

#BlackGirlMagic: The identity conceptualization of Black women in undergraduate STEM education

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Abstract

Much of the research in science education that explores the influence of a racial and gendered identity on science, technology, engineering, and mathematics (STEM) engagement for Black women situate their identities primarily as responses to the oppression and struggles they face in STEM. In this study, we use Phenomenological Variant Ecological Systems Theory as a strengths-based approach to investigate 10 undergraduate Black women's perceptions of race and gender on their STEM identity development and engagement. The qualitative analysis of interview and journal data revealed these women enter STEM experiences cognizant of their race and gender identities, naming them in isolation and intersectionally as a potential risk or as being protective, positive, and empowering for their STEM engagement. These findings illuminate the importance of Black women self-authoring their identities in STEM contexts, both in naming what is salient and defining what those names mean, and have implications for STEM retention and matriculation efforts.

KEYWORDS

Black women, identity expression, intersectionality, racial identity, STEM identity

1 | INTRODUCTION

Recognizing the many contributions that it affords the nation, the United States has increased its efforts in promoting and advancing science, technology, engineering, and mathematics (STEM) education for its citizens (Basile & Lopez, 2015). To meet the rising workforce demands, the President's Council of Advisors on Science and

Technology (PCAST, 2012) stated that the United States must increase its number of STEM professionals by 1 million people by 2022, requiring a 33% increase in STEM graduation rates between 2012 and 2022. Increasing the number of underrepresented students in STEM—students from non-White racial, ethnic, and cultural backgrounds and women—is a priority for the United States given changes in the demographics of the US population. Programmatic efforts targeting specific groups is one approach used in increasing the numbers and representation of certain groups in STEM (Hurtado, Newman, Tran, & Chang, 2010; Palmer, Davis, Moore, & Hilton, 2010). More human capital in STEM, one outcome of an increase in traditionally underrepresented groups, would make the United States more competitive in the global economic market (Hernandez, Schultz, Estrada, Woodcock, & Chance, 2013; Perna, Gasman, Gary, Lundy-Wagner, & Drezner, 2010; Thiry, Laursen, & Hunter, 2011).

Targeted efforts designed to increase STEM attainment for underrepresented students include pipeline initiatives and undergraduate research opportunities comprised of internships and industry and academic-related research (Espinosa, 2011; Maton, Hrabowski, & Schmitt, 2000; Palmer, Maramba, & Dancy, 2011; Pender, Marcotte, Sto. domingo, & Maton, 2010; Russell & Atwater, 2005). These efforts are reported to increase hands-on learning and promote “academic success, retention, and persistence...benefits [that] are pronounced for traditionally underserved students” (O'Donnell, Botelho, Brown, González, & Head, 2015, p. 29). Although targeted efforts are designed to increase underrepresented students' engagement and continued participation in STEM, retaining and matriculating Black¹ students in STEM continues to be a challenge.

Between 2000 and 2015, Black student college enrollment rates increased from 11% to 13% (National Science Board, 2018), a representation similar to their percentage in the US population of 13%. From 2000 to 2014, Black students' STEM enrollment rate (determined by first-year students intending to major in STEM) fluctuated, declining between 2000 and 2007 and increasing between 2007 and 2014 to 40% enrollment (National Science Board, 2016). Despite increases in both general enrollment and STEM enrollment, the conferral rate of STEM bachelor degrees for Black students remained consistent at 9% during that time period (National Science Board, 2016), an outcome lower than their general representation in the US population. According to the National Center for Educational Statistics, in 2015 only 7% of the STEM degrees conferred went to Black students (McFarland et al., 2017). Collectively, these statistics indicate an increasing gap between Black students' STEM enrollment, STEM major intentions, and STEM graduation rates that cannot be attributed to the lack of college enrollment overall. In fact, Chen (2013) reports that Black students have the highest STEM attrition rates in both the bachelor and associate degree-seeking populations, as compared to other races and ethnicities. These statistics further emphasize issues regarding Black student matriculation and retention in STEM fields that persists despite the efforts of targeted interventions designed to increase the number of underrepresented students in STEM.

Given these results, in addition to calls for more empirical investigations of the function and success of targeted efforts (National Academies of Sciences, Engineering, & Medicine NASEM, 2017), this study seeks to explore the retention and matriculation of Black students in STEM, more specifically Black female students in undergraduate STEM education. In framing this study, we would like to point out that although STEM are distinct disciplines with unique challenges (A. R. Brown, Morning, & Watkins, 2005), we focus on the broader experiences associated with them, and therefore use STEM to represent all of these disciplines, their commonalities, and distinctions. This study addresses the following questions:

- (1) What identities do Black female undergraduate students in STEM name within their various STEM contexts? How does the naming of those identities manifest?
- (2) To what do Black female undergraduate students in STEM attribute to those identities named within their various STEM contexts? How do they construct these meanings?

¹In the literature, the terms *African American* and *Black* are often used interchangeably to reference individuals of African descent. Though we believe that these two words are distinct, one representing race and the other culture, when referencing or citing other authors we use the terminology that is consistent with their work.

2 | RESEARCH ON BLACK FEMALES AND STEM

Research studies featuring Black female students in precollege and undergraduate STEM either investigate their experiences individually, focusing only on Black females (e.g., Charleston, George, Jackson, Berhanu, & Amechi, 2014; Parsons, 1997), or collectively as part of either Black students as a whole (e.g., Russell & Atwater, 2005; Zhang & Barnett, 2015) or females of color (e.g., Carlone & Johnson, 2007; Espinosa, 2011; Ong, 2005; Ong, Wright, Espinosa, & Orfield, 2011). The varied ways in which Black females have been grouped for the purposes of systematic examination of their experiences signify the challenges for research.

The challenges result from the multidimensionality of identity and the intersecting nature of those dimensions (Cho, Crenshaw, & McCall, 2013; May, 2015), specifically race and gender for Black females. The tensions between race and gender existed at the outset of the feminist movement as a result of two humanitarian equality issues in the United States, women's rights (meaning "White women" as determined by the legislated inferior status of non-White women) and the abolition of slavery (Frankenberg, 1993). This tension was captured in the "Ain't I a Woman?" speech by Sojourner Truth at the 1851 Women's Convention in Akron, Ohio (as cited in US Department of Interior, National Park Service, n.d.) and tensions continue today (Bates, 2017). The sentiments of Sojourner Truth in 1851 resonate with the contemporary reimagining of Black women as empowered females (Collins, 2000; Farmer, 2017).

This multidimensionality, intersecting nature of the dimensions, and the tensions between race and gender are existent challenges in this study. Because the preponderance of existent research in science education focuses on Black students and the results of studies with a specific interest in Black females often replicate the findings from Black students generally, we begin with race in the forefront, but with a conscious alertness to other dimensions of identity to manage the challenges related to multidimensionality and race-gender tensions. Additionally, we use salience, what is preeminent for the study participants, to manage the intersecting nature of multiple dimensions of identity. As a contribution to literature, this study continues the reimagining of Black females rooted in Black studies and feminist studies (Collins, 2000; Farmer, 2017), an effort not yet explicitly articulated in science education research.

2.1 | Race × Gender and STEM identity

Research related to Black females' presence and engagement in STEM explore the outcome and impact of various factors like resources, representation, pedagogy, and culture on their STEM choices and experiences (Brickhouse & Potter, 2001; Johnson, 2007; Ong, 2005; Ong, Smith, & Ko, 2018). In a synthetic review of research on females in science education, not specifically Black females, Brotman and Moore (2008) highlight four different waves of research involving females and their pursuit of and learning science. The first three waves featured resources, pedagogy, and culture with respect to access, equity, and inclusion. The fourth wave of research that they articulate involves exploring identity (Brotman & Moore, 2008), an area that was emerging in science education at the time but has since grown (e.g., Brickhouse & Potter, 2001; Brickhouse, Lowery, & Schultz, 2000; Carlone, 2004; Carlone & Johnson, 2007; Johnson, 2007; Johnson, Brown, Carlone, & Cuevas, 2011; Tan, Barton, Kang, & O'Neill, 2013; Tate & Linn, 2005).

This study can be situated in Brotman and Moore's (2008) fourth wave as articulated in the study's objectives: To explore the identities named by Black females participating in undergraduate STEM and to examine the meanings they construct of those identities. Central to the research articulated within Brotman and Moore's (2008) fourth wave is students' development or expression of a STEM identity in relation to their STEM engagement, matriculation, and retention, as well as their expressed identity in relation to race and gender.

A STEM identity is an expressed association between one's self and STEM that is contingent upon the individual's belief in their capabilities within and their conceptual and practical knowledge of their particular STEM discipline (Charleston et al., 2014; Gainor & Lent, 1998; Hunter, Laursen, & Seymour, 2007; Hurtado, Cabrera, Lin,

Arellano, & Espinosa, 2009; Lent et al., 2005; McGee & Martin, 2011). A STEM identity is contingent upon the recognition of self as being a competent participant in STEM but also the recognition by others as such (Carlone & Johnson, 2007; Martin, 2006). Not only is the environment in which a person experiences STEM important in fostering a STEM identity, but the perception of resources and support (both tangible and intangible) aid in the formation of a STEM identity (Carlone & Johnson, 2007; Chachra, Kilgore, Loshbaugh, McCain, & Chen, 2008; J. D. Lee, 2002; Merolla & Serpe, 2013; Merolla, Serpe, Stryker, & Schultz, 2012; Rosenthal, London, Levy, & Lobel, 2011; Seymour, 1999).

Many of the studies comprising the corpus of literature on the STEM identity of Black females borrow from social psychological theories rooted in the work of Holland, Lachicotte, Skinner, and Cain (1998), Lave (1991), and Gee (2000). While providing a complete review of these theories is beyond the scope of this study, in efforts to distinguish this study's theoretical approach from similar studies in science education, we briefly describe these theories in relation to the identity conceptualizations of Black females in STEM.

Holland et al. (1998) notion of figured worlds suggest that identity is authored through the process of participating in activities, while also gauging and determining one's position as a result of the acting characters, power structures, norms, and values within a given circumstance. Within the "figured world," individuals' identities are also contingent upon historically rooted connotations ascribed to their identities that transcend both space and time (Holland & Lave, 2001). Black females contemporarily inherit historically rooted ascriptions related to gender, on one hand, and race, on the other; these connotations are primarily negative. For example, former Harvard President Summers contemplated in a speech that innate differences between men and women accounted, in part, for the shortage of female scientists (Dobbs, 2005) and many decades of research document the deficit positioning of Black people in the STEM pipeline from precollege to practicing professionals (B. A. Brown et al., 2016; Mutegi, 2011, 2013; Parsons, 2008, 2014). Within figured worlds and in the face of historically rooted ascriptions, identities are socially constructed with these constructions being influenced by the roles individuals assume and the activities they engage with others, peers and more knowledgeable individuals (Lave, 1991). Studies conducted from the previously described perspective focus on the embodiment of negotiated relationships among the STEM context (its operating power, norms, and culture) and Black females—their goals, thoughts, perceptions, and understandings of self in relation to others (e.g., see Brickhouse et al., 2000; Barton et al., 2013; Carlone, 2004; Tan et al., 2013). These studies point out how STEM culture perpetuates White, middle-class, male norms, and emphasize the importance of context in the STEM identity construction of Black females, articulating the ways in which their intersectional race and gender identity is marginalized within those spaces.

Gee's (2000) work considers identity to be a social performance that varies according to space, place, and time. Gee names four types of performed identities: nature (natural), institution (social), discursive (discourse), and affinity (group). Gee suggests that these identities do not function in isolation, but rather simultaneously and in support of one another; and, that a particular named identity of an individual (e.g., African American) could function as any of the four identities pending the circumstances outlined by the acting social institution in power. Much of the work on identity in science education correspond to the institution and discursive identity types in Gee's framework. For example, Gee's work underpins the influential study of Carlone and Johnson (2007) that featured the role of recognizing self and being recognized by others as a STEM person; emphasized the norms and values associated with natural and social identities (i.e., race, gender, socioeconomic status, scientist etc.); and described how group and affinity identities in STEM, their associated ideologies and practices, influence the extent to which Black women embrace a research, altruistic, or disrupted science identity. Gee's work guides other studies investigating science identity construction for Black females, emphasizing the way in which all four specified identities operate to promote or hinder the development and expression of a science identity (Ceglie, 2011).

Taken together, previous work utilizing these frames demonstrate the contextual and cultural constraints imposed on Black females as a result of their race and gender identity, while describing the ways in which Black females negotiate their identities in relationship to those constraints. Some scholars even situate their studies within the context of intersectionality—a theorized construct that bore from scholarship specific to Black women

and the unique experiences they face (Collins & Bilge, 2016)—to support their assertions of an oppositional and oppressive STEM context for Black females while also highlighting the tools they utilize in response to that opposition (e.g., see Brickhouse & Potter, 2001; Johnson, 2007; Johnson et al., 2011).

In attending to the scholarship focused on identity and the STEM engagement of Black females, we believe that taking a deeper look into identity and STEM is necessary, more specifically seeking to understand “the how and to what extent” an intersectional race and gender identity influences STEM identity and retention beyond being the onset of oppression. We, like previous science education researchers, believe it is important to consider race and gender from a social psychological perspective—the negotiation of self with society’s value (French, Seidman, Allen, & Aber, 2006) foregrounded in the existent research on Black females in STEM—as we view race and gender as social constructions. Race is a classification or grouping of individuals based on, “historically contingent, socially significant elements of their morphology and/or ancestry” (Haney López, 1994, p. 7) and it informs and influences an individual’s and society’s perception and understanding of self. Likewise, gender—the belief— acceptance, and practice of activities, roles, and responsibilities society assigns to a biological sex that is contingent upon the individuals’ “knowledge of membership...felt compatibility...felt pressure...attitudes” (Egan & Perry, 2001, p. 451)—also informs an individual’s and society’s perception and understanding of self. Acknowledging both race and gender as social constructs positions these identities in what Gee (2000) considers social or institutional identities and allows for a critical examination of the influence and impact of social structures (their history, politics, and culture) on STEM identity development separate from negative connotations and deficit orientations; a different perspective from the deficit orientations that dominate the research literature on Black students.

We also believe it is important to consider race and gender from a developmental psychology perspective. We deem a development psychological perspective, that is identity being developed over time as one transitions through different phases in life (Miller, 2011), as helpful given the history of stigmatization surrounding the social groups to which Black females belong and the presence of stigmas throughout their lives (B. A. Brown & Mutegi, 2010; Green, 2014). By taking a developmental psychology informed perspective, we recognize the historically rooted components of a race and gender identity, acknowledging and foregrounding the histories of those identities as they permeate not only the contexts surrounding individuals but also the immediate and present lived experiences of individuals. This perspective differs from other work as it intentionally situates historical connotations of race and gender (and by virtue racism and sexism) at the crux of STEM identity development and expression.

3 | THIS STUDY’S CONCEPTUAL FRAMING

This study gives primacy to its participants’ experiences in relation to the characteristics they name and the experiences they share as Black female undergraduate students in STEM. Attending to their verbalized salient identities and the perceived understandings of those said identities within their operating context, we draw on Spencer’s (2006) Phenomenological Variant Ecological Systems Theory (PVEST).

3.1 | PVEST

PVEST is a framework designed to study the influence and outcomes of identifying characteristics and experiences on an individuals’ perceptions and behavioral responses to their environment and subsequent challenges faced within that environment (Spencer, 2006). PVEST allows for “self-appraisal and meaning-making processes, as a dynamic system, within the various contexts of development” to be studied in conjunction with contextual influences on identity development and performance (Swanson, Spencer, Dell’Angelo, Harpalani, & Spencer, 2002, p. 75). PVEST delineates identity embodiment, the performed and recognized version of self, and its contribution to life-stage outcomes as a result of the obstacles an individual may face, the presence or absence of support within the context of the experienced obstacle, and the individual’s corresponding choice made.

PVEST is an identity focused, cultural ecology framework that incorporates phenomenology to capture the essence and actualized meaning of the individuals' experience (Spencer, 2006). PVEST's inclusion of phenomenology not only accounts for a person's perception of their lived experience but also their agency and power in shaping and determining their environment and behavior. PVEST is based on Bronfenbrenner's ecological systems theory (Bronfenbrenner, 1977), incorporating the influence of the ecosystem on human identity development (Spencer, Fegley, & Harpalani, 2003). Incorporation of the ecological framework allows for a better understanding and interpretation of the role of context on an individuals' identity development (Bronfenbrenner, 1977), specifically attending to how the social, cultural, political, and historical landscape shape the perceptions, experiences, and behaviors of the individual through direct and indirect interactions with one another and the individual (Spencer, 2006). PVEST foregrounds the endemic, systemic, and detrimental nature of racism on identity development (Spencer, 2006). PVEST values intersectionality and purports that the experience of individuals and their embodied identities cannot be determined by one identity alone; however, the intersecting archetype of salient identities (its power, privilege, and history) orient an individual's perceived, understood, and lived experience, along with their subsequent identity embodiment and outcome (Swanson, Cunningham, & Spencer, 2003).

3.1.1 | Components of PVEST

Five components make up PVEST (Figure 1): net vulnerability level, stress engagement, reactive coping methods, emergent identities, and life-stage outcomes (Spencer, 2006). All five factors operate in a bidirectional, recursive process (Spencer, Dupree, & Hartmann, 1997). Net vulnerability relates to factors that a person is either born with (i.e., race, sex, and physical characteristics), born into, acquire, or choose (i.e., gender, socioeconomic status, language, and culture), and that are viewed and valued differently by society (Spencer, 2006). A perceived difference in the value associated with these varying characteristics influences the types of engagements individuals encounter during development, creating a continuum between factors recognized as risk to factors

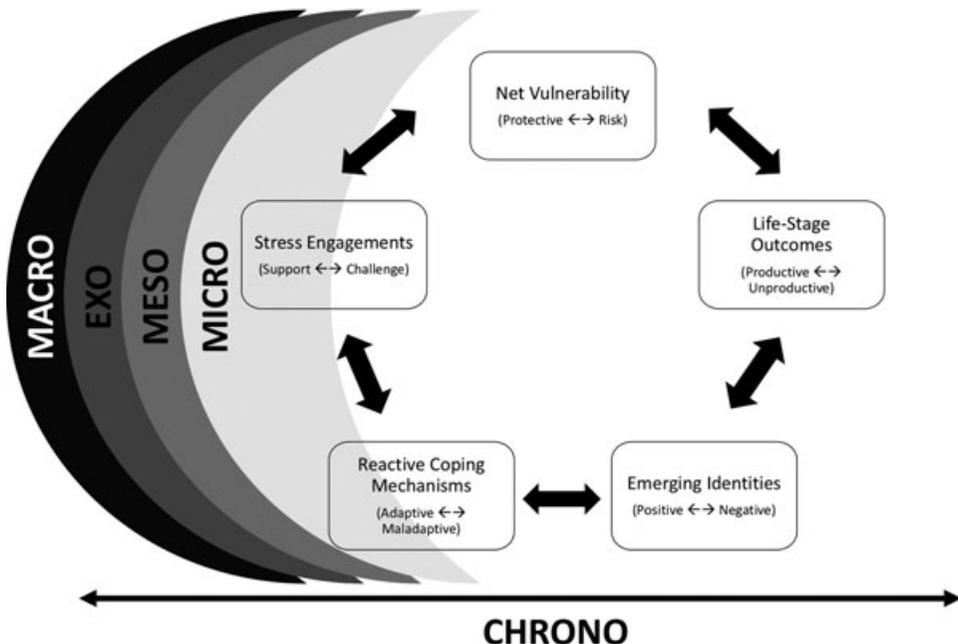


FIGURE 1 Conceptual model of Phenomenological Variant Ecological Systems Theory

recognized as protective, with the recognition made by both the individual and others. The identifiers the Black female participants in this study declare and detail relate to this element of PVEST.

Stress engagement is the actual, experienced circumstance, or incident that a person faces due to their net vulnerability (Spencer, 2006). These situations often take place within the individuals' immediate context, where they face a dilemma that is the result of a juxtaposition between a risk and the availability of supportive measures. Coping responses are the cognitive processes and behavioral decisions enacted in response to stress engagements that range from maladaptive or harmful for identity development to adaptive or positive for identity development (Spencer et al., 1997). As individuals repeatedly encounter similar stress engagements and generate the same coping mechanism, PVEST proposes that these recurring coping mechanisms become stable coping mechanisms or emerging identities (Spencer, 2006). The open-ended nature of this study enabled the participants to label and discuss their stress engagements and their responses to them. These events could have occurred in the past (e.g., recollections of K-12 experiences), present (e.g., encounters at the time of the study), and future (e.g., what they envision as long-term goals).

In PVEST, learning outcomes, denoted as life-stage outcomes in the model but not a focus in this study, are the overall intended effects generated by engaging in the process of identity development. As a consequence of the cyclical, dialectical nature of the theory, learning outcomes also have an influence on the individuals' experiences and the individuals' perceptions of those experiences.

3.1.2 | PVEST in comparison with other theories

PVEST, in many ways, relates to the theories utilized in prior research to explore the identity of Black females in STEM (e.g., figured worlds, and identity as an analytic lens). The theories overlap regarding their social psychological perspective of identity and the significance of perception, agency, power, and context on identity development. PVEST encapsulates Gee's (2000) identity theory in its net vulnerability component and expounds upon it by orienting the ways in which an individual's identity (nature, institutional, discourse, and affinity) contributes to their direct action via their response(s) to stress engagement. PVEST also accounts for Holland et al. (1998) figured worlds by borrowing from phenomenology, emphasizing the individual's self-appraisal in and making sense of their space and place created and informed by their perceptions, values, beliefs, and norms that are socioculturally and contextually defined.

PVEST differs from the perspectives used in science education as it centers the presence and influence of racism through social, cultural, political, and historical contexts that interact directly and indirectly. PVEST is based on developmental psychology and human development, therefore, introducing the construct of time and a compounded understanding of identity on performance. Lastly, by introducing actualized, lived experiences that are out of the individual's control (stress engagements), PVEST bridges the gap between the abstract and the literal of figured worlds and creates an opportunity to understand and unpack the interconnectedness of Gee's identities on identity performance.

3.1.3 | Use of PVEST in this study

As an underutilized theoretical framework in STEM research PVEST offered a theoretical grounding for contemporaneously considering the risks documented in the literature on Black females in STEM and the assets Black females utilize to enter into and remain in STEM. PVEST also provided a frame for thinking about the Black females' perceptions, experiences, and salient identities in relation to each other and within the context of STEM.

In this study, only one PVEST component, net vulnerability, is addressed and explicitly explained in the discussion of the findings. A thorough analysis of an individual's identity—the salient identities named and their ascribed meanings—provides insight on what orients the individual's psychological processes that shape and inform their behaviors and engagements (Ireland et al., 2018). In light of the population of interest in this study, Black

females, race, gender, and race interacting with gender are foci of interest; how these manifests are dictated by what the study participants share. Existent research shows race—not gender, possibly as a consequence of the previously discussed tensions around race and gender—is foregrounded in the vast majority of work involving Black females; consequently, we consider what is known about racial identity. In line with the multidimensionality of identity explained earlier and the study participants' implication of it, we also provide an overview of an intersectional race and gender identity expression for Black females, which is grounded in Black feminist scholarship.

3.2 | Racial identity expression

Racial identity expression is the extent to which an individual performs or exudes beliefs, and ideas that are in relation to their understanding of and connection with a specific racial group (DeCuir-Gunby, 2009; Marsh, 2013; Stewart, 2015). Racial groups, in these instances, refer to a collective of individuals established on biologically and socially based associations and ancestry (DeCuir-Gunby, 2009), including phenotype, morphology, and socialized behaviors and practices (D. L. Lee & Ahn, 2013; Stewart, 2015). Racial identity expression relates to a plethora of positive and negative factors including stress, self-esteem, academic efficacy, and delinquency (Osyermer, Harrisons, & Bybee, 2001). For example, racial identification can serve as a protective measure for Black students in troubling learning environments (Chavous, 2000); the social influences of racial identification are also related to lower academic achievement explained by stereotype threat, a performance-decreasing fear of confirming negative stereotypes about the group with whom one identifies (Steele, 1997). How one perceives race and associates with one's racial group based on that perception has an impact on the individual's self-identification and the individual's worldview and all its accompaniments.

3.2.1 | Positive associations from race

Racial identity expression can serve as a protective mechanism against detrimental psychological processes (e.g., racism) for Black students when these students maintain a positive belief of themselves, racially, and pride in their race (Chavous, 2000; Chavous et al., 2003; Hurd, Sellers, Cogburn, Butler-Barnes, & Zimmerman, 2013; Sellers, Copeland-Linder, Martin, & Lewis, 2006). Black racial identity relates to resilience, academic achievement, and improved educational outcomes for Black students (Chavous et al., 2003; Zirkel & Johnson, 2016). Students who base their expression of their race on a historical understanding of race are more likely to incorporate academic success into their racial identity and positively engage in school (Nasir, McLaughlin, & Jones, 2009).

In contexts where there are very few Black individuals present, Hurd et al., (2013) reveal that individuals with a high private regard, positive personal belief, and pride in their race, exhibit fewer depression symptoms over time. Despite the onset of discriminatory experiences, Black adolescents with high race centrality—exuding strong racial connection with the Black race—hold positive attitudes toward Black individuals and demonstrate high positive psychological well-being, buffering these students from discriminatory experiences (Sellers et al., 2006).

3.2.2 | Negative associations with race

Negative associations with race manifest as a result of racism, perception of isolation, and stereotypes (Beasley & Fischer, 2012; R. T. Carter & Forsyth, 2010; Malone & Barabino, 2009). Researchers have found that Black people experience an onset of prejudice—in the form of racism—due to their race, with Black women being more likely to experience institutional and cultural racism than Black men (R. T. Carter & Reynolds, 2011). In experiencing racism, African Americans are more likely to exhibit feelings of anger, low self-esteem, depression, and increased anxiety, yielding counterproductive behaviors such as isolation, attrition, and lack of engagement (Swim, Hyers, Cohen, Fitzgerald, & Bylsma, 2003; Yip, Seaton, & Sellers, 2006). Malone and Barabino (2009) showed in majority

White spaces where Black individuals perceive themselves to be the “only one” and when the racial identity is highly susceptible to external factors, a Black racial identity can lead to feelings of isolation, marginalization, and undervaluing. In the Malone and Barabino study, students perceived the context as unsupportive, leading to negative psychological well-being.

Stereotypes, common and often overly simplified presumptions of an individual or group based on limited knowledge and understanding of that individual or group (Hilton & von Hippel, 1996), produce negative associations with race. Stereotypes can negatively influence Black students' connection with White faculty at predominantly White institutions, leading to academic behaviors detrimental for their performance such as not seeking academic assistance from the faculty when needed (Guiffrida & Douthit, 2010). Stereotypes can also lead to higher attrition rates in STEM for Black students, given stereotype threat (Steele, 1997), and Black students exhibiting higher group performance anxiety (Beasley & Fischer, 2012). Race also negatively influences continued participation in STEM and STEM identity when considered in light of science and the United States racial history, where society used science to promote racist ideology and messages of inferiority regarding people of color (B. A. Brown & Mutegi, 2010; Green, 2014). Racial identity expression is only one dimension of identity; as previously mentioned, identity is multidimensional with intersecting dimensions.

3.3 | Intersectional race and gender identity expression

A corpus of literature examining intersecting identities explores and defines the unique experiences of being a Black woman. Crenshaw's (1991) concept of intersectionality, bell hooks' (1981) *Ain't I a Woman* and Collins' (2000) *Black Feminist Thought* serve as seminal pieces and ideas in the field of studying and theorizing intersecting identities. These notions stressed the importance of recognizing and understanding the impact multiple identities have on an individual's perceptions of and experiences in the world. Navigating social climates and negotiating the expression and understanding of self within those climates are contingent upon the unique experiences imposed on and lived by the individual; these experiences are based on their multiple identities with various dimensions of identity being more salient in one climate but less salient in another.

Collins' (2000), Crenshaw's (1991), and hooks' (1981) investigation of Black women's collective experience highlight the uniqueness that comes with expressing two identities, race and gender. These authors purport that understanding the experiences of Black women requires an individual to recognize sexism found within opposing racism, racism that is inherent in feminism, and the awkward positioning placed upon Black women by both of these concepts when they are investigated in isolation (Collins, 2000; Crenshaw, 1989; hooks, 1981). A race or gender-based approach to oppression alone leaves out or ignores Black women, creating a system, where Black women are “othered” and positioned at the bottom of the social hierarchy (hooks, 1981). Investigating issues of oppression and discrimination from a single-axis framework favors and privileges Black male and White female experiences, erasing the unique experience of being both Black and female (Crenshaw, 1989). In acknowledging the oppression faced by Black women, these scholars and others called for a framework that described, defined, and empowered Black women, based on the idea that their experience was unique due to their expression of multiple identities.

Crenshaw's (1991, p. 1244), intersectionality acknowledges and examines both the presence and importance of multiple identities combined, unique influence on an individual's perception and experience. She used the term “intersectionality” to “denote the various ways in which race and gender interact to shape the multiple dimensions of Black women's [experiences].” Intersectionality is more than a summative approach for looking at two or more identities (Crenshaw, 1989); it requires multiple identities to be conceptualized from a blended perspective where the perceptions and experiences of one identity are uniquely tied to and related to the perceptions and experiences associated with the other. Crenshaw (1989, 1991) presented evidence of the uniqueness in multiple identity expression as she explained the Black woman experience in relation to issues of racism and sex-based discrimination in law and politics.

Strength, empowerment, and resistance in relation to the prevalent narratives of Black women are constructs researchers conceptualized when exploring intersectionality and identity expression (Collins & Blige, 2016). These constructs come from Black women's understandings obtained and lived experiences in their work and family context, where they are able to observe the hypocrisy between what society states to be true and what reality demonstrates regarding their positioning and influence (Collins, 2000). An intersectional identity is contingent upon the social context in which individuals are operating but defined by what those individuals wish for others to see and know (Collins, 2000). Their decision of what is displayed is a way to promote self-preservation, to address the inconsistencies of society's concepts and reality, and to maintain a high sense of self-concept, value, and pride within themselves (Collins, 2000; hooks, 1981).

Studies investigating race and gender identity expression delineate differences in experience and identity expression for Black women (Osyerment, Harrisons, & Bybee, 2001; Plummer, 1995) or highlight the intersection of race and gender in various endeavors (Buckley & Carter, 2005; Harper, 2006, 2009; Marsh, 2013; Tate & Linn, 2005; Wade, 1996). For example, Marsh (2013) finds Black women are more likely to accommodate rather than assimilate in contexts where White race and norms are valued, maintaining a sense of their Black racial identity while engaging in the environment. Accommodation refers to adapting the ideals and beliefs of the external environment as a way to create a consistency between an individuals' internal understanding and their external reality (Schunk, 2012). Assimilation is abandoning their cultural beliefs, values, and ways of knowing to adopt a dominating culture (Aikenhead, 1996; Cobern & Aikenhead, 1998). From the vantage point of intersectionality, racial and gender identity expression can be an agentic source for Black females (Marsh, 2013), a possibility explored in this study.

4 | METHODS

This qualitative study was designed as an instrumental case study across multiple instances (Stake, 1995). It was situated in hermeneutic phenomenology (Sloan & Bowe, 2014) to uncover identities named and their influence on Black female students' STEM engagement. Phenomenology in general, consonant with PVEST as the theoretical framework guiding the study, provides a vehicle to feature the subjectivities of the Black female students in the study. Hermeneutic phenomenology, specifically, is a perspective that not only identifies aspects of an experienced phenomenon but also includes interpretation by the observer; recognizing that by being within the research setting the observer is operating within the phenomenon and contributing to its essence (Sloan & Bowe, 2014). Hermeneutic phenomenology acknowledges researcher presence within the research project and the researcher role in coconstructing knowledge through data analyses.

The first author identifies as a Black, African American cis-gender male with a background in the physical and biomedical sciences from both a Historically Black College and University (HBCU) as well as a private Predominately White Institution (PWI). The second author self-identifies as a Black, African American female, born and reared in the southern United States. She was educated throughout, precollege to postdoctoral studies, in predominantly White institutions, public and private, with much of her undergraduate studies situated in organic chemistry. Unlike her generational predecessors, the Baby Boomers, as a member of Generation X she did not live the legalized racism and discrimination of the Jim Crow South but experienced its vestiges during her studies at PWIs. The construct Black denotes their racial identities, whereas African American underscores the cultural repertoires of practice for the communities to which they most closely identify. Being both Black and having STEM educational experiences in both an HBCU and PWI, the first author recognizes that his racial identity as Black may grant him access to the Black female participants' space, while his gender identity as male, a privileged identity, possibly affords him an outsider's perspective to their understood experiences; whereas the second author's lived experiences as a Black female may offer insights in the interpretation of what the research participants shared. Because identity is multidimensional and intersectional, the identities of the researchers do not forecast or foreshadow the research participants' experiences.

In maintaining these positions as researchers, our identities function as an asset for this study rather than an impediment by way of bias, given the call for a cultural, historical, and developmental understanding of African Americans in science education (Parsons, 2008); the theoretical framework from which the work is conducted; and the affordances to obtain information from the participants as a result of our shared discourse identities—identities shared based on self-selected terms of engagement (Gee, 2000). To ensure our identities did not exert undue influence in the study, the study design included several measures to enhance credibility which we describe later in the text.

4.1 | Research context

This study took place at two distinct locations and at different types of institutions for the purposes of maximizing the diversity in experiences. Queries related to the differences in experiences by institution are important but are not reported in this study as a consequence of agreements related to data-sharing. The institutions attended by the research participants are public institutions of higher learning located within the Southeast region of the United States. Shakur University, a pseudonym for the first institution, is classified as an HBCU. It serves a student body consisting of 78% African American, 12% White, 2% Latinx, 1% Asian, and 0.007% International students. Shakur University has a first- to second-year retention rate of 80%, a 15:1 student to faculty ratio, and offers a total of 78 degrees with 146 concentrations. Shakur University has a 48.3% four-year graduation rate for Black students.

In contrast, Hurston University, a pseudonym for the second institution, is considered a PWI. Its student population is approximately 63% White, 12% Asian, 8% Black or African American, 7% Latinx, 5% two or more races, 4% Other, 0.5% American Indian, and 0.3% Native Hawaiian or Pacific Islander. Hurston has a 96.4% first-year to second-year retention rate for Black students, 13:1 student to faculty ratio, offers over 75 majors and minors, 68 doctoral programs, and 113 master's programs. Hurston University has an 83% four-year graduation rate for Black students. Participants of this study attended either Shakur University or Hurston University and were part of an institutionally sponsored program that promotes STEM engagement and matriculation via undergraduate research. The study targeted participants involved in institutionally sponsored programs because such engagement indicated a level of interest and commitment to STEM.

Both programs offered financial aid, academic support, advising and mentoring, exposure to STEM, and undergraduate research experience. Students participated in these programs via cohorts, building a sense of community among each group. As a member of either program, the students were awarded a merit-based scholarship each year (\$10,000 for the program at Hurston and the cost of attendance or \$10,000 at Shakur), paid for the duration of their time in the program, and were expected to maintain at least a 3.0 GPA on a 4.0 scale. Students of the programs were expected to major in a STEM field and aspire to obtain a Ph.D. or MD/Ph.D. within a STEM area postundergraduate graduation.

Study participants, identified by self-selected pseudonyms, varied regarding their classification (first-, second-, third-, and fourth-year), age (ranging from 18 to 21), STEM major, and cohort within their respective program (Table 1). Participation in this study was voluntary. The first author recruited participants from Shakur University by attending several of their initial welcome meetings during the summer of 2016 and presenting about the research opportunity. He informed the 13 participants at the program orientation sessions that they would be awarded three small incentives—not exceeding \$15 in total value—over the duration of the study. He also followed up via individual email with individuals at Shakur to elicit participation. Seven participants from Shakur participated in the study. To obtain participants from Hurston, ensuring that the sample there matched the sample from Shakur in terms of race and gender, he accessed Hurston's STEM program's website to identify individuals who visibly embodied the presentation of a person of African ancestry. He emailed these individuals separately, recruiting them to participate in the study. Initially, two participants responded and agreed to participate in the study. These two individuals then recommended additional people to consider, and using a snowball sampling procedure, he connected with and recruited six additional participants. The information obtained for the Black female students, five from each institution, are presented in this study.

TABLE 1 Research study participants

Name	School	Classification	Major
Buttercup	Shakur	First-year	Physics + Electrical Engineering
Ginnette	Shakur	First-year	Chemistry
Lexi	Shakur	Fourth-year	Mathematics-Secondary Education and Physics
May	Shakur	Third-year	Chemistry
Nicole	Shakur	Second-year	Chemistry
Teresa	Hurston	Third-year	Environmental Health Science (Public Health)
Sunshine	Hurston	Third-year	Biology (Public Health)
Charlotte	Hurston	Fourth-year	Biology + Women and Gender Studies
Sara	Hurston	Third-year	Biology + Chemistry
Jenny	Hurston	Third-year	Biology + Latin

Note. Parentheses include the reported majors participants desired to pursue.

4.2 | Data sources and analysis

The study used three methods to elicit the participants' perspectives. The sources of data included field notes, interviews, and journal prompts. The different sources of data provided multiple opportunities to consider the students' information from distinct vantage points: field notes captured students engaged in activity, interviews elicited spontaneous responses with the chance to follow up for details, and journal prompts offered a chance for more reflective, deliberative replies from the participants. The findings from this study draw heavily on the interview and journal prompt data to ascertain the naming, manifestation, and understanding of identity from the perspectives of the participants. Field notes supplemented the interview and journal prompts to aid in data analysis.

Research participants completed five journal prompts. The prompts obtained information about the participants and their experiences (both in and outside of STEM) that they might have wanted to contemplate or felt uncomfortable sharing aloud. Questions in the journal prompts reflected questions in the interviews but were phrased in ways to share stories or specific events (i.e., "tell me about a time in which you experienced a challenge"). The participants received the journal prompts via email with a secure link for them to upload their typed documents to a secure server. Participants were instructed to be as thorough as possible in their responses but were given the freedom to determine the overall length of their response.

The first author also conducted two face-to-face interviews with the participants in a setting of their choosing that lasted approximately 1 hr. The two interviews contained questions regarding the students' background experiences in STEM and their thoughts and beliefs on how the college STEM experiences (e.g., coursework, STEM program, and research) have influenced their goals, aspirations, and understanding of STEM. The interviews were semistructured, having order and purpose to the question while allowing for probing and spontaneous questioning to occur. The first interview led with the questions, "how do you identify?" where participants were then provided with a follow up of "race, gender, ethnicity, religion, pretty much any identity that is most salient to you," if they expressed confusion about the question. Once the participants responded, the remaining questions in the interview protocol were specific to the referenced salient identities initially mentioned. Additional questions, informed by field notes and the participants' journal prompts, were added to the second semistructured interview. The first author also conducted follow up "mini interviews" with the participants asking for clarification on responses provided and more insight into their responses as it was needed. All interviews were recorded and the recordings transcribed verbatim by a professional service. To ensure the transcripts reflected the audio recordings, transcripts were reviewed in tandem with the audio files, making any corrections that were necessary.

4.2.1 | Analysis

Data analysis in the qualitative tradition is not a distinct stage of the research process, rather an on-going reflexive activity that informs future data collection and writing (Coffey & Atkinson, 1996). Using an open-coding process (Corbin & Strauss, 1990), data (e.g., first interview, first prompt) were coded and categorized, while simultaneously collecting additional data (e.g., field notes, second prompt) at both research sites. Analyzing data while also obtaining new data allowed for the exploration of concepts in the second interviews that emerged from the participants' previous accounts.

For each individual case (e.g., student), throughout data collection and at the conclusion of data collection, existing transcripts and journal prompts were read sequentially and in their entirety. After reviewing the first round of collected data in its entirety (all of the cases), open, inductive coding (Corbin & Strauss, 1990) was used to create a list of codes that described what was occurring within the data. The qualitative software HyperRESEARCH (ResearchWare, Inc., Randolph, MA) was used to conduct all data coding. After establishing the codes, the documents were separated and reviewed by case, and codes were compared and contrasted within and across individual cases to generate categories that represented the overall conglomerate of cases.

Categories consisted of broad labels that encompassed a variety of different, related codes. Categories further assisted with the organizing, management, and retrieval process of the meaningful pieces of the data (Coffey & Atkinson, 1996). All codes and categories developed from the existing data were applied to newly acquired data; that is, deductive coding was used in conjunction with inductive coding, to generate new codes from newly acquired data. New codes captured commonalities that appeared both prominently and consistently within and across the cases. After collecting, coding, and categorizing all of the data, the research literature, research questions, and conceptual framework were referenced in conjunction with the categories to develop themes (Table 2). The findings presented are representative of the emergent themes.

4.3 | Rigor and quality checks

Researchers have posited various criteria and several measures for enhancing the quality and rigor of qualitative research. This study's focus on the study participants' perceptions elevates the importance of trustworthiness, one of the criteria reported to enhance rigor (Guba, 1981). Trustworthiness, in relation to the research situation as experienced by the research participants vis-à-vis the study's findings, pertains to truth value, applicability, consistency, and neutrality. Trustworthiness consists of four elements: credibility, dependability, confirmability, and transferability.

TABLE 2 Exemplar of a developing code, category, and theme

Theme: Meanings Inferred Category: Understanding Identity Codes		
Externally Defined	Perception of identity is based on outside perspectives or events	when you're a woman, you have to prove yourself a little bit more, to show that you're adequate, even though that's not how it should be. Also, with being African American, I feel like that's a challenge in itself, and again, you have to prove yourself a little bit more than someone who isn't African American would have to (Ginnette, Interview 1, p. 20)
Self-Defined	Perception of identity is based on internal perspective or introspective events	Yeah, back home a lot of the students in my class they felt like "yeah you might be smart now but you can't really do it later." Um... Even some of the faculty that didn't really like me. I was kind of a troublemaker, but I was smart so they couldn't get rid of me (Lexi, Interview 1, p. 16)

Credibility addresses how accurate and adequate the findings represented the research situation, including the meanings intended by the research participants (Lincoln & Guba, 1985). Three measures established credibility in this study. Participants conducted member checks by reviewing the findings as they emerged by responding to questions in the second interview, conducted later in the data collection process, regarding researchers' interpretations of the data collected earlier in the study and in the follow up "mini interviews" conducted. Additionally, findings highlighted participants' direct quotes and triangulated information across three different data sources—field notes, interviews, and journal prompts. Dependability is the public inspection of decisions made during the research process, and confirmability is the illumination of chains of evidence that link data collection, data analysis, and subsequent interpretations (Guba, 1981). To satisfy both dependability and confirmability (also addressed in Table 2), an external auditor, an expert in the field of higher education retention for marginalized populations, reviewed all documentation to ensure the integrity of the decision-making process and that all reporting and practices aligned. Transferability, the ability of someone to make an informed judgment on similarities between the research context and other environments (Guba, 1981; Shenton, 2004), was satisfied by providing thick descriptions of the research contexts and in the research findings, and by investigating the phenomena of interest across multiple cases.

5 | FINDINGS

In this section, we present the findings to the investigated research questions by using an alternative literary form to ensure that the presentation style best captures the messages and experiences of these participants (Coffey & Atkinson, 1996). Alternative reporting styles allow researchers, "to work out and spotlight particular ironies or paradoxes inherent in particular positions and cultural conventions" (Coffey & Atkinson, 1996, p. 123).

In her writing, "Poetry is not a Luxury," Black feminist scholar and poet, Lorde (2007), discusses the power of poetic prose to capture and reveal the real concepts, ideas, and understandings behind the experiences and power of Black women, the participants in this study. Lorde understands poetry to be a "revelatory distillation" (p. 37) that shares both the ideas of Black women—ideas being a source of liberation—and Black women's deep, dark consciousness of living, their experience being their source of power, and the creator of true knowledge and understanding. Embracing Lorde's perspective on poetry as it pertains to its ability to capture the essence and meaning of Black women, we utilize poetic transcription to present our findings. Poetic transcription is a nontraditional way in which researchers can present their findings where the participants' words constitute a poem that captures the meanings obtained (Glesne, 1997).

I Am... is a composite poem composed of words and phrases from each of the 10 Black female students' interviews and journal prompts used to produce an overall representation of their collective experience. The poetic transcription consists of 16 stanzas. The arrangement of *I Am...*, the grouped stanzas and general flow of the poem, is based on the participants' responses to the various questions posed and the themes ascertained through the data analysis process. For example, the words the participants used in naming their identities in response to the question "how do you identify" are grouped together in stanza I. The subsection title "I Am-Identities Named" and the contents of stanza I and II in the overall flow of *I Am...* corresponds with the results of the data analytical processes previously described. That is, the contents of the poem for the examples stanza I and stanza II reflect the theme of "identities named," the category "demographic identities" and the codes "race, gender, biological sex, religion/spirituality."

Likewise, the theme "meanings inferred" (Table 2) corresponds with stanzas VII–XV, as indicated by the headings "socially regulated" and "self-determined," where stanza VII articulates the general experiences of the Black female students and stanza VIII articulates the perceptions of Black females in STEM. As such, the construction of *I Am...* constitutes our interpretations and understandings of the data, representing all levels of the data analytic process. To further unpack the findings embedded within *I Am...*, we also provide additional data, when needed, to support the meaning of the constructed stanzas. We present the additional data in a traditional format (e.g., quotes). The findings

address the two research questions guiding the study: (a) What identities do Black female undergraduate students in STEM name within their various STEM contexts? How does the naming of these identities manifest? (b) To what do Black female undergraduate students in STEM attribute to these identities named within their various STEM contexts? How do they construct these meanings?

I Am...—Identities Named

(I) I Am...

African American... Muslim... Nigerian... Christian... Black
I'm African American...African American slash Black
But...

(Interview #1 and Journal Prompt 1, Buttercup, Lexi, Nicole, May, Ginnette, Teresa, Sunshine, Charlotte, Jenny, & Sara)

(II) First, I'm a woman

I'm a female... a cis-woman
A Black American... a young Black woman
Female, African American. African American female
I am an African American woman, a Black lady

(Interview #1 and Journal Prompt 1, Buttercup, Lexi, Nicole, May, Ginnette, Teresa, Sunshine, Charlotte, Jenny, & Sara)

I Am... captures the expression of these participants' salient identities within their STEM context, the objective of the first research question. As demonstrated by these first two stanzas, these participants name their race and gender identities as most salient. The participants used words such as "Black," "Black American," "Nigerian," and "African American" to feature their racial identity, associating racially with people of African ancestry or descent (Larkey, Hecht, & Martin, 1993; Smith, 1992). For most of them, the terms "Black" and "African American" were used interchangeably, acknowledging that both terms defined what they considered to be their racial identity. Words such as "female," "woman," or "lady" represent the gender identity they named. Though we acknowledge that the word "female" is characteristic of biological sex, given the stories shared by the participants in response to additional questions asked during the interview protocol, we associate the term with gender, a construct discussed earlier.

In addition to capturing the various identities that these participants named, *I Am...* displays the manner in which these students disclosed their salient identities; one identity in isolation of another or intersecting with another. Some participants presented a list of descriptors that captured their race, gender, and religious identity (e.g., "African American," "Black American," "female," "woman," "cis-woman," "Muslim," or "Christian"). Their responses were presented, for the most part, in sequential order: race, gender, religion, or gender, race, religion. Presenting their identities in an individual, sequential order, while using phrases such as "First I am a..." suggest that these participants saw their identifiers as distinctive enough to both individually and collectively influence their experience.

Some participants declared "African American woman," "African American female," "Black woman," or "Black lady." These responses, unlike the others, presented a more intersectional approach toward their understanding and expression of their identity, where their naming of identity did not separate their experiences as a Black individual from their experiences as a woman (Crenshaw, 1991). Despite the differences in their presentation of identities—isolated or intersectional—when it came to discussing their identities through their stories and experiences, the presence of both race and gender were preeminent.

I Am...—Manifestation of Identity

- (III) I was the only Black Girl, and the teacher would make Black jokes
 This boy that used to call me stupid, He said I was stupid cause I'm Black
 Privileged White students, very ignorant, they had questions, and I'm impatient
 Not seeing a lot of Black people, feeling like I don't belong
 Going to White schools, I wasn't treated fair by teachers, they would single me out
 Being in class with White people, there was racial tension among the students
 (Interview #1, May, Nicole, Buttercup, Teresa, & Jenny; Interview #2, Nicole)
- (IV) My neighbor, she was Black, she told me that I made Black people look bad
 One woman from church, in her mind, M.D./Ph.D., that's reserved for them over there
 When it happened, I was ashamed of myself
 Sometimes I would believe it, but sometimes I just didn't
 A lot of the self-doubt came through, I shut down... I became suicidal
 Maybe I really am the problem?
 (Interview #1, Charlotte, May & Nicole; Interview #2, Sara; Journal Prompt #2, Sara)
- (V) But I had to realize that I wasn't
 I shouldn't be afraid of not being accepted in this environment
 I realized we are just as good as them
 They instill in us that you can't do it, we take that
 Black people, we tell ourselves, "just because they said, we can't do it," But you can.
 They have no right to make us feel inferior!
 (Interview #1, May, Lexi, Sunshine, Jenny, & Sara)

Beyond their direct statements of their race and gender identity they named, through stories of specific encounters and experiences, the participants share what identities are most salient and how they became salient. Stanza III details experiences that occurred within their K-12 school setting that sparked the salience of their Black racial identity. During their K-12 experience, the participants recall being the only "Black girl" in their STEM classes, having teachers making "Black jokes," or having White students make fun of them. Stanza IV explores the stories shared of experiences that occurred outside of the K-12 classroom context and within their various communities. The participants describe negative encounters with church and community members that brought about feelings of shame and doubt pertaining to their identity as Black women and their STEM pursuits. For example, elaborating on her experience with an older Black woman from church, Charlotte names her Black woman identity as the onset of a negative encounter as she shares:

Charlotte: I ran into her, she was like, "Hey, baby, how're you doing?" I was, "Hi," and she was like, "Where are you going to school?" I was, "I'm going to [Hurston] and I'm thinking about majoring in some kind of science, maybe biology. I'm not really sure, but I'm definitely going to be a scientist." She was, "Oh, what do you want to do with that?" "I'm thinking maybe M.D./Ph.D., just M.D., not really sure, but maybe M.D./Ph.D. would be pretty cool." She goes, "Hmm, maybe you should look into plan B. M.D./Ph.D., that's kind of big."

Interviewer: Why do you think that she asked you for a plan B?

Charlotte: Because that's a really big dream. It's dreaming big, M.D./Ph.D. I know the double degree. It will take a very long time and I guess in her mind that's reserved for the really, really, really smart people who most likely doesn't look like me, so what is your backup in case that doesn't work? Yeah,

pretty much in case that doesn't work because of you being a Black woman and that's really reserved for them over there. What's your plan B? (Interview 1)

Their identities were not only made salient through negative encounters, as featured in the previous stanzas, but also through positive events.

(VI) Growing up, I've had social safety nets, my family, church family, and dance school
I've been around Black people all my life, I didn't want to change that
Black people...It's just the culture, it makes it more relatable
My high school, it's a historically Black school, I didn't feel any negativity
The community, it's mostly Black people, the community supported me a lot
I wanted to attend an HBCU, Black people in America are more open to Islam
(Interview #1, Lexi, Buttercup, Sunshine, & Charlotte)

Stanza VI represents the stories shared where the participants were made aware of their racial identity through positive encounters. Positive encounters occurred both in and outside of their school context during their K-12 developmental period, and included being surrounded by all Black people, relating to their Black racial identity. These positive experiences highlight their perceptions of a community or support related to their identity. For them as Black women growing up in an all-Black neighborhood and being around all Black people created a feeling of a sense of community and support. As noted in stanza VI, the feeling of community and support from their K-12 encounters influenced decision-making, in this case college choice.

Overall, it was through the negative and positive encounters with peers, teachers, and community members during their K-12 developmental period where the participants were made aware of their salient named identities. These previous encounters informed their racial identity as Black, as prevalently indicated in the existent research, but these encounters also informed their intersectional identity as Black woman. When faced with a negative encounter, their identity manifested as oppositional or different from the established norm within that social space (e.g., being a Black woman in a White STEM education context). When faced with a positive encounter, their identity manifested as inclusion within the social space (e.g., being a Black woman among Black people and culture).

I Am... - Socially Regulated

In the previous section, "Manifestation of Identity," *I Am...* reveals the participants' emphasis on their Black racial identity, with some indications of intersectionality, and how it manifested through positive and negative encounters that occurred during their K-12 home and school experiences. In this section, "Socially Regulated," the participants' intersectional Black woman identity is more prominent.

(VII) You face discrimination as a Black person and as a Female
A Black Woman in society, there's so much pinned against
you Being African American, that's a challenge in itself
People don't really care about us
As far as people of color go, African-Americans have the worst of it
Being Black and Female presents a disadvantage
(Interview #1, Nicole, May, Jenny, & Lexi; Interview #2, Sara)

(VIII) Society doesn't see Black Females as Scientist.
Black Females are sassy, loud, intimidating, not intelligent, or sleep around
Black Females have bad attitudes; being entertainers, or baby mommas

People aren't used to seeing Black doctors, chemists, mathematicians, or engineers
 There's not many minorities in STEM
 It goes back to exposure... The representation is lacking!

(Interview #1, May, Lexi, Jenny, Ginnette)

(IX) STEM is hard to get into, especially for people of color

It's really hard to get Black people into STEM, you'll see very few Black people
 STEM is pushed more on White people and Asians, they're stereotyped as smart
 A Black Female to enter that field? It's very rare.

There aren't many Black American Females in the STEM field. It's very uncommon actually
 You are the minority, a Black Woman in STEM...We're the minority in STEM fields

(Interview #1, May, Lexi, Nicole, & Buttercup; Interview #2, Ginnette)

(X) Black Females in STEM have a little bit more to prove than others do

In STEM, you have to prove yourself more

If I don't show them up or show them they're wrong, they won't accept me

People have an idea of you before they even know you...

Those disadvantages make me want to disprove the stereotype

If I show a sign of weakness, it brings out their stereotypes of me

(Interview #1, Sara, Jenny, & Ginnette; Interview #2, Sara, Lexi, & Ginnette)

An intersectional view of race and gender is evident in the outset of stanza VII. Stanza VII "you face discrimination as a Black person and a Female," "A Black woman in society, there is so much pinned against you," and "Being a Black female presents a disadvantage" are exemplars that articulate an intersectional recognition of their Black woman identity within the larger societal context. An intersectional manifestation of Black woman is also prevalent in the STEM specific experiences they described. In stanza VIII "Society doesn't see Black females as scientist" introduces the STEM specific intersectional manifestation that reifies the larger societal characterization of Black women, "Black females are sassy." Stanza IX, "A Black female to enter that field" and "there aren't many Black American females in STEM," and stanza X, "Black Females in STEM have a little bit more to prove" also corroborate the emphasis of an intersectional identity manifestation of Black woman specific to STEM contexts.

Outside of naming their various identifiers, both in general and within STEM and disclosing the way in which those identities manifested, the previously presented stanzas of *I Am...* also display the ways in which these participants conceptualize their identities, the meanings they associated with them—focal objectives of the second research question. When describing what it means to be a Black woman, the participants' responses included numerous characterizations. Within these descriptions, the participants implicate external forces, such as their environment and the people within it, and internal dynamics, like conflicting thoughts and beliefs, in their understanding of their identities.

In discussing their identities, the participants speak of their identities in relation to the societal context. They emphasize the environmental and societal influences on their identities by referencing the discrimination they face (stanza VII), the stereotypes they endure (stanza VIII), and how the STEM context heightens those socially regulated connotations of their identity (stanzas IX and X). Elaborating on the social regulations Black women face in STEM, Charlotte recalls an experience in which the Principal Investigator (PI) of her research lab challenged her ability to handle the rigor of STEM. Charlotte shares that her PI stated:

"You're doing well in lab, but sometimes I see you struggle with explaining some of the genetics, and if you're struggling with stuff, that tells me you don't care about this," and I didn't know where he was getting this from. I'm like, "I really don't know where you're getting this from. I might have struggled a bit with explaining some genetics, but I would always go back and read and then the next time we meet I

would know it better.” He was like, “Yes, I know you were good with that, but still if you’re struggling in the first place, that means you’re not caring.”... Then I was telling him what I wanted to do in the future, and then he was, “You know, you don’t *have* [emphasis added] to be a scientific researcher and get a Ph.D. for that. You can still just be an M.D. or do public health or something if you want to get that done. You don’t *have* [emphasis added] to get a Ph.D.” (Interview #1).

Despite Charlotte “doing well in lab,” the PI still felt that she did not care about her work because she was struggling. Rather than help in the areas where Charlotte was struggling—those struggles possibly occurring due to a variety of reasons—the PI automatically presumed that Charlotte was incapable of handling the rigor of a Ph.D. and suggested that she pursue a path the PI implicates as less rigorous like an M.D. or public health. This incident illustrates the last line of stanza X, “if I show a sign of weakness.” First, in the detailed experience Charlotte admitted that she struggled a bit with explaining some of the genetics. The PI’s response, a message that she was incapable as conveyed by the discouragement to pursue a research route, confirmed her suspicions that “it brings out their stereotypes of me.”

The end of stanza X introduces the flip-side to the participants’ shared understanding of their identity as Black women which featured what existed external to them: It highlights their capacity to act. Here, the participants speak on the effort they must exert to disprove the stereotypes they experience, introducing the idea of their identity as Black woman as not just socially regulated, but also internally regulated or self-determined (Harris-Perry, 2011; hooks, 1995).

I Am... - Self-Determined

Harris-Perry (2011) and hooks (1995) state that in the face of opposition and stereotypes, rather than be the sum of their disadvantages, Black women become active agents in creating meaning out of their circumstances. A self-determined point of view is one in which Black women do not embrace a victim mentality in response to racism and stereotypes, but rather fight for liberation and the chance to define their own sense of self and destiny (Harris-Perry, 2011; hooks, 1995).

(XI) Being a Black Female means being driven, strong, facing adversity
 Proud, confident, strong, determined
 Being a Black Female, it’s a good thing!
 More powerful, intelligent, and strong
 To be a Black Woman, it’s hard, but it’s great!
 To be a Black Woman, it’s difficult at times, but I’m proud!
 (Interview #2, May& Sara; Interview #1, Lexi, Ginnette, & Sara)

(XII) Being a Black Female in STEM means success...It can be powerful
 Just one of few. The cream of the crop.
 There were two African American women in that lab, I appreciated that
 My identity as a Black Woman drives me to do my best in STEM
 For now, I’m the minority in STEM. They’ll see me as a Black Woman
 There is nothing that I can do to really change, I might as well work with what I have:
 (Interview #2, May, Nicole, & Teresa; Interview# 1, Lexi & Buttercup)

(XIII) Have a lot of strength and perseverance, resilience
 Have to motivate myself
 Have to navigate to get what you want
 Have to be knowledgeable
 Have to be confident in ourselves

Have to be determined

(Interview #1, Lexi, Nicole, & Charlotte; Interview #2, Sara)

(XIV) We can overcome these obstacles that life throws at us because we are Black Women

Slave mothers had a lot to deal with, but they still managed

We're so unique. We always stick out.

Taking the scraps and making a lifestyle

I can do this. I went through this and I did it! You can do it too

You got to take that first jump and get in there

(Interview #2, May, Sara, Sunshine, & Lexi)

(XV) I'm self-sufficient. Getting stuff done on my own.

I'm responsible for the things I do and the outcome

I don't need someone pushing me, I can do that myself

I'm strong. I can keep going, wanting to pursue my dream to help underserved women

I want to be a part of helping people, I want to help Black youth

I'm really interested in racial disparity issues

(Interview #1, Lexi, Sunshine, Ginnette, & Charlotte; Interview #2, Teresa; Journal Prompt #2, Charlotte)

(XVI) My Mother...She inspires me...when she's talking and spitting out facts

My Mom... seeing her become a nurse inspired me to make a difference too

My Mom is a Chemist. She's the reason I've pushed towards science, mathematics

My Mom, she's very supportive

My Mother has been really influential

My Mom would have supported me regardless

(Interview #1, May, Ginnette, Lexi, Sunshine, & Buttercup)

Stanzas XI–XV show the Black female study participants engaging as active agents in reimagining, with regard to how externalities in the United States have defined Black women, what it means to be a Black woman. Stanza XI promotes this idea of being an active agent by articulating the participants' understanding of their identity to be "driven, strong, facing adversity" or "hard, but great." These statements acknowledge the difficulty experienced as a Black woman but also the consciousness to self-author their identity in the midst of their struggle. Despite previously acknowledging that being a Black woman in STEM meant being the "minority" (articulated in stanza IX), stanza XII shows that the participants find being a Black woman in STEM to mean "success" and "powerful," redefining what their identity means within their STEM context aside from the oppression they experience.

Stanza's XIII–XV further the explanation of participants' self-determined identities as Black women. They highlight the characteristics they bring to their context (e.g., strength, perseverance, resilience in stanza XIII), their belief in being able to overcome because of the history of Black women's triumph (e.g., the success of slave mothers in stanza XIV), and their statements of being self-motivated or motivated by their self-defined goals (stanza XV). These statements display their agency, belief in their ability to control their environment (Bandura, 1989), in determining the meaning of their identity.

As featured in stanza XVI, we found that mothers played a significant role in modeling and teaching the meaning of a Black woman identity. In general, mothers provided support. Specifically, those who worked in a STEM or STEM-related career exposed these Black women to STEM. Of the 10 participants in this study, six of them shared that their mother worked in a STEM or STEM-related career. Mothers worked as nurses (Jenny, Sara, May Ginnette, and Nicole) or as a chemist (Buttercup). In these STEM related or STEM careers, mothers served as a source of inspiration for these Black women by modeling characteristics of persistence and determination. For example, May shares:

My mother serves as an inspiration for me because she is 39-year-old, she has three children, she takes care of her mother and she is still going to school... There was one point in time where she wasn't in school but even then, she was still learning and now that she's working on her doctorate... She was the only source of income in our household, but she's still pushing through it. She kind of inspires me when school gets hard . (Interview 1)

May internalizes her mother's modeling of persistence when times are hard and attempts to emulate it as she shares, "my sister my brother, I'm the oldest of all three of us...I know that if I show them that I'm focused and I can still have fun and I can still be a part of the family then they'll know that they can do the same" (Interview 1).

Mothers in STEM or STEM-related fields exposed the participants to the possibilities of STEM, encouraging them to pursue STEM careers. Ginnette shares that

seeing her [mom] become a nurse inspired me to want to do something that will really make a difference, and I think you can do that with STEM... the impact that she tells us, like, she tells us stories about what goes on at work every day, and the impact in how she seems to interact with the kids shows that she makes a difference in their lives. So that is what inspired me. (Interview 1)

Jenny shares "growing up with my mom being a nurse, I was always exposed to someone that was in the medical field and was super passionate about it. She would always come home and tell us an interesting story from work. I mean I guess that influenced me" (Interview 1). Buttercup shares, "My mom is a scientist. So that's um, she's a chemist. So that is why that's, she's been the reason I've always been pushed towards science, mathematics, engineering. She makes it very clear that that's a good career choice" (Interview 1).

Overall, as Black women in STEM or STEM-related careers, the participants' mothers modeled and taught them what it meant to be a Black woman within those fields and encouraged them to pursue STEM opportunities. The mothers modeled characteristics of determination and persistence despite challenging circumstances and demonstrated Black women in STEM being successful as they shared stories of their experiences working in STEM careers and the impact they were having on different communities.

6 | DISCUSSION

Giving the participants a platform to share their thoughts and perceptions regarding the identities most salient to them and their understanding of those identities within STEM context, we reveal the importance of considering and promoting the voices of Black women in determining their identity. Our findings demonstrate that for these participants, being a Black woman in STEM implicates both a racialized and intersectional experience when considering their identity. Being a Black woman in STEM both equates to and transcends the oppression and struggle they endure as a result of social constraints on their identity; their identity as Black women being socially regulated yet self-determined to mean power, strength, and success that manifest through their positive and negative encounters. Although the participants did not use the labels ascribed to the PVEST framing, we find that in using PVEST to map their responses, their named and conceptualized identities (net vulnerability) operate as both risk and protective factors for their STEM engagement.

6.1 | Net vulnerability

According to PVEST, net vulnerability for engagement encompasses an individual's identifiers (e.g., race, gender, ethnicity, socioeconomic status, health, etc.) depicted along a continuum from risks to protective factors. Where the identifiers lie along that continuum depends upon, "the character of the context and the individual's history of

experiences and even the group's history in the nation" (Spencer, 2006, p. 841). In this study, the most salient identifiers across the study's participants included the participants' race (Black) and gender (woman). These identities, presented as both insular and intersectional, as discussed by the participants illustrate PVEST's construct of net vulnerability.

The naming and conceptualization of the participants' racial identity as Black, African American, or Black American aligns with the shared history of Black people across the African Diaspora; a history fraught with oppression and struggle as well as triumph and celebration. These participants were cognizant of the trials and tribulations associated with the Black race, from a historical and present-day point of view, and felt a part of that racial group through their shared struggle. They acknowledged the risks—stereotypes, discrimination, and so forth—but they also acknowledged the pride and sense of comfort in being Black and among Black people. Within the context of STEM, situating the history, shared experience, and societal attitudes associated with Black as a racial identifier and the negative experiences it elicited gives credence towards racial identity as a risk (Spencer, 2006) when considered in light of the stereotypes experienced by the participants and stereotype threat (Bowe, Desjardins, Covington Clarkson, & Lawrenz, 2017; Steele, 1997). When racial identity is situated as a risk, it can be a contributing factor to STEM attrition in light of the negative associations with racial identity previously discussed. Despite the recognition of society's negative ascription to a Black racial identity, the Black women found solace, pride, and support in their Black racial identity previously affirmed through positive encounters, suggesting it might also function as a protective measure according to PVEST (Spencer, 2006). This protective function highlighted in PVEST aligns with the positive associations with racial identity discussed earlier in the article. When racial identity operates as a protective mechanism, it can be a contributing factor to STEM persistence and matriculation.

When using the terms "female," "woman," "cis-woman," and "lady," the participants implied biological sex as part of their identity. However, their stories illustrated the meaning of those listed labels as being a gendered identity of woman. Gender identity encompasses a belief, acceptance, and practice of activities, roles and responsibilities that society assigns to a biological sex that is contingent upon "knowledge of membership...felt compatibility...felt pressure...attitudes" (Egan & Perry, 2001, p. 451). Unlike racial identity, the participants did not discuss gender in isolation of other identifiers, they discussed gender in connection with race.

Intersectionality, as defined by Crenshaw (1989) acknowledges and examines both the presence and importance of multiple identities' combined, unique influence on an individual's perception and experience. Intersectionality is more than a summative approach for looking at two or more identities (Crenshaw, 1989); it requires multiple identities to be conceptualized from a blended perspective where the perceptions and experiences of one identity are uniquely tied to and related to the perceptions and experiences associated with the other (Crenshaw, 1989). In their conceptualization of their identity as Black women, the participants provided information that was specific and unique to the Black woman experience. Statements of society's historically rooted perception of Black women (e.g., not being a scientist or being sassy, loud, not intelligent), the negativity to indicate a risk in PVEST, do not disaggregate the perceptions that are based on race from the perceptions based on gender. Rather, those statements present an interwoven view of race and gender.

In naming their race and gender identity (e.g., Black, African American, Woman, Black woman, etc.), revealing the manner in which those identities manifested (e.g., social encounters), and providing the meaning assigned to them, these Black women acknowledged their identity as "Black woman" align with Gee's institutional and discourse identities. An institutional identity is a socially constructed identity based on rules and regulations enforced by an authoritative body, where a discourse identity is an identity created through discursive practices (Gee, 2000). By defining their identity as Black women to be contingent upon the norms, values, and roles assigned by both the larger society and the STEM context, manifesting through social encounters, these participants acknowledge the "creators" of society and STEM culture as being the authoritative figures enacting its power to determine the "who" of a STEM identity that is then reified through those who "fit" that socially constructed mold of a STEM identity. Scholars recognize that "who" as being White, middle-class males given the dominant culture perpetuated in the United States and STEM (Carlone, 2004; Johnson, 2007; Parsons, 1997; Wong, 2015).

Countering the social regulation of their identity with self-determination and having the power and agency to author their identities and meanings (e.g., Black woman meaning strength) aligns with Holland et al. 1998 adaptation of identity. Identity within figured worlds is a performance of how one understands their self in relation to the “world” they constructed that is socially, culturally, and contextually bound (Holland et al., 1998). In a “world” bound by social, cultural, historical, and contextual norms that marginalize and “other” Black women, these participants construct meanings of strength, power, determination, and success for their identity as Black women. With race and gender (subsequently racism and sexism) as central constructs in the participants’ purview, they responded with Black women in STEM being “Success,” “Just one in a few,” “rare,” and “The cream of the crop.” These descriptions suggest that the mere presence of a Black woman in STEM is a major accomplishment given the historically rooted ideologies of Black women being inferior and STEM being White male dominated fields that create obstacles and barriers to either oppress or exclude Black women. The participants’ explication of identity not only aligns with Black feminist and womanist scholarship about the power of being a Black woman (Crenshaw, 1989; hooks, 1995; Lorde, 2007) but it also aligns with scholarship that reveals the educational and life trajectory promises associated with maintaining a positive racial identification (Chavous, 2000; Chavous et al., 2003; Hurd et al., 2013; Nasir et al., 2009; Sellers et al., 2006; Zirkel & Johnson, 2016).

The definitions ascribed to their self-determined perspective of their identity as a Black woman, in part, aligns in some ways with the characteristics of what constitutes a Black woman as modeled by their mothers. The participants described mothers who maintained a STEM or STEM-related career as being persistent and determined amidst challenges (indicated by May). Additionally, the participants’ descriptions of their mothers indicated that the mothers offered notions of success through their stories of impact and experiences within their careers. The participants’ mothers implicitly and explicitly conveyed what it means to be a Black woman within specific context (Bailey-Fakhoury, 2014). Through their persistence and determination, the participants’ mothers resisted the negative societal images of what it means to be a Black woman (Ward, 1996). The persistence and determination the participants learned from their mothers have implications for Black women’s major and career choices (Hackett & Byars, 1996), and even their retention in STEM fields (Drury, Siy, & Cheryan, 2011).

Using PVEST to connect the participants’ salient identities and their understood meanings with the theoretical frames supporting relevant scholarship to Black women and Black women in STEM, we unpack the way in which a Black racial identity and an intersectional Black woman identity function for Black women in STEM. Where previous scholars attend to one side of the net vulnerability spectrum presented for Black women’s identity, that is their identity being the onset of experienced oppression, exclusion, and opposition (e.g., Brickhouse et al., 2000; Barton et al., 2013; Carlone & Johnson, 2007; Johnson, 2007; Johnson et al., 2011; Tan et al., 2013), this study reveals Black women’s identity as also being strength, empowerment, and resilience, a positive-protective perspective. Acknowledging both sides of the vulnerability spectrum presents a more holistic point of view regarding Black women’s identity in STEM. Additionally, with previous scholars sharing that Black women persist in the face of their opposition (e.g., Charleston et al., 2014; Espinosa, 2011; Ong, 2005; Ong et al., 2018), we find that our participants specifically articulate their intersectional Black woman identity to mean resilience and persistence. Their expressed meaning of their identity demonstrates a potential relationship between their race and gender and their STEM persistence, that not only supports the notion of their intersectional Black woman identity as being protective and even promotive of their STEM engagement, but also provides evidence for the need to further explore the relationship between a positive-protective identity expression and continued STEM engagement for Black women.

7 | CONCLUSIONS AND FUTURE DIRECTIONS

In their 2015 editorial, Rivera Maulucci and Mensah (2015) considered naming to be political acts and challenged members of the science education community to reflect on how we as scholars conceptualize and utilize the names ascribed to our participants. Rivera Maulucci and Mensah (2015) demonstrated that in many ways, we as scholars

either intentionally or unintentionally silence and marginalize individuals through our representation of their names and identities. Without acknowledging and incorporating the social, cultural, and political nature of names and identities that are historically grounded and pervasive, we as scholars can promote deficit orientations and presumptions of the individuals within our research projects (Rivera Maulucci & Mensah, 2015). Alternatively, taking into consideration the previously listed dimensions works to “un-silence” the voices behind the names and promote equity through respect and acknowledgment (Rivera Maulucci & Mensah, 2015). This perspective holds true for the “#BlackGirlMagic” title created as an offshoot of CaShawn Thompson’s “Black Girls are Magic” movement to feature positive characteristics and achievements of Black women (Thomas, 2015). Rivera Maulucci and Mensah’s (2015) perspective on naming also holds true for the research literature on Black women, their identity, and STEM that does not fully explicate an intersectional race and gender identity. In using research as a platform to elevate the voices of the participants and in accordance to the #BlackGirlMagic name, we reveal the names important to Black women in STEM postsecondary education and how they define them. We show the importance of foregrounding race and gender for Black women from an integrated social and developmental psychological point of view that also captures an ecological perspective. In addition, we demonstrate the ways in which racism and sexism historically and contemporarily inform the identity expression of our participants through social regulation and self-determination.

Where prior scholarship attends to Black women’s race and gender identity as being the onset of hardship and oppression experienced in STEM education, positioning these identities as risk factors, this study uncovers an alternative. Using PVEST we demonstrate how this group of Black women named and conceptualized their identity as “Black woman” to be a positive and protective factor for their STEM engagement. Although we do not unpack the role and influence of the participants’ expressed religious identity in this manuscript, expressed by many of this study’s participants but not all of them, given prior research on this matter (Agosto & Karanxha, 2011; Patton & McClure, 2009) we believe it is worthwhile exploring in future studies.

Additionally, in recognizing race and gender as salient, positive, protective, and potentially related to persistence, we prompt future studies that can systematically explore such relationships. Future studies are also needed to investigate the various tools and strategies used by Black women in their STEM persistence that relate to their named and self-determined race and gender identities, including the role their mothers and other significant others play. This insight would show how Black women perceive, interpret, and draw upon STEM contextual affordances and constraints and key individuals in negotiation with their understood race and gender identity to develop a STEM identity—areas that can be both targeted and addressed programmatically to enhance their STEM retention and matriculation. The positioning of a race and gender identity in relation to the STEM context and STEM identity is particularly important when considering research that explores the role and influence of the STEM context on STEM retention and matriculation via identity like undergraduate research experiences and Black student STEM engagement (Carpi, Ronan, Falconer, & Lents, 2017; F. D. Carter, Mandell, & Maton, 2009; Seymour, Hunter, Laursen, & Deantoni, 2004), research on race and science identity (Chang, Eagan, Lin, & Hurtado, 2011), Black student persistence in STEM (Estrada et al., 2016; Tsui, 2007), and persistence among Black women in relation to their context (O’Connor, 2002).

Given the prevalence of the precollegiate encounters in the narratives shared by this study’s participants, more qualitative research exploring the influence of precollegiate encounters on college STEM engagement is necessary. This study demonstrated the influence of pre-encounters on the participants’ salient identities while participating in undergraduate STEM education. It is possible that their pre-encounters influenced more than their identity salience, particularly given research that suggest identity expression shapes future orientations and endeavors (Tan et al., 2013).

By prompting those future studies, we find PVEST to be an appropriate framing for exploring and unpacking the psychological and social influences of a race, gender, and intersectional race and gender identity for Black women in STEM spaces. As evident in this study, PVEST unlocks the self-assigned meanings of the participants’ identities—those identities positioned as risk and protective—and provides an avenue for future explorations of the resulting

identity-performance outcomes. Further unpacking these constructs through PVEST explores the nexus between being and becoming as they relate to the development of a STEM identity and STEM retention and matriculation for Black women. The use of PVEST also adheres to and facilitates in meeting the call for investigating the psychology of intersectionality for Black women and girls in STEM, that is the “the mental process and behavioral choices associated with the meaning and consequences of holding multiple coconstructing categories of social group membership” (Ireland et al., 2018, p. 231).

The findings obtained from this study are the beginning stages of unpacking and understanding the influence of race, gender, and other salient identities on STEM identity and retention for Black women and Black students. Attending to what identities the participants name and how they understand those identities must come first. Equally important, is the employment of antideficit orientations for exploring and understanding identity, an imperative that aligns with calls for using antideficit framings to research Black students in STEM (Harper, 2010). To reiterate the importance and necessity of exploring and understanding identity through promoting the voices and perspectives of those researched or serviced, one possible means to alleviate deficit orientations of their names (Rivera Maulucci & Mensah, 2015), we conclude with the voices of this study's participants in an attempt to acknowledge, honor, and understand their self-determined names.

I'm a sister, a daughter...I'm a human being so I have multiple parts...I am still the person that I am...
I'll Still Be Distinguished...I have two identifiers: Black and Female...My Blackness is huge. My being a
Woman is huge...African American Woman...It's just a different vibe

(Interview #1, May, Nicole, Ginnette, Charlotte, & Lexi)

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