A NARRATIVE INQUIRY APPROACH TO COMMUNITY CULTURAL WEALTH OF BLACK MEN IN ENGINEERING

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This study engages in methodological activism—using research methods for the explicit purpose of enacting social change. We chose the culturally relevant, asset-based theory of community cultural wealth to study a Black man's educational journey towards an engineering degree. Our focus on the story of one individual disaggregates his experience from the experiences of other participants, allowing us to deeply interrogate theoretical constructs. By employing narrative methodology, our work advances theoretical understanding of community cultural wealth, revealing temporal nuances, and confirms that different forms of capital can be used in multiple, overlapping ways. Our choice of narrative methodology also addresses recent critiques of shallow analysis of community cultural wealth in STEM education research. Consistent with critical race scholarship, we situate our work in its sociohistorical context and reject an interest convergence argument for its value.

KEY WORDS: community cultural wealth, capital, methodological activism, engineering, narrative analysis, Black men, critical race theory, interest convergence

1. INTRODUCTION

Black men represented only 3% of the total number of engineering bachelor’s degrees awarded in 2019 (American Society for Engineering Education, 2019), illustrating broad underrepresentation. Higher education institutions fail to recruit and retain members of this population because they do not recognize the value of Black men as significant contributors to the field of engineering (Burt et al., 2019). Black men face unwelcoming institutional climates, institutional and social barriers, as well as racial and ethnic stereotyping, all born from White male supremacy (McGee, 2016).

The argument for increasing the representation of Black men in STEM should focus on addressing these structural and institutional inequities and should also focus on how to eliminate them so the field can enact social change, becoming equitable to those who have been excluded. Instead, the argument for increasing the representation of Black men—and other members of minoritized groups—in STEM is often based on the United States’ economic needs for growth and global competitiveness. Framing the urgent need
for participation of minoritized groups in STEM education based on global competitiveness is a form of interest convergence (Baber, 2015; Priddie, 2020). Interest convergence stems from early critical race theory (Bell, 1980, 2008) and purports that the achievements of minoritized groups will not advance until their interests align with the interests of dominant White culture (Morales and Delgado, 1996). Baber (2015) pointed out that national reports, such as Expanding Underrepresented Minority Participation published in 2011, promoted broadening participation in STEM for interest convergence reasons (National Academies of Science, Engineering, and Medicine, 2011). When we researchers advocate for increased participation of minoritized groups in this way, we risk encouraging the “assimilation to current institutional norms” of minoritized group members (Baber, 2015, p. 261) while ignoring deeper equity concerns. We also all too often fail to ask members of minoritized groups if these interests benefit individuals from nondominant cultural populations (Bell, 1980; Morales and Delgado, 1996).

Priddie (2020) argued that there are two ways researchers can effectively address the overuse of interest convergence in STEM education and in STEM diversity initiatives: (1) we should use more culturally relevant frameworks and analytic lenses, and (2) we need to disaggregate the voices of minoritized research participants. We use both approaches in this research. Our work employs the community cultural wealth (CCW) framework (Yosso, 2005) which is an asset-based, culturally relevant framework to amplify the voice of a Black man who earned an engineering degree in 2012.

Asset-based frameworks stand in contrast to deficit-based frameworks that have been ubiquitous in education and education research when looking at students of color and especially when looking at Black students. Yosso (2005) characterized deficit theorizing as “one of the most prevalent forms of contemporary racism in US schools” (p. 75). Deficit-based theorizing occurs when researchers or teachers judge students of color using “White, middle-class values” and norms (p. 77). As a result, incongruences with the dominant culture’s educational system are interpreted as deficiencies for which the individual student, their family, or their culture can be blamed (Castro, 2014; Huber, 2009; Valencia, 1997). Asset-based frameworks have been slowly gaining traction in STEM education (Castro, 2014; Johnson et al., 2011; Martin and Garza, 2020; Pawley, 2019; Rahm and Moore, 2016; Syed et al., 2011). In Denton and colleagues’ (2020) systematic literature review on CCW in STEM education, they noted the emergent use of CCW and its potential to shape the field because CCW allows us to identify how students from nondominant cultures successfully navigate STEM, unlike deficit-based frameworks that attribute institutional shortcomings to students, their families, or their cultures.

To reconstruct the life story of a Black man in engineering and to demonstrate how narrative analysis can be used to develop an enhanced understanding of the community cultural wealth Black men bring to their engineering degree pursuits, we embrace the concept of methodological activism. Ong (2005) used “methodological activism” to describe using research methods in a politically purposeful way, describing methods “as an activist’s way of enacting social change” (p. 2). We want our methodological activism to create educational systems based on students’ assets—not perceived deficits—and we also want teachers and mentors to adopt asset-based approaches to teaching and mentor-
ing marginalized students. We utilize methodological activism in several essential ways in this research, including selecting CCW as a culturally relevant, asset-based framework; utilizing narrative analysis, a methodology that focuses on the story of a Black man and disaggregates his experience from those of other participants and allows us to deeply interrogate theoretical constructs; and situating our work temporally.

1.1 Community Cultural Wealth Theoretical Framework

Yosso developed the CCW framework to show how students from nondominant culture groups cultivate capital to persist in education (Dika et al., 2018). Yosso developed the initial conceptualizations of CCW for Latinx people, but scholars have extended the theory to other people of color (Carabajal, 2015; Chavez, 2018; Dika et al., 2015, 2018; Foxx, 2014; Samuelson and Litzler, 2016) and to Black students in particular (Dika et al., 2015; Forbes, 2016; Foxx, 2014; Mcknight, 2016; Preston, 2017; Revelo and Baber, 2018; Samuelson and Litzler, 2016; Tolbert and Cardella, 2016). CCW conceptualizes at least six types of community cultural wealth as a critical race theory (CRT) challenge to traditional interpretations of cultural capital (Yosso, 2005). Yosso characterized familial, aspirational, navigational, social, resistant, and linguistic capital as being “forms of capital not mutually exclusive or static, but rather [as] dynamic processes that build on one another” (2005, p. 77).

- Familial capital is “the cultural knowledge nurtured among familial (kin) that carry a sense of community, history, memory, and cultural intuition” (p. 79).
- Aspirational capital is “the ability to maintain hopes and dreams for the future even in the face of real and perceived barriers” (pp. 77–78).
- Navigational capital includes “skills of maneuvering though social institutions” (p. 80).
- Social capital includes “networks of people and community resources” (p. 79).
- Resistant capital is “knowledge and skills fostered through oppositional behavior that challenges inequality” (p. 80).
- Linguistic capital is “intellectual and social skills attained through communication experiences in more than one language and/or style” (p. 78).

In this article, we operationalize these types of capital in ways that illustrate how and in what ways Black students employ capital in order to carry on in education. Familial capital includes support from families, such as encouragement to persist or expressing pride in the student’s accomplishments (Brooms and Davis, 2017; Chavez, 2018). Previous researchers have operationalized aspirational capital as participants referring to dreams of going to college and their future career goals (Chavez, 2018), and their internal drive to succeed (Carabajal, 2015). Researchers have operationalized navigational capital as participants conducting self-directed learning and asking questions (Samuelson and Litzler, 2016), familiarizing themselves with engineering academia (Schlemer et al., 2018), and developing time management skills (Martin and Newton, 2016). Similarly, researchers have operationalized social capital as members of students’ social networks such as teachers and professors providing encouragement (Martin, 2015);
peers, family members, and professional networks also sit inside the social networks understood as social capital (Saw, 2020). Lin (2001) defined two roles in a social network: an individual in a social network, and an “alter,” who usually has a higher social position or status and can provide an individual with unique resources. We use the term source of capital instead of alter in this work to minimize jargon. Our research also utilizes Solórzano and Bernal’s (2001) four types of resistance: self-defeating, conformist, transformative, and resilient. Researchers have operationalized linguistic capital not only as speaking other languages and acting as a translator (Fránquiz et al., 2011), but also as developing mathematical skills and code-switching ability (Tolbert, 2016).

Our work using narrative inquiry to expand our understanding of community cultural wealth responds to a critique from Denton and colleagues. Denton and colleagues (2020) revealed that STEM education researchers have a great deal of work to do to improve the way we use a CCW framework. These authors asserted that much of the work on CCW in STEM education has resulted in “shallow analysis” (Denton et al., 2020, p. 27), a feature they believe has resulted in part from the nature of the interview guides used in the research. As researchers, we need more nuanced examples of capital, and we need to use varied methodological designs to expand the range of participants’ examples of capital. Denton and colleagues (2020) called for interview protocols to be designed to elicit deeper participant responses than, for example, simply asking about immediate family when eliciting responses about familial capital.

1.2 Black Men in Engineering

Previous research has established more than well that “STEM education has systemically disserviced Black males” (McGee and Pearman, 2015, p. 514). Harper (2013) noted that generations of Black students share experiences of systemic racism, such as “onlyness,” which is the psychosocial burden of navigating a racially polarized space occupied by few others from one’s same racial or ethnic group, racial microaggressions, and a shortage of same-race faculty role models, especially at primarily White institutions (PWIs). McGee and Pearman (2015) similarly noted that other people in higher education possess gendered and racialized deficit-based perspectives about Black men. The microaggressions that Black men in STEM experience include negative presumptions of their presence in STEM and of their intellect more generally (e.g., Black men are only enrolled because of affirmative action), as well as increased overt racism like hyper-surveillance and verbal prejudice (Harper, 2013). In addition to social and institutional barriers to their engineering educational pursuit, some Black men also encounter significant financial obstacles in their engineering education pathway (Flowers and Banda, 2018). These issues are exacerbated by funding issues at major universities that significantly impact engineering majors (Flowers and Banda, 2018).

However, researchers note that systemic support to help Black men overcome these obstacles in postsecondary engineering education is undersupplied. Minoritized students, especially Black men, need advocates in STEM environments who “can validate their competence, belongingness, and racialized experiences” (Harper, 2013, p. 196).
Professors and administrators of color experience onlyness in engineering as well, especially at PWIs, where minoritized students outnumber minoritized faculty members and therefore there simply are not enough Black mentors for Black students (Harper, 2013; Harper et al., 2011). Thus, Black men must leverage other assets—that is their community cultural wealth—to persist in engineering.

Prior research on Black men in engineering has demonstrated that students rely on support from their family and community (familial capital) to develop college and STEM aspirations, which carry through to higher education. For example, Brooms and Davis (2017) noted that in order for college preparation and aspirations to start early, pre-college educational environments should support the academic performance, aspirations, and outcomes of Black men (aspirational capital). Burt and Johnson emphasized the need for a “all-hands-on-deck” approach to nurture STEM interest in Black male students and described it as a community affair that includes teachers, siblings, and family friends (2018, p. 265). In addition to examples of parents of Black men who nurtured their children’s interest in engineering, there are also instances of parents who were instrumental in contributing to their sons’ academic success because they questioned systems and structures of oppression that overlook their students’ academic potential (resistant capital; Burt and Johnson, 2018). During the college experiences of Black men, parental involvement via emotional and financial support remained critical to academic success (Burt et al., 2019; Forbes, 2016). Black men also build supportive pre-college familial and mentorship relationships that are reflected in them building helpful peer and mentorship relationships during college that contribute to successful STEM educational and career outcomes (Burt et al., 2019).

Our work shares characteristics with recent literature on Black men in engineering and offers unique insights in several ways. Like McGee and Pearman (2015), we aim to counter ubiquitous deficit perceptions of Black men by presenting a narrative of “success and triumph” (p. 514). We also adhere to Burt’s (2020) advice to contribute to “amassing more accounts” of successful Black men by focusing on the story of a single participant (p. 836). Whereas McGee and Pearman (2015) focused on K–8 mathematics students’ internal processes and strategies for success, and Burt’s (2020) and Burt and Johnson’s (2018) work focused on master’s and doctoral students’ early origins of STEM interest, we focus on how our participant utilizes community cultural wealth to earn his bachelor of science (BS) degree. Like other studies focusing on different education levels (e.g., McGee and Pearman, 2014, 2015), our theoretical framing firmly grounds our work in anti-deficit depictions of Black men, and the specific use of CCW follows Burt and Johnson’s (2018) study of Black male graduate students. Thus, this work shares some of the analytical traits of prior work by presenting a narrative analysis (e.g., Burt, 2020; McGee and Pearman, 2014) using CCW.

1.3 Research Question

The following research question guided this inquiry: How did Moises, a Black man, use and develop community cultural wealth to earn a degree in engineering?
2. METHODS

2.1 Researcher Positionalities*

In examining our positionality and writing this statement, we were guided by Sochacka and colleagues’ (2009) three-tiered model. We examined our ontological and epistemological assumptions, the influence of our personal values, and the influence of our prior experiences. Throughout the analysis and writing process, we engaged in *diffraction*, which Secules and colleagues summarized as the process that occurs when “researchers proactively engage with the research context and their own differences from participants” (2021, p. 21). This positionality section of our manuscript incorporates the many discussions among the research team including our writing coach and editor, the feedback from our content expert scholars, peer reviews and comments from the journal’s associate editor who handled those reviews, and the participant himself, who became a coauthor.

Victoria and Julie: We are aware of the perceived power differential between our positions as White researchers and Moises as a recent Black engineering graduate. We used narrative analysis so that his voice is interwoven within this work. The cultural context of the spring of 2020 as we were writing impacted our approach to this manuscript. Momentous protests focused on police violence against Black people began in the United States. Simultaneously, Black people were disproportionately getting and dying from COVID-19 while also bearing the brunt of the financial impacts of the pandemic in the United States. In light of these events and the progress that still needs to be made in engineering for it to be equitable for all who pursue it, we seek to use our privilege as two White women to highlight the participant’s assets using his voice.

Victoria: I am a White, first-generation undergraduate and graduate student from a working-class family. I grew up in the southeastern United States. While I am a woman in STEM and have experienced sexism, I have never needed to grapple consciously with my racial identity in my degree pursuits. This is a privilege afforded to me by systemic racism and the exclusion of diverse ethnic and racial groups in the academy. I completed a master’s in hydrogeology and a doctorate in science and engineering education from a predominantly White, public institution in the southeastern United States. I inform my worldview with critical race theory because of systemic racism that seeps into all institutions, especially academia. I was initially motivated to be involved in this research because I value broadening participation in engineering and because of people I have met in STEM who have had to fight for space and representation in STEM as “othered” individuals. I shifted my motivation from how this work would benefit me to how this work would do justice to Moises’ lived experiences and to his persistence to become an engineer by sharing his narrative from an asset-based perspective.

*Throughout this paper, we refer to Victoria and Julie (and in some cases, other early members of the research team who are mentioned in the Acknowledgments) as “we” and refer to Moises in the third person.
Julie: I am a White woman, and an engineering education scholar who is dedicated to methodological activism. Writing a positionality statement for an article about a Black man makes me uncomfortable because I worry about making this article too much “about me” and not about him. And yet, I know that making my positionality clear is important to frame this work.

I started this project years ago, writing the proposal that funded this work in 2014, which was about one year after Alicia Garza, Patrisse Cullors, and Opal Tometi initiated the #BlackLivesMatter movement in response to the acquittal of the murderer of Trayvon Martin (Black Lives Matter, 2020). When I started the project, I was just beginning to explore critical race theory. My goal in writing the proposal to the National Science Foundation (NSF) was to critique my own prior work and redirect my scholarship to explicitly use critical and asset-based frameworks.

While always deeply troubled by the pervasive issue of systemic racism, power disparities, and the oppression of people of color that is ever apparent in STEM, I never intended to focus a manuscript exclusively on a Black man. I worked alongside Black collaborators on other research with Black participants which I felt lent credibility to the work. With this project, however, even though I felt like I was doing the work to examine my own privilege, I was fearful of inadvertently exploiting my participant. I had the opportunity to speak with Peggy McIntosh (McIntosh, 2009) about the project twice. Even after Dr. McIntosh reassured me that I was unpacking my knapsack, I still questioned: Was I really? I engaged two scholars of color, a Black male scholar who is an expert on Black men’s experiences in STEM and qualitative methods (Dr. Brian Burt), and a Latina scholar who is an expert in the cultural/social capital and community cultural wealth of non-dominant students (Dr. Sandra Dika) to conduct thorough, paid reviews of the manuscript after we had a draft of the paper written. They were generous with the quantity and quality of their feedback. We treated these reviews similarly to ones from the journal, documenting our changes based on their feedback to create an audit trail. The paper improved immeasurably as a result of their perspectives and expertise.

My concerns about exploiting a Black participant seemed to drag out the project, but there also were other challenging hurdles. A White graduate student whom I hired for the project admitted that they did not believe in the central tenets of CRT. I temporarily left my faculty role to serve as a program director at NSF. I moved to another state to become a faculty member in a relatively new Engineering Education department. I took the position of editor-in-chief of this journal. There was the global COVID-19 pandemic that began in 2020 and continues well into 2021 as we are revising the manuscript. And then there were more—so many more—murders of Black men and women that highlighted the immediacy of the problem of systemic racism. For example, while we were analyzing data for this project, the racism that has always existed in this country surged into national consciousness in a renewed way when George Floyd was murdered. In my editor-in-chief role, I added a requirement that authors include positionality statements and discuss how they protected marginalized participants.

I renewed my personal commitment to methodological activism. Victoria and I knew we needed to center the voice of our participant who was a Black man. He deserved to
be heard. It was our way of being activists, using the tools we had, in our own sphere of influence. My main regret as we prepared this manuscript was that I had lost contact with the participant in the six years since the initial interview. Embarrassingly, when I changed institutions, I had not successfully transferred the only file that contained the code linking the participant’s real name and contact information and his chosen pseudonyms. I was not able to contact Moises and this gap prevented us from member checking the final narrative and our interpretations of his community cultural wealth with him, and also prevented us from discussing his wishes for how he wanted his contribution to the research to be recognized. With encouragement from the manuscript’s initial anonymous peer reviewers, I redoubled my efforts to find the participant and was successful.

2.2 Narrative Inquiry and Participant Selection as Methodological Activism

Our use of narrative analysis has the potential to advance the theoretical understanding of students’ use of community cultural wealth in engineering education by revealing nuance and overlap in forms of capital. Narrative analysis is consistent with calls for improved data collection and data analysis made by Denton and colleagues (2020) in their systematic literature review. Narrative researchers commonly focus their analysis on only one or two participants (Clandinin and Connelly, 2000; Creswell and Poth, 2018; Marshall and Case, 2010) to provide insights into larger issues (Chism et al., 2008) as well as to advance theory (Riessman, 2008) by theorizing from the case.

Victoria and Julie selected Moises as a critical and paradigmatic case that provides “metaphorical and prototypical value” (Flyvbjerg, 2006, p. 16) demonstrating the overlap and nuances of how students use community wealth in their engineering education. We selected Moises from our sample of 27 recent engineering graduates for two reasons: He used many forms of cultural wealth in his pursuit of an engineering degree; therefore, he theoretically composed the richest story of all the participants. And, we wanted to focus on a Black man’s use of CCW in order to promote an asset-based view of Black men that counters majoritarian societal narratives of violence, depravation, and underachievement.

The research team recruited and interviewed our participants through chain and snowball sampling (Creswell, 2013). Our recruitment utilized our team’s professional and personal networks, as well those of our project advisory board members. We posted interview notices on Facebook, encouraging social network contacts to share the notices. We identified prospective participants and then asked participants to share our call for interviews with their contacts. The entire sample consisted of 17 male and 10 female engineering graduates. Participants self-identified as White (n = 10), Hispanic (n = 4), Asian, (n = 3), Black (n = 3), Middle Eastern (n = 2); some participants (n = 5) did not disclose their racial or ethnic identity. Moises is a Black man whose parents immigrated to the United States from a Caribbean country before he was born.
2.3 Interviews

In the interview, we wanted Moises to tell his life story so he could identify the important parts of his life that related to his persistence to become an engineer. Moises thus possessed the discursive power and direction in the interview, which was one way we sought to prevent interviewer overreach. At the start of the interview, we informed Moises that we would not interrupt his storytelling and would only ask follow-up questions after he finished sharing. We explained that while the silence might feel uncomfortable, we were choosing this quiet manner of engagement with him because we did not want to misdirect Moises’ telling of his story. We let Moises know that he did not have to tell his story linearly and that he could feel free to share details as he thought of them. We asked follow-up questions after Moises indicated he was finished. The interview was transcribed by a professional service and were verified by the research team when the transcript was returned. We also asked Moises to read through his transcript, make corrections, and strike any part of his interview from the transcript.

Years later, once we had written the manuscript, Moises read and approved the manuscript draft, making a minor change in the chronology of an event we recounted in the narrative. He discussed his impressions of the manuscript, saying that he appreciated the thought and consideration we had given his story. He told us that he had nearly forgotten about participating in the interview and previously remember checking the transcript shortly thereafter. He noted that he found it interesting to see his words and his story reflected back to him now that he was in a different phase of his life than when the interview took place.

One result of our subsequent conversation about the manuscript draft was a discussion about linguistic capital, which did not come up in the original interview. We asked Moises if he had any thoughts about how linguistic capital had influenced his engineering education journey after having read about CCW in the manuscript. He readily offered multiple examples. We felt it was important to fully represent the spectrum of Moises’ community cultural wealth and thus we have included linguistic capital in the findings and analysis here.

2.4 Data Analysis

With narrative analysis, we can relate events to one another by configuring them as contributors to the advancement of a plot (Polkinghorne, 1995) and re-story the participant’s experiences into a framework that weaves key elements into a chronological story (Chism et al., 2008; Creswell, 2013). We reconstructed Moises’ pursuit of an engineering degree by interweaving his verbatim quotes (raw data) with our paraphrasing of his chronological story and our identifications of community cultural wealth (our analysis; Clandinin and Connelly, 2000; Polkinghorne, 1995). As a result of this reconstruction, we can see how Moises used community cultural wealth chronologically as he progressed from childhood to becoming an engineer, but also how he used multiple types of capital simultaneously.
We performed analytical passes through Moises’ transcript for a sense of prominent plot elements to determine the chronology of his life events. We carried out additional passes to identify examples of the types of community cultural wealth he used in his journey to become an engineer and tabularized the data. We compiled these notes on different forms of capital into structured memos. We then used his chronology and direct quotes to frame the narratives, and we embedded the types of capital in the narratives to tie their quotes to the CCW framework.

During data analysis, it became useful for us to operationalize Yosso’s (2005) definitions of capital to how we were defining Moises’ life story. We operationalized Yosso’s aspirational capital as Moises’ examples of determination and persistence in achieving a goal even when confronted by challenges. We operationalized Yosso’s definition of navigational capital as the skills and creative solutions Moises used to circumvent social institutions and barriers in those social institutions. We wanted to highlight how Moises traversed barriers himself to become an engineer, thus addressing Denton and colleagues’ (2020) critiques about researchers who use CCW to focus on the navigational capital provided to participants by others. As with Martin and colleagues’ (2014) operationalization of social capital, the sources of capital in Moises’ network are people who influenced his decision to pursue and persist in engineering as he is a recent engineering graduate.

We extended Yosso’s (2005) definition of resistant capital to include Solórzano and Bernal’s (2001) four types of resistance: self-defeating, conformist, resilient, and transformative. According to Solórzano and Bernal (2001), self-defeating resistance refers to an individual who possesses critical awareness of systemic forces shaping inequalities but possesses low motivation for social justice. A student dropping out of school is an example of self-defeating resistance (Solórzano and Bernal, 2001). Conformist resistance is “when individuals or groups fail to challenge structural inequalities but focus on improving opportunities for traditionally marginalized populations by changing individual or group dispositions to better match norms within the structure” (Solórzano and Bernal, 2001, p. 318). A student who offers tutoring to others so they can adapt to a university is an example of conformist resistance, but as you will see in the narrative, Moises’ father also saw the benefits of conformist resistance for his son.

Transformational resistance “refers to both a critique of the system and high motivation for systemic changes to the structure” (Solórzano and Bernal, 2001, p. 319). An example of transformational resistance is a student motivated by social justice to attend graduate school. Garibay (2012) suggested student outcomes in STEM education should extend beyond scientific, mathematical, and technical literacies and should also include the development of transformational resistance to create a more just and equitable world. Yosso (2000) extended transformational resistance to include resilient resistance, which is the intersection of conformist and transformational resistance and involves “leav[ing] the structures of domination intact yet help[s] the students survive and/or succeed” (p. 180). An example of resilient resistance is a student from a nondominant culture group proving their peers’ negative stereotypes of them wrong by excelling in a course and in
Moises’ story, we see transformational resistance/resilient resistance when he procured a research opportunity for himself.

We operationalized Yosso’s (2005) definition of linguistic capital to not only using more than one language, as Moises does with learning multiple languages in addition to the language his parents spoke at home, but also to honing verbal professional skills (e.g., public speaking, speaking up for one’s self).

2.5 Quality Considerations and Protection of Vulnerable Populations

We used Walther et al.’s (2017) qualifying qualitative research quality (Q3) framework in our research design and implementation. We were concerned with ethical validation aspects that included integrity and responsibility throughout the research process (Walther et al., 2017). Our initial drafts used a pseudonym Moises chose and we generalized the specific names of programs, jobs, institutions, and locations he discussed to protect his identity in ways he wanted. Later, after Moises chose to be recognized as a coauthor, we restored the identifying information and used his real name. As we analyzed and wrote the manuscript, we addressed communicative validation in the way we represented Moises’ story. We used his verbatim quotes to frame his narrative but wrote it for the research community as the primary audience to preserve communicative validation and social construction with the relevant communication communities (Walther et al., 2017). Because we were concerned that we would not do justice to Moises’ lived experiences by simply listing the forms of capital and deductively illustrating the capital with examples from Moises’ life, we told Moises’ story in chronological order to describe capital as it occurred.

We were initially apprehensive about how we presented Moises’ story, and we wanted feedback about our contributions to the theory and the implications for CCW’s future application in engineering education. These concerns overlap as ethical, theoretical, and communicative validation concerns. We paid two respected scholars who have published on related topics in engineering education to review an early draft of this manuscript. We incorporated many of their suggestions, specifically by adding to the literature review, condensing our discussion, and strengthening our implications. We think these changes helped with communicative validation of Moises’ story and the implications for CCW’s future use in engineering education.

We shared later drafts of the manuscript with Moises and discussed a spectrum of ways in which he could stay involved in the research and be recognized. He opted to be a coauthor on the published manuscript. Given a busy work schedule that involves international travel, Moises decided to contribute through reviewing the text that we wrote reflecting our recent conversations, rather than writing or editing the manuscript, thus ensuring the accuracy and ethical validation of his story while honoring his work obligations.

3. NARRATIVE FINDINGS

We present Moises’ narrative chronologically as events in his life contributed to his engineering degree attainment and beyond. Throughout the presentation of Moises’ story,
we highlight the types of capital Moises is activating, cultivating, or sharing. Moises’ narrative begins with his early memories of his parents’ influence on his education and moves to his unsettling high school environment. Moises’ narrative then focuses on his choice of engineering as a college major and his academic struggles in college. A considerable portion of his narrative focuses on how and when he used various types of community cultural wealth to succeed as an engineering major and earn his degree. His narrative ends at the time of the interview, a few years after graduation, though we have included very brief information about his current family and career.

3.1 Moises

Moises activated familial and expressive social capital he received from his parents because they encouraged his childhood academic growth. Moises’ parents immigrated to the United States in the 1970s from a Caribbean country to escape political unrest. Both parents work as educators. Moises noted that their immigrant status and emphasis on education significantly influenced his upbringing. For instance, he said, “My dad was pretty hard on me, especially when it came to academics and the books.” The pressure his father put on him is familial capital because that encouragement helped Moises value education. It also represented conformist resistance because his dad understood that he could improve his son’s success in academic institutions by preparing him from an early age. Moises brought up examples of familial and expressive social capital when discussing how his parents taught him and his three siblings how to read and write “before we showed up at our first day of [class].” Moises activated navigational capital and familial capital he received from his parents because as educators they recognized the challenges in their local school system, and they chose to move to a different school district to improve their children’s access to quality schools. Moises talked about how his parents navigated the school system when they “pushed me into a gifted program.”

Even after the family’s move, Moises talked about challenges that highlight the importance of his parents’ support to his persistence. Moises offered up examples of his familial and aspirational capital by illustrating how the value his family placed on education was different than what he observed in his peers’ families. While his elementary school had “great programs,” he also noted “we had to ride the bus with middle school kids . . . that weren’t in the same realm or weren’t pursuing the same academic pursuits.” Moises elaborated, saying “a lot of [kids] that don’t necessarily have much . . . and their parents may not value the importance of academics as mine did.” Moises repeatedly activated the capital he received from his parents because they valued academic achievement, noting that “if it wasn’t for the fire of my parents under me . . . [and] the fear of my parents, it would have been very difficult.” His parents told him, “Don’t worry about all these other distractions” even though the distractions seemed to be the “norm” for his peers. Moises’ parents’ constant emphasis on learning and their encouragement to succeed academically are also examples of aspirational capital; his parents understood through their own academic achievements and experiences as educators that education was a way to transcend obstacles and pursue goals.
3.1.1 High School

Moises discussed how his familial capital guided him through a turbulent high school environment. Moises described his high school as being “a magnet school, which had a little bit more when it came to the opportunities.” Despite some additional academic opportunities, the school also employed police complete with “horses and . . . riot gear.” Moises described how the weaponized atmosphere interfered with his academic pursuits. In fact, one day the police threw a mace bomb to dispel a fight, and Moises experienced physical symptoms of being maced. He highlighted the importance of his familial capital in keeping him on a steady course, despite his own adolescent feelings of invincibility. “If I didn’t have my brothers and my dad and people that really struck the fear of God in me,” he contemplated, “I would have thought I could rule the world, and I would have found out the hard way that I can’t.” Moises contrasted his high school experience with the other high school he would have attended if his parents had not moved to the new district. He said that the other school was “literally a dropout factory . . . [where] three or four people got stabbed.”

Moises also cultivated familial and navigational capital from his older sister’s guidance. During high school, Moises said he was overly focused on athletics even though he excelled academically. He was recognized at the state level as an exceptional track and field athlete, and he believed his athletic talent would attract college money. He initially considered colleges that would offer him an athletic scholarship, but Moises’ older sister discouraged this focus. When she asked what he liked to do, he told her, “I like to build stuff, and I like to blow stuff up.” Moises’ sister then encouraged him to consider engineering programs. According to Moises, “She made me make a list of the top engineering programs in the country.” Moises applied and was accepted to an engineering-focused school several states away from home. Moises noted that having the familial capital from his sister (helping him identify majors that he would enjoy that were lucrative) helped him get into a well-known university and made him believe “I can pursue something like engineering.”

Additionally, throughout his K–12 education, Moises’ parents encouraged him to put himself in situations where he would be in front of an audience “in the spotlight.” He participated in Martin Luther King Day speeches and “played everyone from Jesus to Satan” in church plays. He attributed speaking in front of groups starting at an early age to his development of linguistic capital. He said he was not shy speaking to groups or to authority figures and this linguistic capital gave him confidence once in college to “aggressively advocate” for himself and achieve his goal of earning a degree.

3.1.2 College

In the summer between high school and college, Moises derived conformist resistance from the engineering bridge program in which he participated. Moises had not taken calculus in high school because he “didn’t know that it would be a requirement” in college engineering programs and he explained that he had “no one else to tell [him].” Despite
not being provided with the necessary guidance at school, Moises’ parents and his sister “pushed” him to enroll in an engineering bridge program. The College of Engineering’s requirement for students to have calculus coursework prior to enrolling in the program displaces the onus of preparation from the college to students and the public-school system, instead of requiring all first-year students to take the same core curriculum to improve educational equity. Moises described the bridge program as an “amazing opportunity” where he “met so many great people.” He derived instrumental social capital from the program, which allowed him to meet the College of Engineering’s calculus requirement before starting his first year at the university. Having earned a C in the course, Moises did not meet the minimum grade requirement to matriculate into the engineering program, so he enrolled in an “undecided” major while he held onto his aspirational capital and his goal of eventually transferring into an engineering major. “I’m not in the College of Engineering,” he recalled thinking at this moment, “but I’m going to get in because otherwise I’m going to get sent home.”

Moises cultivated additional instrumental social capital when one of his mentors convinced him to get a tutor to help him adjust to his first semester in college. His first year in college was particularly difficult because of the inequities caused by his public-school system’s curriculum and also because he had not yet cultivated his own forms of capital that would help him succeed in undergraduate engineering curriculum. When Moises talked about how he “failed the . . . prelim test trying to get into engineering,” he described how he was initially “stubborn” and thought he could get into engineering “all by myself.” With tutoring, the rest of his semester went smoother, and he did not experience other difficulties until his final exams. Moises explained that he was unprepared for final exams in college because final exams had been optional at his high school. He also assumed that his professors would curve exam grades because such a large percentage of the course grade was determined by just one test. He discovered that his assumptions were not accurate. He failed many of his final exams, ending his first semester with a 1.7 GPA.

Moises confessed how he had been afraid to tell his parents about his grades when he went home over his first winter break, and because of his initial refusal to tell them, his parents kicked him out of the family home. Moises was afraid of his strict parents who placed a high value on educational achievement, and he stated that his fear drove his aspirational capital to improve his grades. In retrospect, Moises noted that this punishment, while harsh, really forced him “to think about what would happen if I don’t get into the College of Engineering” and made him even more determined to succeed. He remembered thinking, “I’m going to completely change the game.” By the end of Moises’ first year, he raised his GPA to 2.1 and was accepted into the College of Engineering. He discovered further obstacles, however. First, he needed to take engineering courses during the summer after his first year of college in order to get on track. Second, he needed to be accepted into a specific engineering departmental major.

Moises continued to demonstrate aspirational and linguistic capital when he obtained a job in the dean’s office; the position offered him opportunities that he used to develop navigational capital. Moises reflected on his tenacity in asking for a job even
before he raised his GPA. He attributed part of the confidence he possessed to “aggressively advocate” for himself to his previous public speaking experience: “[The dean] gave the guy with a 1.7 GPA a job because I wouldn’t stop begging, and I wouldn’t stop being persistent.” Moises stated that “I learned that my persistence would help me overcome anything . . . because when people say to you ‘no’ enough times, eventually somebody is going to say ‘yes’.” Moises’ job in the dean’s office involved sending emails to the student listserv about research and outreach opportunities. Moises said: “I think this was an advantage I had over my peers because if I wasn’t in the office . . . [those opportunities] wouldn’t have been so readily accessible for me.” Moises was able to work on his first research projects because he had access to the announcements about those opportunities. His job also made it possible to use administrators in the engineering college as references, which helped grow his instrumental social capital. Moises also cultivated navigational capital in his job in the dean’s office because he learned how to create a résumé, a skill that he noted “set me apart from a lot of my peers.”

Moises combined his aspirational capital with navigational capital and found an engineering department that did not have a GPA requirement for matriculation. Even though his chosen major did not have a GPA requirement to be accepted, Moises was aware of the subdiscipline’s reputation for being particularly rigorous, causing many students to drop out. Moises recalled an example of his aspirational capital when he told his professors up front, “I’m here to pass. I’m not going to fail your course.”

Moises used the navigational capital he learned in his dean’s office job to create a résumé and instrumental social capital he cultivated by participating in the National Society of Black Engineers (NSBE) student chapter to gain financial support to attend the National NSBE Convention after his freshman year. Moises attended the job exposition at the conference but was belittled because of his low GPA when he approached a booth about a job opportunity. He recalled that the company’s representative told him: “Why would you bring [this résumé] in front of me? . . . you need to do better.” Moises remembered how this rejection “really, really hurt” because “[my résumé] is the best of me,” but he argued that the experience instilled in him even more resilient resistance. He framed the representative’s rejection as a pivotal moment that he translated into perseverance, after which “I was able to get the research opportunities,” and “I was able to get enough money through working . . . just to pay for my semester” because “[I] never gave up.”

Moises exercised his linguistic capital throughout his undergraduate career, stating that it had a “significant impact” on his confidence, both through engineering and non-engineering related events geared towards difference audiences. For instance, he taught kids about engineering via at NSBE’s Pre-College Initiative and represented his NASA’s national Lunabotics team as the team spokesperson where he presented in front of a panel of experts at Cape Canaveral. Moises displayed his linguistic capital at non-engineering activities such as his campus’s Trayvon Martin March and at NSBE’s National Slam Poetry contest. Later, after graduation, Moises gave a TEDx talk entitled “Poetic knowledge,” and he talks about being an “engineer by trade, but poet by night” and a storyteller. At the date of manuscript submission, his TEDx talk had 15,700 views.
on YouTube. Moises attributes these accomplishments with providing him confidence to interact with people his peers found intimidating, but who helped Moises build instrumental social capital through expanding his network of people that could help him in his pursuit of a degree.

Moises described how he leaned into his aspirational and linguistic capital to build social capital with his professors when he said: “[I] bugged the hell out of all my teachers” and “sat in the front, front, front, front row” in all of his classes. He remembers thinking, “[W]hen you’re the guy the teachers know, they [call] on you.” Moises even talked about how “If my teacher couldn’t get me the answer, I’d go find whoever the department head was, and I’d have the department head tutor me on the subject.” Moises noted that these relationships set him apart from his peers. Moises’ social capital with his engineering professors helped him do well in his classes.

When he could not develop social capital with his instructors, Moises used his aspirational capital to build social capital with his peers who would help him with course content. Moises used social capital to find peers who were excelling in his classes and tried to study with those students. He talked about how he incentivized students who were doing well in his classes by inviting them to eat with him at the on-campus restaurant, which he could pay for with his meal plan. Moises remembered asking them, “What if I buy you a steak at [the on-campus restaurant]?” and then while they were enjoying the free meal, he would ask them questions about course problems, such as “How did you get this? . . . Cool, how did you figure that out?” Moises eventually cultivated enough social capital with a core group of friends and peers who were “go-getters.” They helped each other with concepts and homework. They were “the ones who stalked the teacher” for help.

By his junior year, Moises cultivated social capital by developing relationships with peers and organizations on campus that were especially useful in difficult junior-level courses. He explained, “You never know who is taking that class that . . . you’re looking to take.” Moises and like-minded friends formed a group they called “Team 5 a.m.” because they would endeavor to finish their work by 5 o’clock in the morning. Moises and the rest of Team 5 a.m. would meet in the evenings to get something to eat, and then would “go to all the different extracurricular activities.” He recalled how many different student organizations he belonged to that year: “I was in NSBE. I helped out with Society of Women Engineers . . . helped out with BOC (Black Organizational Council). I helped out with . . . the Caribbean Society. I helped out with the chess club. I helped with . . . literally if there was something, I was involved in it.” Moises and Team 5 a.m. would then “go to the gym from 10:00 [p.m.] until midnight” and would then “study from midnight until 5 a.m.” Moises continued to use his social capital as navigational capital to circumvent his low GPA. For example, Moises stated that “someone called in a favor for me to get an internship” at a telecommunications company that “opened up so many other opportunities.”

Moises cultivated navigational capital by searching for financial assistance throughout his undergraduate education. Paying for college was a barrier each semester because his university account would be placed on hold, and the university would
not allow him to register for classes until he paid his tuition and fee balance. He said he “applied to every scholarship under the sun,” even to scholarships such as Latinx and women’s scholarships that were not applicable to him. He would “call different banks and see where I could get money.” Moises demonstrated aspirational capital by sitting in the financial aid office “for two weeks” until “people started to help” by offering Pell Grants and other funding. Moises eventually realized that most of the available help came in the form of student loans. In the summer after his sophomore year, he continued to work in the engineering office “to make enough money,” but Moises also secured a research opportunity because he used his transformative resistance and “fussed with the professor about why a [GPA] recommendation isn’t a requirement.”

By Moises’ senior year, money was even more of a pressing need and his social capital came through again; friends contacted him with information about competitions for money and prizes. He recalled “thinking about how much I needed that money, and the rent was getting ready to come up and all the things I couldn’t afford.” Moises planned to attend another engineering exposition and was worried “I still had my old cheap suit that I got for church.” Then a friend told him about a competition where the prize was a new suit and shoes. Moises recalled telling his friend, “Thank you for telling me because . . . I’m not going to lose.” He won the new suit and noted that “it really changed the game.” Moises displayed conformist resistance by working to win a new suit because he recognized how he would need to conform to the business dress norms of dominant culture to be successful.

Moises utilized the social capital in his network of friends and contacts who notified him of and participated with him in a showcase through a different college at the university. He signed up his group with the bare minimum of team members so that he would not have to split the prize money more ways than was absolutely necessary. His team won the competition. These examples of Moises’ aspirational capital—refusing to lose the competitions and being determined to improve his financial situation—also gives us examples that Moises cultivated navigational capital. That is, he started understanding and utilizing opportunities to gain resources. Moises cultivated navigational capital from his many research and internship experiences. During his senior year, he attended the engineering exposition and presented three different résumés tailored to three sub-disciplines in his major.

3.1.3 Career and Future

Immediately after graduating, Moises began working for a telecommunications company. He generated social capital after graduating in his first industry job in the region where he lived. Moises noted that he “made so many great friends and so many networking opportunities.” He also worked as a mentor with several youth program where he exercised his linguistic capital and “went out to the inner city” and spoke to groups of students. Moises used his linguistic capital of being comfortable speaking publicly to share aspirational capital with students who wanted to
become engineers. About two years into his industry job, Moises decided to relocate. Moises used his social capital from his undergraduate education and contacted a former study group friend who worked for the same company in an office across the country. The friend told Moises to apply for the job and promised to “put in a good word.” Moises applied to the job and explained, “I got flown out and they were like: ‘This is just a formality’.” He now works at Boyd Corporation as a Business Development Executive.

Moises is married and is focused on building familial capital for the next generation. Moises discussed that his focus has shifted, saying, “It’s truly the legacy of family, for me to be a better half and create little creatures and put them on this world and for them not to suck.” Thus, by building networks and social capital, building financial stability and aspirational capital, and meeting someone who shares his goals, Moises is now focused on building familial capital and passing on to his children the lessons he has learned. He speaks continues to grow his linguistic capital and speaks, or is learning, five languages: Vietnamese, Spanish, Portuguese, and Tagalog, in addition to his family’s native Haitian Creole.

4. DISCUSSION

Our use of narrative inquiry addresses recent critiques regarding analysis techniques used to date in engineering education CCW studies. We agree with Denton and colleagues that an overreliance on thematic analysis as a sole analytic approach in engineering education research using CCW has the tendency to result in interpretations that are not deep enough to capture the nuances that exist (Denton et al., 2020). This lack of depth is likely related to “taking bits and pieces—snippets of an account often edited out of context” (Riessman, 2008, p. 12). Narrative analysis allowed us to see things that we would have missed if we were solely using thematic analysis or other types of analysis. That is to say, with narrative analysis, we were able to frame Moises’ rich, lived experiences in the context of his personal and historical contexts (Riessman, 2008). Narrative analysis and Moises’ story, specifically, allowed us to advance CCW in the following ways: (1) Moises’ salient types of capital changed with time; (2) Moises shifted how he used capital over time; and (3) multiple types of capital can be used at the same time and can overlap. Thus, we confirmed other researchers’ observations that capital can be concurrent and overlapping (Denton et al., 2020; Mobley and Brawner, 2019; Preston, 2017; Yosso, 2005).

4.1 Benefits of Narrative Analysis for Determining Chronological Progression of CCW

By using narrative analysis to reconstruct a chronological account of Moises’ engineering educational journey, we identified how Moises changed the type of capital he used to confront challenges at different stages of life. Other researchers (Bourdieu, 1986; Samuelson and Litzler, 2016) have suggested that types of capital accrue over time,
but we have not found anything in the extant literature that suggests a chronological progression of the salience of types of community cultural wealth. Even Yosso’s (2005) presentation of CCW did not identify an order to the types of capital.

4.2 CCW is Concurrent and Overlapping

We saw Moises’ use of multiple, concurrent, and overlapping types of capital to develop relationships and to improve his access to resources, as well as to persevere and to circumvent challenges within social institutions as he became an engineer. Moises activated, cultivated, and shared capital, and he transformed his existing capital into other types. Multiple researchers (Burt and Johnson, 2018; Carbajal, 2015; Huber, 2009; Yosso, 2005) have acknowledged that the component types of community cultural wealth are not mutually exclusive and can overlap. We show selected experiences from Moises’ narrative and the types of community cultural wealth in Table 1.

4.2.1 Activating Capital

Moises began with strong familial capital that helped him develop and maintain aspirational, linguistic, and navigational capital. His familial capital also supported his resistant capital in college engineering. Unlike some of the participants in Burt and Johnson’s

<table>
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<th>Example</th>
<th>Community cultural wealth</th>
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<td>Parents moved to a different school system</td>
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<tr>
<td>Public speaking at an early age gave him confidence to advocate for himself</td>
<td>X</td>
</tr>
<tr>
<td>Sat in financial aid office for weeks until someone helped him find funding</td>
<td>X</td>
</tr>
<tr>
<td>Passing financial security and morals to future children</td>
<td>X</td>
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(2018) study, Moises’ parents did not necessarily cultivate an interest in STEM, but they provided and facilitated many forms of capital that Moises applied to his interest in engineering. It is likely his parents did this because they were both school counselors. Previous researchers (Burt and Johnson, 2018; Moore, 2006) noted that Black men in STEM typically had a teacher or mentor outside of the family who guided them into STEM, but in Moises’ case, his parents and sister were instrumental in providing career guidance. Both studies affirm the importance of parents/family and educators.

Previous researchers have listed any familial support as familial capital, which Denton et al. (2020) considered a “limited interpretation” (p. 17) because this classification of familial capital did not extend to fictive kin or to the surrounding community. Burt (2019) noted that a supportive “village,” including but not limited to family members, helped Black male graduate students persist during their STEM doctoral studies. While Moises’ narrative focused on familial capital from his parents, we do not discount Burt’s extended village of other people who influence young Black men to become interested and to persist in engineering (Burt et al., 2019; Burt and Johnson, 2018). These fictive kin, who are not related by blood, consist of mentors, spiritual communities, and friends and extend familial capital into other forms of capital, particularly aspirational and social capital for Black children and adolescents.

We agree with Denton, Borrego, and Boklage that fictive kin should be considered familial capital, but we would also like to push the concept of familial capital to be even more nuanced. We interpret encouragement or emotional support from family as expressive social capital. For example, we interpret financial advice, favors, or family members seeking information on Moises’ behalf as instrumental social capital. Recent work by Martin and colleagues (2020) demonstrated how parents and intergenerational family members use expressive actions to support students pursuing engineering degrees. We extend their classification of instrumental social capital in families even further, such as Moises’ parents teaching him how to read as a young child as well as his sibling suggesting that he consider undergraduate engineering programs.

Moises’ early familial and social capital also overlapped with resistant, aspirational, navigational, and linguistic capital. Other researchers have acknowledged the connection between familial, aspirational, and social capital (Longoria, 2013; Rubinson, 2016), especially parental influence on education. When Moises was young, his family paired support and encouragement (familial and expressive social) with other forms of capital in multiple instances. Moises’ parents encouraged and taught him how to read from an early age (familial, instrumental and expressive social, and conformist resistance), to perform in front of audiences of adults (linguistic), to remain focused on academic achievement (familial, expressive social, and aspirational), and his parents placed him in a different school system that offered more opportunities (familial and navigational).

4.2.2 Cultivating Capital

Moises was a cultivator and agent of his own capital, which is an asset. Moises cultivated his own capital when he was completing high school and continued to do so in college. It is not surprising that Moises began his engineering program possessing
multiple forms of capital, particularly familial, linguistic, and social capital. Samuelson and Litzler (2016) similarly found that students entered engineering programs already possessing some forms of capital, and they noted what students bring with them is essential to dismantling deficit-based perspectives of Black men in engineering. His ability to activate capital he received from others is also an asset. Moises’ narrative reminds researchers in the field of engineering education that asset-based frameworks should not focus solely on the resources provided to minoritized people; asset-based frameworks should also consider the resources minoritized people create for themselves.

Moises cultivated navigational capital that overlapped with other types of capital, particularly as he worked through his college options. Moises’ sister helped him realize that he should switch his focus from universities where he could be a track and field athlete to universities with an engineering focus (familial and instrumental social capital). Moises then applied to multiple engineering-focused universities. Moises’ sister helped him learn how to navigate institutions for his benefit (familial, instrumental social, and navigational). Moises participated in a university program to help students succeed in engineering (aspirational capital), and he cultivated other types of capital through this program. Samuelson and Litzler (2016) found that participants connected to people who helped facilitate their navigation were more likely to become engineers.

When Moises was in college, he cultivated ways to pay for his tuition and fees (aspirational capital), specifically by sitting in the financial aid office until someone helped him find loans or grants (navigational, linguistic, and instrumental social). Samuelson and Litzler (2016) remarked that navigational capital is skills-based, whereas aspirational capital is dispositional. We agree with this framing. Moises’ persistence to pay for his education—and his ingenious methods to find financial assistance—demonstrates how aspirational capital can work together with navigational capital to support student tenacity. Later in college, Moises’ friend called in a favor so that he would be considered for an internship (instrumental social). This favor enabled Moises to be considered for the internship without the sole emphasis on his GPA (navigational capital). Moises also begged (his word choice) an associate dean for a job in the dean’s office (aspirational, linguistic, and instrumental social), which allowed Moises to have access to additional financial resources, including research opportunities (instrumental social). Moises also collaborated with friends to win competitions for prize money (linguistic, instrumental social) which he vowed not to lose (aspirational). Moises cultivated his professional skills as a source of linguistic capital, which counters typical examples of linguistic capital that Denton and others (2020) noted in multiple studies using CCW.

4.2.3 Sharing Capital

Moises shared capital with others, especially after he graduated from college. Samuelson and Litzler’s (2016) participants also discussed supporting younger students, such as mentoring incoming freshmen or doing community service projects with students as a way to enhance community well-being. Unlike Samuelson and Litzler (2016), who classified community outreach as familial capital, we classified Moises’ community engage-
ment as instrumental social capital because his role with the students resembled being a source of social capital more than forming a kinship. Moises shared with local students how he overcame obstacles to become an engineer (aspirational, linguistic). He served as a source of instrumental social capital for them.

Moises also envisioned sharing capital with his future children. Samuelson and Litzler (2016) found that when the hopes and dreams that students possess include a sense of morality, the hopes can be attributed to familial capital. We saw this connection with Moises as well. Moises valued raising his future children to be good people (instrumental social and familial), just as his parents had raised him.

5. LIMITATIONS AND FUTURE WORK

A limitation of using narrative analysis is that by applying an analytical lens of CCW, we made determinations about what parts of Moises’ story appear here. We omitted details from his story that could have provided an even richer depiction of his educational background and his journey to become an engineer, but we could not accommodate those details in this format. Instead, we chose highlights that allowed us to illustrate the richness of Moises’ capital without compromising the flow of his story.

Denton and colleagues (2020) noted that conducting a study where one’s only participants are students is a limitation of CCW data collection because students will find it difficult to “critique the systems in which they are currently embroiled” (p. 21). The benefit of interviewing only students is that their voice becomes the focus. We see how this hyper-focus on student voices could place an unintended burden on them to be the arbiters of systemic change. While not part of this study, we agree that collecting data from faculty, staff, administrators, and families is a rich area for future work. Interviewing university personnel who are—or who should be—aware of systemic barriers that minoritized engineering students face could offer data on how they observe students developing resistant capital against tacit policies that exist to oppress them.

We recognize that a follow-up study using an additional methodology that could accommodate more participants and/or the complementary perspectives of faculty, staff, administrators, and students’ families would enrich our findings. For example, using phenomenology to study accounts from family members, fictive kin, and educators could reveal how participants develop asset-based forms of capital that address different systemic barriers. These perspectives could enrich our nuanced and overlapping understanding of community cultural wealth. Because narrative analysis theorizes from a small number of participants, we wonder how a follow-up study with a larger sample of Black men might reveal different examples of the progression of familial capital to other types of capital.

We also wonder how other minoritized students in engineering, such as Latinx people, build capital over time. Others researchers have highlighted how Latinx people describe family and extended family as their main source of affirmation for considering college (Peralta et al., 2013; Zamudio, 2015), but we do not know how Latinx students
build additional capital upon the foundation of familial capital to be successful in engineering. This is an opportunity for future research using narrative analysis and CCW.

5.1 Methodological and Theoretical Implications

We encourage other STEM education researchers to consider their methodological choices as crucial to deeply interrogating CCW theory and overcoming some of the prior limitations of its use in STEM education. We specifically encourage other STEM education researchers investigating CCW to use narrative analysis. Our methodological choice enabled us to ascribe *temporal nuances* to community cultural wealth by telling the story of how Moises cultivated and used various forms of capital in earning an engineering degree. By focusing on a single participant’s use of CCW rather than an amalgamated participant pool, we illustrated tangible ways in which Moises used multiple, overlapping types of cultural wealth. We recommend that other STEM education researchers interrogate how types of capital overlap in their participants’ lived experiences. Our work found a salient overlap between familial and aspirational capital in Moises’ narrative. We encourage researchers to consider other participants of different intersectional identities and how they experience overlapping capital.

6. CONCLUSION

Research is political. Education is political. Our article provides an example of methodological activism in STEM education. We were politically purposeful in our choice of CCW theory and narrative methodology to describe the educational journey of a Black man at a time in our country’s history when racial injustices perpetrated against Black people demand responses from social institutions and from those of us doing research inside these social institutions. We invite our STEM education colleagues to be explicitly political in conducting research by engaging in methodological activism and we commit to continuing to do so as well.

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