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ARTICLE

Perspectives on Career Advancement Among African American Women Leaders in STEM: A Single Case Study

Malika Buchanon
Walden University

Blair Presley Bone
University of Tennessee, Knoxville

Kenneth Levitt
Frostburg State University

Teresa Lao
Walden University

The purpose of this qualitative, single-case study with embedded units was to explore the opportunities and challenges African American women faced while having successfully ascended the corporate ladder in STEM fields. Qualitative data from six semi-structured interviews, reflective journaling, and archival data on career trajectories and labor statistics of African American women in the STEM industry were collected and triangulated to answer the central research question. This study was grounded in theories that included two key concepts: (a) Bourdieu's (1977a) concept of social capital and (b) Collins' (2015) concept of intersectionality. Three identified themes were revealed from the thematic analysis of data: (a) the importance of mentorship, (b) the sense of self or belonging, and (c) success strategies: overcoming the barriers. This study's results indicate that African American women in STEM fields successfully overcame obstacles to break the discriminatory barriers they faced while progressing toward diversity and inclusion goals that afforded them leadership opportunities. This study may drive positive social change by highlighting the benefits of diversity and inclusion and equal opportunities that promote and support the value of processes to advance African American women to executive-level positions.

The persistent underrepresentation of African American women in science, technology, engineering, and mathematics (STEM) professions (Fatourou et al., 2019) is, in part, a reflection of the compounded disadvantages attributed to the intersectionality of their race and gender (Kachchaf, 2015; Williams, 2016). According to the National Science Foundation (2023), African American workers represent 8% of STEM careers compared to 11% of the total workforce, which stands in contrast to White and Asian workers who overindex in STEM careers compared to the total workforce. Similarly, men nearly double women in their participation in STEM careers. This disparity continues despite significant research that supports the positive correlation between diverse organizations and organizational performance (Gross-Gołacka, 2022) and innovation (Alshemmari et al., 2024; Ozgen, 2017). While there is a variety of research on the comparatively thin pipeline of women choosing STEM education (Gorman, 2010; Tandrayen-Ragoobur & Gokulsing, 2022) and the complexities that women face in STEM careers (Kahn & Ginther, 2022), the intersectional experiences of African American women, in particular, is worthy of continued inquiry. This study aims to broaden the awareness of the challenges, opportunities, and unique experiences of African American women in STEM careers as it relates to career advancements.

The National Science Board (2018) cited that women account for only 28% of all STEM employees. Despite the presence of women in STEM leadership positions and recent increase of women earning STEM degrees, women still only represent less than one-third of the STEM jobs. Women struggle to ascend the corporate ladder. Given the demographics, additional insight into how African American women experience career advancement in STEM careers is necessary. This study aimed to increase awareness of the potential for integrating and promoting African American women in STEM fields and captured the attention of such barriers to career development and advancement (Vuong et al., 2021), which may create a dynamic of positive social change (Smith et al., 2019).

Extant research provides a precedence for academic inquiry relative to diversity and inclusion practice within the African American women in STEM careers population. Three articles published by Aydin & Rahman (2017), Dinesen et al. (2020), and Holmegaard (2015) addressed the essentials of understanding diversity and inclusion problems and opportunities. The researchers also focused on the importance of diversity and inclusion and how advocating for the progression of African American women in STEM early in life can encourage positive

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influences and promotion in STEM fields. Haddon et al. (2015) noted that to gain a better understanding of what employees want from organizations, continuous communication between all parties – leadership and its employees – must take place to understand the importance of advocating for opportunities for leadership for African American women in STEM and effective decision-making, which can influence resources to build the organization's brand (Urbancová et al., 2016).

Advances for African American women in STEM leadership may provide various workforce benefits, with means of improving organizational competitiveness through new ideas and innovations, which also may lead to a balanced workforce in STEM fields (DeAro et al., 2019) and result in positive social change (Alfred et al., 2019). According to Amunga and Musasia (2021), African American women in STEM fields play a vital role in sustainable development and advancement. There is a need to promote gender and racial equality by opening career opportunities to African American women as change agents in STEM organizations. Effective change management is needed, as African American women in STEM fields may provide opportunities that unlock the potential of economies for growth and can improve integration between stakeholders within STEM organizations (Kansake et al., 2021).

Career advancement opportunities for African American women in STEM are often limited by barriers, best explained by the glass and concrete ceiling metaphors, sticky floor concept, labyrinth, and/or social capital theory. The social problem explored in this study was related to how African American women experienced multiple forms of career suppression in STEM professions, as research suggests that African American women face compounded effects when compared to White women or men of color (McGee, 2018; Wilkins-Yel et al., 2022). African American women represent only 2.5% of the STEM workforce, and that number sharply declines when referring to the more mathematically based fields, such as physics, chemistry, engineering, and math (National Science Foundation, 2019). The workplace environment and structures in STEM continue to restrict professional opportunities for women and students of color, resulting in diminished achievement, low satisfaction, and high attrition rates for African American women in the STEM fields (Seymour et al., 2019).

The purpose of this qualitative, single-case study with embedded units was to explore the opportunities and challenges African American women faced while having successfully ascended the corporate ladder in STEM fields. A single case study with an embedded unit design (see Yin, 2018) was used. Six semi-structured, online interviews were conducted with African American women in the United States with successful STEM careers to gather data to meet the study's purpose. A thematic analysis guided by Yin's (2018) pattern-matching logic sequence was used as a data analysis tool, and data were triangulated with reflective journal notes and archival data on career trajectories and labor statistics of African American women in the STEM industry to support the trustworthiness of the study results and make recommendations for future practice and research (Farquhar et al., 2020; Halkias et al., 2022).

This study was guided by a singular research question: what are the opportunities and challenges African American women faced while successfully ascending the corporate ladder in STEM fields? Understanding the perspectives of the participants as a proxy for African American women in STEM careers may allow future researchers to build subsequent quantitative research agenda to stimulate productive solutions. Additionally, the qualitative nature of this study, driven by the research question, allowed for a rich, contextual commentary for consumers of this study. By exploring the opportunities and challenges African American women faced while successfully ascending the corporate ladder in STEM fields, this study also supports the importance of diversity and inclusion in the workplace and the representation of African American women in executive leadership positions in STEM fields.

Literature Review

The theories and concepts that grounded this study included two key concepts that focus on aligning with the purpose of the study to explore the opportunities and challenges African American women faced while having successfully ascended the corporate ladder in STEM fields: (a) intersectionality (Collins, 2015; Crenshaw, 1991), and (b) Bourdieu's (1977a) concept of social capital. This empirical investigation aimed to advance research and address a literature gap on the experiences of those African American women who successfully ascended the corporate ladder in STEM. While extant research provides insights on the challenges of African American women, agnostic of industry or domain (Khosrovani & Ward, 2011; Sales et al., 2020), few studies specifically explore the presenting opportunities and challenges for African American women in STEM careers.

The concept of intersectionality in career advancement research, explaining why African American women have not ascended the corporate ladder at the same pace as other racial and gender groups despite having equitable education and experience, challenges meritocracy arguments, has emerged in a variety of theories and concepts including glass ceiling (Cornelius & Skinner, 2005), concrete ceiling (Burke, 2006), sticky floor (Berheide, 2013), and labyrinth (Haber, 2009). Collins (2015) grounded the concept of intersectionality in Crenshaw's (1991) theoretical works about aspects of personal identity (e.g., race, gender, class, sexual orientation) interacting with the condition of individual lived experiences (Crenshaw, 1991). The concept of intersectionality refers to the compounding effects of a person's identity may impact their experiences of privilege and/or power (Crenshaw, 1991). While navigating corporate environments as an African American or female may independently present unique challenges, this study aims to high provide data to illuminate the specific challenges that may present while occupying

both identities simultaneously. In this study, intersectionality in career advancement for African American women in STEM is evaluated via through the glass ceiling metaphor, concrete ceiling theory, sticky floor theory, and the labyrinth concept.

Glass Ceiling Metaphor

More than simply a barrier, the glass ceiling metaphor was described by researchers as governed behaviors or organizational culture that obstructed the career progression of qualified African American women (Beckwith et al., 2016). Beckwith et al. (2016) explored different barriers, perceived or actual, that prevented African American women from ascending to the C-suite within organizations. Berman (2015) found that there were only four African American chief executive officers (CEOs) in Fortune 500 companies. Further, Berman (2015) found six factors generally used to enrich careers, which include: (a) holding an advanced degree, (b) participation in national organizations, (c) communication skills, (d) people support, (e) administrative experience, and (f) being mobile. The researchers further implied that the glass ceiling phenomenon impacted all industries and represented a barrier that significantly limited the advancement of African American women. While a barrier for African American women, the glass ceiling concept has been attributed to stunt the career progression of women of other races, too, not just African American women (Beckwith et al., 2016).

Concrete Ceiling Theory

Experts suggested that African American women experienced more difficulty shattering the proverbial glass ceiling than White women, thus popularizing the term concrete ceiling.

Extant research supports this phenomenon; African American women remain unequally represented in corporate leadership positions, despite equitable education and experience (Krivkovich et al., 2024). For every one hundred white men promoted to management positions, only 89 white women were promoted to management positions, and even worse, only 54 Black women were promoted (Krivkovich et al., 2024). The concrete ceiling metaphor illustrates the rigid roadblocks, which African American women experience at higher levels of corporate hierarchy, as White men seemed to be considered better leaders based on their ability to contribute to mechanistic or task-oriented responsibilities (Devillard et al., 2018).

Sticky Floor Theory

The sticky floor theory (Berheide, 2013) is a derivative of the glass ceiling metaphor; however, the sticky floor criticized the labor economic factors identified between genders in the workplace. The premise is similar to the glass ceiling except focusing on the constructs to keep groups in low wage, low mobility jobs, which often results in lower wages despite being equally qualified to perform the job responsibilities (Avolio et al., 2020; National Science Board, 2018). Sticky floor theory argues that despite changes in social norms and policies, there remained a gap of around 15% in hourly earnings between similarly qualified men and women (Ciminelli et al., 2021). Extant research suggests that the intersectionality of race and gender are predictors for the sticky floor phenomenon (Shih, 2006), and the sticky floor phenomenon persists particularly for women in male-dominated industries (Weinberger, 2011; Weichselbaumer & Winter-Ebmer, 2005).

Labyrinth Theory

The labyrinth metaphor describes the obstacles women encounter, such as a series of complexities, detours, dead ends, and unusual paths, in a manner that the glass ceiling metaphor, sticky floor theory, or concrete ceiling do not adequately capture (Lucia & Padgett, 2011). Each women's journey through the labyrinth is complex and divergent, but the results were the same: not reaching the executive level positions they desired (Carli & Eagly, 2016; Prescod-Weinstein, 2020). Researchers suggested that as African American women work to prove their ability to hold executive level positions, they are also impacted by their failure to believe in themselves, which leads to a lack of self-esteem, self-worth, and self-efficacy (Crites et al., 2015; Ibourk et al., 2022; McGee et al., 2022). Many African American women have found coping strategies to protect themselves in the workplace (Dickens & Chavez, 2018; Ibourk et al., 2022; McGee et al., 2022). These coping strategies assist African American women with shifting the impact of stress from discrimination and altering the workplace's cultural behaviors to form positive well-being and work outcomes (O'Brien et al., 2016).

Social Capital Theory

Social capital, defined as an "investment, and use of embedded resources in social relations for expected returns" (Lin, 2000, p. 786), has been commonly viewed as a factor of an individual's economic growth and a contributor to the well-being of societies, and has, thus, captured the attention of organizations, policymakers, researchers (Woolcock & Narayan, 2000). Social capital is connected to structural relations and subjective beliefs associated with inequalities of resources and power accumulated through strong interpersonal skills, conflict resolution skills, and a diversified alliance pool (Bourdieu, 1977b, 1986; Lomsky-Feder & Sasson-Levy, 2015). Drawing on Bourdieu's concept of social capital, resources can also become an intervention to advance diversity and inclusion in the workplace for disadvantaged groups that remain within and across generations (Simmons & Parks-Yancy, 2018). Mentorship and employee resource groups are examples of organization-driven social capital programming often designed to drive equitable resourcing for employees.

Methods

To address the research question, this qualitative, single-case study with embedded units was to explore the opportunities and challenges African American women

faced while having successfully ascended the corporate ladder in STEM fields. Meeting the purpose of this exploratory case study addressed the literature gap on the experiences of those African American women who successfully ascended the corporate ladder in STEM (see Vuong et al., 2021). I used a single case study with an embedded unit design (see Yin, 2017). The unit of analysis in the identified case study was the African American woman in a STEM field. Saturation was achieved after repetitive responses from participants were identified during the coding process. To evaluate and eliminate personal views or biases (Amin et al., 2020), self-referent skills to cross-examining previous notions were evaluated to eliminate personal views or biases (Amin et al., 2020).

Procedures for Recruitment, Participation, and Data Collection

The enlistment of participants took place with the dissemination of a recruitment e-mail blast and snowball sampling. The recruitment e-mail blast letter was promoted on LinkedIn (in various STEM-focused groups), ERGs such as Black Organization Leading in Diversity, MOSAIC Multicultural ERG, and Women in Science and Engineering, to obtain qualified participants. Upon receiving an "interest to participate" response, a consent form was sent to the potential participant.

Data Analysis Plan

Based on the general criteria, theoretical contributions and exploratory design approaches were used. This methodology demonstrated the importance of creating collaborative approaches to interact and embrace African American women's opportunities and challenges while successfully ascending the corporate ladder in STEM fields. (Wolff et al., 2019). Upon review of all the data, the notes and audio to the text files provided trustworthiness for data management, representing the qualitative approach to validate this study.

Data Collection

Six African American women answered 11 approved interview protocol questions (Appendix A). The interview protocol designed for the study helped capture participating African American women's experiences and perceptions of the opportunities and challenges they faced in ascending the corporate ladder in STEM fields. In addition to listing the interview questions, Appendix A maps the relationship between the interview questions and the conceptual theories (Intersectionality and Social Capital Theory) discussed previously. Participation in the study was conducted after an availability email was sent asking for dates and times that appropriately aligned with the participants' schedules. Each Zoom call took approximately 45–60 minutes, and after the interview, each participant was thanked for their time and participation in the study.

In addition, after each interview, participants were provided with copies of the interpretations of the interview, and each participant was asked to review (i.e., member checking) to ensure the accuracy of the data captured. The participants were advised that if a response was not received within 24 hours of providing the transcripts, there was an assumption that the data collected and interpreted were indeed accurate.

Analysis

Following the extraction of each transcript, three themes emerged: (1) the importance of mentorship, (2) the importance of a sense of self or belonging, and (3) success strategies, overcoming the barriers. The outcomes of the data support the Central Research Question (CRQ) and highlight opportunities and challenges African American women faced while successfully ascending the corporate ladder in STEM fields. In this study, the CRQ and supporting themes were also discussed to denote the results. Participants were coded as Participant 1 through Participant 6 for anonymity (see the Table, which provides the CRQ, themes, categories, and codes).

Theme 1: The Importance of Mentorship

Each of the six participants believed that a mentor added to their accession to an executive level position as a mentor provided different perspectives of situations within their personal and professional experiences. Although four out of six had mentorship experiences in professional

Table

Themes, Categories, and Codes

Theme	Category	Code
The importance of mentorship	Networking, planning, leadership training, support, and transparency	Mentorship, allies, family, spiritual leaders, religious programs, and building a reputation
The sense of self or belonging	Purpose, empowerment, knowing self, unique treatment and experiences, self-confidence	Cultural differences and uniqueness, experiences (negative and positive), hair, makeup, lack of voice, exclusion, isolation, microaggression, code-switching
Success strategies: overcoming the barriers	Planning, intentions of success, positive interactions, controlled biases	Pressure to be perfect, speaking up, self-empowerment, challenging the status quo, self-awareness

settings, the two who did not have such experience indicated they thought it would have been beneficial to experience mentorship to aid in the pursuit of career advancement. Given that each participant has ascended into executive level positions, they each described how they maintain mentorship to continue the dynamics of interpersonal, cultural, and structural hierarchy within the workplace.

Participant 4 not only used mentorship to assist her with the ascension to an executive leadership role, but she also was "fortunate to be a part of Employee Resource Groups (ERGs). These ERGs made a difference for African American women in STEM and supported her ability to network and get guidance to continue her career advancement." Participant 4 further exclaimed how she was able to connect with someone in HR who became her mentor and assisted her with obtaining her current role as a one finance development enablement lead. Participant 1 explained how her mentor allowed her to look past situations and take a different perspective. She expounded upon the importance of eliminating one's own biases and grasping an understanding of "allowing me to look past some things and kind of move forward to gain more experience and work with different kinds of people." Participant 3 discussed how her mentor encouraged her to continue her career advancement pursuits for an executive level role and to limit her code switching based on the opinions of others. She advised that her mentor encouraged her to embrace herself authentically, despite the differences in her physical appearance when compared to her counterparts.

> *(I was encouraged to) wear my hair straight if I want to wear my hair curly if I want to wear a wig, and I want to color my hair a different color, that's who I am. It doesn't take away from the fact that I know my job, am well educated and am well-spoken. And I can run circles around my own boss. (Participant 1)*

Consistently, mentorship was acknowledged as an important factor to career acceleration or the absence thereof as a career advancement inhibitor. The ability to see and learn from others further in their STEM careers served as a validation of career aspiration, a source of advice and perspective for the participants.

Theme 2: The Importance of Sense of Self or Belonging

Multiple participating commented on the impact of negative workplace behaviors on their self-confidence at various points in their careers. Perceptions of less qualified colleagues in peer-level positions or colleagues who pirated a participants' idea and positioned as their own often negatively impacted their sense of team belonging. One participant noted that interpersonal challenges created hesitation in the desire to excel to the next level of her career.

> *Walking into a room. It's automatically assumed, especially because my name is unique. And whatever the case may be, I don't know what I'm talking about, or there's no way that I can contribute because of who I am or what I look like. And I personally think it's funny now because I've matured, but when I was younger, I thought it was very offensive. Of course, it is still offensive, but I used to get upset about it. I don't do that anymore because I can't control someone else's ignorance. (Participant 1)*

The perception of this behavior negatively impacts a sense of belonging; however, resilience and the confidence that accompanies a strong sense of self reduced the impact of the negative experience on her career progression.

Theme 3: Success Strategies, Overcoming the Barriers

The six participants shared several commonalities. However, the one theme of overcoming barriers continued to emerge through all their responses. Each participant created and sustained their own professional pathways within the workplace and ensured they obtained their desired level of success. Despite the barriers they faced while ascending the corporate ladder, they each managed interpersonal rejections or discrimination; they also managed to focus on furthering their education or on mentorships and networking to assist with their positive results in the workplace. The women all addressed how the landscape of increasing the presence of African American women in STEM fields in executive level positions is critical to the benefit of STEM and society as productivity and innovation can impact investments (see Charlesworth & Banaji, 2019) for all stakeholders. Participant 1 advised how her education and training experience contributed to her preparation for obtaining an executive level position.

> *Definitely getting my Masters in Information Technology (helped). I also believe going to Purdue, the name itself kind of helped a bit. I did do a bunch of internships while at Purdue. I interned at John Deere; I interned at General Electric. And with those two different organizations, that kind of helped to pad my resume for moving forward. I also did get a master's in Crime Analysis from Tiffin University. And with that, I was granted the opportunity to get clearance, which helped me kind of get into the government world. (Participant 1)*

Despite each participant noting some degree of perceived barriers to career advancement, each participant shared their experiences relative to what personally worked for them. Resilience in the form of continuing in the career, despite perceived adversity, seeking mentorship, and continuing their education helped each participant to overcome career advancement barriers.

Research Question

The central research question was: "What are the opportunities and challenges African American women faced while successfully ascending the corporate ladder in STEM fields?" Every participant expounded upon their lived experiences and perceptions of African American women's opportunities and challenges they faced while aspiring to ascend into executive level positions. Each woman discussed the importance of education, mentorship, a sense of self or belonging, and strategies to overcome barriers successfully. While five out of the six women held bachelor's degrees or higher, many were still able to discuss the obstacles faced by microaggression

behaviors within the workplace by their White counterparts. They were forced to stay silent or resolve their appearances to traditionally fit in the "old boys" or "old girls" club. However, each participant was able to maintain their professionalism and obtain the development and training needed to ascend the corporate ladder in their respective STEM fields.

Summary

This empirical investigation aimed to advance research and address a literature gap on the experiences of six African American women in the United States who successfully ascended the corporate ladder in STEM. It also shed light on the potential for integrating and promoting African American women in STEM fields and captured the attention of such barriers to career development and advancement (Vuong et al., 2021). Data for this study were collected through semi-structured interviews and thematically analyzed for reemerging findings.

Data analysis of the 11-question semi-structured interview revealed three main themes: (a) the importance of mentorship, (b) the sense of self or belonging, and (c) success strategies: overcoming the barriers. More than 95% of the participants identified each of the themes as elements that influence or prevent African American women in STEM fields while ascending into executive-level positions.

Discussion

The disparities of opportunities within the STEM workforce for African American women to successfully ascend into executive-level positions raised awareness of the various challenges that caused the researchers' pursuit of exploring deeper into this matter. The findings are consistent with two key concepts: (a) Bourdieu's (1977a) concept of social capital and (b) Collins' (2015) concept of intersectionality.

Limitations of the Study

In the initial proposal for this study, a few limitations were of concern and needed to be considered when interpreting such research implications. First, the analysis was based on self-reported data. I relied on intuitive answers from participants through social media outlets such as LinkedIn, Facebook, and ERGs in the United States. Each participant was accessible for interviews based on their schedules and understood that their participation in such study was voluntary. As a result, each participant's responses may be conditioned by their intentions to safeguard their reputation or to retain their executive-level position in such STEM organizations.

To amend this potential bias, Zoom meetings for the data collection method were used, which allowed observation of each participant's verbal and nonverbal cues. The research design, sampling, methods, and central research question were to explore African American women's opportunities and challenges while successfully ascending the corporate ladder in STEM fields. Understanding such opportunities and challenges allowed one better to understand the business case for diversity and inclusion. I assumed the research participants were all African American women in STEM. White women and all men were excluded from this study. Therefore, the transferability of this study is limited based on contextual intentions and not generalizable, which may still pose limitations. However, the voices of other minority women from STEM organizations may have provided more depth to the interviews.

Secondly, a fair and balanced analysis based on different women's perspectives would shed more light on the effect of sustainability efforts on diversity and inclusion and socially conscious societal growth in STEM organizations promoted and supported by leadership styles, behaviors, and decision-making strategies. Finally, other potential biases may have impacted the study, providing limitations. For example, I am African American woman in STEM and work in an executive level leadership capacity.

As such, my role and perspective of the opportunities and challenges while successfully ascending the corporate ladder in STEM fields may have predispositions. However, to interject such opinions of having shared similar experiences, as a researcher, I minimized such biases by reflective journaling. Upon the completion of each interview, the video or voice recordings were transcribed and emailed to each participant for review, which entailed member checks to ensure the accuracy of the captured data. As a researcher, I was cautious not to suggest or influence the participant responses as my association in the interview process was vital for such qualitative research (see Patton, 2015).

Recommendations

Due to the collected data during this study, it is recommended that further research should examine the importance of teaching early STEM curricula in middle and high school in urban communities. Additionally, further research may include highlighting the importance of promoting and supporting the retainment and advancement of African American women in STEM fields. In this study, African American women expressed the impact of experiencing mentorship, the ability to reinforce the sense of belonging, or knowing one's self-worth, which may contribute to the attainment of advanced roles in leadership.

While the experiences of the six interviewed African American women in leadership positions in STEM fields involved their perceptions, it would also be vital to study organizations committed to diversity and inclusion. Insights relative to successful best practices and implementation processes of targeted initiatives (e.g., ERGs, etc.) may positively impact on the development and progress of African American women in STEM fields. Moreover, it would be critical to reinforce the significance of how ERGs in organizations assist with the development and progression of African American women in STEM fields. Extant research suggests that ERGs positively impact leadership development (Krivkovich et al., 2022). Further research toward understanding the direct impact of ERGs

on the careers and well-being of African American women in STEM is recommended.

Implications

The implications for positive social change include the potential to increase societal, cultural, and organizational awareness of the importance of diversity and inclusion in STEM fields and how African American women are viewed based on their educational and professional achievements. This research helped encourage the need to create an inclusive approach to diversity that maintains and supports an open line of communication, transparency, and challenges that African American women face that affect equal opportunities, organizational growth, and its stakeholders. This study's findings may also contribute to positive social change by extending research in the STEM career advancement space.

Positive social change can also occur when organizations are proactive in assessing diversity and inclusion within their workplace not just based on gender; but also, on racial equity (Cheryan et al., 2017), build networks through ERGs, and provide incentives to employees who are allies to navigate through the structural dynamics of leadership paths. The second result may present a competitive advantage for organizations as all stakeholders' perceptions will remain optimistic and, in turn, remove the stigma of deficit credibility and the lack of diversity and inclusion, which may also improve the organization's culture (Coldwell et al., 2011). Nevertheless, exploring the underrepresentation of African American women in STEM remains valuable and recognizing their ability to alter the outlook of identity shifting within the workplace.

Conclusion

While African American women in executive-level positions in STEM are still underrepresented, one needs to examine the approaches and dispel the lack of positive influences these women bring to organizations, the importance of mentorship, and early studies of STEM curricula. All these factors can foster the impact of and assist with the benefit of the nation's social, economic, and environmental responsibilities. In turn, it helps improve diversity, equity, and inclusion in careers within such fields. This study served as a platform for African American women in STEM in executive-level positions to share opportunities and challenges they faced while ascending the corporate ladder. As organizations create diverse and inclusive foundations to reinforce the improvement in achieving internal and external stakeholders' expectations to stimulate positive outcomes, the impact of African American women in STEM fields may advance. After thoroughly reviewing the participants' interview transcripts and existing literature, a better understanding of the CRQ and purpose from a theoretical, qualitative point of view was acquired. Each method provided a theoretical framework and focused on the ethical perspectives that expanded not only the gap of the identified problem of diversity and inclusion in STEM fields but also provided data that aligns with the research question of how to improve awareness within such fields.

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Malika Buchanon (malika_wicks@yahoo.com)

Blair Presley Bone (bpresle5@utk.edu)

Kenneth Levitt (kjlevitt@frostburg.edu)

Teresa Lao (drteresalao@gmail.com)

Appendix A

Interview Questions with Mapping to Intersectionality Concepts and Social Capital Theory

1. What is your current position title?
2. How long did it take to reach such an executive level position? (INTERSECTIONALITY > LABYRINTH)
3. What educational and training experience contribute to your preparation for obtaining such an executive level position?
4. How did working with a mentor influence your ascension to an executive leadership position? (SOCIAL CAPITAL THEORY)
5. Can you tell me your perceptions of an African American woman in the STEM field?
6. What barriers have you faced that may have caused hesitation in excelling to the next level in your career? (INTERSECTIONALITY > GLASS CEILING)
7. Why do you think there is such a low percentage of African American women in executive level positions in STEM? (INTERSECTIONALITY > GLASS CEILING, CONCRETE CEILING)
8. What advice would you give an African American woman aspiring to ascend the corporate ladder into an executive in the STEM field? (SOCIAL CAPITAL THEORY
9. How do you feel about your organization's willingness to promote women of color into leadership roles? (INTERSECTIONALITY > GLASS CEILING, CONCRETE CEILING)
10. How do you think you can help your organization see the value of diversity and inclusion in their career advancement process?
11. As an African American woman with a successful career in a STEM field, do you have any final thoughts to add now that we have come to the conclusion of our interview?