A qualitative inquiry into the intersectionality of race, gender, and social networks in STEM education.

La'Ree Alexandria Shontee
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UNVEILING PATHWAYS: 
A QUALITATIVE INQUIRY INTO THE INTERSECTIONALITY OF RACE, GENDER, AND SOCIAL NETWORKS IN STEM EDUCATION

By
LaRee Alexandria Shontee
B.A. University of Louisville, 2021

A Thesis
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Master of Arts
In Sociology

Department of Sociology
University of Louisville
Louisville, Kentucky

May 2024
UNVEILING PATHWAYS: 
A QUALITATIVE INQUIRY INTO THE INTERSECTIONALITY OF 
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A Thesis Approved on

May 1, 2024

by the following Thesis Committee:

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Dr. Linda Fuselier
ACKNOWLEDGMENTS

This thesis is dedicated to two remarkable Black women in STEM who have profoundly impacted my life with their dedication, brilliance, and love: my sister, Jalyn Shontee, and my best friend, Alana Gipson.

I extend my immense gratitude to God, my family, my thesis chairs, and the Indomitable 18, whose support and guidance have been crucial in bringing this project to fruition.

Without you all, there is no me.

To all the women whose voices are embedded in this writing: continue to show up in these spaces and let your voices be heard. You are extraordinary and necessary.
ABSTRACT

UNVEILING PATHWAYS:
A QUALITATIVE INQUIRY INTO THE INTERSECTIONALITY OF RACE,
GENDER, AND SOCIAL NETWORKS IN STEM EDUCATION

LaRee Alexandria Shontee

May 1, 2024

This study explores the intersectional experiences of Black women in Science, Technology, Engineering, and Mathematics (STEM) education by focusing on the strategic utilization of social capital to navigate systemic barriers and challenges. The unique struggles faced by Black women within predominantly white and male-dominated STEM programs are addressed in this study. Drawing on a growing body of literature, this research diverges from prevailing narratives of disinterest in or departure from STEM programs and instead illuminates proactive strategies employed by Black women.

Through an exploration of social capital - encompassing networks, resources, and support systems - this study offers a comprehensive understanding of how Black women navigate and succeed within STEM disciplines. By interrogating the intertwined racial and gendered experiences shaping their educational trajectories, my research contributes to a nuanced discourse on diversity, equity, and inclusion in STEM education. Ultimately, the findings underscore the pivotal role of social networks and support structures in empowering Black women to thrive in STEM environments.
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INTRODUCTION

Higher education is one of many institutions that have been historically racialized and gendered (McGee 2020; Nzinga 2020; Porter et al. 2020). Scholars who study students’ experiences in Science, Technology, Engineering, and Mathematics (STEM) education have found that these academic units are often overwhelmingly white and male (Hughes et al. 2024; Ireland et al. 2018; Tichavakunda 2021; Wilkins-Yel et al. 2023). This creates an especially unique and somewhat daunting experience for women of color within these units (Charleston et al. 2014; McGee and Bentley 2017).

This investigation is an exploration of the intertwined racial and gendered experiences that shape the educational trajectories of Black women within STEM fields. Specifically, this study aims to answer one central question: what are the experiences of Black women within male dominated STEM programs at a predominantly white institution? Additionally, this study aims to interrogate the pivotal role of social capital (i.e. networks, resources, and support systems) in molding the academic experiences of Black women and how they navigate STEM spaces. This study contributes to the broader discourse by shifting focus towards understanding the proactive strategies employed by Black women, highlighting the crucial role of social networks, resources, and support systems in shaping their experiences within STEM education.

Being both Black and female creates a “double bind” which subjects Black women to compounded discrimination and microaggressions (Ireland et al. 2018; Ong et al. 2011).
Microaggressions are subtle, often unintentional, verbal or nonverbal actions or comments that convey discriminatory attitudes towards marginalized groups based on race, gender, sexual orientation, or other identities (Sue et al. 2008). These actions can undermine a person's sense of belonging and perpetuate stereotypes and biases. Furthermore, microaggressions are often racialized and gendered. For instance, Black women may encounter stereotypes that question their competence or suitability for STEM fields, based on both race and gender biases (Erving et al. 2022).

These biases can manifest in various forms, such as assumptions about intellectual inability and microaggressions from peers which can be exacerbated in STEM contexts (Leath and Chavous 2018; McGee and Stovall 2021). Furthermore, institutional barriers and systemic inequalities within STEM education can disproportionately affect Black women (Alfred, Ray, and Johnson 2019; Allen et al. 2022; McGee 2020). They may face challenges in accessing resources, advancing, and gaining recognition in STEM, which can hinder their development and perpetuate cycles of marginalization and exclusion (Anderson 2023; Sanchez et al. 2019).

The double bind of discrimination that Black women encounter in STEM contexts often leads to their departure from their STEM academic programs (Leath and Chavous 2018; Wilkins-Yel et al. 2023). There is a developing body of STEM education research centered around the experiences of Black women in STEM programs. While the current body of literature predominantly focuses on the negative experiences faced by Black women and what contributes to their departure from STEM fields (Allen et al. 2022; Ireland et al. 2018; McGee and Bentley 2017), this study diverges from that trend.
Instead, this study investigates how Black women strategically utilize their social capital to navigate the myriad barriers and challenges within STEM environments. By shifting the focus towards understanding the proactive strategies (i.e., leveraging social networks) employed by Black women, this research seeks to contribute to a more comprehensive understanding of their experiences in STEM disciplines.
LITERATURE REVIEW

Race and Gender Disparities in STEM

STEM fields are essential to innovation, economic growth, and solving global challenges (McGee and Stovall 2021). The demand for professionals within this field is continually growing (McDonald 2016); however, women, especially Black women, have been historically underrepresented within this field (Farinde and Lewis 2012). Although women constitute 47% of the overall labor force, they are disproportionately represented in STEM fields, holding only 24% of these positions. Similarly, while Black women make up 14.1% of the workforce, they account for a mere 2% of those in STEM roles. These statistics highlight significant disparities and underline the urgency of addressing the barriers that limit diversity in STEM professions (Sendze 2022). Despite the increasing the number of women in STEM, Black women continue to face significant barriers to entry and advancement in these fields, leaving them underrepresented within the field of STEM.

Scholars have attributed the underrepresentation of Black women in STEM to their underrepresentation and experiences in STEM education (Farinde and Lewis 2012; Wright, Gunther, and Bitar 2023). Past research has shown that post-secondary education is where many Black women in STEM experience their first lessons of exclusion, self-doubt, and loss of interest in STEM (Alfred et al. 2019). To better understand the scarcity of Black women in STEM professions, we must first explore their experiences in STEM education.
In recent years, Black women have become one of the most educated groups in the United States compared to other demographic groups (Katz 2020). Despite this increase in educational attainment among Black women, substantial racial and gender gaps in post-secondary STEM degree attainment remain (Alfred et al. 2019; Wicker et al. 2023; Wilkins-Yel et al. 2023). For example, Black women only make up 4.2% of biology sciences, 2.6% of computer sciences, 2.8% of physical sciences, 2.3% of math and statistics, and 0.99% of engineering degrees (Ireland et al. 2018).

To address and dismantle the barriers that Black women face when entering and navigating the STEM field, it is essential that we understand the consequences of their underrepresentation in STEM (Alfred et al. 2019; Wicker et al. 2023). The lack of diversity in STEM fields means that the perspectives, experiences, and skills of Black women are not adequately represented in STEM environments such as the workplace and classroom. This can lead to a lack of innovation and missed opportunities for progress in STEM as research has shown that diverse teams produce better outcomes (Beilock 2019; McGee 2020).

The absence of representation can also make it challenging for Black women to envision themselves succeeding in STEM fields which may lead to a lack of confidence or imposter syndrome (Allen et al. 2022; McGee 2020; Tichavakunda 2021; Wilkins-Yel et al. 2023). Imposter syndrome is a psychological pattern where individuals doubt their accomplishments and fear being exposed as frauds, despite evidence of competence and success (Tulshyan and Burey 2021). This can cause Black women to choose other career
paths or drop out of STEM altogether (Alfred et al. 2019; Allen et al. 2022; McGee 2020).

Furthermore, imposter syndrome can often be racialized and gendered, reflecting the unique pressures and biases that individuals from marginalized groups face in environments where they are underrepresented or subject to certain stereotypes (Johnson 2022). For instance, Black women in predominantly white and male-dominated fields, such as STEM, may experience heightened feelings of inadequacy or fear of being regarded as unqualified, despite their qualifications and achievements.

Finally, the lack of representation can perpetuate negative stereotypes and biases, creating a cycle of exclusion for Black women in these fields. Creating a more inclusive and diverse STEM workforce has benefits for everyone. The skills, experiences, and perspectives of Black women are essential for innovation and progress in STEM fields (McGee 2020) By addressing the barriers to entry and advancement faced by Black women in STEM, we can create a more equitable and prosperous future for all.

Experiences of Black Women in STEM
Sirma Bilge and Patricia Hill Collins (2020) provide an expanded definition of intersectionality that encompasses a broader range of social identities beyond gender and race, including class, sexuality, and others. They argue that the multidimensional nature of an individual’s identity, shaped by intersecting social categories, influences how they navigate societal structures and are treated within these structures (Collins and Blige 2020). This more comprehensive understanding of intersectionality allows us to grasp the interlocking ways that multiple systems of power and oppression, stemming from various social identities, shape hierarchical structures and experiences of marginalization.
By utilizing this framework, researchers gain insight into the interconnected ways in which systems of power and oppression operate, particularly within educational trajectories and opportunities in STEM fields. While this project may focus primarily on gender and race, it acknowledges the broader definition of intersectionality put forth by Bilge and Collins, which remains central to understanding the complexities of social inequality.

Focusing on race and gender within the context of intersectionality is crucial for understanding the experiences of Black women in STEM education. While other identities contribute to individuals' experiences in STEM education (Casper, Atadero, and Fuselier 2022; Charlesworth and Banaji 2019; Reggiani, Gagnon, and Lunn 2023; Saw and Agger 2021), the focus on race and gender is essential due to the historical and systemic marginalization faced by Black women in STEM fields. Black women occupy a unique position at the intersection of race and gender, facing distinct forms of discrimination and barriers that may not be adequately captured by examining other identity factors alone or in conjunction with race and gender (Collins 2008; Lewis et al. 2017).

Race and gender have historically been significant determinants of access to education, employment opportunities, and societal privileges (Bécares and Priest 2015). Focusing on race and gender allows researchers to delve into the specific dynamics that shape the experiences of Black women in STEM, providing insights into the systemic and compounded inequities they face.

The experiences of Black women in STEM programs are profoundly influenced by the intricate intersections of race and gender, shaping their treatment within higher
education. Women in STEM fields commonly encounter challenges such as discrimination, sexism, academic bullying, and microaggressions (Borum and Walker 2012; Flores, Bañuelos, and Harris 2023). Black women are often entangled in a particularly challenging "double bind" of discrimination (Ireland et al. 2018; McGee and Bentley 2017). This means that their marginalization and basis for discrimination are not only related to their gender identity but also their racial identity.

For example, in their book *What Works for Women at Work*, Williams and Dempsey (2014) highlights the concept of "prove-it-again" bias, where women of color, including Black women, often encounter heightened scrutiny and skepticism regarding their competence and qualifications compared to their white counterparts. This means that Black women may need to provide more evidence or justification to prove their abilities and qualifications, even when they possess the same credentials as their white peers. This illustrates how the intersection of race and gender creates a distinct experience of discrimination for Black women, wherein they must navigate both racial and gender biases simultaneously.

In STEM education, this "prove-it-again" bias manifests in various ways, as highlighted by Ireland (2018). Black women pursuing STEM fields often confront skepticism and microaggressions questioning their capabilities, despite their qualifications and achievements. This skepticism highlights the intersecting challenges Black women face due to their gender and racial identities within STEM disciplines. Thus, the experiences elucidated by Williams and Dempsey extend to the STEM context, where Black women encounter heightened scrutiny and must continually validate their
competence, which illustrates the compounded effects of race and gender biases in their academic and professional pursuits.

This dual marginalization not only amplifies the barriers and biases faced by Black women but also highlights the unique complexities they navigate within STEM educational environments. Intersectionality-focused scholars have addressed the research question essential to this study by exploring the intricate and interconnected experiences of Black women within STEM contexts (Bécares and Priest 2015; Charlesworth and Banaji 2019; Ireland et al. 2018; Tichavakunda 2021). They highlight the significance of analyzing both race and gender as intersecting identities that intricately shape individuals' positionality and their access to power and resources within these fields.

In STEM education, Black women encounter unique challenges at the intersection of race and gender, leading to systemic biases, stereotypes, and limited opportunities (Ireland et al. 2018; Leath and Chavous 2018). For example, Black women in STEM often encounter stereotypes that undermine their intellectual capabilities and question their suitability for scientific pursuits. These stereotypes stem from deeply entrenched racial and gender biases prevalent in academic and professional settings (Wilkins-Yel et al. 2023).

Additionally, institutional barriers hinder their progress, such as limited access to resources, opportunities for advancement, and recognition for their contributions to STEM fields (Leath and Chavous 2018; McGee and Stovall 2021; Sanchez et al. 2019). This lack of support exacerbates the already marginalized status of Black women within STEM disciplines, perpetuating cycles of exclusion and underrepresentation.
Understanding the nuanced manifestations of systemic biases and stereotypes is crucial for comprehensively analyzing the experiences of Black women in STEM. By delving into these intricacies, this project sheds light on the multifaceted challenges these individuals face and develop targeted interventions to promote inclusivity, diversity, and equity within STEM education and professional spheres. Recognizing and addressing these interconnected forms of discrimination is essential for creating a more inclusive and equitable environment that empowers Black women to thrive in STEM fields.

Social Capital in STEM Contexts

The existing literature on Black women in STEM education tends to emphasize their resilience or lack thereof (Hughes et al. 2024; Leyva 2021; Morton and Nkrumah 2021). Scholars who study the experiences of Black women in STEM education often discuss the tools of resilience that these women use to navigate challenges and obstacles within this field (Ferguson and Martin-Dunlop 2021; McGee and Bentley 2017). However, this discussion of resilience still centers on the negative experiences and discrimination that Black women often face in STEM contexts. This type of thinking takes a deficit approach when exploring the academic journeys of these students which overlooks the broader structural and systemic factors at play.

A deficit approach focuses on identifying and highlighting the perceived deficiencies or deficits of marginalized individuals or communities (Davis and Museus 2023). This often emphasizes their shortcomings or failures within educational contexts. Furthermore, this approach tends to frame the problems faced by marginalized groups as inherent to the individuals or communities themselves, rather than considering broader structural or systemic factors.
Education scholars can reinforce negative stereotypes and contribute to the perpetuation of inequality by ignoring the social, economic, and historical factors that shape the educational outcomes of marginalized students (Mejia et al. 2018). However, by incorporating the concept of racial realism, which recognizes the systemic nature of racism and its pervasive influence on societal structures and individual experiences, scholars can move beyond this deficit-oriented perspective (Bell 1992).

Racial realism acknowledges that the challenges faced by Black women in STEM education cannot be divorced from the racialized dynamics of the broader society and educational institutions (Tichavakunda 2021). Therefore, a critical examination of their experiences should consider the complex interplay between race, gender, and institutional structures, providing a more nuanced understanding of the systemic inequalities that shape their academic journeys.

The anti-deficit approach, on the other hand, challenges deficit-oriented perspectives by emphasizing the strengths, assets, and resilience of marginalized communities (Harper 2010). It acknowledges that individuals and communities facing social and economic marginalization possess valuable cultural capital, knowledge, and resources that are often overlooked or undervalued in traditional educational settings (Edney 2022). This approach seeks to reframe the narrative around marginalized groups by centering their experiences, agency, and cultural strengths, rather than focusing solely on their deficits or shortcomings (Peck 2021; Perez II et al. 2017).

This study and other anti-deficit research aim to uncover and amplify the voices and perspectives of marginalized groups, while also advocating for structural changes and reforms within educational institutions to address systemic inequalities. The way
education scholars have described Black women in STEM programs, and their resilience thus far implies that these women have developed these skills of resilience in the face of marginalization within STEM (Hughes et al. 2024). This fails to acknowledge the social capital and skills that Black women often possess when entering college.

Social capital has traditionally been defined through a Bourdieusian lens which focuses on the accumulation of resources such as networks, relationships, and cultural capital that individuals can leverage to gain an advantage within society (Bourdieu 1986). This perspective emphasizes the inherent inequalities in access to and distribution of social capital, highlighting how individuals from marginalized backgrounds may have limited access to these resources.

This vantage point differs from Lane et al. (2023) and Yosso’s (2005) conceptualization of social capital, which is defined as encompassing a network of individuals, resources, and knowledge utilized by communities of color to navigate institutions and access opportunities within existing power structures (Lane and Id-Deen 2023; Yosso 2005). Unlike Bourdieu’s emphasis on individual accumulation, this perspective emphasizes communal and collective forms of capital, emphasizing the strengths and assets within marginalized communities. Therefore, while traditional perspectives may overlook the social capital and skills already present in Black women when entering college, alternative frameworks like Lane et al. and Yosso’s approach recognize and validate these existing resources.

While many education scholars have relied on Bourdieu’s theoretical framework concerning social capital, it is imperative to recognize its limitations, especially when examining the experiences of Black women in STEM programs (Mishra 2020).
Traditional interpretations of social capital tend to prioritize conventional forms of capital, neglecting non-traditional uses (Lane and Id-Deen 2023). This limited acknowledgment of non-traditional uses perpetuates the notion that traditional avenues hold greater value within institutional settings (Yosso 2005). Critical scholars have expanded the notion of capital, particularly social capital, to encompass non-traditional sources such as community connections, peer relationships, and organizational affiliations. This broader understanding not only enhances our understanding of social capital but also provides a framework for examining its protective function for marginalized groups.

Concerning Black women in STEM education, these scholars would identify and highlight the various forms of collective capital they possess. By reframing the concept of capital to encompass aspirational, linguistic, familial, social, navigational, and tools and assets employed by various groups, Yosso and others advocate for a more holistic understanding of success and advancement within academic and professional spheres (Lane and Id-Deen 2023; Mishra 2020; Yosso 2005).

In the context of STEM education, this means acknowledging and leveraging the multifaceted strengths that Black women bring to the table, ultimately fostering more inclusive and equitable environments where all individuals can thrive and contribute meaningfully. Using an anti-deficit approach, this study examines the impact of social capital on the academic experiences of Black women in STEM. This study highlights the need to further explore how social capital shapes educational journeys in STEM, particularly regarding race and gender intersections.
By investigating the networks, resources, and support systems available to Black women in STEM, this research offers insights into the role of social capital in both facilitating and hindering their success. This study aims to deepen understanding of how social capital, race, and gender intersect in STEM education, informing efforts to promote inclusivity and equity. Ultimately, this study seeks to fill gaps in existing literature and provide actionable recommendations for supporting Black women’s advancement in STEM, focusing on their experiences in male-dominated fields at predominantly white institutions.
METHODS

To examine the experiences of Black women within male-dominated STEM programs at a predominantly white institution, I relied on qualitative methods. Specifically, I employed the method of in-depth interviewing to better understand the nuanced experiences of my participants. In-depth interviews are a highly effective qualitative method that requires researchers to conduct intensive interviews with a pool of respondents (Lareau 2021). From these interviews, researchers can gain detailed insight into the attitudes or perspectives of their respondents (Boyce and Neale 2006; Lareau 2021).

In-depth interviews are often seen as more flexible in comparison to questionnaires in survey research (Knott et al. 2022). In-depth interviews are also iterative, and the continuous nature of these interviews means that questioning can be redesigned throughout a research project (Lareau 2021). Conducting in-depth interviews granted me access to the thoughts, attitudes, and perceptions of Black women and insight into their lived experiences in higher education.

To analyze the data derived from the in-depth interviews, the interviews were transcribed. This provided a detailed record of the participants' voices and perspectives. I employed line-by-line coding strategies to examine each segment of the interview transcripts (Charmaz 2006; Charmaz and Thornberg 2021). This approach enabled me to capture the nuances and intricacies of the participants' narratives. Through this initial
coding process, common codes emerged, reflecting recurring ideas, concepts, and experiences shared by Black women in STEM programs.

Subsequently, these initial codes were systematically organized and further developed into broader themes that encapsulated the essence of Black women's experiences in STEM education. The study revealed two key themes: participants' heightened awareness of their race and gender in STEM contexts coupled with experiences of differential treatment based on these identities and the significant role of community and support in their academic journey. This thematic organization allowed for a comprehensive exploration of the various dimensions of their academic journeys, challenges, and triumphs within the STEM disciplines.

Reflexivity is a critical concept in qualitative research that emphasizes the researcher's awareness of their perspectives, biases, and subjectivity, and how these elements might influence the research process and outcomes (Bourdieu 1990; Krause 2021). I identify as a Black queer woman. This identity is like the identities of the women whom I have included in this study. Since I share similarities with my participants, I must remain cognizant of any biases that I may hold when entering the field and interacting with participants. I am also a student, so I have experienced discrimination within the classroom based on my race and gender. Since I have had negative experiences in an academic setting because of my race and gender, I must refrain from projecting my experiences onto my participants.

My position as a Black student who identifies as a woman gives me a unique vantage point when engaging with this research. My race and gender allow me to delve into this research with a deep understanding of the intersectionality at play. Presently
navigating a predominantly white institution affords me the ability to grasp the nuanced and systemic challenges that Black women face within the academy and society. This enables me to approach this research with sensitivity and authenticity. Because of my positionality, I can connect personally with the women whom I wish to study, further amplify their marginalized voices, and shed light on the nuanced barriers and opportunities that shape their academic experiences in STEM programs.
DATA

To assemble the sample for this study's in-depth interviews, I utilized a combination of non-random sampling methods, including snowball sampling and utilizing campus organization rosters and social media platforms (Darko, Kleib, and Olson 2022; Dever 2018). Snowball sampling involves selected participants referring additional participants to the study (Audemard 2020; Kirchherr and Charles 2018). By employing snowball sampling, participants had the opportunity to recommend others who they believed could provide valuable insights, thus facilitating the recruitment of individuals with diverse perspectives and experiences. Additionally, this method indirectly elucidated the significance of social belonging and connectedness in the experiences of Black women within STEM programs, as participants relied on their social networks for referrals. Furthermore, snowball sampling promoted participant comfort, as individuals were likely recruited by someone they knew and trusted.

In addition to snowball sampling, I leveraged the power of social media platforms and campus organization rosters (Darko et al. 2022; Fazzino et al. 2015). Recognizing the potential reach and accessibility of these tools, I strategically incorporated them into the recruitment process to enhance the diversity and representativeness of the sample. Social media flyers were disseminated across various platforms frequented by university students.

Additionally, campus organization rosters were leveraged to identify and reach out to potential participants within specific academic disciplines or affinity groups,
tailoring recruitment efforts accordingly. This involved targeting groups such as the Black Student Union and minority scholarship groups, aiming to ensure a comprehensive representation of perspectives and experiences within the study. These groups are likely to include individuals who identify as Black women and are pursuing STEM education or careers.

By reaching out to these groups, I aimed to capture a range of perspectives and experiences that are relevant to the research focus on Black women's experiences in STEM fields. Additionally, targeting these groups allows for a more focused recruitment approach, increasing the likelihood of engaging participants who can provide valuable insights into the unique challenges and opportunities faced by Black women in STEM.

This study’s interviews took place from October 2023 to February 2024 on Microsoft Teams. Participants were provided the choice between in-person or virtual interviews, with a clear preference for Microsoft Teams meetings. This preference facilitated remote participation, ensuring a diverse range of perspectives from various locations, thus enriching the study’s breadth. However, despite the logistical advantages and broader inclusivity of virtual interviews, they also introduced challenges such as reduced non-verbal communication, technical disruptions, and possible distractions, which could potentially impact the depth and quality of the collected data.

Students interviewed for this study were students in STEM-related programs at Williamson University. Williamson is a public university located in an urban city within the Bible Belt region. This urban city has experienced significant sociopolitical shifts post-COVID-19 pandemic and amidst the racial reckoning following the tragic death of Breonna Taylor (Goodner 2024). This period has been marked by the introduction of new
diversity, equity, and inclusion (DEI) bills that directly target systems of support that benefit underrepresented students (Duke 2024).

This city, recognized for its diversity, particularly with a substantial refugee (Draut 2023) and LGBTQ+ population (Katayama 2015), provides a rich context for examining the educational experiences of Black women in STEM. These interviewees were all STEM students at Williamson, offering insights into the multifaceted dynamics at play within this educational setting.

I draw from 18 in-depth interviews of Black women in STEM programs at Williamson. Participants were required to possess specific characteristics: they must identify as of African descent (African or African American), be currently enrolled at the university, self-identify as women, and pursue a degree in STEM. All the majors and programs represented by participants in this study are STEM-related disciplines, ranging from Biology to Pharmacology and Toxicology, Bioengineering, Civil Engineering, Neuroscience, and Psychology (Pre-Med/Bachelor of Science) and Nursing. Participants were asked questions surrounding their academic experiences, identity, and interpersonal relationships. A complete list of questions asked to participants can be found in in the Interview Guide in Appendix A.

This diversity in STEM majors and programs among Black women at Williamson University highlights the variation in disciplinary focus both across institutions and within STEM education research. Table One presents each participant (with a pseudonym), including her major, race/ethnicity, and preferred pronouns.
<table>
<thead>
<tr>
<th>Name</th>
<th>Major/Program</th>
<th>Year</th>
<th>Ethnicity</th>
<th>Pronouns</th>
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<td>Graduate Y2</td>
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<td>She/They</td>
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<td>Tasha</td>
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FINDINGS
In exploring the educational experiences of 18 Black women in post-secondary STEM programs, a significant theme emerged: participants' heightened awareness of their race and gender, coupled with their recognition of the differential treatment they receive based on these identities. Additionally, the immense power of community and support in shaping the academic experiences of participants also emerged as a key finding. These themes provide insights into the central aim of this study: understanding the lived experiences of Black women in STEM programs, particularly at predominantly white institutions.

Navigating Predominantly White Spaces and the Centrality of Race and Gender: “I have only met one Black woman in STEM academia, one. There's a reason.”

Salience of Race and Gender
Among these participants, there was an overwhelming self-awareness of race and gender. Black students are often hyperaware of their race in academic settings; however, due to racial realism, the idea that racism is an integral and permanent component of our society, Black students focus on navigating this within the institution rather centering their marginalization (Bell 1992; Tichavakunda 2021). Sixteen participants were able to recognize the prevalence of inequities in educational spaces and speak to the salience of their racial, ethnic, and gendered identities.

When asked about the centrality of their race and gender, participants responded in varying ways. Tanae, a senior Psychology Pre-Med student, highlighted the inseparability of race from her identity and the pervasive influence of societal
perceptions. She reflected, "Like there's no way I can separate being black from my identity...That's just how people perceive me. It's how I perceive myself. It's like I can't take that away." Tanae's perspective highlights the overarching impact of race on Black women's self-perception and interactions within society.

In reflecting on her own identities, Junior Biology major, Alexis echoed Tanae's sentiments, emphasizing the pervasive influence of race on societal perceptions and opportunities. Alexis stated,

And there are different like opportunities that you get or don't get, treatment that you get or don't get because of your race. And I think the first thing a person is gonna see is like you're race and that you're Black.

Here, Alexis is very aware of her race and how it affects her place within society.

Alexis's awareness highlights the significant role of race in shaping Black women's experiences and interactions within society, echoing Tanae's perspective on the inseparability of race from identity. She goes on to say that while her gender is central to who she is, it may matter less than her race. She stated, “I feel like my race definitely like, overshadows my gender.”

In this observation, Alexis recognizes the overriding influence of her race compared to her gender in defining her societal position. She suggests that while her gender remains integral to her identity, it takes a backseat to her race in shaping how she navigates societal structures. This insight emphasizes the principles of intersectionality, highlighting the complex interplay between various aspects of identity and privilege in shaping individuals' lived experiences.

A similar sentiment is shared by Mia, a senior Nursing student. She mentioned, “being black is very pivotal to my identity just because it’s first thing people see when
they meet me, and it defines how I'm able to move through the world.” Both Alexis and Mia's reflections shed light on the impact of race on their lived experiences, which highlights the overarching influence it holds in shaping their identities and interactions within society. Their insights emphasize the complexities of intersectionality, illustrating how the convergence of race and gender dynamics intricately shapes individuals' perceptions of self and their positioning within societal structures.

As a freshman nursing major, Rudy's perspective sheds light on the heightened visibility and scrutiny faced by Black women in both professional and academic environments. She emphasizes,

I feel like black women always have eyes on them. And so, you always want to strive to, like, be the best and do your best, cause people are always looking at you to mess up, you know.

This sentiment resonates with Mia and Alexis's reflections, illustrating the pervasive impact of racial dynamics on Black women's experiences.

In Rudy's context of nursing, where white women are the dominate demographic, the pressure to excel and assert one's capabilities amidst racial minority status is particularly pronounced. Her narrative emphasizes the intersectional challenges faced by Black women, navigating both racial and gender biases while striving to establish their competence and presence in predominantly white spaces.

**Double Bind of Discrimination**

Eight participants recounted instances of firsthand discrimination or prejudice. Participants revealed how societal perceptions and systemic biases intersect to create unique barriers to success. These firsthand experiences shed light on the nuanced forms of discrimination faced by Black women, highlighting the need for deeper examination and advocacy within STEM disciplines. Alexis reflected on the societal perceptions that
shape individuals' experiences, emphasizing the significant impact of external perceptions on navigating through life. She articulated, "What it really comes down to is how society perceives you cause that's how you'll like, navigate life because people will treat you differently because of this."

Black women often express the feeling of having to exert significantly more effort to gain recognition and respect in professional and academic environments due to the discrimination they face based on their race and gender (Allen et al. 2022; Leath and Chavous 2018). Sara, a second-year Physiology graduate student, stated “I do feel like I have to work 10 times harder to be seen and still be look as a respected colleague.” Sara's sentiment echoes the sentiment shared by Alexis, illustrating the pervasive societal expectations and biases that dictate the experiences of Black women in STEM. Both Sara and Alexis express the need to surpass conventional standards and work diligently to gain recognition and respect, highlighting the additional hurdles faced by Black women in navigating professional and academic spaces.

When asked about the impact of her identities on her academic experience, Tanae stated, “It's not like blatant, but you can just tell that it's an issue or like, makes you uncomfortable” She is describing how she feels in academic settings due to her race. Many of the instances of discrimination that negatively affect Black women in STEM contexts are covert, meaning they often are subtle which can take a psychological toll on these women (McGee and Bentley 2017).

Most participants could recount a specific moment when they realized that they received differential treatment from their peers which then in turn impacted the way they interacted with their peers and instructors. Tanae expressed feeling overlooked by
professors, along with her peers who share similar identities, often being passed over in favor of students from majority groups. Additionally, she described the discomfort of being singled out when topics related to race or issues affecting Black women are discussed in class, illustrating the subtle yet impactful ways in which discrimination manifests in educational environments. Tanae’s experiences shed light on the challenges faced by Black women in academic spaces.

Three participants reported accounts of academic bullying and mistreatment within STEM spaces. Shania, a senior Biology major, reflects on an experience she had with her professor when she went to him for additional help after struggling with the content of the assigned reading. The professor said, “What did you not learn how to read to be successful in this in school? I don't see how you got here if you don’t know how to read.” Shania was visibly offended by how this professor treated her. She said it “left her feeling crappy” and that she was already being hard on herself for not doing well in the class.

This encounter with her professor left Shania discouraged and made her have doubts about taking the class: “Okay, so at that point I forgot the class I was like obviously this is not for me” While not every respondent discussed encountering such challenges, there was a collective awareness of the distinct academic hurdles faced by Black women in these contexts. The account of Shania exemplifies the impact of microaggressions and insensitive remarks from instructors. Shania's encounter with her professor, who questioned her ability to read, not only left her feeling offended but also contributed to her self-doubt and discouragement in pursuing the class further.
Her encounter demonstrates how such incidents can contribute to self-doubt and discouragement among Black women pursuing STEM degrees. Similarly, Cydney’s, a Pharmacology and Toxicology Doctoral student, account further illustrates the prevalence of academic bullying and mistreatment, particularly targeting BIPOC women. Cydney experienced an extreme case of academic bullying as she later had to be placed in another lab after an infraction with an instructor. Cydney explained that BIPOC women do not stay in STEM academia because they are bullied out of it. Furthermore, she was “bullied” out of her lab after speaking up against the mistreatment that took place in her research lab.

I got chastised like I was just dismissed from the lab. They didn't bring it to the higher ups. they kept in the department. Dude has his job still. He's still taking students and things like that. Didn't even get more than a slap on the wrist, but I had to switch labs. I had to switch projects. I was the one that got the brunt off that.

Cydney found herself in distress due to the frequent encounters with her instructor, which triggered panic attacks because of the daily microaggressions. This led her to seek prescription medication for anxiety. Contemplating whether to continue pursuing a Doctoral degree or to stop after obtaining her master’s degree became a regular thought for her. She mentioned, “I can't do this for the rest of my PhD, like there were times when I was thinking about like, should I just quit like after my master’s, like it got really bad.”

When asked about her closing thoughts, Cydney expressed her gratitude for women in STEM; however, she was aware that Black women are often underrepresented in STEM education. She stated,

There are black women in STEM, and I'm thankful for them. My mom's a black woman in STEM, but I have only met one black woman in academia, one. There’s a reason.
Cydney’s experience sheds light on the pervasive issue of academic bullying within STEM academia, particularly affecting Black women. Her account emphasizes how instances of mistreatment and microaggressions from instructors can significantly impact the academic journey of students. Despite enduring distressing encounters and experiencing panic attacks triggered by daily microaggressions, Cydney’s resilience was tested as she grappled with the decision of whether to continue her doctoral degree. The toll on her mental health was evident, as she found herself contemplating quitting after obtaining her master’s degree. Moreover, Cydney’s acknowledgment of the underrepresentation of Black women in STEM academia highlights the broader structural barriers that contribute to their marginalization.

While expressing gratitude for the few Black women in STEM, she recognizes the stark reality of their scarcity within academic spaces. The narratives shared by participants in this study shed light on the multifaceted challenges faced by Black women within male-dominated STEM majors and programs. These experiences reveal a harsh reality where discrimination, microaggressions, and academic bullying are distressingly common occurrences.

**Power of Community, Support, and Belonging:** “Not everyone is gonna be praying on your upward success, but it's important to be around the people who are doing that.”

Although respondents discussed many of the negative experiences they had in these STEM spaces, participants also spoke of the transformative power of social and institutional forms of support. The main forms of support that arose amongst these interviews were staff and faculty support, mentor support, and peer support. The presence
or the absence of all three of these types of support can make or break the academic experiences of Black women pursuing STEM degrees (Mishra 2020; Wicker et al. 2023).

When asked about additional forms of support, Faith, a sophomore Biology major stated, “if you don't have this support system, it makes being in a STEM program like 10 times more difficult.” Faith's testimony highlights the critical nature of these support systems, emphasizing their indispensable contribution to the success and resilience of Black women pursuing STEM degrees.

**Staff and Faculty Support**

Participants proudly identified members of university faculty and staff who have been instrumental in their success while at Williamson University. These members of Williamson’s faculty and staff served a pivotal role in their academic journey. When Faith was asked about significant support systems, she named a Cultural Center staff member.

She’s one of the advisors for Porters in medicine. I meet with her probably like every semester now. So, it's funny because she knows who I am. And I'm like, man, you actually know who I am. She's a good encourager. Oh, and she's good at finding information that you would need. Uh, especially with the competitiveness or PhD MD program, she's very helpful in that regard.

Participants often highlighted the crucial support they received from Williamson University's faculty and staff, acknowledging their pivotal role in their academic journeys. Faith specifically mentioned a Cultural Center staff member who provided consistent encouragement and valuable assistance, particularly in navigating the competitive landscape of post-baccalaureate programs. These relationships participants have established with university faculty and staff highlight the importance of support.
systems within academic institutions, fostering a sense of belonging and empowerment among students.

Tessa, a senior exercise science major, stated that one of her professors is one of her biggest influences within the field of exercise science. She also explained that even though this professor teaches some of the most difficult courses in the major, she took the time to breakdown the content so Tessa can better understand the information. She concluded this account by stating,

She just was so caring and always has led me to other paths. She would send me to research studies because I would tell her what I wanna do and she, whenever she thought of me, she would send me an email like, hey, there's this opportunity. In the quote, Tessa describes how her professor not only provided academic support by breaking down difficult course material but also demonstrated care and mentorship by guiding her towards additional opportunities.

When Tessa expressed her interests and goals, her professor actively sought out research studies or other relevant opportunities and shared them with her via email. This proactive approach shows the professor's investment in Tessa's academic and professional development. This fosters a supportive relationship that extends beyond the classroom which can be pivotal to success of Black women in STEM programs.

Sara also shared a parallel experience as she reflected on her advisors in the Physiology department. She stated, “They speak life into my goals and knowing what my goals are and knowing that I can reach that next level because they see the effort I put in and the passion that I have.” Sara's testimony further highlights the significance of
faculty support, as she describes how faculty members uplift her aspirations and recognize her dedication and passion, ultimately contributing to her academic success.

These quotes highlight the importance of staff and faculty support in nurturing the academic success of Black women pursuing STEM degrees. Personalized guidance, encouragement, and access to valuable resources from supportive staff and faculty members significantly contribute to their sense of belonging and achievement in their academic pursuits.

In addition to institutional support from various faculty and staff, participants mentioned how mentor support emerged as a crucial factor in their academic success. This support provided guidance and resources to participants as they navigated challenges in their academic setting. Several participants mentioned the role their mentors played in their academic success. Faith reflects on her relationships with her mentors:

They've definitely been helpful, and I've built a relationship with them, and I think it was easier because they've been dealing with marginalized communities like they're the ones that fund grants for underprivileged communities and different things like that.

In this quote, Faith emphasizes the importance of her mentors in providing valuable guidance and support throughout her academic journey. She highlights the significance of her mentors' experience and expertise in working with marginalized communities. This suggests that Faith's mentors possess a deep understanding of the challenges faced by individuals from marginalized backgrounds, making them particularly effective in offering support tailored to Faith's needs. Faith experienced a meaningful and supportive
mentorship relationship, as she felt understood and supported in navigating her own academic journey.

Although mentors were useful, not all participants had access to them. Jackie, a senior Bioengineering major, requested that if anything came from this study, it should be a mentoring program where Black students are paired with a Black faculty member. Throughout her interview, Jackie expressed that she missed out on several opportunities to make social connections during her time at Williamson University. Due to her co-op schedule, she was often unable to join campus organizations.

She states, “I know other professors who are Black, but they’re just not in my field. I would have to go out of my way to find those and I would have needed them freshman year and it was too hard to do that.” Although Jackie did not have a faculty mentor herself, she still understood the importance of this relationship and how it could have changed the trajectory of time at Williamson University. Her reflection also highlights the critical need for mentorship initiatives to support Black students in STEM programs.

Informal Means of Support

Peer support emerges as a cornerstone of success and perseverance for participants in STEM programs. This form of support was a fundamental component of participants’ success and ability to persist within their STEM major. When asked about her relationship with her peers, Natalie, a sophomore Nursing major, states, “I have imposter syndrome and like things like that, as anyone would. But I have a really good support system like and my friends and family and stuff like that.” Natalie suggests that
oftentimes, students are more likely to withstand academic challenges when they have a strong sense of peer support.

Natalie's acknowledgment of her imposter syndrome brings light to the common challenges students face, highlighting the importance of a strong support system comprising friends and family. This sentiment is also shared by Janae, a freshman Biology Pre-Medical student, who explained the role her group of friends had on her academic career thus far:

There's a lot of diversity within my friend group, but we all have goals that we intend to achieve, so I would definitely say having a community of people who look like me and people who are like minded in terms of their goals in terms of what they want to pursue, I think that's been extremely beneficial and I would definitely say it's a blessing to have.

When students have a group of peers who resemble them and who they share commonalities with, they are more likely to stay motivated and committed to finishing their degree (Mishra 2020).

Marginalized students often have to go out of their way to find these groups of resemblance which can be seen in this quote from Tanae:

I feel like all my friends are black, but we had to create that space for ourselves. Like we're in a space of all white faces and we're like, hmm, the only other black girl in the room. I should probably talk to her.

This sentiment is echoed by Nadia, a freshman civil engineering major, who emphasizes the crucial role of peer support in bolstering students' ability to overcome challenges and persist in their academic pursuits. Nadia expressed gratitude for having friends who share her racial and academic background, noting that their shared experiences and insights
provided her with a sense of belonging and understanding, ultimately contributing to her confidence and resilience in navigating her STEM major.

In navigating the challenges of academia, Rudy expressed the importance of having a supportive network of peers, stating, “we bond off that because we're all working so hard with one of us stressed out. It's OK because we know we're all stressed out and we're all trying to get together.” Having a network of peers who understand and uplift each other fosters motivation and determination to overcome obstacles. When concluding her discussion on peer support, Janae stated, “Not everyone is gonna be praying on your upward success, but it's important to be around the people who are doing that.” Janae's reflection on surrounding oneself with individuals who support and encourage personal growth encapsulates the invaluable role of peer support in navigating the rigors of academia.

STEM majors and programs can be academically challenging and demanding. Having a strong community of peers who share similar experiences and challenges can provide an immense amount of support. This helps Black women in STEM manage stress, anxiety, and imposter syndrome, which are highly common in these high-pressure academic environments. Feeling a sense of belonging is crucial for their overall well-being and academic success. For Black women in STEM, who often find themselves in the minority, fostering a sense of belonging can be a powerful motivator. It assures them that they are not alone and that their presence is valued.
DISCUSSION
The findings from this study on the educational experiences of 18 Black women in post-secondary STEM programs provide valuable insights into the nuanced challenges and sources of support encountered by this student demographic. The themes of heightened awareness of race and gender, coupled with the recognition of differential treatment, as well as the immense power of community and support, offer significant implications for understanding the lived experiences of Black women in STEM programs, particularly at predominantly white institutions.

This study's exploration of the heightened awareness of race and gender among participants highlights the pervasive influence of societal perceptions and systemic biases on Black women's academic experiences. Participants demonstrated self-awareness of their racial and gendered identities, acknowledging the differential treatment they receive based on these intersecting identities. This aligns with existing literature on racial realism, which emphasizes the integral role of race in shaping individuals' perceptions of self and interactions within society (Bell 1992; Ireland et al. 2018; Tichavakunda 2021).

The narratives shared by participants, such as Tanae's reflection on the inseparability of race from identity, highlight the profound impact of societal perceptions on Black women's lived experiences. Additionally, Alexis and Mia's recognition of the overriding influence of race compared to gender further emphasizes the complexities of intersectionality and its implications for Black women in STEM. Moreover, this study illuminates the covert nature of discrimination faced by Black women in STEM contexts,
with participants recounting instances of firsthand discrimination, microaggressions, and academic bullying.

Rudy's and Sara's experiences also exemplify the persistent challenges and barriers encountered by Black women in navigating predominantly white academic spaces. Despite their notable achievements and contributions, they confront skepticism and scrutiny that necessitates them to continuously validate their competence and worth. In Rudy's narrative, her need to navigate predominantly white academic spaces while being hyperaware of her racial identity reflects the inherent challenges faced by Black women. Despite her qualifications and efforts, Rudy still finds herself needing to prove her capabilities repeatedly, mirroring the burden imposed by “prove-it-again” bias, where women of color, including Black women, often encounter heightened scrutiny and skepticism regarding their competence and qualifications compared to their white counterparts (Williams and Dempsey 2014).

Similarly, Sara's account brings attention to the pervasive nature of skepticism and scrutiny directed toward Black women in STEM fields. Despite her diligence and passion for her work, Sara encounters skepticism and doubts regarding her abilities, requiring her to constantly reaffirm her competence. These experiences highlight how prove-it-again bias (Williams and Dempsey 2014) operates as a systemic barrier that perpetuates inequality and undermines the achievements of Black women.

These experiences highlight the persistent challenges and barriers encountered by Black women in navigating predominantly white academic spaces (Borum and Walker 2012; Flores et al. 2023). The narratives of Shania and Cydney exemplify the detrimental
impact of systemic biases and mistreatment on Black women's academic trajectories, emphasizing the need for deeper examination and advocacy within STEM disciplines.

In contrast to the pervasive challenges highlighted by participants, this study also highlights the transformative power of community and support in shaping the academic experiences of Black women in STEM (Mishra 2020; Sanchez et al. 2019; Wicker et al. 2023). Participants identified various forms of support, including staff and faculty support, mentorship, and peer support, as essential components of their success and resilience within STEM programs.

The accounts of participants such as Faith, Tessa, and Sara illustrate the instrumental role of staff and faculty members in providing personalized guidance, encouragement, and access to resources. These supportive relationships fostered a sense of belonging and empowerment among participants, contributing to their academic success and persistence in STEM programs. Additionally, participants emphasized the importance of mentorship in navigating academic challenges and accessing opportunities for professional growth. While not all participants had access to formal mentorship programs, their reflections underscored the critical need for mentorship initiatives tailored to the needs of Black students in STEM.

Furthermore, this study highlights the significance of peer support as a cornerstone of success and perseverance for Black women in STEM. Participants consistently emphasized the importance of having a supportive network of peers who share similar experiences and challenges, providing essential elements of motivation, understanding, and solidarity. The narratives of participants such as Natalie, Janae, and Rudy vividly illustrate the pivotal role of peer support in managing stress, anxiety, and
imposter syndrome, while simultaneously fostering a profound sense of belonging and community within STEM programs.

These findings contribute significantly to theoretical understandings of race, gender, and social capital in STEM education. By elucidating the intersecting dynamics of race and gender and their profound implications for the experiences of Black women in STEM, this study enriches theoretical frameworks aimed at addressing inequality and promoting diversity within STEM disciplines. Moreover, this study highlights the importance of community and support mechanisms in fostering academic success and resilience among Black women in STEM.

In contrast to traditional explanations of social capital, such as those proposed by Bourdieu (1986), which often emphasize formal, institutionalized networks of power and prestige, this study draws upon Yosso's (2005) concept of community cultural wealth. Yosso shifts the focus towards community-based, informal networks that are deeply rooted in cultural and interpersonal relationships. These relationships are primarily concerned with fostering a sense of belonging and resilience among marginalized groups (Yosso 2005). This perspective is particularly relevant for understanding how Black women in STEM leverage various forms of social capital to navigate systemic barriers and achieve academic success.

These findings support Yosso's framework over Bourdieu's by highlighting how the social capital utilized by Black women in STEM often stems from more informal, culturally enriched community ties rather than the traditional, hierarchical networks that Bourdieu describes. These community networks not only provide support and resources but also reinforce personal and group identity, enhancing a collective commitment to
mutual success. This study challenges deficit-based narratives and underscores the unique strengths and resources that Black women bring to STEM education through their community-centric forms of social capital.

Ultimately, this study emphasizes the need for targeted interventions and support mechanisms within educational institutions to cultivate inclusive environments that empower Black women to thrive academically and contribute meaningfully. It has also emphasized the importance of implementing initiatives to address the unique needs of Black women in STEM, including mentorship programs, diversity training for faculty and staff, and the creation of supportive peer networks. By centering the experiences and voices of Black women in STEM, institutions can foster more inclusive and empowering environments that enable Black women to thrive and excel in their academic pursuits. Moreover, this study calls attention to the need for institutional changes to address systemic biases and promote equity and inclusion within STEM disciplines.

One limitation of this study is the relatively small sample size of students from a single university, which may limit the generalizability of the findings to other contexts. While the experiences shared by participants offer valuable insights into the challenges faced by Black women in STEM at this particular institution, they may not fully capture the diversity of experiences across different predominantly white institutions and geographic regions.

Therefore, future research should aim to include larger and more diverse samples from multiple predominantly white institutions across the country to provide a more comprehensive understanding of the experiences of Black women in STEM. By examining a broader range of institutional contexts, researchers can identify common
patterns and unique challenges that may exist within different educational settings, thus informing the development of more targeted interventions and support mechanisms to address the needs of Black women pursuing STEM degrees.

Another limitation of this study is found in the methodological approach to sampling. While snowball sampling can yield a robust sample, it is not without limitations. One notable limitation is the researcher's limited control over the sample composition, potentially compromising its representativeness. In this study, there was a possibility of several participants belonging to the same academic unit or major, which could skew the sample.

Additionally, sampling bias may arise as participants recruited through snowball sampling may share similar values or traits, leading to the formation of sub-groups within the sample (Kirchherr and Charles 2018). Despite efforts to diversify recruitment methods, there may still be a bias towards individuals who are more willing or able to participate in interviews. This could result in a skewed representation of the experiences within the target population. Future research can address this limitation by employing a mixed-methods approach that combines qualitative interviews with quantitative surveys or other data collection methods. By triangulating data from multiple sources, researchers can mitigate the potential bias towards individuals more willing or able to participate in interviews.
CONCLUSION

In conclusion, this study contributes to our understanding of key concepts and theories related to the experiences of Black women in STEM, offering valuable insights surrounding the salience of race and gender and the power of community and support that can inform interventions and initiatives aimed at promoting greater equity and inclusion within STEM education and employment sectors. By addressing the intersectional challenges faced by Black women, we can work towards creating more supportive and inclusive STEM environments where all individuals can thrive and contribute to scientific innovation and discovery.

The findings of this study have significant implications for both practice and future research in STEM education. Institutions must prioritize the creation of inclusive and supportive environments that address the intersecting challenges faced by Black women. These findings suggest that efforts to enhance diversity and representation among faculty and staff and targeted support services are essential steps in promoting the retention and success of Black women in STEM education. Additionally, future research should continue to explore the nuanced experiences of Black women in STEM, including the role of intersectionality, social capital, and institutional support in shaping their academic trajectories.

This study highlights the complex interplay of race, gender, and discrimination in shaping the educational experiences of Black women in STEM. By amplifying their voices and experiences, this research contributes to a more nuanced understanding of the
barriers and opportunities encountered by Black women within STEM academia,
informing efforts to create more equitable and inclusive STEM environments.
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APENDIX A: INTERVIEW GUIDE

All responses to questions asked in this interview will be kept confidential. Your interview responses will only be shared with this study’s research team. Any information that is included in this study’s report will not identify you as the respondent as we will use pseudonyms to protect the confidentiality of yourself and other respondents. Remember, you do not have to talk about anything you do not want to, and you may end the interview at any time. Are there any questions about what I have just explained?

**Academic**
1. What is your major? Academic
2. What led you to choose your major?
   a. Now that you are a [STEM MAJOR] major, how do you feel about your decision?
3. Can you describe an experience or moment that has shaped your academic experience?
4. What are some challenges that you have encountered within your program, if any?
   a. What strategies did you use to overcome those challenges?
5. Can you describe your short- and long-term academic goals?
   a. Have they changed since you began your undergraduate career?

**Individual**
6. How would you describe yourself as a student?
7. In your own words, please explain what identity means to you?
8. Do you feel that your racial identity is central to who you are?
   a. Why or why not?
9. Do you feel that your gender identity is central to who you are?
   a. Why or why not?
10. How has your identity impacted your academic experience, if at all?
11. In your experience, have you encountered any biases or stereotypes related to your race or gender within your major?
    a. If so, how have these experiences impacted your academic progress and overall experience at the university?

**Interpersonal**
12. How would you describe your involvement on campus? (ex: RSOs, cocurricular activities, etc.)
13. How would you describe your relationship with your peers within your major?
14. How would you describe your relationship with your peers outside your major?
15. Are there any specific support systems, resources, or communities that have played a significant role in your academic success?
   a. If so, have these support systems contributed to your sense of belonging within your major?

Are there any stories or experiences that you feel are important to share regarding this topic.
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Education

Master of Arts  University of Louisville, Sociology 2024

Master’s Thesis: Unveiling Pathways: A Qualitative Inquiry into the Intersectionality of Race, Gender, and Social Networks in STEM Education

Member: Alpha Kappa Delta Honor Society and Sociology Graduate Student Association


Bachelor of Arts  University of Louisville, Sociology 2021

Recipient: Dean’s List; Woodford Porter Scholarship; William J. Kircher Scholarship

Member: Delta Sigma Theta Sorority, Incorporated, Engage Lead Serve Board, National Association of Black Journalists, Black Student Union, Society of Woodford Porter Scholars, Saving Our Students Campus Ministry

Courses: Race, Gender, and Human Studies; Caribbean Studies, Abnormal Psychology, Family Relationships, Public Speaking, Microeconomics, African Americans in the Media, Comparative Humanities, African American Literature, Black Lesbian Lives, Black Feminism in Action, Research Methods, Sociology of Gender, Social Theory, Sociology of Health and Illness, Human Sexuality, Immigrants and Identity, Gender and Work, Sociology of Education, Spanish, Social Work

Academic Occupational Experience

Community Engagement Specialist | University of Louisville Arts and Sciences | April 2024

- Acted as a liaison for the Arts & Sciences (A&S) Community Engagement Advisory Council, playing a key role in the development and implementation of the A&S Community Engagement Strategic Plan.
o Spearheaded local educational activities including the Yearlings Club Forums and Saturday Academy, enhancing community knowledge and engagement.

o Managed partnerships and coordinated projects such as the JCPS Professional Development Workshops, fostering educational growth and collaborative opportunities among educators.

o Successfully secured funding for community-engaged scholarship projects through meticulous grant writing and robust fundraising strategies, thereby supporting sustainable community initiatives and academic collaborations.

o Oversaw a diverse team of volunteers, staff, and external vendors, ensuring effective teamwork and program delivery that met all planned goals and community needs

Department Coordinator | University of Louisville Arts and Sciences Advising | June 2023-24

o Developed and implemented systems for the A&S Advising office, ensuring efficient operations and improved service delivery.

o Successfully managed the front desk and provided leadership to a team of 10 federal work-study student workers, fostering a positive work environment and enhancing productivity.

o Led outreach efforts, marketing campaigns, and communication strategies for the Advising office, effectively engaging with students, faculty, and community partners.

Research Experience
University of Louisville

Community Listening Sessions; Youth Responses to Racial Inequalities 2021

o Created the presentation for the Cooperative Consortium for Transdisciplinary Social Justice Research Spring Showcase

o Assisted with data collection planning and organization

University of Louisville

Unveiling Pathways: A Qualitative Inquiry into the Intersectionality of Race, Gender, and Social Networks in STEM Education

o Master’s Thesis chaired by Dr. Jasmine Whiteside and Dr. Karen Christopher

Leadership Experience
Delta Sigma Theta Sorority, Incorporated

o Collegiate Connection Chair

o Facilitated the connection and communication between Collegiate and Alumnae chapters of the Sorority

Sociology Graduate Student Association

o Secretary 2022-2024

o Vice President 2024-Present

Awards and Honors
University of Louisville | Arts and Sciences | Outstanding Staff Performance Award

Research Interests
Black women in STEM education, race, gender, human sexuality, higher education, Black girlhood, Black joy