudes are constructed and the role they play in dynamic processes within the organization of the institution” (Palys, 2008, p. 697). Nested in the notion of a purposeful sample is an understanding of who an individual is and what their position is at the university (Dortch, 2016a; Palys, 2008). Three women were chosen to reflect on their experiences during their undergraduate years because they were underrepresented in their respective disciplines and they had graduated with bachelor’s degrees in STEM in the previous six years.

Procedures

The research study began by exploring the narratives of currently enrolled Black doctoral students reflecting on their lives as undergraduate students who attended highly selective, research one institutions located in the northeastern and midwestern United States. Participants were interviewed three times for roughly 90 minutes each time. Interviews were semi-structured, and interview questions were open ended. Interviews were audio recorded and conducted in person at mutually agreed upon locations.

The purpose of a three-interview process is to not only search for “the essence of the lived experience,” (Seidman, 1998, p. 16) but also to present a holistic view of the participants’ subjective experiences by putting their doctoral student experiences in the context of their academic lives, beginning from childhood onward. The first interview was conducted to gain an understanding of how school, beginning with academic experiences in elementary school, high school, and undergraduate school (Seidman, 1998), fit into the context of the participant’s life. The second interview explored the present experiences—both challenges and successes—the student faced while in school. The third interview allowed the participant to reflect upon

³ Anthony Michael University is a pseudonym being utilized to protect the identity of the institution and the participants of this study.

emotional and intellectual connections between their coursework and academic life. We focus solely on data from the first interview in this article.

Analysis

This co-constructed article used data from a larger study that had been collected but not previously analyzed. The data analysis methods used to carry out this study were in line with phenomenology and drew from experts in interpretive qualitative research (Bontekoe, 1996; Nakkula & Ravitch, 1998; Seidman, 1998; Titchen & Hobson, 2011; Van Manen, 1997). There were five stages in the analysis (see Figure 1) (Ajjawi & Higgs, 2007; Dortch, 2016a). Throughout all stages of the data analysis, there was ongoing interpretation of the research text and the phenomenon of how Black undergraduate women are experiencing sense of belonging at PWIs. Initially, we coded by question, and we went over each statement line by line. In addition to using emergent codes, we used theoretical codes found in sense of belonging literature. By constantly cross-checking with the original transcripts, we maintained fidelity to the participants' narratives, grounding interpretations in the data.

Positionality

The first author is an African American woman educational research social scientist who has attended PWIs for much of her academic upbringing. She has noticed the complex relationships that are presented as Black women experience microaggressions, and in turn, those microaggressions affect the ways in which students experience their STEM program, the university environment, and the level of community to which they feel they have access. The second author is entrenched in social justice, equity, and inclusion work on university campuses and cares deeply about the inequities faced by Women of Color. We find that African American women

1. Organizing the data-set into texts
 - Iterative reading of texts
 - Preliminary interpretation of texts to facilitate coding
2. Identifying (participant) constructs
 - Coding of data using NVivo software
3. Identifying (researcher) constructs
 - Grouping constructs into sub-themes
4. Synthesis and theme development
 - Grouping sub-themes into overarching themes
 - Further elaboration of themes
5. Illumination and illustration of phenomena
 - Linking the literature to the themes identified above
 - Reconstructing interpretations into stories

FIGURE 1. Adapted from Ajjawi and Higgs (2007, p. 622).

science students and their experiences both in out-of-discipline contexts and within-discipline contexts are important to research because there are so few African American women who enter and continue down the academic pipeline. We wish to strengthen the notion that African American women not only have a place in the sciences but that they can also thrive in these environments if we as academicians, practitioners, and policymakers create environments in which they can do so.

Trustworthiness

To ensure trustworthiness and accurate representation of participant' stories, we engaged in member checks. Member checks are essential to elevating a study's credibility (Guba, 1981; Lincoln, 1995; Shenton, 2004). As elaborated by Shenton (2004), "checks relating to the accuracy of the data may take place 'on the spot' in the course, and at the end of the data collection dialogues" (p. 68). In each subsequent interview, the first author asked the participants to clarify the interpretations about the previous conversation and checked in with them about questions that they had about the last conversation. The first author also agreed to share findings with them at the conclusion of the study for their reactions.

FINDINGS

Sense of belonging can be highly influenced by the greater campus climate and institutional culture, but it can also be impacted by individual experiences or interactions (Strayhorn, 2012). This section presents the experiences of belongingness that Brittney, Ivy, and Monica encountered during their undergraduate years as science students at PWIs. We categorized participant sense of belonging through the lens of microaggressions experienced within the context of STEM, along with those experienced outside of STEM in the greater campus environment.

Microaggressions Within STEM Contexts

Microaggressions experienced within STEM departments were those encountered in the direct social and academic proximity of their science majors. These microaggressions directly impacted the sense of belonging that the three women felt in STEM. Below are a few examples of those microaggressions.

Brittney experienced a microaggression in the form of exclusion or isolation, which stems from the notion that Black women are incapable of being in STEM. Isolation describes the loneliness felt from the underrepresentation of one's own race or gender in an environment or in one's department or classes. Brittney recalls experiencing isolation on her campus and in her science department:

I started off as a physics major, and switching into that course and being literally the only Black woman in my department and I'm in the third largest department on campus . . . Like, how is this possible? And the people that I'm dealing with never had to address these issues in the past. . . . Being the only [Black] student and feeling so isolated . . . I step on my alma mater's campus and saw nobody that looked like me. No faculty members. And decided I wanted to change that . . . First time

in a classroom with White students . . . I ended up double majoring in nuclear physics, because physics was just so isolating. Nobody talked to me.

Ivy experienced microaggressions through a lack of Blackness on campus. She discussed the absence of Black science faculty members, wherein she was unable to have someone who looked like her as a mentor, along with frustration toward her White first-year roommates who did not understand her need to find other Black people or students on campus to deal with the lack of Black people in her STEM department:

I'm like a science person . . . and we didn't have any Black science faculty. I was a biology major; the only Black faculty members were in the social sciences, like more in the liberal arts. . . . As a freshman, my roommates, which were like—I don't think they were kind of racists or anything, I don't think they understood where I was coming from, why I needed to go to all the Black meetings, so they all were really like, "Oh she's going to like another Black meeting" . . . Like they were really great girls, but I don't think they could really quite understand why I needed to do that.

Monica experienced microaggressions in her nursing program that were aimed at demeaning her racial heritage:

I had some racial experiences based on patients. One encounter was, they kept asking if I was Hispanic because I look racially ambiguous. Then they went on this tangent on how Mexicans shouldn't be in this [country]. This is before I had told them that I was Black and White and they assumed that I was Mexican. They said that Mexicans should just go back over the border, just said some horrible racial things about Mexican people and that was like, I was just like, you just like assume that I was Mexican and then you said all this nasty stuff! It was completely inappropriate and I remember going to my professor and clinical instructor and she was like, "Oh, that's horrible." Period. That's it. And so this was outrageous. I remember reading that some of the nursing books that said when you press down your skin, you should turn pink; my skin doesn't turn pink, so I was pissed like from the literature that we were reading, from my clinical and interactions with patients who didn't wanna work with me because I was like brown. And you're not gonna address this? You're not gonna say nothing, I was told about cultural competence and I was like, I was very upset . . .

As is evidenced through these quotes, Black undergraduate women in STEM experience racial microaggressions on a regular basis that challenge their existence and realities. When they encounter such a vast array of different types of microaggressions directly related to their race, it begins to solidify their belief that they are not welcome in the sciences.

Microaggressions outside of STEM Contexts

The examples highlighted above within STEM contexts are mirrored outside of those departments across the broader campuses that Brittney, Ivy, and Monica attended. Experiencing microaggressions becomes inescapable in situations wherein Black women are surrounded by Whiteness everywhere they go on campus. Here are some examples of these microaggressions experienced out of the STEM context.

Brittney experienced microaggressions most notably about her presence on campus, either by security officials or other students questioning her intellect, implying that they were admitted based on their skin color and not on their academic merits:

The standout things are being carded to go in doors when you see White men going past you who didn't tap in or anything. That's so frustrating. Like, stuff like that just rattled me. . . . Being asked if I was lost when walking the physics halls . . . Me and my friends have also experienced like, situations where students are like, to our face, "You're only here [in college] because you're Black." . . . And there were a lot of microaggressions. Like every seat around me being empty in class. [I thought], oh, maybe it's not intentional. Maybe it's just today. Maybe it was where I sat? But four years of that? [Then I decided to] just go sit with the Black people because [White male and female students] are going to leave us [to work] all alone anyways. Every Black person I've talked to at my alma mater had experienced being the last person to be selected to work with for a group project.

Ivy discussed the isolation she experienced in the Black community by the men, which highlights intra-racial and gender microinvalidation within Black groups:

There were some real like strange gendered dynamics in the Black communities in my, in my school. . . . I mean, you got to the school and you were Black and you were automatically cool and the Black men had their own organization, and it was very much like "we're Black men and we beat the odds and we're the upper bachelors of our breed, we're the best of the Black men and we're the best." . . . [As a Black woman], you largely had to be skinny and lighter skinned and have cool hair. Like, those were the girls that were more successful at maintaining relationships with Black men. Those were the Black women that were more successful. I was not skinny in college. I was overweight all throughout college. . . . I was like medium skin toned and I did not have good hair. I didn't have like long hair that you could just press and it would be long and beautiful. So, I didn't fit that criteria, and that was very clear to me early on that that was the case, and I think it was kind of hard.

Monica shared an example of a more overt microaggression she experienced one night during a party on campus that most exhibits blatant racism:

I remember we all went to a football party, again it was pretty mixed, but there were four of us who walked in at the party and two of us walked out cause we weren't feeling it. So we were sitting on the ground putting on our shoes and this White girl passed and she looks at us like "Ew," and I was like, "Excuse me, what did you just say?" She said "Ew, gross," and I got up and I was like, "What?" And she was like, "Fuck you, Black niggers!" I lived in [this Midwest city] my whole life and that was the first time I had ever experienced blatant racism like that so I wanted to act like her, I was like, "What did you say?" And she said, "Fuck you, Black" and repeated it. She was like "nigger, nigger," and I was angry, I was gonna choke her, I was shaking her and my friend who's one of the other Black girls was like, "Calm down, Monica."

Even though Monica labels this incident as blatant racism, the incident itself does not perpetrate an act of prolonged oppression, but rather it unfolds as a violent verbal attack and purposeful act of discrimination, also known as a microassault. The attacker's intent was to hurt Monica based on her racial heritage, utilizing verbal violence and name-calling.

Through these examples, we find that the participants' experiences of microaggressions are not unique to their STEM environments and that those experiences extend beyond into the larger campus environment. Whether the microaggressions were encountered in STEM or in the greater campus, we discovered that microaggressions materialized in multiple ways for the three participants. The examples seen above provide just a fraction of the microaggressions Brittney, Ivy, and Monica experienced that may have significantly impacted their sense of belonging in STEM at their respective PWIs.

DISCUSSION

Brittney, Ivy, and Monica highlighted their experiences with microaggressions as Black *students* in the sciences more than those as Black *women* in science. Race and racism, even same-race discrimination, were discussed more than sexism or gender discrimination. This could be because this study was a subset of a much larger study that focused on the ways in which African American doctoral students experience and respond to race and racism at PWIs. Although race played a more significant role than gender in the ways that microaggressions influenced sense of belonging at their respective undergraduate institutions, the intersections of race and gender cannot be ignored. The double marginalization each woman experienced was a result of being Black women in fields dominated by White men at institutions that celebrate White men and White women. Therefore, we have framed our discussion to explain how types of microaggressions—microassaults, microinvalidations, and microinsults—manifested inside and outside of STEM contexts.

Because of their overtness, it takes a more conscious effort to display microassaults, so they tend not to occur as frequently as microinvalidations or microinsults (Sue, 2010). Nevertheless, microassaults are harmful, especially because they intend to hurt, threaten, or intimidate People of Color into feeling unsafe because of their racial status (Sue, 2010), as is evidenced in Monica's account of being verbally attacked at a party. Since the traditional sense of racism is considered publicly unacceptable by most people, microassaults manifest themselves by the attackers in three ways: (a) when they feel secure in anonymity, (b) when they feel safe in the presence of others who may believe similarly, or (c) when they lose control of their actions and judgments (Sue, 2010).

Microinvalidation manifested mostly in the form of isolation or exclusion for the interviewees, as is indicated in Brittney's case of being the only Black woman in her physics department. Isolation is reinforced through unconscious policies or culture that send messages to Women of Color in STEM that they do not belong (Seymour & Hewitt, 1997) and their presence becomes invalidated. This is especially the case when these students feel underrepresented in a particular setting. Even when fully capable to do well in STEM, when Students of Color do not see others who look like them in their classes or departments, they begin to question if they belong there, which ultimately affects their self-confidence (Seymour & Hewitt, 1997).

Even when women adopt the perceived characteristics necessary to be successful (being assertive, more competitive, less feminine, well-spoken, and so on), which are often associated with masculine identities, they are still excluded for various reasons such as not adopting socialized roles of women in academia (e.g., passive, demure, downplaying expertise) (Dortch, 2016b; Seymour & Hewitt, 1997). When the Black women in our study espoused the characteristics necessary to be successful in STEM, they were not only marginalized by men but also by White women, such as an experience Brittney recounted of being excluded from an all-White and female science study group. Whereas White women in STEM may be marginalized by White men, Black women are marginalized by White men *and* White women, producing a double marginalization and further fueling a lack of belonging.

The absence of Black faculty in the sciences is stark and apparent for students who desire to see reflections of themselves in the academy (Jordan, 1994; Sedlacek, 1999). The stress of being the only or one of few was evident when Ivy spoke of the lack of role models in her discipline. Conversely, Black women who do not identify with networks of support could experience

exclusion from their own racial communities (Rosales & Person, 2003). Whereas Black men at these institutions get rewarded for going to college (especially through athletic scholarships, on-campus organizations with national ties, and Black fraternities) (Harper et al., 2013), Black women do not get rewarded or acknowledged to the same degree. And thus, not only do they have to fight to fit into the White environment around them, they also must work hard to fit into their own Black communities on campus. Lack of institutional support for Black women in STEM plays a role in Black women feeling isolated from other Black women *and* Black men at PWIs. The example Ivy offered illustrates how Black women experience a double-bind at PWIs because of their race and gender, perpetuated not only by White men and women but also by men of their own race.

Microinsults tend to be highly presumptive of a person's racial heritage, and often even the most well-intentioned people can say or commit the most racially insensitive things or actions (Sue, 2010). Brittney's second example of being told that she only got into the school because she is Black represents the ascription of intelligence, which assigns a lower degree of mental capability and prowess because she is Black and believed to be inferior in intelligence and incapable of getting into college without affirmative action (Sue, 2010). Through the Black women's examples, we see that microinsults can make trivial incidents like being carded to enter a building on campus assume greater implications for Students of Color. Microinsults can also be promoted and reinforced into STEM cultures or environments through textbooks and inactions of faculty members.

CONCLUSION

Racial and gendered microaggressions influence Black women and their sense of belonging in nuanced and complicated ways. We would like to acknowledge that Black women were able to develop a sense of belonging based on same-race role models, positive experiences with peer groups, and the like. However, our study indicated that microaggressions and discrimination stemming from racism and sexism tended to influence their belongingness more profoundly. Women of Color, especially Black women, may find that increased marginalization from Black men, White women, and White men can serve as a deterrent to their sense of belonging and ultimately their success. The marginalization and lack of sense of belonging experienced by Black women in STEM are a direct product of the microaggressions they encounter in STEM at institutions across the nation. For those women who are currently engaging in the sciences at PWIs, the challenges resulting from being a Black woman at a White institution in a White male-dominated field can hinder students from completing their degrees, forcing them to choose other fields.

Intra-racial gender discrimination is an area in which sense of belonging literature could be expanded. New scholarship exploring the ways that Black men and women interact with each other could also address the intra-racial and gender dynamics within Black student communities. Thus, to advance Black women's representation and quality of experience, we must address the racial *and* gendered microaggressions that occur on a regular basis, along with the greater campus climate of which microaggressions are an inherent part. This will lead to Black women experiencing a greater sense of belonging, more inclusion, and higher levels of success in the sciences.

Researchers, administrators, and policymakers seeking to encourage the success and belongingness of Black women STEM students should consider developing not just Faculty of Color hiring and recruitment initiatives but also recruit more Black women so that women like the ones presented in our study can see reflections of themselves in their respective disciplines and programs. This would mean that institutions would have to create effective pipeline programs promoting the successful transition of women undergraduate students to successful graduate students who then become faculty members. By increasing the Black faculty pipeline, Black women could then begin to shift into administrative positions in which they have relevant levels of authority and decision-making power (see Essed, 1994). In so doing, undergraduate Black women would begin to experience a sense of community and belonging at the institutions that they are attending. Further, predominantly White colleges and universities may also consider institutionalizing support systems for Women of Color such as learning communities to specifically meet the racial, cultural, and gendered needs of Black women in the sciences.

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