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Unsolicited Narratives: The Experiences of Afro-Caribbean Women as Mathematics Learners and as Mathematics Educators in U.S. Institutions of Higher Education

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This dissertation, UNSOLICITED NARRATIVES: THE EXPERIENCES OF AFRO-CARIBBEAN WOMEN AS MATHEMATICS LEARNERS AND AS MATHEMATICS EDUCATORS IN U.S. INSTITUTIONS OF HIGHER EDUCATION, by DIHEMA R. LONGMAN, was prepared under the direction of the candidate's Dissertation Advisory Committee. It is accepted by the committee members in partial fulfillment of the requirements for the degree, Doctor of Philosophy, in the College of Education & Human Development, Georgia State University.

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ABSTRACT

UNSOLICITED NARRATIVES: THE EXPERIENCES OF AFRO-CARIBBEAN WOMEN AS MATHEMATICS LEARNERS AND AS MATHEMATICS EDUCATORS IN U.S. INSTITUTIONS OF HIGHER EDUCATION

by

Dihema R. Longman

Under the Direction of Dr. David W. Stinson and Dr. Janice B. Fournillier

Afro-Caribbean immigrant women are part of the brilliant makeup of Black excellence in the United States. Nevertheless, the experiences of Afro-Caribbean women as mathematics learners and as mathematics educators in U.S. institutions of higher education have yet to gain interest among researchers. These experiences are too often absent in the literature or are more times than not buried within categories such as women, foreign-born, or "Other" (Alfred & Swaminathan, 2004; Lather, 1991). When the experiences of Afro-Caribbean women are the focus of research, that inquiry rarely extends into the discipline of mathematics (Beck, 2010; King Miller, 2013) and is nearly nonexistent in examining the experiences of mathematics educators.

The aim of this qualitative study, therefore, was to examine the social and contextual experiences of Afro-Caribbean women as mathematics learners and as mathematics educators in U.S. institutions of higher education. The narrative research project (e.g., Polkinghorne, 1988) employed figured worlds (e.g. Holland, Lachicotte, Skinner, & Cain, 1998) and intersectionality (e.g. Collins & Bilge, 2016) as theoretical frameworks. Data collection included dialogical interviews (Kvale, 2007) and documentary data (Patton, 2002); data analysis included dialogic

and categorical approaches (Charmaz, 2014; Goodall, 2000). A heuristic (Moustaskas, 1990) approach to the study included the researcher positioning herself as a guide representing the outcomes of the analysis.

The analysis of the data showed that when Afro-Caribbean women enter the figured world of mathematics as learners, an actualization of their social positioning, based on practices witnessed, creates spaces for authoring their self-in-person now as mathematics educators. As the now actualized mathematics educator, Afro-Caribbean women become advocates in mentoring people who look and sound like them and use key moments to educate others about their Caribbean figured worlds. Afro-Caribbean women shared moments of how being Black, women, and immigrant in mathematics figured worlds brought both challenging and dismaying experiences as well as praiseworthy experiences. Nonetheless, as demonstrated by the participants' narratives, having a strong sense of self, knowledge, and purpose is useful in making oppressive moments teaching and learning opportunities rather than sources of distress in their mathematics and academic figured worlds.

INDEX WORDS: Afro-Caribbean Women, Figures Worlds, Higher Education, Immigrants, Intersectionality, Mathematics Teaching and Learning, Narrative Inquiry

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DEDICATION

I dedicate this dissertation with love, humility, authenticity, and faith to my brilliant and beautiful American Caribbean daughters, Elise Patrice and Claudia Marcia. I do this dissertation in hope that your narratives become just as much a part of the solution.

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First, I would like to thank God and my family who were ever-present in making the dissertation process easier. This dissertation required me to seek God persistently for guidance, strength, and acknowledgment of my worth. Through my family, God has allowed me to receive support, motivation, and inspiration during this 6-year journey. God and my family, along with this dissertation, allowed for practicing gratitude, learning patience, and gaining an understanding of acceptance of self.

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Last, I acknowledge the evolutional transformation of the process.

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CHAPTER 1

CONTEXT AND RESEARCH QUESTIONS

The focus of this study is the experiences of seven Black[1] immigrant[2] women, born in the Caribbean (Afro-Caribbean[3]), as mathematics learners and as mathematics educators in institutions of higher education[4] in the United States. In this chapter, I provide a context for the study, briefly discussing Black immigrants, the motivation behind the study, and research on foreign-born and Afro-Caribbean faculty in U.S. higher education. I conclude the chapter with the interest statement and research questions.

Introduction

Immigrants have faced intense scrutiny as an alarming increase of xenophobia toward nonwhites has plagued the United States (Boot, 2018). This xenophobia has materialized in various ways: thousands of detained migrant[5] children held in concentration facilities referred to as "camps" and "tent cities"; Greyhound buses stopped by border patrols 50 miles within the

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[1] Fournillier, McLean, and George (2013) note that "Black" is a social construct used to refer to three groups of people: Blacks born in the United States (i.e., African Americans), U.S. Black Africans (immigrants from Africa), and Afro-Caribbean immigrants (which includes Haitians).

[2] Permanent Resident Alien: an alien admitted to the United States as a lawful permanent resident. Permanent residents also are commonly referred to as immigrants; however, the Immigration and Nationality Act (INA) broadly defines an immigrant as any alien in the United States, except one legally admitted under specific nonimmigrant categories (INA section 101(a) (15)) (Department of Homeland Security, 2018).

[3] The term *Afro-Caribbean* is used throughout the study when referring to the women of African heritage from the Caribbean. The term Afro-Caribbean is defined by Rogers (2006) as voluntary immigrants from predominantly Black, English-speaking Caribbean countries who are "accustomed to living as part of the majority and seeing people who look like them in control of political and economic power" (p. 9).

[4] The terms *institutions of higher education* or simply *higher education* in this study include post-secondary technical schools and colleges and 2- and 4-year colleges and universities in the United States, unless otherwise noted.

[5] The United States Department of Homeland Security defines migrant as a person who leaves her or his country of origin to seek residence in another country.

United States interrogating passengers for “documents”; and the establishment of the new “denaturalization task force” charged with identifying those “cheating” the naturalization process “by omitting or failing to mention any aliases or iteration of their names” on their applications (Contreras, 2018). These issues are just a few of the negative actions and discourses surrounding immigrants’ experiences in the United States. Indeed, in addition to racism, Black immigrants in the United States independently undergo issues of xenophobia (Hernandez, Ngunjiri, & Chang, 2014; Louis, Thompson, Smith, Williams, & Watson, 2017; Rong & Fitchett, 2008).

These incidents of xenophobia have occurred even at the highest level of the U.S. government. A January 2018 *Washington Post* article reported that the 45th President of the United States, during a meeting in the Oval Office discussing the bipartisan deal on the protection of immigrants, allegedly asked: “Why are we having these people from shit-hole countries come here?” (Dawsey, 2018) According to the White House officials, the countries to which the president was referring were on the continent of Africa, as well as Haiti and El Salvador. The White House officials further stated that the president specifically singled out Haiti, asking: “Why do we need more Haitians? Take them out.” Haiti, a country in close proximity to the United States, is one of the two Caribbean countries with the most substantial number of Black immigrants in the United States (Thomas, 2012). Of the total U.S. Black immigrant population, Haiti has the second highest percentage at 15%; Jamaica, my motherland, has the highest at 18%. As the President seemed to notice with his (supposed) mention of Haiti, there is a significant number of Black immigrants from the Caribbean in the United States.

The significant number of Black immigrants in the United States is a result of the loosening of the 1965 Immigration and Nationality Act. The amendment more than doubled the number of Black immigrants in the United States over the past decades (Alfred, 2004a; Thomas,

2012). Black immigrants in the United States who voluntarily enter the country for economic, education, and social advancement are largely from non-Hispanic or Afro-Caribbean countries such as Jamaica, Haiti, and Trinidad and Tobago (Ogbu & Simons, 1998; West, 2011). Black immigrants in the United States from the Caribbean comprise about 50% of the U.S. foreign-born[6] Black population, which is approaching 4 million people (Alfred, 2004a; Massey, Mooney, & Torres, 2007; Louis, et al., 2017; Rong & Fitchett, 2008; Thomas, 2012).

The United States, currently and historically, has benefitted from this skilled international transferability of a high number of Caribbean immigrants as human resources who hold a variety of positions in the U.S. workforce (Chiswick & Miller, 2007; Fournillier, 2010; O'Reilly, 2012; Thomas-Hope, 2002; West, 2001). Part of the Afro-Caribbean immigrants' presence in the United States has been associated with the human capital or "brain drain" phenomenon (Castellani, 2007; Fournillier, 2010; Hutchison & Wiggan, 2009; Mishra, 2007). This economic theory describes the net costs to the home country when a high number of skilled professionals migrate to other countries such as the United States (Becker, 1992; Castellani, 2007; Mishra, 2007; Skachkova, 2007). Waters (1999) claimed that Caribbean immigrants who decide to work in the United States are "those with the ambition and drive to move to a place where they think opportunities will be better" (p. 101). Waters further explained that immigrants "judge jobs based on comparisons with the opportunities available to them in their own country" (p. 101).

[6] I struggled with trying to determine which word to give power in this study, the word *immigrant* or the word *foreign-born*. Immigrant and foreign-born have the same meaning to me in terms of a person born in one country but living and working in another. The United States Department of Justice, however, defines immigrant as an alien resident or one with permanent U.S. status. A foreign-born can be an immigrant but also can be someone living in the United States without permanent status. In the literature on educators not born in the Unites States, I find the word foreign-born is used most often. I have yet to determine if foreign-born is used for non-Black Others, while immigrants are applicable for Blacks and people of color. Nonetheless, both words found in the literature will be used interchangeably here.

These highly skilled migrants from the Caribbean are part of the "brain gain" for the United States, particularly in the professional fields of nursing and education.

An Other from the Others Category

I entered my Ph.D. program as a ninth-year Assistant Professor of Mathematics at a junior college in the United States. I started the program trying to understand why so many of my students were either afraid of mathematics, had several gaps in their prior knowledge, or lacked basic study and academic skills to be self-directed learners (Merriam, Caffarella, & Baumgartner, 2007). As I progressed through the program, I noticed that there were not many individuals like me in the mathematics education literature who were writing and researching about the issues I was experiencing. The more I engaged in the mathematics education literature (and the education literature broadly), the more I learned that not many studies were done from the perspective of Black immigrant women in the field of mathematics (King Miller, 2013; 2017). I, therefore, shifted the focus of my research. With the near nonexistence of such literature, I decided to use my dissertation as a platform to effect change in the presence of Afro-Caribbean women in the mathematics education literature.

Whenever I read mathematics education research, it seemed that I was placed in/under the "Others" category. But who are the Others? Are they immigrants? Migrants? Refugees? "Documented"? "Undocumented"? Where did I fit in these studies? Whose experiences, culture, or pasts were similar to mine? Whose stories[7] might encourage or inspire me? There were descriptions such as Blacks, Latinos/as, and Asians mentioned in the literature but rarely did they

[7] In constructing the narratives for this dissertation, the words stories and narratives share a reflexive relationship where the words are used interchangeably throughout the study. Clandinin and Connelly (2000) explained "that in the construction of narratives of experience, there is a reflexive relationship between living a life story, telling a life story, retelling a life story, and reliving a life story" (p. 71).

distinctly state if they were people like me—a Black immigrant woman from the Caribbean who still speaks with a Jamaican accent. Undeniably, Afro-Caribbean immigrants are part of the foundational makeup of the educational system in the United States, but too often fall under the subject category of Other or not mentioned at all in academic research and literature (Davies, 2013). As Others, Afro-Caribbean immigrants are the present-day "zero-denominator" with no real defined presence (Gagne, 2007, p. 262). Black immigrants in general have been disconnected from studies on Western[8] minority achievement and linked to immigration studies despite the increasing distinction within the Black population in the United States (Fournillier, McLean, & George, 2013; Ibrahim, 2020; Massey et al., 2007).

Distinctively defining Others in research literature would add richness and context, and recognize and validate the Others' experiences (Gagne, 2007). Including the unique experiences and perceptions of these Others who are missing requires dissecting the broader racial categories. As Fournillier, McLean and George (2013) argued:

> The overarching/umbrella categories of race/ethnicity that are currently used to identify migrant minority groups fail to address the distinct real-world perspectives, sociocultural practices, and identities that exists in authentic ways with which individuals identify. We argue that no more is this evident than in the identity categories assigned to Black immigrants—as in the case of Caribbean Blacks—who are generally subsumed under the broader racial categories. (p. 261)

That is to say, Others has become a subject position in research literature that is too easily taken up and has not been given the attentiveness to the critical distinctions and differences between

[8] "The term 'Western,' of course, can no longer be thought of as racial term, and would need to include all 'ex-native colonial subjects' raised in, educated in/by, and otherwise socialized in/of/by the West" (Gagne, 2007, p. 254).

the people in these categories (Collins, 1986). This lack of attentiveness includes the unsolicited unique mathematics experiences of Afro-Caribbean immigrant women.

I was compelled therefore to conduct research that distinctively defined the Other as the Afro-Caribbean immigrant woman to increase her visibility in the mathematics education literature. The research presented here acknowledges Afro-Caribbean women's experiences, using their narratives to illustrate how they make meaning of their experiences as mathematics learners and as mathematics educators in U.S. institutions of higher education. These narratives challenge the negative discourses on immigrants, and broaden the scope of the existing mathematics education literature. The narratives also bring positive representation of Afro-Caribbean women to the academic and research literature more broadly, and is intended to be self-empowering for the Black immigrant woman—an Other of the Others category (Fournillier, 2004; Henderson, 1989; Lather, 1991).

Foreign-born and Afro-Caribbean Faculty in U.S. Institutions of Higher Education

The Survey of Doctorate Recipients revealed there are about 100,000 immigrant educators in U.S. higher education (Lin, Pearce, & Wang, 2009). Because U.S. institutions of higher education often depend on foreign-born faculty to diversify their campuses—given the low numbers of U.S.-born Black and Hispanic faculty—there has been an increase in the research interest on foreign-born academics (Cruz, 2018; Kim, Twombly, & Wolf-Wendel, 2012; Lin, Pearce, & Wang, 2009; Mamiseishvili, 2010). In that, the growing presence of foreign-born faculty has generated interest among higher education researchers to examine their roles and experiences (Mamiseishvili, 2010).

Skachkova (2007) cautioned, however, that while higher education immigrant women faculty might be expected to share similar experiences with women faculty generally,

particularly women faculty of color, "there is a major problem in their representation in the American academic profession" (p. 700). Louis and colleagues (2017) shared similar views: "Afro-Caribbean faculty members continue to be rendered indiscernible in higher education and to be frequently and erroneously perceived as African-Americans" (p. 668). In other words, although the number of foreign-born faculty may have surpassed U.S.-born Western minority faculty, the way that data have been reported often hides the actual level of distinction in U.S. higher education.

The limited research that does exist on foreign-born and Afro-Caribbean women faculty in higher education examines their experiences on issues such as: (a) underrepresentation, (b) mentorship, (c) loneliness, and (d) promotion and equity (e.g., Borum, 2010; Hirshfield & Joseph, 2012; Saye, 2002; Toe, 2014; Tran, 2014; Zambrana et al., 2015). But despite the growth of foreign-born faculty in U.S. higher education and an increased presence in the research literature (mathematics or otherwise), research on foreign-born women faculty, and especially Afro-Caribbean women faculty, is lacking. The mathematics education research that does exist is primarily in the area of teacher preparation and cultural assimilation, largely within the K–12 education system in the United States (e.g., Cross, Hong, & William-Johnson, 2011; Rhone, 2007).

Interest Statement and Research Questions

Alfred (2004) argued that institutions of higher education often report social constructs such as race, gender, and class as characteristics of distinction, but fail to report the too often hidden immigrant characteristic as a construct for comprehensive knowledge. Similarly, Bullock (2017) suggested that the larger mathematics education research community should explore "how identities are hidden in mathematics education," how they become hidden figures within

mathematics (p. 3). Afro-Caribbean women mathematics educators in U.S. institutions of higher education are some of these hidden figures. It is crucial then, I believe, to excavate and examine the experiences of Afro-Caribbean women to gain comprehensive knowledge about mathematics learning and teaching.

The inclusion of Afro-Caribbean women experiences as mathematics learners and as mathematics educators in U.S. higher education can enrich the research literature and reduce privileging the dominant discourse (cf. hooks, 1994). Therefore, the research project reported here is a form of agentive action in response to the scarcity of Afro-Caribbean women experiences in the mathematics education literature. In this narrative project (e.g., Polkinghorne, 1988), I employed figured worlds (e.g. Holland, Lachicotte, Skinner, & Cain, 1998) and intersectionality (e.g. Collins & Bilge, 2016) as theoretical frames to facilitate the creation of a collective community of agents of Afro-Caribbean women as mathematics educators in the United States. Details of the theoretical and methodological choices are provided in Chapter 3 and Chapter 4, respectively. The three research questions that guided the project were:

1. How do Afro-Caribbean women experience mathematics as learners, and as educators in the Caribbean and in the Unites States?
2. How do race, gender, and immigrant status position Afro-Caribbean women differently in mathematics as learners, and as educators?
3. How do Afro-Caribbean women make meaning of their social and contextual experiences that shape their mathematical identities (i.e. personas) as learners, and as educators?

CHAPTER 2

LITERATURE REVIEW

In this chapter, I review some of the literature on women mathematics educators in U.S. institutions of higher education, highlighting the growth of women faculty in mathematics and providing an examination of foreign-born and Afro-Caribbean women faculty. I then identify gaps in the literature on Afro-Caribbean women faculty in higher education, particularly, in the discipline of mathematics. I conclude the chapter with summative remarks with respect to the limited research on Afro-Caribbean women in U.S. higher education.

Introduction

Afro-Caribbean women arrived from many regions in the Caribbean to the United States either as labor workers, post-secondary students, or as privileged professionals (Alfred, 2004b). Immigrants' incorporation into the United States, historically and currently, fall in the general category of "voluntary minority" and under other categories such as: classical assimilation theory, segmented assimilation, spatial assimilation, collective identity, social capital and embeddedness, and transnationalism[9] (Lee, 2009; Miller, 2013; Ogbu & Simons, 1998). Upon arrival, Afro-Caribbean women immediately find themselves in multiple social and contextual settings that accentuate aspects of their race, gender, ethnicity, and immigrant status. The literature review presented here explores settings where Afro-Caribbean women experience mathematics as educators in institutions of higher education. The exploration has two foci: (a)

[9] Transnationalism, according to Faist (2010), is often used "to refer to migrants' durable ties across countries—and, more widely, to capture not only communities, but all sorts of social formations, such as trinationally active networks, groups and organizations" (p. 9). Diaspora, a term often used interchangeably with transnationalism, has different intellectual descent that denotes religious or national groups living outside a homeland.

Afro-Caribbean women in the category of women faculty in mathematics in U.S. higher education, and (b) Afro-Caribbean women in the category of foreign-born women faculty.

Of the estimated 43 million immigrants in the United States, people from the Caribbean region represent about 4 million, accounting for over half of all the Black immigrants in the country (Thomas, 2012; Zong & Batalova, 2016). The Caribbean is a region of 26 countries—14 of those countries make up the Caribbean Community and Common Market (CARICOM), which includes: Antigua and Barbuda, Bahamas, Barbados, Belize, Dominica, Grenada, Guyana, Haiti, Jamaica, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Suriname, and Trinidad and Tobago. There exist strong historical, cultural, and economic linkages between the United States and the Caribbean, contributing to a high number of Caribbean immigrants in the U.S. workforce (Chiswick & Miller, 2007; Thomas, 2012). Literature on Caribbean immigrant workers, however, is overrepresented among the less educated and underrepresented among the highly educated. Interestingly, the majority of Afro-Caribbean immigrants to the United States are women who are also likely to be educated and more likely to participate in the highly skilled workforce (Thomas, 2012; Zong & Batalova, 2016).

One theory that explains Caribbean migration is the brain drain theory. The theory speaks to the issues of highly skilled individuals who leave the developing economies of their home country for the advanced economies of other countries. This movement results in the loss of these talents often hindering the developing economies (Castellani, 2007; Fournillier, 2010; Fournillier et al., 2013; Thomas-Hope, 2002). The host country, in turn, gets an increase in brain gain from immigrants and a benefit of increase intellectually diversity in the workforce. In the context of U.S. institutions of higher education, this brain gain results in an increase in racial and ethnic diversity among faculty (Hutchinson & Wiggan, 2009; West, 2001). Despite theories

explaining the consequences of migrating to the United States, once Afro-Caribbean immigrants settled into the country, they are placed in social, economic, cultural, political, and racial structures that create distinctive experiences (Lima, 2010).

Afro-Caribbean immigrants and African Americans share common racial identity and discriminatory experiences (Massey et al., 2007; Rogers, 2006). African Americans rely on racial group consciousness to elevate their status and confront the challenges of racism. Rogers (2006) argued that Afro-Caribbean identity as immigrants in the United States has two hypotheses: (a) Afro-Caribbean immigrants place a greater emphasis on their ethnic identity to avoid racial stigmatization, and (b) Afro-Caribbean immigrants when encountered with discrimination tend to emphasize their racial group identity. Moreover, Afro-Caribbean immigrants, given their proximity to the United States, may use their home country or transnationalism to help navigate their racial barriers as they "make periodic treks back home as if enacting a life-reinvigorating ritual to an ancient mystic Mecca" (Premdas, 2011, p. 816).

Some researchers who studied Black immigration have commonly noted that Whites are more comfortable interacting with Black immigrants compared with U.S.-born Blacks or African Americans (Massey et al., 2007; Ogbu & Simons, 1998). This somewhat comfortable interaction, however, may be related to the miseducation of some Black immigrants about U.S.-born Blacks before coming to the United States. King (1991) referred to this state of miseducation as "dysconscious racism" (p. 133). Dysconscious racism is where people accept the existing inequity and dominant White norms and privileges as a given, creating a distorted understanding of U.S.-born Blacks (King, 1991).

Nonetheless, the idea that some Afro-Caribbean immigrants use the tactic of separating themselves from African Americans in an effort to avoid negative stereotypes connected with

them or to gain upward mobility is nonsensical (Rong & Fitchett, 2008; Waters, Kasinitz & Asad, 2014). The periodic treks allow Afro-Caribbean immigrants to take a break from the messages they receive about their social position in the United States. Therefore, they learn how to comfortably operate in multiple spaces (e.g., their birth country and the place where they currently live). Nonetheless, Afro-Caribbean immigrants over time come to realize that in the United States their fate is linked with that of African Americans—that they are indeed seen as the same (Waters et al., 2014).

Given that whiteness is a silent norm in the United States, Lobban (2013) argued that mainstream U.S. (White) culture either sees immigrants through a negative prism or does not notice them at all. She further argued, "All immigrants are faced with the specter of 'double consciences'…[and] all immigrants are interpolated as the 'other,' but North American culture has a hierarchy of 'others' based on class, race, religion, sexual orientation, and language" (p. 558). The experiences of Afro-Caribbean women are still buried even deeper in the hierarchy as gendered immigrant. As mathematics educators, Afro-Caribbean women experiences are again buried in the hierarchy of others, and these mathematics experiences are absent in academic research and literature.

The Afro-Caribbean faculty who are mathematically inclined, according to Damarin (2000), comprise a marginal population and should be considered a marked category. This marked category of faculty is among the underrepresented Black faculty population of only 6% in U.S. higher education (Louis et al., 2017; Smith, 2018; Zambrana et al., 2015). Louis and colleagues (2017) noted, "the American Academy, as diverse as it has become, continues to be an environment controlled by a White power structure operating on a White belief system" (p. 672). Afro-Caribbean women experienced a "double invisibility" of being Black and foreign-

born (Corra & Kimura, 2009; Louis et al., 2017; Rhone, 2007). This double invisibility expands further in mathematical spaces for Afro-Caribbean women given that mathematics is perceived as an intellectual domain for men (Daramin, 2000; Hottinger, 2016). Therefore, in academia, both as learners and as educators, Afro-Caribbean women operate under a triple invisible belief system: whiteness, maleness, Caribeanness. The discussions in the next sections review literature on women faculty in mathematics and foreign-born women faculty to situate the Afro-Caribbean higher education mathematics educators who participated in this study.

Women Mathematics Faculty in U.S. Higher Education

Since the 1990s, the number of women faculty teaching mathematics in U.S. institutions of higher education has been increasing (National Research Council [NRC], 2010). Recruitment efforts by leaders of government, industry, and academia have often specifically focused on diversifying STEM (science technology, engineering, and mathematics) professional fields, due to the historically underrepresentation of women, Blacks, and Hispanics (Blackburn, 2017; Landivar, 2013). But despite these increases and efforts, women continue to be underrepresented in STEM faculty positions, in general, and mathematics faculty positions, in particular. When women do hold faculty position (mathematics or otherwise), they often have fewer resources, lower salaries, increased workloads, less job satisfaction, and shorter retentions (Blackburn, 2017; Hirshfield & Joseph, 2012; Kessel, 2014; Ladivar, 2013; Saye, 2002). In U.S. 4-year colleges and universities, women represent 23% of full-time doctoral faculty but are more likely to hold assistant professor positions (see Figure 1). Moreover, women faculty, in comparison to their male counterparts, often experience harassment and sexism and are often expected to be the "token" at department gatherings (Hirshfield & Joseph, 2012; Kessel, 2014).

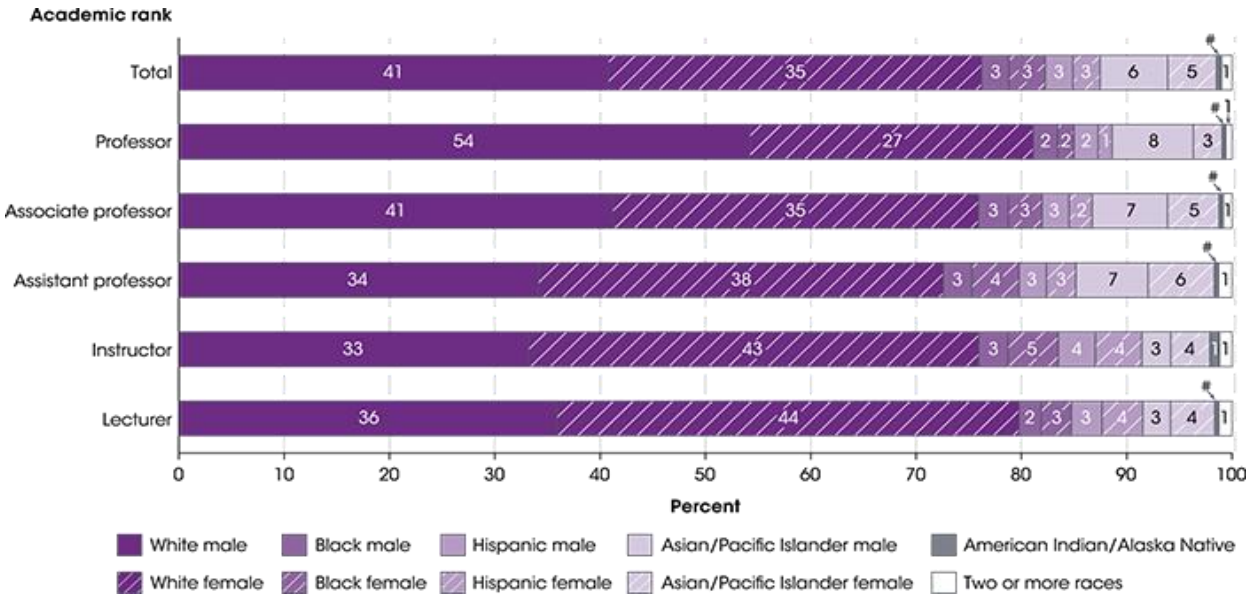

Figure 1. Percentage distribution of full-time faculty in degree-granting postsecondary institutions by academic rank/ethnicity and sex: Spring 2017 (U.S. Department of Education, National Center for Education Statistics, 2018).

Saye's (2002) study on power and influence, with respect to women faculty in mathematics departments, showed that women too often experience restrictions in rank, salary, types of degrees, and tenure status. Saye noted, "The voices of the women confirmed that inequity does exist and that women had to work harder to overcome barriers that men in their departments did not face in their effort to attain positions of power and prestige" (p. ix). The results of Kessel's (2014) study provided one explanation for the lower rank and prestige: a statistical pattern showing a higher representation of women faculty in mathematics departments at bachelor's and master's granting institutions and a lower representation at doctoral granting institutions.

Furthermore, according to Hirshfield and Joseph (2012), women faculty feel a greater need to become mentors and advisors to women learners, experiencing a large burden of "identity taxation" (p. 217). Identity taxation is when members of a marginalized group are expected to shoulder additional labor—physical, mental, and emotional—that is not expected of

their counterparts. Kessel (2014) stated that there is a pattern were women are "overrepresented as recipients of service awards but underrepresented concerning awards for scholarship" (p. 12). Although women faculty produce fewer publications than men, Bentley and Blackburn (1992) noted that there is an increase of women who are being awarded grants at the federal level, which, in turn, results in gains in publication output. Increases in grants and publications are examples of what Blackburn (2017) identified as making great strides toward gender equity in mathematics related disciplines. But in comparison to their male counterparts, these strides toward equity have a way to go to reach parity.

In summary, the literature on women faculty in mathematics departments in U.S. higher education indicates a growing presence; however, they are still often marginalized in direct and indirect ways. Women, despite making up half of the U.S. workforce, are underrepresented in terms of rank, salary, and research, and continue to be underrepresented in STEM fields in general (Ladivar, 2013; NRC, 2010). Nonetheless, important to note here, a portion of this growing presence of women faculty in mathematics departments can be attributed to women born outside of the United States (Lin et al., 2009).

Foreign-born Women Faculty in U.S. Higher Education

Most foreign-born educators throughout the entirety of the U.S. education system (K–16) are women. But in U.S. higher education, foreign-born faculty are more likely to be men, about 56% (Furuya, Nooraddini, Wang, & Waslin, 2019). Foreign-born faculty, both men and women, represent more than half of the Western "minority" faculty in U.S. higher education and around 22% of the full-time faculty at 4-year colleges and universities (Lin et al., 2009; Furuya et al., 2019). This growing presence of foreign-born faculty has also increased their presence in the

academic and research literature. Research specifically on foreign-born women faculty, however, remains limited. Exceptions to this nearly non-existent research strand does exist, however.

For instance, Skachkova's (2007) study provided the narratives of 34 immigrant women faculty in the social sciences and humanities. The participants represented countries such as India, Germany, Korea, Iran, Canada, and the Caribbean. Skachkova (2017) described the methodology of her study as a culturally hybrid ethnography, which included oral history framed by a feminist perspective. Skachkova (2017) used oral histories to capture the women's experiences as they told stories of what it meant to be an immigrant faculty member, the sacrifices they made to achieve in their academic career, and the differences among their peers. In her analysis, Skachkova (2017) noted that U.S. higher education "still treats the new academic generation of foreign-born women as strangers," and that they "encountered obstacles in teaching, research, administration/service, and interaction with colleagues because of the combined effects of their national origin, race, ethnicity, gender, and age" (p. 728). In closing, Skachkova (2107) suggested that immigrant women brought diversification and internationalization to U.S. classrooms and most likely challenges to Eurocentrism, sexism, and racism.

Similarly, Alfred and Swaminathan's (2004) work shared the experiences of immigrant women faculty in U.S. higher education who represented the African continent, Asia, the Caribbean, and Latin America. The women's unique experiences as faculty, particularly their efforts in adapting to the culture of U.S. higher education while adding a sense of global understanding, were highlighted. Alfred and Swaminathan (2004) work discussed issues such as identity, career development, coping mechanisms, and the immigrant women's experiences as transnationals. They framed the women's experiences using W.E.B. Du Bois's concept double

consciousness, but added that because the immigrant women participate in "multiple worlds" (p. 10) that they also experience "multiple consciousnesses," living in a global world structured by race, gender, class, ethnicity, immigration, and other methods of "Othering" people (p. 60). Other experiences highlighted in the study included loneliness and marginalization and the "triple heritage" of being Black, immigrant, and woman. Alfred and Swaminathan (2004) aimed to introduce those in higher education to the experiences and perspectives of immigrant women faculty in hopes of reducing their ongoing marginalization.

An autoethnographic study by Hernandez, Ngunjiri, and Chang (2015) explored each of their own experiences as foreign-born women faculty of color: Hernandez is from Trinidad and Tobago, Ngunjiri is from Kenya, and Chang is from South Korea. Using intersectionality as the theoretical framework, they clearly noted their uniqueness as foreign-born, women, and faculty of color, stating—

> as foreign-born female faculty of color, our race/ethnicity and gender statuses have created significant challenges for us in the US academy, which are not fully represented in the research relevant to the experiences of women of color in the academy. Although we experience some of the same issues of racism, sexism, xenophobia, and discrimination in teaching, research and service in the academy as native-born faculty of color, our immigrant status marks us as Caribbean, African and Asian woman, respectively. To navigate within the academy, we are learning how to leverage our unique position at the intersection of outsider/within and majority/minority immigrants statuses for advancement within the academy. (p. 546)

Cruz (2018) conducted a phenomenological study on three Chinese women and three Latinas (who earned their advanced degrees in the United States) to gain a greater understanding

of their teaching experiences as foreign-born women faculty at predominantly White institutions in the United States. The purpose of her study was to examine women's experiences with respect to the influence of culture on classroom leadership, the challenges of how collectivistic and individualistic values often collide, and the factors that lead to job burn out. Cruz (2018) argued that examining these specific experiences from Chinese and Latina faculty proved valuable for Chinese women learners and increased the limited research that existed on the leadership style of foreign-born Latinas. Cruz concluded stating, "teaching is an emotionally charged profession that can lead to burnout" (p. 50).

The quantitative study by Lin, Pearce & Wang (2009) explored the "imported talents" and job satisfaction of foreign-born faculty, both men and women. Using data from the 2004 National Study of Post-Secondary Faculty (national faculty data from 2- and 4-year institutions), Lin and colleagues examined the extent to which immigrants play an important niche role in U.S. higher education. They claimed that the inflow of foreign-born faculty blurs the issue of limited gender and racial diversity in U.S. higher education and that foreign-born faculty make a significant contribution to science teaching and research. They also stated that although foreign-born faculty earn less than their U.S.-born counterparts, they tend to be more satisfied with their jobs.

Mamiseishvili's (2010) quantitative study that used the 2004 National Study of Postsecondary Faculty, focused was on examining differences between foreign-born and U.S.-born women faculty's work life at research universities. Specifically, her study was an exploration on foreign-born women faculty's roles and productivity in the areas of teaching, research, and service. Mamiseishvili (2010) claimed, "foreign-born women academics made significant contributions to research that was evident in the higher levels of scholarly outputs

they produced compared to US-born women" (p. 151). Mamiseishvili (2010) concluded emphasizing that, in general, foreign-born women faculty tend to differ from their U.S.-born counterparts in the number of contact hours of undergraduate teaching, in research productivity and time spent on research, and in engagement with service activities such as committee and program work.

J. Collins's (2008) study explored the experiences of 30 men and women foreign-born faculty members. J. Collins (2008) used surveys to understand the faculty's perceptions of support offered by their institutions and by their students, inside and outside the classroom. The survey results showed that the three most important aspects foreign-born faculty deal with are green cards status, cultural differences, and loneliness. Moreover, the faculty indicated that their differences in worldviews such as social and cultural conventions are often-times challenging, isolating, and lead to misunderstandings between faculty and students. J. Collins (2008) suggested, "mentoring and facilitating networking for foreign-born faculty members should be seen as activities involving faculty members (both junior and senior), departments, (especially the chair), the university, professional associations … and funding agencies that are concerned with improving higher education" (p. 187).

Folwell's (2013) qualitative study that examined cultural differences, faculty accents and green card status also included both men and women foreign-born faculty. Folwell conducted in-depth, semi-structured, face-to-face interviews with 20 (11 men, 9 women) tenure and tenure-track foreign-born faculty (2 of the men and 3 of the women were in STEM fields). Specific findings related of the study indicated that the faculty believed that their accents had an adverse effect, no effect, or a positive effect when interacting with their students. In that, some faculty believed that students used accents as an excuse for poor performance, while others believed that

accents increased students' exposure to diverse cultures and global awareness. It is important to note, however, that Kim and colleagues (2012) claimed that foreign-born faculty are perceived as less credible and less intelligible due to their non-native speakers of English status (also see Hutchinson, Quach, & Wiggan, 2009).

In summary, the literature reviewed on foreign-born women faculty in U.S. higher education has explored issues such sacrifices and achievement; multiple consciousness; intersectionality; job burnout and job satisfaction; roles and productivity; green card status, cultural differences, and loneliness; mentorship; and accents, among others. Moreover, because men constitute a larger portion of the foreign-born faculty in U.S. higher education, the bulk of the research has not specifically focused on women, especially so in the field of mathematics. Thus, foreign-born women faculty in the field of mathematics can be identified as an underexamined group within the academic research and literature. The Afro-Caribbean women who participated in this study are among this latter group. The next section explores some of the existing research on this group of women, in general, and in mathematics (or STEM broadly), in particular.

Afro-Caribbean Women in U.S. Education System

In the United States, Afro-Caribbean women in research studies are typically lumped under the category of Black women, women of color, or Other. According to Beck (2010), in educational research "Afro-Caribbean teachers are often not viewed…as being distinct from African American and other international teachers" (p. 41). Nonetheless, the number of studies on Afro-Caribbean women faculty in U.S. higher education is growing, particularly in the fields of sociology, economics, and history. But much of the research on Afro-Caribbean women educators examines them in the teacher education field or the K–12 arena (e.g., Rogers, 2006;

Rhone, 2007). Generally speaking, research focusing on Afro-Caribbean women in higher education, specifically in the field of mathematics, is limited.

One study that came close to examining Afro-Caribbean women in mathematics was King Miller's (2013) qualitative study. King Miller's project examined the lives of five Panamanian Afro-Caribbean women in STEM related fields. In particularly, King Miller explored the experiences of these Afro-Caribbean immigrants in STEM training or careers using grounded theory as the methodology and collective identity as the theoretical perspective. According to King Miller:

> It is important to note that research findings regarding Afro-Caribbean females' or African females' participation in STEM are relatively sparse. Perhaps this is because in the United States Afro-Caribbean and African immigrants are grouped or racialized into the categories of Black or African American. Therefore, little research focuses specifically on females who are Afro-Caribbean immigrants in STEM training or careers. (2013, p. 33)

Louis and colleagues' (2017) research study that specifically focused on Afro-Caribbean faculty in higher education, explored Afro-Caribbean immigrants' experiences with students and peers. Specifically, their qualitative study examined personal narratives of five Afro-Caribbean faculty members who taught at predominantly White institutions in the United States. Louis and colleagues used critical race theory as the theoretical framing and counter storytelling as the means for retelling Afro-Caribbean faculty's experiences. One central focus of the study was the "elimination of the double-invisibility that stems from Caribbean immigrants learning about blackness" (p. 686). Louis and colleagues' findings indicated that Afro-Caribbean faculty have similar experiences as African Americans who experience marginalization and

"were the recipients of demeaning and demoralizing actions from some of their White faculty peers and students" (p. 685). They suggested strengthening the relationship between Afro-Caribbean and African American faculty members, arguing, "exploring the Afro-Caribbean faculty members' experiences in the American Academy becomes vital to discourses on the multifaceted nature of Blackness" (p. 674).

A similar qualitative inquiry conducted by Smith (2018) is about three Afro-Caribbean teacher educators at a university in Florida. Her study aimed to identify the ways Afro-Caribbean women working as teacher educators described their learning about cultural difference and their ways of coping. Smith conducted individual and group interviews with the three participants over a 2-year period. Smith (2018) claimed:

> Afro-Caribbean faculty, those of whom are women and immigrants to the U.S., constitute a unique population whose challenges present a nexus at which to examine their learning with cultural differences as they move from their home countries of predominantly Black nationals to a predominantly White society. (p. 265)

Findings from Smith's study indicated that as the participants transitioned to understanding the cultural differences, they experienced intercultural learning. Intercultural learning included adjusting their body language, changing expectations of students, code-switching, modifying their communication, and maintaining an open stance toward cultural difference.

Other studies—such as Rhone (2007) and Cross, Hong, and William-Johnson (2011)—focused on Afro-Caribbean women as preservice, K–12 teachers. Rhone (2007) spoke of the importance for Caribbean immigrant teachers to understand the history of U.S. education and its relations to race, gender, and class before or as soon as they decide to become teachers in the United States. According to Rhone (2007), Caribbean teachers have become "multicultural

teachers" who represent a form of distinction in the classrooms (p. 45). Similarly, Cross and colleagues (2011) conducted a qualitative study analyzing the interviews of five women elementary teachers from Jamaica. Their study examined the teachers' first-year experiences as a cohort group recruited to teach in the United States and the ways they overcame challenges and the coping strategies that influenced their decision to remain in the profession.

Beck's (2010) study also examined the experiences of Afro-Caribbean women in the K–12 arena. Using womanism as the theoretical frame, her study aimed to highlight the voices of international women recruited from the Caribbean to teach in the United States and to examine how Afro-Caribbean women's new experiences as immigrants and racial Western minorities living in the United States affected their pedagogies. Beck (2010) stated that after reviewing the existent research that "no body of literature fully addresses the experiences of Afro-Caribbean women specifically" (p. 13). Beck (2010) claimed that the earlier Caribbean teachers begin to understand how they are positioned within the classroom as gendered, racialized, and immigrants, the sooner they can make decisions about themselves and teaching in the United States.

Summative Remarks

A survey of the literature focusing purposefully on the experiences of Afro-Caribbean women in U.S. higher education indicated a lack of representation. Moreover, outside of King Miller's (2013) study on Afro-Panamanian women in STEM related fields, the subject of mathematics or mathematics education in the literature was seldom the discipline of focus. Although the United States gains human talent through Afro-Caribbean women, their lack of representation in the academic research and literature was clearly evident. Researchers such as King Miller (2013), Alfred and Swaminathan (2004), Hernandez, Ngunjiri, and Chang (2015),

and others have begun to address this gap. But the problem with most of the studies reviewed here was that the women, although some were in STEM fields, were not necessarily in higher education. And if they were in higher education, they were not in mathematics or mathematics education departments. The participants for this study are established professionals who have chosen to become mathematics educators in U.S. higher education. The existent literature rarely mentions their experiences, or how they thrive and navigate resourcefully in the discipline or in higher education.

Therefore, contributing research on Afro-Caribbean women mathematics educators to the literature, particularly research reporting their experiences as mathematics learners and as mathematics educators in U.S. higher education, is noteworthy. Perhaps research that distinctively and deliberately highlights the experiences of Afro-Caribbean women mathematics educators will be a start in making visible their unique contributions to higher education in the United States. This study sheds light on Afro-Caribbean women's experiences and perceptions of what it means to be Black, gendered, and immigrant mathematics educators.

CHAPTER 3

THEORETICAL FRAMEWORKS

In this chapter, I provide details of the theoretical frameworks that I believe ethically and responsibly contribute to the shedding of light on the experiences of Afro-Caribbean women as mathematics learners and as mathematics educators. Figured worlds (e.g., Holland et al., 1998) and intersectionality (e.g., Collins & Bilge, 2016; Crenshaw, 1991) were used to highlight how these experiences position the participants both in the Caribbean and in the United States socially and contextually in mathematics spaces. I conclude the chapter with often argued critiques of the two theories and with summative remarks.

Introduction

Mills (2007) argued, "at all levels, interests may shape cognition, influencing what and how we see, what we and society choose to remember, whose testimony is solicited and whose is not, and which facts and frameworks are sought out and accepted" (p. 24). As Mills noted, it is *interest* that influences whose testimony is solicited, and what we and society choose to remember. A chief aim of this research, therefore, is to interest readers in the belief that it is essential to add the learning and teaching experiences of Afro-Caribbean women's solicited testimonies to the mathematics education research literature. The narratives on these experiences can shape and reshape not only mathematics education literature specifically but also society generally. This shaping and reshaping could influence the importance of highlighting Black excellence in higher education, particularly the excellence of Afro-Caribbean women positioned as mathematics educators in U.S. institutions of higher education.

According to Taylor (2007), "the older forms—call them, collectively, classical racialism—led people to believe that nature had sorted humanity into distinct and hierarchically

ranked types, each with its own complement of physical, moral, and mental traits" (p. 138). In reference to these "older forms," Afro-Caribbean women are positioned as immigrant mathematics educators in the United States operating in several hierarchical systems. Socially, Black immigrant women, who are mathematics educators, are too often sorted as humans in the lesser end of physical, moral, social, and mental traits (cf. Collins, 2000; Taylor 1998).

As such, to understand the experiences of Afro-Caribbean women as mathematics learners and as mathematics educators, no single theory is sufficient. Rousseau (2013) argued, "no one theory has been able to grapple with the multi-tiered simultaneous and interconnected oppressions that make up the Black women's experience in the [United States]" (p. 191). Undeniably, for a person who is Black, a woman, an immigrant, and a mathematics educator, a single theory is insufficient to explore the complexities of their mathematics experiences. Therefore, in the interest of exploring the complexity of Afro-Caribbean women's mathematics experiences, I employed two frameworks: figured worlds (e.g., Holland et al., 1998) and intersectionality (e.g., Collins & Bilge, 2016; Crenshaw, 1991).

Identity and Agency in Cultural Worlds

In the foundational book *Identity and Agency in Cultural Worlds*, Holland, Lachicotte, Skinner, and Cain (1998) connected the works of Bakhtin and Vygotsky to "comprehend and articulate a vision of both person and society true to the parts played by cultural forms, the machinery of power and social positioning, and the continual processes of identification" (p. 5). They combined the work of these theorists to form four constructs or components of "identity in practice": figured worlds, positionality, space of authoring, and making worlds. Figured worlds is the first component of identity in practice, and is the main component that applies to this study.

Figured Worlds

Holland and colleagues (1998) defined figured worlds as "a socially and culturally constructed realm of interpretation in which particular characters and actors are recognized, significance is assigned to certain acts, and particular outcomes are valued over others" (p. 52). People enter or are recruited into figured worlds where their identities are developed or reproduced through practices and activities (Skinner, Valsiner, & Holland, 2001). From these practices and activities, people form interpretations of the characters and actors, the significance, and the outcomes in those figured worlds.

Figured worlds are historical phenomena with constructed activities where people produce concepts of themselves acting as agents in response to those characters and actors with whom they interact (Holland et al., 1998). These characters and actors—these figures—have positions, some of power and privilege, that they can use to enact on other figures in their figured worlds. Fecho, Graham, and Hudson-Ross (2005) explained: "People construct their identities within context of figured worlds, contexts of positionality with those figured worlds, space of authoring a response to those worlds, and context of an ability to make or remake those worlds through 'serious play'" (p. 177). In other words, when a person enters figured worlds they form identities from their positionality, they then author a response to their positions by improvising and find ways to remake their world through imagination or play. Figured worlds, therefore, might be described as the politics of social positioning and spaces of authoring (Holland et al.).

Social Positioning, Spaces of Authoring, and Making (Imagining) Worlds

Positionality is the different standings that people are offered in their figured worlds (Urrieta, 2007). Positionality "refers to the fact that personal activity (the identified action of a person) always occurs from a particular place in a social field of ordered and interrelated points

or positions of possible activity" (Holland et al., 1998, p. 44). Positionality is the hereness and thereness of a person's social position that is linked to power, status, and rank (Holland et al.). A person's social standing is based on their positionality: "Social position has to do with entitlement to social and material resources and so to the higher deference, respect, and legitimacy accorded to those genders, races ethnic groups, castes, and sexualities privileged by society" (p. 271). It is important to note that social positioning is developed heuristically over time into positional identities (Holland et al.).

Positional identity is a "person's apprehension of her social position in a lived world that is depending on the others present, of her greater or lesser access to spaces, activities, genres, and, through those genres, authoritative voices, or any voice at all" (Holland et al., 1998, p. 127). A person chooses to have an authoritative voice or remain self-censored depending on their social situation and social activity. There are different categories of social placements, such as Black, women, and immigrant, that have different meanings throughout society (Wortham, 2006). These social positionings create ordered and interrelated points of view for a person's actions and activities. Once the person creates their point of view from their social positioning in their figured worlds, they begin to author their world. Social position, then, is the subtext of interaction in figured worlds, and spaces of authoring is the unnoticed interpretation of these interactions based on positional identities.

People, when socially positioned, engage in accepting, negotiating, or rejecting their social placement (Urrieta, 20007). A person's act of accepting, negotiating, or rejecting their social placement occurs in their spaces of authoring. Spaces of authoring is a "broad venue, where social languages meet, generically and accentually, semantically and indexically, frightened with the valences of power, position, and privilege (Holland et al., 1998, p. 191).

Spaces of authoring is the internal dialogue people must use to make sense of their figured worlds and to create their response to the social position within those worlds; it creates the opportunity to improvise. The human agency comes through this process of improvisation. Improvisations "are the sort of impromptu actions that occur when our past, brought to the present as habitus, meets with a particular combination of circumstances and conditions for which one have no set response" (p. 17).

Identity gained within figured worlds constitutes historical developments that are defined by social activities which contribute to agency: "participants develop an identification with a figured world in different degrees of engagement, and these 'levels of identity' are products of people's social histories, lived as 'history in person'" (Holland et al., 1998, p. 98). In time, "the 'voice' that makes up the space of authoring takes shape and occurs heuristically over time. The shaping and reshaping results in a person's 'history-in-person'" (p. 46). This history-in-person can be defined as sediments from past experiences that one uses to improvise based on the resources they have available and based on their social positioning in the present.

People in a constructed realm of interpretation of figured worlds form identities through historical and social encounters with situated activities that give them landscape to human voice (Holland et al., 1998). Therefore, through figured worlds, a person can share historical and current stories involving people and social interactions in their life during a time of change or incoherence. These stories facilitate the unfolding of significant moments, experiences, and spaces where the person (might) become aware of their position, identity, and agency (Holland et al., 1998). An awareness of these past moments and experiences provides an understanding of how they improvise and inform their present. The outcome of this awareness for the person creates a sense of human agency and imagined worlds.

The fourth context of identity comes from making worlds, or imagined communities: "through 'serious play,' new figured worlds may come about" and our fancied selves become material (Holland et al., 1998, p. 272). Play is a form of activity that happens through the world in which it is observed and draws upon genres of speech that takes the player beyond immediate settings. The real setting of play is imaginary that answers only to a figured world. Each person learns to play historically and socially within the confines of their figured worlds that they can pass down to their successors. Play, therefore, is a creation of ourselves as human actors, and the medium of mastery, for "without the capacity to formulate other social scenes in imagination, there can be little force to a sense of self, little agency" (Holland et. al, 1998, p. 236). Through play, imagination becomes embodied and creates an opening for new figured worlds, a refigured world where new identities emerge.

An imagined community is a "developed and continued through common participation in activities that figure for people their identification with others who also, elsewhere or nearby perform similar acts" (Holland et al., 1998, p. 247). Imagined community becomes a marker, an index of relational identity with others imagined to be in the same world, and created on the margins of regulated space and time. Relational identities have to do with a person's behavior and how a person identifies their position in relation to others. In imagined communities, the stories and images are learned, retold, analyzed, and revalued in the context, and these stories are embodied by "commentaries, practical guides, rule of thumbs, and outright regulations" that make the effect of the figured world of our mass media anything but automatic" (p. 249). In the product of imagination, figured identities arise and are reproduced in the special attitude of imaginative framing. When fully actualized, imaginative communities or making worlds then brings us back to the first context of figured worlds (Urrieta, 2007).

Figured Worlds and Afro-Caribbean Women Mathematics Educators

According to Urrieta (2007), the concept of figured worlds is useful to study identity production and agency in education. In this study, the framework helps to understand the relations of power, deference, and entitlement within the social interactions in the figured worlds of mathematics. In the figured worlds of mathematics, Afro-Caribbean women construct the social and contextual meanings of their activities of mathematics as learners and as educators. In acknowledging mathematics spaces as figured worlds, the theoretical concept provides a means to conceptualize Afro-Caribbean women's history, social encounters, the roles that they and others play, and the agency they give to their voices in their positions as mathematics learners and as mathematics educators. In figured worlds, positional identity is viewed as the way Afro-Caribbean women are socially positioned in their mathematics figured worlds, and spaces of authoring is viewed as the way Afro-Caribbean women comprehend and enact their social position, and imagined world is viewed as the way Afro-Caribbean women reproduce their figured identities (Boaler & Greeno, 2000; Holland et al., 1998).

Therefore, identities as defined by Holland and colleagues (1998) are improvised and are possibilities for mediating agency:

> Identities are improvised—in the flow of activity within specific social situations—from the cultural resources at hand. Thus, persons and, to a lesser extent, groups are caught in the tensions between past histories that have settled in them and the present discourses and images that attract them or somehow impinged upon them. (p. 4)

In other words, improvisations are important forms of reformation that demand people's attention because they speak from a critical perspective (Holland et al., 1998). People's identities are an elaborated response to the social and contextual afflictions that through improvisations

allows them to produce and reproduce themselves. This reproduction happens heuristically, and can transpire over and over allowing a person to "become tools of agency or self-control and change" (i.e. an agent) (p. 40). Figured worlds provides the term for answering a conundrum of personal agency, and provides the means to conceptualize subjectivities, actualization, and agency.

Mathematics learning and teaching are "figuring out" processes. In figured worlds, the figures carry social characters, identifications, and meanings:

> Thinking, speaking, gesturing, cultural exchange are forms of social as well as cultural work. When doing these things we not only send messages (to ourselves and others) but also place "our selves" in social fields in degrees of relation to—affiliation with, opposition to, and distance from—identifiable others. (Holland et al., 1998, p. 271)

Employing figures worlds facilitated categorizing who were the identifiable others (i.e., the characters and actors) in Afro-Caribbean women's mathematics experiences. It also assisted in identifying Afro-Caribbean women's placement in their mathematics figured worlds, and the meaning they gave to those placements, their positionality. Figured worlds was helpful in understanding Afro-Caribbean women's responses to the messages they receive in their mathematics figured worlds. Everything about the Afro-Caribbean woman's presence sends a message to them and society; using figured worlds helped to decipher the meanings of these messages in mathematics spaces. These messages vary according to Afro-Caribbean women's pasts and how they identify themselves in their figured worlds from the messages they received and sent from the degree of relations to these identifiable others.

People's anticipations regarding the future figure are significantly biased toward the sense we make of the present moment (Pagano, 1991). This sense making is similar to the

African principle of “Sankofa,” symbolized by a bird holding an egg in its mouth and looking backwards, even though its feet are facing forward. This imagery implores those in the present to reflect on the past in order to best care for and move forward into the future (Powell & Temple, 2001). To understand Afro-Caribbean women’s future expectations, one activity undertaken in this study was a form of imagined community through narratives (Holland et al., 1998). This activity in the present moment was to gain insight into an imagined community in the form of advising other Caribbean women in the future. In this sense of community, Afro-Caribbean women provided commentaries, practical guides, rule of thumbs, and outright regulations within their narratives for other potential Afro-Caribbean women who wish to become mathematics educators in the future.

Afro-Caribbean women’s mathematical identity and agency are actualized in this imagined world, that takes us back to their figured world of mathematics. The activity of interpretation was one in which Afro-Caribbean women form expectations about what will be said or what will happen next. By looking inward at their lived experiences, Afro-Caribbean women can provide valuable insights, habits, and social practices into their present mathematics figured worlds. We all have stories from our pasts, and the products of those stories, those experiences are mediators for change and growth that allow us to form levels of identities in the figured worlds in which we live (Holland et al., 1998).

Intersectionality

Intersectionality is a movement that emerged out of Black feminism and critical race theory (CRT) during the late 1980s (Gillborn, 2015). The theory is a heuristic practice that addresses the multiple forms of inequity and identity, as well as a dynamic of other differences (Cho, Crenshaw, & McCall, 2013; Gillborn 2015). Intersectionality applies to many disciplines

such as feminist studies, ethnic studies, legal studies, history, sociology, literature, philosophy, public health, and anthropology (Cho et al., 2013; Collins & Bilge, 2016). Law scholar and author Kimberlé Crenshaw (1991) is credited with using the concept of intersectionality initially in her examinations of case law of women of color within the dimensions of race, gender, class, and disability. Other scholars have noted that the idea of intersectionality appeared in earlier works such as Sojourner Truth's 1851 speech "Ain't I a Woman," as well as being present in the scholarship of the Combahee River Collective[10] (Butler, 2017; Collins, 1991; Moradi & Grzanka, 2017).

Collins (2000) defined intersectionality as an "analysis claiming that systems of race, social class, gender, sexuality, ethnicity, nation, and age form mutually constructing features of social organization, which shape Black women's experiences and, in turn, are shaped by Black women" (p. 299). As a theory, intersectionality functions in research on three complex identity levels or matrix of domination: individual, group, and institutional. Intersectionality has two elements: (a) an empirical approach that examines the social inequities and methods that sustain them, and (b) an activist approach that incorporates CRT to produce solidarity among different groups enabling them to effectively resist and fight back inequities (Dillborn, 2013).

Researchers have used intersectionality to recognize varying forms of social inequities that shape the lived experiences of particular groups; it has also been used as a means of resisting biases (Gillborn, 2015; Kidd, 2009; Love, 2016). Intersectionality, as an analytic tool can demonstrate the racial, gendered, and global inequity gap for women of color (Collins & Bilge, 2016). Intersectionality helps explain differences within groups and the positions of certain

[10] For information about the Combahee River Collective see: https://combaheerivercollective.weebly.com and http://circuitous.org/scraps/combahee.html.

groups within social institutions (Butler, 2017). According to Collins and Bilge (2016), "Rather than seeing people as a homogeneous, undifferentiated mass, intersectionality provides a framework for explaining how social divisions of race, gender, age, and citizenship status, among others, positions people differently in the world, especially in relation to global social inequality" (p. 15).

The Combahee River Collective "identified the importance of building a collective identity as a political project for women of color and other disenfranchised groups like themselves" (Collins & Bilge, 2016, p. 116). Group centered intersectionality ensures that "the voice of marginally subordinated people or groups is prioritized" in the politics of identity (Falcon & Nash, 2015, p. 3). Intersectionality, as a framework, recognizes the social positioning of certain groups across systems of hierarchy and oppression (Collins, 2000); it recognizes that no one is without multiple identities. Intersectionality is useful for highlighting how racialized and gendered individuals identify within themselves and their worlds as well as the relationship between identity and power.

Moreover, intersectionality recognizes that experienced realities are a valid source of knowledge (Collins, 1986). According to Collins (1986), studies that use intersectionality forces a reexamination of what counts as knowledge, data, and for intellectuals to "learn to trust their own personal and cultural biographies as significant sources of knowledge" (p. 529). Moradi and Grzanka (2017) claimed that the most productive use of intersectionality as an analytic strategy in research is to investigate and produce new knowledge about social experiences. They argued that intersectionality is useful to identify whose experiences are at the center of research and recognize the pattern of limited attention to certain groups across research studies. Intersectionality can be considered an intellectual descendent of narrative studies given that

individual or group narratives are the primary analysis for intersectionality in research studies (McCall, 2005). According to McCall (2005), personal narratives and single group studies represents one of many sides of a set of intersecting social relations.

Tenets of Intersectionality

According to Collins and Bilge (2016), "using intersectionality as an analytic tool means contextualizing one's arguments, primarily by being aware that particular historical, intellectual, and political contexts shape what we think and do" (p. 28). Social inequality, power, and relationality are three cores of intersectionality worthwhile for providing a focused method to interpret and understand how people contextualize their experiences in higher education worlds. These cores are useful as analytic tools for understanding how aware participants are of historical, intellectual, and political dominances that shaped how they think and act (Collins & Bilge, 2016). Historically, domains of power relations are mainly structural, disciplinary, cultural, and interpersonal, and are means of contributing to social inequality.

Intersectionality occurs because of the existence of social inequality. It "adds to additional layers of complexity to understanding social inequality, recognizing that social inequality is rarely caused by a single factor" (Collins & Bilge, 2016, p. 26) but rather caused by interactions among various categories. Social inequality exists beyond sexism and racism; social inequality also exists in social institutions that offer unequal opportunities and rewards based on race, age, gender, class, and ethnicity (Collins, 2012).

Collins and Bilge (2016) argued intersectionality works in understanding that power relations exist through the lens of mutual construction. Intersectionality is useful to understand that people's lives are shaped by many forms of domains of power that are mutually constructed in interlocking systems of power. Systems of power such as race, gender, class, age, country of

origin, and citizenship status emphasize the relationship among the agents doing the mutual construction. Systems of power are not understood in isolation, but rather "intersect and co-produce one another to result in unequal material realities, the distinctive social experiences that characterize them, and intersecting belief systems that construct and legitimize these social arrangements" (Collins, 2012, p. 455).

Relationality, another component of intersectionality, "demonstrates how various social positions (occupied by actors, systems, and political/economic structural arrangements) necessarily acquire meaning and power (or a lack thereof) in relationship to other social positions" (Collins, 2012, p. 454). Collins and Bilge (2016) contended that relationality is a significant core of intersectionality; "whether the relationality of multiple identities within the interpersonal domain of power or the relationality of analysis required to understand how class, race, and gender collectively shape global social inequality," the idea of relationality is essential (p. 27). Relationality, as one core of intersectionality, embraces both/and frames that examine the interconnections of social inequalities in a global sense.

Once the intellectual core of diversity work, intersectionality is now mainly applied to teaching and research to analyze experiences of marginalization, oppression, and privileges (Ahmed, 2012; Collins & Bilge, 2016). When placed in dialogue, intersectionality employing social inequality, power relations, and relationality are useful insights into the complexity of social inequalities (Collins, 2012). Butler (2017) stated that when broadly and critically applied, intersectionality provides a pathway toward the complexity in higher education inquiry and praxis. Therefore, the intersectionality cores are integral for how Afro-Caribbean women distinguish their experiences as learners and as educators in mathematics figured worlds. Here,

Afro-Caribbean women's gender, race, status as immigrants, as well as their conceptual mathematical identities, are each intersections of analyses that shape their lived experiences.

Intersectionality and Afro-Caribbean Women Mathematics Educators

Education is a medium of sustaining just and unjust ideologies, and mathematics is a subject that plays a significant role in normalizing Western knowledge production (Davies, 2013; Hottinger, 2016; Outlaw, 2007). The mathematics experiences of Afro-Caribbean women fall under persons of color in the racial or ethnic constructs that are other than the White category in higher education spaces (Collins & Bilge, 2016). Intersectionality, used as an analytic tool, identifies the forms of social inequalities that shape Afro-Caribbean women's experiences as mathematics learners and as mathematics educators. The framework provides a means to examine the structural, political, and social representation of Black immigrant women in higher education as educators, and as women in mathematics spaces as learners (Crenshaw, 1991; Hottinger, 2016; Moradi & Grazanka, 2017). Therefore, intersectionality is integral for examining Afro-Caribbean women with mathematical competence who are positioned at the intersection of the complexity of the domains of social inequalities, power relations, and relationality that exists in higher education inquiry, praxis, and worlds.

Afro-Caribbean women's narratives are the primary source for analysis of the complexities of social inequalities, power, and relationality in this study (discussed in detail in Chapter 5). The examination of the participants' narratives about their mathematics experiences was not only the witnessing, recognizing, and understanding the many forms of social inequities beyond race and class but also among their immigrant status. Moreover, an examination of the participants' narratives is to highlight how structures, disciplines, cultural, and interpersonal factors influenced and shaped their experiences about aspects such as race, gender, and ethnicity

(Collins & Bilge, 2016). An exploration of the narratives is to identify any power relations that manifested with and in the exchanges between the participants and me (Collins and Bilge, 2016; Esin, Fathi, & Squire, 2014) and to reveal terms or phrases used to indicate their perspective of any global connection between the Caribbean and the United States.

Figured Worlds, Intersectionality, and Afro-Caribbean Women Mathematics Educators

The use of figured worlds and intersectionality frameworks facilitated the understanding and interpretation of ways in which Afro-Caribbean women identified what they experience. Anzaldúa (1999) explained: "like all people, we perceive the version of reality that our culture communicates. Like others having or living in more than one culture, we get multiple, often opposing messages" (p. 100). The theories were used to make meanings of the participants' transformation, reformation, identity production, and their agency in their mathematics learning and teaching figured worlds as they received messages moving from one country to another (Collins & Bilge, 2016; Holland et al.,1998).

Frost et al. (2010) argued, "it is often at the time of change or incoherence in their lives that stories are particularly useful to individuals to understand changes in their identities and their relationships" (p. 444). Similarly, Lobban (2013) claimed, "the way in which the immigrant's particular 'otherness' is mirrored and evaluated by the mainstream culture in her host country will determine how positively she sees herself and how freely she can 'stand in the spaces' and experience and express her multiplicity" (p. 558). Afro-Caribbean women are from societies that are perceived to safeguard their interests as Black people (Taylor, 2007). This safeguarding shaped their consciousness, agency, and identity that were each reshaped in relation to identifiable others (Holland et al., 1998; Lobban, 2013). The reshaping caused Afro-Caribbean

women to re-evaluate how they see themselves and how they figure out ways to freely stand in mathematics figured worlds as learners and as educators.

This study is a figured world, a privileged space where Afro-Caribbean women came together to author their social positions in mathematics pasts as learners and their present as educators. The research is a fleeting space to expose the messages they received and the meaning they made about the relations of powers, positions, and privilege. These meanings came from their social and contextual experiences with the characters and actors within their significant narratives. The study is also a figured world where the participants can create imagined worlds about their futures in the form of advice (hooks, 1994; Holland et al., 1998). This research venue is used as a means to examine the domains of power, social inequality, and relationality within Afro-Caribbean women's figured mathematics worlds. From this examination, the study is used to inform about Afro-Caribbean women's meanings about their mathematics experiences over social groups, in the research literature, and other immigrant diaspora. In the light of making sense of Afro-Caribbean mathematics experiences to create new meanings to add to the literature, I propose these new meanings come from their voices and their perspective —the Afro-Caribbean women's mathematics perspectives.

The Afro-Caribbean women's mathematics perspectives illustrated in Figure 2, provides a diagram to show how the theoretical concepts and sensibilities of figured worlds and intersectionality were incorporated. The Afro-Caribbean women's mathematics perspectives are to capture their mathematics learning and teaching experiences as gendered and racialized U.S. immigrants. The diagram illustrates the many social constructs and identities that forever orbit the Afro-Caribbean woman embedded in their mathematics figured worlds as learners and as educators. Socially and contextually, the ideas of both theories constantly revolve around Afro-

Caribbean women while being rooted in mathematics figure worlds either as learner or as educator.

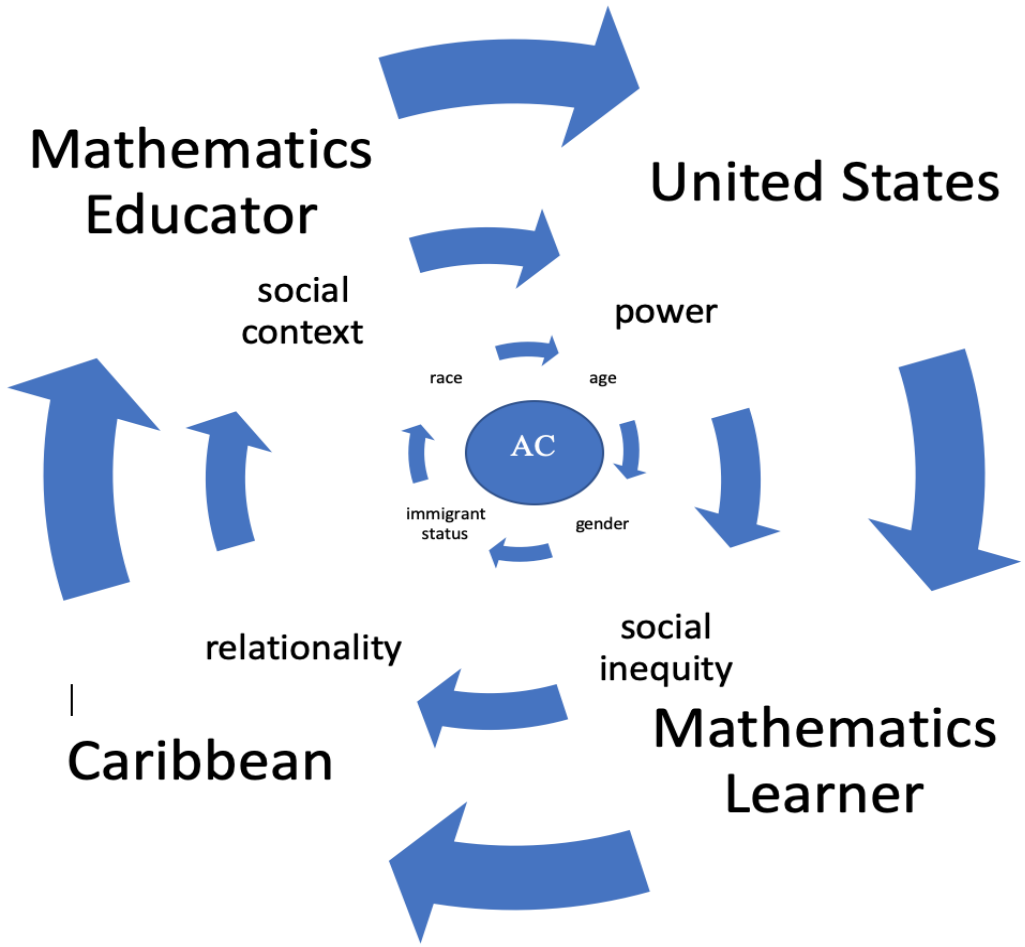

Figure 2. Diagram of how figured worlds and intersectionality were used to inform Afro-Caribbean Women's Mathematics Perspectives.

Moreover, the Afro-Caribbean women's perspective presented here is the collective voice of the participants' experiences as mathematics learners and as mathematics educators. This project is part of the distribution process giving a human voice and tone to the unsolicited stories of Afro-Caribbean women in the mathematics education literature. Mills (1997) argued that theories are produced without the inclusion of all. Afro-Caribbean women's mathematics perspectives offer an opportunity to incorporate unsolicited narratives into the academic research

and literature. Documenting Afro-Caribbean women's experiences and narratives assists in furthering our understanding and knowledge of immigrants living in other countries and extends the perspectives of mathematics educators in U.S. institutions of higher education as well as the mathematics field.

Critiques of Figured Worlds, Intersectionality, and the Researcher

The application of the appropriate theory or multiple theories offers the possibility of global description and predictive adequacy that aims to fill in the blanks that a single theory would fail to address holistically (Baker, 1991). Each theory, however, comes with restrictions, including Eurocentrism that becomes a factor in how the research is conducted and thus, analyzed. And because I, the researcher, identify as a Jamaican-American novice social scientist, these social constructs come with conscious and unconscious decisions to use these theories.

The strength of figured worlds as a theory is that it is not specific to one setting (Urrieta, 2007). Some authors, however, critique that the theory changes its definition according to who is the researcher (Cho et al, 2013), while others claim that the inconsistency of the definition of figured worlds makes the theory less operationalized for empirical research (Urrieta, 2007). Some critiques on intersectionality are that it too changes its definition often. Researchers claim that intersectionality promotes victimhood and places value on cultural recognition more than economic distribution (Butler, 2017). And still others have argued that intersectionality is seen as a domestic and a non-global concept that applies to the lives of only those who live in Western spaces (Cho et al., 2013).

In its application to Afro-Caribbean women, intersectionality, remains outside of transnationalism (Cho et al., 2013). Transnationalism offers the bi-national and bi-cultural lens to pursue racial and gender justice about lived experiences not only in the United States but also in

other countries. As such, intersectionality might not address the specifics of those whose mathematics experiences are inclusive of inside and outside Western social groups and cultures (Cho et al., 2013; Falcon & Nash, 2015).

Nonetheless, figured worlds and intersectionality are useful to address educational context and the domains of power related to racism, sexism, and systems of power, respectively. The topics of color and class relations, specifically colorism[11] and classism, are limited in both theories, however. People of color in the United States often focus on the larger issues around racism and White supremacy. According to Waters (1999), "the recognition of gradations of color between white and black is also bound up with class divisions in the islands" (p. 29). Afro-Caribbean women have been exposed to more experiences that involve issues of colorism and classism growing up in the Caribbean. Colorism, as well as classism, are concerns that would seem more prevalent in the Caribbean region but are not often dealt with in the United States openly.

As a novice social scientist, I applied these two frameworks to explore the experiences of Afro-Caribbean women as they (we) navigated their (our) figured worlds as mathematics learners and as mathematics educators. These experiences were explored specifically in higher education, where the predominant philosophical foundations are from a Eurocentric framework that most often prohibits different worldviews in the production of knowledge (Schiele, 1994). Throughout, I took caution, attempting to avoid too much seepage of Eurocentricity in making meanings of the perspectives of Afro-Caribbean immigrant women. My own reality is that I am embedded in a culture and teaching a subject where I must consciously and continuously aim to

[11] Colorism is a form of race-based discrimination where darker skin toned individuals experience more discrimination and witness more privilege given to lighter skin toned individuals (Banks, 1999; Gasman & Abiola, 2016)

resist and accept simultaneously the assumptions of the White normalizing ways of thinking and producing knowledge (Ashcroft, Griffiths, & Tiffin, 2000; Mills, 2007). I am required, therefore, as part of this study, to avoid the tendency of reifying the knowledge and representation that Eurocentrism promotes (Mills 2007).

Summative Remarks

Figured worlds and intersectionality are the two frameworks used for exploring the mathematics learning and teaching experiences of Afro-Caribbean women. The figured worlds framework encompasses the shared social experiences, contextual meanings, and activities of Afro-Caribbean women that surround their past, present, and future. Whereas intersectionality is the tool for examining the domains of power and social and global inequalities in relation to their positioning with respect to the complex intersecting matrix of race, gender, age, and immigrant status.

In this study, figured worlds performs as the main frame of meaning for identity; however, the other components of identity in practice are also linked throughout. Afro-Caribbean women's positionality is linked to intersectionality; spaces of authoring is linked to individual and collective narratives through time and space; and making worlds is linked to the imagined question soliciting advice for the sake of other Afro-Caribbean women. In the end, their (our) "voices" are a representation of their (our) social positioning in the mathematics discipline, the voice of being Afro-Caribbean immigrant women and all the intersections that entails as mathematics learners and as mathematics educators. Figured worlds and intersectionality, I believe, are two frameworks that assists in creating an empowering voice; this voice is a collective community of agents of Afro-Caribbean women as mathematics educators in the United States. Through these collective voices, there can be an enhanced visibility to the

landscape for more positive representations of immigrants and Blacks in the academic research and literature as well as in U.S. higher education.

CHAPTER 4

METHODOLOGY

In this chapter, I outline in detail my methodological choices for the study. I begin with an explanation of narrative inquiry and why it was an appropriate methodology to employ. I then discuss heuristics, a methodological approach that allows for my mathematics experience as an Afro-Caribbean woman to become part of the research process. Next, I discuss selection and recruitment, the participants, the methods of data collection, and the data organization and management plan. I continue by providing details of the methods of data analysis, which included verbal exchange and focused coding. I conclude the chapter with discussions on ethical considerations and limitations, followed by summative remarks.

Introduction

Methodology is a social science discourse (a way of acting, thinking, and speaking) that occupies a middle ground between discussions of method (procedures, techniques) and a discussion of issues in the social sciences (Schwandt, 2015, p. 161). Therefore, I, as the researcher, created an opportunity for a middle ground process to make meanings of the experiences of Afro-Caribbean women as mathematics learners and as educators who now teach mathematics content and education courses in U.S. institutions of higher education. In creating this opportunity, however, I caution that this research study is but a mere "gaze" into the experiences of these Afro-Caribbean women. As Denzin and Lincoln (2005) unambiguously noted:

> There is no clear window into the inner life of an individual. Any gaze is always filtered through the lenses of language, gender, social class, race, and ethnicity. There are no objective observations, only observations socially situated in the worlds of—and

> between—the observer and the observed. Subjects, or individuals, are seldom able to give full explanation of their actions or intentions; all they can offer are accounts, or stories, about what they have done and why. (p. 21)

The data collected and analyzed therefore provided merely one way of offering an account for understanding and documenting Afro-Caribbean women as learners and as educators in their mathematics figured worlds.

As an Afro-Caribbean mathematics educator conducting the study, I became an intricate part of the study, included through a heuristic approach (Moustakas, 1990). My role was to give an account of the thoughtful re-living, re-telling, and reflective adoption of the participants' mathematics experiences, including my own. As mutual storytellers and characters in our socially and contextually constructed figured worlds, the participants and I went through the collaborative process using dialogic interviews and documentary data as the methods of data collection (Clandinin & Connelly, 1990; Holland et al., 1998). The collaborative process of our exchanges included characteristics such as mutual respect, active listening, and authenticity, which were used to value each participant's narratives (Ravitch, Tarditi, Montenegro, Baltodano, & Estrada, 2017). The collaboration was useful for making more meaningful relationships between the participants and me, as we retold stories about our mathematics experiences. These stories were then analyzed for identifiable commonalities using verbal exchange and focused coding (Charmaz, 2014; Goodall, 2000).

Narrative Inquiry: A Gaze on Afro-Caribbean Women's Figured Worlds

Narrative is a cognitive scheme used to present an awareness to our world that links meaningful experiences and connects these experiences to create an opening for new meanings to come to light (Polkinghorne, 1988). The narratives from Afro-Caribbean women were used to

connect their significant experiences as mathematics learners and as mathematics educators. The narratives were useful for exhibiting the social and contextual relationships that brought an awareness of their mathematics figured worlds in the Caribbean and in the United States. These relationships were used to help create an opening for new meanings that might aide in filling a gap in the existing literature. Each participant's narratives were used as parts of the whole meaning of an Afro-Caribbean woman's perspectives on experiencing mathematics as a learner in the Caribbean and the United States and being a mathematics educator in U.S. institutions of higher education.

Narrative inquiry as a methodology provided for a focus on the educational experiences and the qualities of life of the participants. The participants' experiences were instrumental in creating opportunities for authoring and refiguring personal and social stories as lived in educational spaces (Connelly & Clandinin, 1990; Holland et al., 1998). The process of understanding and interpreting the meanings of Afro-Caribbean women's mathematics experiences required a methodology that was useful for emphasizing what *they* say are those experiences in those educational spaces (Clandinin & Connelly, 2000; Riessman, 2008).

Narrative inquiry as both methodology and analysis harmonized with the two theoretical frameworks for the study: figured worlds (e.g., Holland et al., 1998) and intersectionality (e.g., Collins & Bilge, 2016; Crenshaw, 1991). The significance of socially and contextually related events allowed for exchanges (interviews and documents) with a sense of self-discovery into the social experiences and positionings in the participants' figured worlds that "*happens* as social process and in historical time" (Holland et al., 1998, p.55; Polkinghorne, 1988). Narrative inquiry, therefore, was the overarching methodology that allowed for emphasizing what the participants say were their experiences as lived as mathematics leaners and mathematics

educators in education figured worlds (Clandinin & Connelly, 2000; Frank, 2012; Holland et al., 1998). Narratives also allowed for analyzing the participants experienced for issues of social inequality, power systems, and relationality—each components of intersectionality.

The narratives of Afro-Caribbean women mathematics experiences was structured in a presentation of a schematic format. Schematic knowledges are organized knowledges that can be related spatially or temporally (Polkinghorne, 1988). The narratives in this study were structured temporally by linking pieces of the participants' mathematics experiences into categories. The categories were used to create Afro-Caribbean women's collection of narratives that explain their mathematics happenings. The presentation of the collection of narratives were from Afro-Caribbean women's past experiences as mathematics learners to current experiences as educators.

Narrative inquiry, therefore, assisted in identifying a "collective meaningfulness" in Afro-Caribbean women's social and contextual experiences as mathematics learners and as educators. Ultimately, using narratives to emphasize their mathematics experiences assisted in providing a more comprehensive representation of mathematics educators in U.S. colleges and universities in a beneficial way for future immigrant women mathematics educators. Polkinghorne (1988) contended, "the process of seeing human actions as meaningful sequences of events linked together in causal chain requires cognitive skill, judgment, and the application of previous experiences" (p. 112). As the researcher, my past and current experiences also became essential components of the study through a heuristic approach.

Heuristic Approach

A heuristic approach was used in the study to acknowledge my mathematics experiences along with the participants'. In its purest form, heuristic, according to Douglass and Moustakas

(1985), “is a passionate and discerning personal involvement in problem solving, an effort to know the essence of some aspect of life through the internal pathways of the self” (p. 39). As the main “actor” in this research production, inserting my voice and tone into the narratives, I was also contributing my personal experiences as a mathematics learner and mathematics educator (Holland et al., 1998; Luis, 2007). My role, therefore, in the study was twofold: (1) I was a participant in a process that required collaboration and an ethics of care among the participants as we told and re-told our experiences; and (2) I presented these experiences no longer as a storytelling participant but as the meaning making and authoring researcher (Riessman, 2005).

The ability to understand and author the meanings imbedded in interactions between the experiences of the Afro-Caribbean women participants and my own experiences was significant and worthy of exploration. According to Moustakas (1990):

> The heuristic researcher is not only intimately and autobiographically related to the question but learns to love the question. It becomes a kind of song into which the researcher breathes life not only because the question leads to an answer, but also because the question itself is infused in the researcher’s being. It creates a thirst to discover, to clarify, and to understand crucial dimensions of knowledge and experience. (p. 43)

In other words, my role in the process becomes heuristic, guiding the exchanges between the participants and me as well as the actor representing and making meanings of the exchanges. To avoid superimposing my experiences on to the participants, the research process began with the internal retelling of the stories within my own cultural and historical experiences and within my own mathematics figured worlds both as learner and as educator.

Ezzy (2002) suggested that researchers who recognize their cultural and historical

positions can listen to, respect, and voice the experiences or "truths" of others. A heuristic approach highlights who I am in my mathematics figured worlds as an insider examining the experiences of the participants while also experiencing the experiences (Clandinin & Connelly, 2000). Clandinin and Connelly (2002) cautioned, however, "narrative inquirers need to re-construct their own narrative of inquiry histories and be alert to possible tensions between those narratives histories and the narrative research they undertake" (p. 46). My task throughout the project, therefore, was to give considerable thought and re-thought to my own experiences and to explicitly state how my positions or experiences related to the issues being researched (Laverty, 2003).

These heuristic applications were the bridge between explicit and tacit knowledge allowing my depiction of the phenomenon to be richer and more "accurate" and "credible" (Moustakas, 1990). I used the heuristic applications of self-dialogue, internal frame of reference, and intuition for (re)discovering my experiences as they related to the participants' experiences. These heuristic applications were used to potentially provide trust and a direct connection to the participants as someone who has had and is still having the experiences. Self-dialogue, frame of reference, and intuition were also helpful in requiring me to be open and honest about my experiences relevant to the research questions. The research questions that guided the project were:

1. How do Afro-Caribbean women experience mathematics as learners, and as educators in the Caribbean and in the Unites States?
2. How do race, gender, and immigrant status position Afro-Caribbean women differently in mathematics as learners, and as educators?

3. How do Afro-Caribbean women make meaning of their social and contextual experiences that shape their mathematical identities (i.e. personas) as learners, and as educators?

Participant Selection and Recruitment

The selection of the six primary participants for this study was small, targeted, and purposeful. The approval of Internal Review Board (IRB) process made it possible to start the selection and recruitment process. The recruitment process was done using "snowballing," but with specific criterion, despite the process often being frown upon because it is considered convenient sampling. I used snowballing because of the sampling population's hard to reach locations, small sample size, and Afro-Caribbean women's unique descriptions for who might met participant criteria (Ezzy, 2002; Marshall & Rossman, 2006). The snowballing process involved sending emails to faculty members at my university, mathematics organizations, mathematics departments at other colleges and universities, and state diaspora consulates. Table 1 outlines the steps for the criterion process for recruiting participants.

The recruitment process to locate Afro-Caribbean women who met each item of the participant criteria was a challenging task (see Appendix B for list of criteria). Initially, the women who showed interest were missing one or two listed items. For instance, although some women were Caribbean-born and teaching mathematics in higher education, they were either retired, working only part-time, teaching less than two years, teaching at higher education institutions outside of the United States, teaching only mathematics theory courses, or a combination of these. And in some cases, I received information about women who met every participant criterion, but despite my many attempts to reach out, they did not respond.

Table 1
Steps for Recruiting Participants

Step 1: Appendix A	The first step of the recruitment process was to send out solicitation emails to several people asking if they were familiar with women who met the criteria of the study. The emails, requesting referrals, were sent to schools, professors, organizations, consulates, and friends. Some responded they had no suggestion, others provided possible names of participants.
Step 2: Appendix B	If a person responded to the email with someone who might met the criteria, I contacted the potential participant with Appendix B—Participant Criteria and Acceptance Notice.
Step 3: Appendix C	Once the participant agreed to be part of the study, we then set up a meeting time and date. One week before the meeting, I shared with the participants the informed consent form: Appendix C, written descriptions: Appendix D, and the documents database: Appendix E.

Nonetheless, I kept the recruitment process ongoing until I was able to locate six participants. This sample size of six was used to provide breadth and depth of the information attributed to their experiences as Caribbean-born learners and mathematics educators (Teddie & Tashakkori, 2009). Patton (2002) stated, "the logic and power of purposeful sampling is derived from the emphasis on in-depth understanding" (p. 46). Patton also explained that a purposeful and targeted selection of participants often leads to information-rich exchanges that support an understanding of their experiences.

I sent out reminder emails to the participants the day before our meeting. At the first interview, the participants asked questions about the study, the documents, and the activities they were required to do during the process. Some of the participants decided to use this first interview to discuss the written descriptions (discussed later), explaining that they preferred to talk rather than to write.

Participants

Born and nurtured in the Caribbean, the participants are all currently teaching in mathematics and/or education departments at U.S. institutions of higher education. Each participant has had at least a high school experience in their country of origin, and earned at minimum a Bachelor of Science (or Arts) degree in Mathematics or the Mathematical Sciences, either in their country of origin or in the United States. Each of the participants is currently positioned at public institutions that are either urban[12]/predominantly Black institutions (PBI) or predominantly White institutions (PWI) in midwestern, northeast, and southeast states. These educators are teaching undergraduate or graduate mathematics and/or mathematics education courses, and have been holding their U.S. higher education teaching position for at least two years. None of the participants teach at a Historically Black College or University; however, all participants have received at least one academic degree from a predominantly Black institution either in the Caribbean or in the United States.

Collectively, the participants' ages range from 20s to 60s and their length of time living in the United States from 7 years to 39 years. The positions of four participants are in PWI in rural and urban areas, and the other three participants teach at PBI located in urban cities. As a heuristic concept, I offered each participant during the interviewing process the option of selecting their own name (i.e., pseudonym) in the research (Djuraskovic & Arthur, 2010). Table 2 is a demographical synopsis of the participants listed in alphabetical order according to their pseudonyms. The information in Table 2 also provides a brief representation of each participant.

[12] I define urban here in terms of geographic location as an institution that is predominantly non-White that has high economic, population density, and cultural diversity, and one is confined within city limits (Waddell, 2014).

It includes: country of birth, number of years in the United States, the type of institution (PWI or PBI), degrees earned, and the type of mathematical courses they currently teach.

Table 2
Participant's Criteria Demographics

Name (age range)	**Country of birth—number of years in the United States** **Title/college or department** **Type of institution (PWI or PBI)** **Degrees earned and where** **Mathematics or mathematics education courses taught**
Astina (50–59)	Jamaica — 37 years in the United States Instructor/Director, College of Education and Department of Biological Sciences Predominantly White Institution (PWI) Doctor of Philosophy in Teaching and Learning specialization in Mathematics Education (United States) Master of Art in Curriculum & Instruction concentration in Mathematics Science, Middle Grade (United States) Bachelor of Science in Meteorology (United States) Mathematics content, for example College Algebra Mathematics education courses, for example Math for All Students
Dihema* (30–39)	Jamaica — 24 years in the United States Assistant Professor, Department of Mathematics Computer Science and Engineering Predominantly Black Institution (PBI) Doctor of Philosophy in Teaching and Learning specialization in Mathematics Education (United States, in progress) Master of Education in Mathematics Education (United States) Bachelor of Science in Mathematics (United States) Mathematics content, for example College Algebra
Francis (30–39)	St. Kitts and Nevis — 12 years in the United States Assistant Professor, Associates in Arts Program Predominantly White Institution (PWI) Doctor of Philosophy in Mathematics Education (United States) Master of Science in Mathematics (United States) Bachelor of Science in Mathematics (Caribbean) Mathematics content, for example Analytical Geometry/Calculus A
Grace (20–29)	Jamaica — 11 years in the United States Adjunct Instructor/Graduate Teaching Assistant, Department of Mathematics and Statistics Predominantly Black Institution (PBI) Doctor of Philosophy in Mathematics (United States, in progress) Master of Science in Mathematics (United States) Bachelor of Science in Mathematics (United States) Mathematics content, for example College Algebra, Trigonometry, Statistics

Kathy (40–49)	Jamaica —18 years in the United States Associate Professor/Director, Center for Research and Collaboration Predominantly White Institution (PWI) Doctor of Philosophy in Educational Psychology (United States) Master of Art in Education (United States) Diploma of Secondary Education in Mathematics (Caribbean) Bachelor of Art in Mathematics (Caribbean) Mathematics Education, for example Teaching and Learning Elementary Mathematics
Patricia (60–69)	Trinidad and Tobago — 30 years in the United States Adjunct Professor, Department of Mathematics Computer Science and Engineering Predominantly Black Institution (PBI) Master of Education specialization in Secondary Education in Mathematics (United States) Bachelor of Science in Mathematics and Computer Science (Caribbean) Diploma of Education in Mathematics (Caribbean) Mathematics Content, for example Quantitative Skills and Reasoning
Ramona (30–39)	Bahamas — 7 years in the United States Associate Professor/Coordinator, Department of Teaching and Learning Predominantly White Institution (PWI) Doctor on Philosophy in Curriculum and Instruction specialization in Mathematics Education (United States) Master of Science in Education specialization in Mathematics Education (United States) Bachelor of Education specialization in Mathematics Education (Caribbean) Associates of Arts in Mathematics with Statistics (Caribbean) Mathematics content, for example Intermediate Algebra Mathematics Education, for example Curriculum History and Research in Mathematics Education

* Researcher

Given that human agency comes through authoring (Holland et al., 1998), I used the participants' own narratives to describe their roles as educators and as a way for them to, in a manner of speaking, introduce themselves in the project. This means of introduction aligns with narrative inquiry as well as identity and agency elements of figured worlds. Moreover, I view the participants as experts whose narratives did not required me to write over who they are in order to introduce them to the reader.

> Astina: I'm very careful in my role as a teacher. I look at it as if I'm a mother… I find myself in a mother role of trying to mentor and encourage and then the math comes afterwards. … And so, I build a relationship with students of color, especially female students of color. In that I want to push them towards doing something or continuing to take more math courses. … You know, um, because that's something that I think not only does it, um empower me, it gives me energy… I feel like I have to tell them about the benefits that they will get from mathematics.

Grace: I just see myself as a facilitator who just clears up any misconceptions they may have.… So, I would try to pick out what I think may be difficult for them and go over those concepts.… So yeah, at this point I'm just the facilitator.

Francis: I want to make sure that I'm using the terminology correctly so I can bring up my students to a level where they can say alright, I can speak mathematically.… I'm very easygoing, very welcoming, I encourage students to come and talk to me all the time. And so, you do have some students who take you up on it but other students are more hesitant. And so, again but I'm also working with my personality. I'm a little bit reserved by nature and so sometimes, it may mean I may have to get out of my comfort zone a bit in some sense, yeah.

Kathy: It is important for me to be a quality teacher because I have to be able to connect with you in ways that that address the issues that inform your learning. There's a psychology that you bring that's important for how you take up information and me not being able to connect with you well in that way impedes my ability to really deal with you in the mathematical space.… I want them to feel more competent in their own thinking. I want them to start to identify with ways that their struggle should not be seen as a failure on their part, but oftentimes it was it's a failure of the instructional terrain that they have had or been a part of or had to navigate. And to be able to start to separate where you have not putting enough effort with why you're not understanding this and you're not just a bad mathematician.

Patricia: I encourage my students to share solutions and when time permits—because usually we are in a time crunch. When time permits, I have my students to share on the board and we discuss, ya know. Well, is it written properly? What's wrong with it? How can you improve it? So, I tell students that um, they need to write their solutions so that any—and I like to try be funny sometimes just to keep their interest you know.… I counsel, if I can use that term. I counsel students as needed…. I may be able to offer you some type of advice as to how you can manage—time management, your children, your home whatever.

Ramona: Teaching is not a linear model. Teaching is what I call a very complex system because you are dealing with the human element. You are dealing with personalities, financial situations because all these things could affect someone's academic functionality. And so, the first thing is you have to be human. What is the limitation? What are the constraints? What is it that we want to achieve? And how do you equip them with the skills needed? So, I try to asks lots of guiding questions…. My goal is to make you the best person possible. So, I try to make sure that they succeed based on what they bring to the table. When we work with what you have, see how we can support you forward.

Table 3
Participants' Learning and Teaching Experiences Grid

Experiences	Astina	Dihema	Grace	Francis	Kathy	Patricia	Ramona
Completed high school in the United States	✓	✓	✓				
Taught school in the Caribbean and the United States	✓			✓	✓		✓
Teaches mathematics education courses	✓				✓		✓
Teaches mathematics content courses	✓	✓	✓	✓		✓	
Teaching career started in higher education		✓	✓				
Teaches at PWI	✓			✓	✓		✓
Teaches at PBI		✓	✓			✓	
Requires research					✓		✓
Does not require research		✓	✓			✓	
Does non-required research	✓	✓		✓			
Teaches at undergraduate level	✓	✓	✓	✓		✓	
Teaches at graduate level	✓				✓		✓

The information in Table 3 came from the participants' interviews, curriculum vitae (CV), course syllabi, projects, and research articles and/or presentations. The participants' analysis grid assisted with constructing the narratives and the meanings that came to light. The grid illustrates that each participant brought abundant and varying mathematical experiences to the project, and that their narratives are possibly filled with many social and contextual experiences from the varying teaching spaces they occupy.

Methods of Data Collection

The methods of data collection included semi-structured dialogical interviews that were transcribed verbatim and documentary data. Connelly and Clandinin (1990) claimed, "humans are storytelling organisms who, individually and socially, lead storied lives" (p. 2); these methods of data collections allowed the participants to tell their distinctive mathematics stories. I used the data to help construct the narratives of six Afro-Caribbean women's experiences that described who these women are and their social and contextual positionings in their mathematics worlds (Collins & Bilge, 2016; Holland et al., 1998).

According to Gildersleeve and Kuntz (2011) in traditional research practices, researchers have to make room for a transformative dynamic when examining sociocultural contexts and for the process of communication. The process of communication with the participants took place via multiple media such as face-to-face interviews, emails,[13] videoconferencing, and telephone calls during the winter/spring of 2019 (January to April). The multiple sources of communication were necessary given the participants' distance and locations. The communication interactions took place during the participant's office hours, at the library, after work, while driving in the car, and included weekends.

Dialogical Interviews

An interchange of inter-views between myself and the participants was the principal method of data collection for the study (Kvale, 2007). Dialogical interviewing is when the researcher and the participants act in mutually beneficial personal relations (Kvale). The semi-structured, dialogical interviews were a fundamental technique used for capturing our

[13] Given that the participants were from different parts of the United States, emails were the primary means of recruiting and communicating with the participants. Emails were also how the participants and I, no matter their locations, exchanged the documentary data.

experiences, from our perspectives, and in our own words prompted by the research questions (Kvale, 2007; Rubin & Rubin, 2015). The purpose of the interview was to gather and explore narrative material using deep conversations to find commonalities of our shared experiences, as well as to describe and interpret the meaning within our figures worlds of learning mathematics and being mathematics educators (Marshall & Rossman, 2006; Van Manen, 1990). The participants' roles clearly came forward in the research process in interviewing. so as to not only naturally obtain ideas, thoughts, and feelings about the study but also to understand any power dynamics that might exit (Esin et al, 2014; Kvale, 2007).

I conducted two, 1-hour interviews with each participant that varied either as face to face, videoconferencing, or telephone. I confirmed with the participants through email on their preference for the dates, times, and the mode of communicating. I sent a confirmation to each participant via email the day before each of our scheduled interviews. The interview process included a tape recorder, cellular phone (as back up recorder), and handwritten notes. An interview protocol (see Appendix F) was also sent to each participant via email and served as a guideline for the questions to ask during the interview.

The initial interview gathered preliminary background information, asking the participants to sign the consent forms and to gather documents (i.e., archival data) for later analysis. The second interview focused on the research questions, and followed up on items from the first interview (Rubin & Rubin, 2015). There were two types of interview methods, physical and nonphysical. The face-to-face interviews were in a public space mutually agreed on where I could physically shake the participant's hand. The nonphysical interviewing methods were videoconferencing and telephone.

In videoconferencing, I could observe the participants' expressions. Sedgwick and Spiers (2009) argued, "In studies where participants are geographically dispersed over large areas, videoconferencing technology that includes a variety of telecommunication systems that transmit voice, pictures, and data over telephone and/or internet connections might be appropriate medium for conducting in-depth qualitative interviews" (p. 2). The benefits of videoconferencing were the ability to record the interview sessions; the participants and I were both in a quiet place (setting); and I was able to reach any participant no matter their location in the United States as long as there was an internet connection. The participants chose the type of videoconferencing medium they preferred (e.g., Zoom, Hangout, Skype). Moreover, videoconferencing has recording features that allowed for going back to examine physical expressions during the interviews, unlike face to face or telephone.

The telephone interviews were the other nonphysical method. Although telephone interviews are economical, time effective, and flexible, they are the least favorable method of communicating with research participants (Bernard, 1994; Novick, 2008). Nonetheless, I had to use the telephone process with two participants due to unforeseen circumstances that caused our scheduled videoconferencing meetings to go awry. Although it is essential to set up telephone interviews ahead of time to avoid interruptions and to minimize extra background noises, I had to remain flexible.

According to Kvale (2007), methods of recording interviews for analysis include audio recording, videotaping, note-taking, and remembering. All interview recordings for each participant were transcribed verbatim for later verbal exchange analysis as well as accuracy. Verbatim transcripts are abstractions from the original dialogic interview from which they were transcribed (Kvale, 2007). The decision to have a verbatim transcription for each interview was

to gain a deeper level of understanding during the construction of the narratives (Charmaz, 2014).

Nonetheless, no system of transcription can fully capture an interview. As Kowal and O'Connell (2014) argued, "all transcription is in principle selective and entails the inevitable risk of systematic bias of one kind or another" (p. 66). The verbatim transcripts used here, however, may have fewer risks given my proximity to the participants in terms of our mutual Caribbean culture and some degree of language and experiences. Yet, I remained critical, considering the length of time of the transcription after the interview and other factors such as language, missed cues, or gestures that might have increased the risk of biases.

Documentary Data

Documents were texts, including artifacts and visuals, that constituted the basis for quantitative research (Given, 2008; Patton, 2002). Documents functioned to develop and broaden the reader in new ways of thought and aimed to discover a connection to wider information (Patton, 2002; Prior, 2006). The documentary data for this study included collected artifacts from participants, journals, and memo notes that covered a broad spectrum of textual data, which with careful and critical attention provided evidence of experiencing the participants' figured worlds (Coffey, 2014). The documents collected were also useful in portraying actions and interactions that the participants produce in their everyday occurrences as mathematics learners and as mathematics educators (Marshall & Rossman, 2006). (See Appendix H for a list of the documents provided by the participants.)

Prior (2006) stated: "Documents are not just manufactured, they are consumed. Further, as with all tools, they are manipulated in organized setting for many different ends, and they also function in different ways—irrespective of human manipulations" (p. 4). As Prior (2006)

suggested, my focus was to examine the documents not only based on what they contained but also on how they were manufactured and how they functioned for the participants. I reviewed each participant's CV, course syllabus, and/or one example of published or presented research to provide personal and professional social settings, for background information and academic context.

Although all documents were artifacts created for a purpose, to function according to a social convention, they did, however, also had limitations by not providing sufficient data and may be subjective for analysis (Bogdan & Biklin, 2007; Bowen, 2009; Coffey, 2014). Patton (2002) argued that some of the challenges analyzing documents include getting access to documents, understanding how and why the documents were produced, and determining the accuracy of the documents. Moreover, in this case, there were challenges in linking the documents with other sources, including interviews or deconstructing and deciphering institutional documents.

Lived Experience Descriptions (LED)

Another method of data collection used was LED. This method is more closely related to van Manen's (1990) hermeneutic phenomenology, however, it was very useful in gathering the participants' experiences. van Manen's written descriptions or lived experience descriptions (LED) were ways to gather phenomenological data in human science van Manen claimed—

> the "data" of human science research are human experiences. It seems natural, therefore, that if we wish to investigate the nature of a certain experience or phenomenon, the most straightforward way to go about our research is to ask selected individuals to write their experiences down. (p. 63)

These LED required a writing protocol that generated original drafts (see Appendix D). The LED that the participants gave during data collection as another method of analyzing the participants' experiences. They functioned as written documentary data that described an event, a feeling (or mood), a specific example of an incident (or happening or event) of the participants' day-to-day experiences as mathematics educators.

The use of dialogical interviews and documentary data was to retrieve information that brought to light the experiences of Afro-Caribbean women as mathematics learners and as mathematics educators. The purpose of using multiple data gathering techniques was to identify a convergence of categories across data sources, to address credibility, and to provide enough data for deep and rich descriptions of the participants' experiences (Nowell, Norris, White & Moules, 2017). Despite Vagle's (2016) warning that triangulation may make the research process too mechanic (p. 97), I used triangulation to identify the categories that, I believe, were present across the data. Triangulation across each data gathering method—interviews and documents—further gave credibility and increasing the validity of the study (Creswell & Miller, 2000; Vagle, 2016).

Data Organization and Management Plan

Patton (2012) suggested that when protecting the data, it is crucial to make back-up copies and to treat them as valuable material. The original data should then be stored safely, using copies for analysis or to write on. Moreover, Dewalt and Dewalt (2002) offered that researchers should plan a strategy to store the data before the data collection begins by use of a computer to make the process of recording and organizing easier. The Computer-Assisted Qualitative Data Analysis Software (CAQDAS), MAXQDA, a software that "efficiently stores,

organizes, manages, and reconfigures your data to enable human analytic reflection" (Saldaña, 2016) served as my data management and storage tool.

I stored printed transcripts, handwritten memos, and fieldnotes in my home office in a locked file cabinet. On my computer, I created unique identifiers for each participant, such as using the participants' code name, type of document, and the date of data collection (Nowell et al., 2017). I created a data inventory of all data sets, including all interviews and documents, which were organized and labeled, and any electronic and hard copy of these data sets (Cohen, Steeves & Kahn, 2000; Merriam, 2009). I assembled the collected data on my computer, in a folder, and on MAXQDA. I uploaded the transcript files from my laptop into MAXQDA for later analysis. Overall, I organized, analyzed, and presented the data by narratives that provided insight into the participants' experiences.

Narrative Data Analysis: The Dialogic and Categorical Approaches

Narrative analysis is a "family of methods for interpreting texts that have in common a storied form" (Riessman, 2008, p.11). According to Frost and colleagues (2010), narrative analysis is "especially useful in the study of formation, reformulation and maintenance of identity since this approach gives prominence to human agency and imagination" (p. 445). The participants' narratives told as much about their mathematics figured worlds as they did about the participants themselves. The participants' experiences from the past and into the future became unique episodes. Each episode was different due to history, environments, the type of teaching courses, and each of their lived experiences. Yet, there existed a common understanding from each interaction, based on our situated relative positioning as Afro-Caribbean women at institutions of higher education teaching mathematics content and education courses. As such, I

used a combination of two narrative analysis approaches for interpreting the data: the dialogic and the categorical (Charmaz, 2014; Goodall, 2000; Riessman, 2005).

The dialogic approach allowed for recognizing the co-construction of the meanings of the experiences between the participants and me, and dealt with aspects of the data with respect to identities of the participants and me (Riessman, 2008). This approach made me aware of the power relations and the connections between us. These relations were manifested not only in the content of their narratives but also in our interview exchanges (Collins & Bilge, 2016; Esin et al., 2014). I agree with Esin and colleagues (2014): "storytellers and listeners do not move freely between subject positions, they are invested in and by them" (p. 206). In other words, the dialogic approach can reveal the back-and-forth acts of agency between the participants and the researcher as well as between the participants and the characters and actors in their mathematics figured worlds. The categorical approach is derived from the context and content to what is said in the participants' narratives (Charmaz, 2014; Esin et al., 2014). I examined the narratives repeatedly to identify probable categories in their experiences and used them to provide the set of narratives that tell shared understandings of our experiences (Riessman, 2008). These categories, in turn, became the common Afro-Caribbean women mathematics perspectives I was soliciting throughout this project so as to contribute another perspective—a different perspective—to the research literature on mathematics learning and teaching, immigration, and U.S. higher education.

Pre-Coding Cycle Analysis: Gathering Initial Codes

The initial codes were used to input the data into the computer software program used to assist with coding and organizing the narratives. The initial coding for analytic direction happened while in the early stage of the study while I interviewed the participants and during my

initial examination of the transcribed interview data (Charmaz, 2014). Although, according to Saldaña (2014), these initial codes are merely labeling at this point in the analysis, I used them to make jottings on the transcripts and for expanding my thoughts in my researcher journal.

The initial codes came from analysis of the documents, such as interview transcripts, notes written during the transcription process, memo notes from the interview process, and journal reflections entries after the interviews. The interview transcripts and notes helped start the initial analysis by reflecting on the possible connections from the narratives. These documents became part of the analysis in the first cycle. An analysis of the transcripts became the most vital part of the process to decide what words, ideas, or stories to include or expand on when presenting the participants' experiences. I also used the transcribed interview data to create memo notes about the connections among the participants based on my memory, interview notes, and journal entries.

Writing journal entries and memo comments after each interview were an integral part of the initial coding process. Ezzy (2002) contended, "keeping a journal and regularly writing memos encourages researchers to reflect routinely on their emerging understanding of the data" (p. 72). I also wrote memos while creating the initial labels used in the MAXQDA input process. According to Charmaz (2014), "memo-writing provides a space to become actively engaged in your material to develop your ideas, to fine-tune your subsequent data-gathering, and to engage in critical reflexivity" (p. 162). These entries and memos were conversations I had with myself while pre-coding the data seeking connections among the participants (Charmaz, 2014).

By the second interview, I determined who had similarities and differences in background, stories, and social and contextual experiences based on our conversations and documents. After transcribing each interview, I carefully read each over, noting discussion topics

that I sensed a paragraph was describing. I also took notes by circling and underlining any words or phrases that seemed strikingly powerful, or that resonated with my own story. Many of the terms, phrases, and topics identified in the pre-coding process were what Charmaz (2014) and Saldaña (2016) noted as either in vivo or descriptive coding, respectively. Some codes are called in vivo or descriptive coding because, according to Saldaña (2016), I was using words or short phrases directly from the participants, and I was summarizing in a word or short phrase in the data record. These pre-coded data can later become critical pieces of evidence to support assertions or may even become part of the results (Saldaña, 2016).

After the initial coding (i.e., labeling) process, I started making notes on paragraphs that either discussed a mathematics, academic, or well-being (personal) experience. I decided to input these three labels in the MAXQDA program (the CAQDAS used to assist with data organization and analysis). I used these three words only to have an idea of where to put each data set. I was not giving the data any structural form per se; at this point, I only had a novice sense of data analysis. Nevertheless, based on my pre-coding labeling process, the MAXQDA program output provided a code matrix browser (see Figure 3). It illustrates what each participant's data set contributed to the pre-coding labeled words or phrases. I used the code matrix browser to provide an idea of what narratives to focus on during the second phase of the analysis process.

After completing a pre-coding analysis of the data, I used Saldaña's (2016) methods of data coding during the analysis. Saldaña's coding methods include a first and a second coding cycle. The first cycle is Literary and Language Methods, which includes dramaturgical coding, motif coding, narrative coding, and verbal exchange coding. Narrative coding and verbal exchange coding stood out given the narrative inquiry methodology of the study.

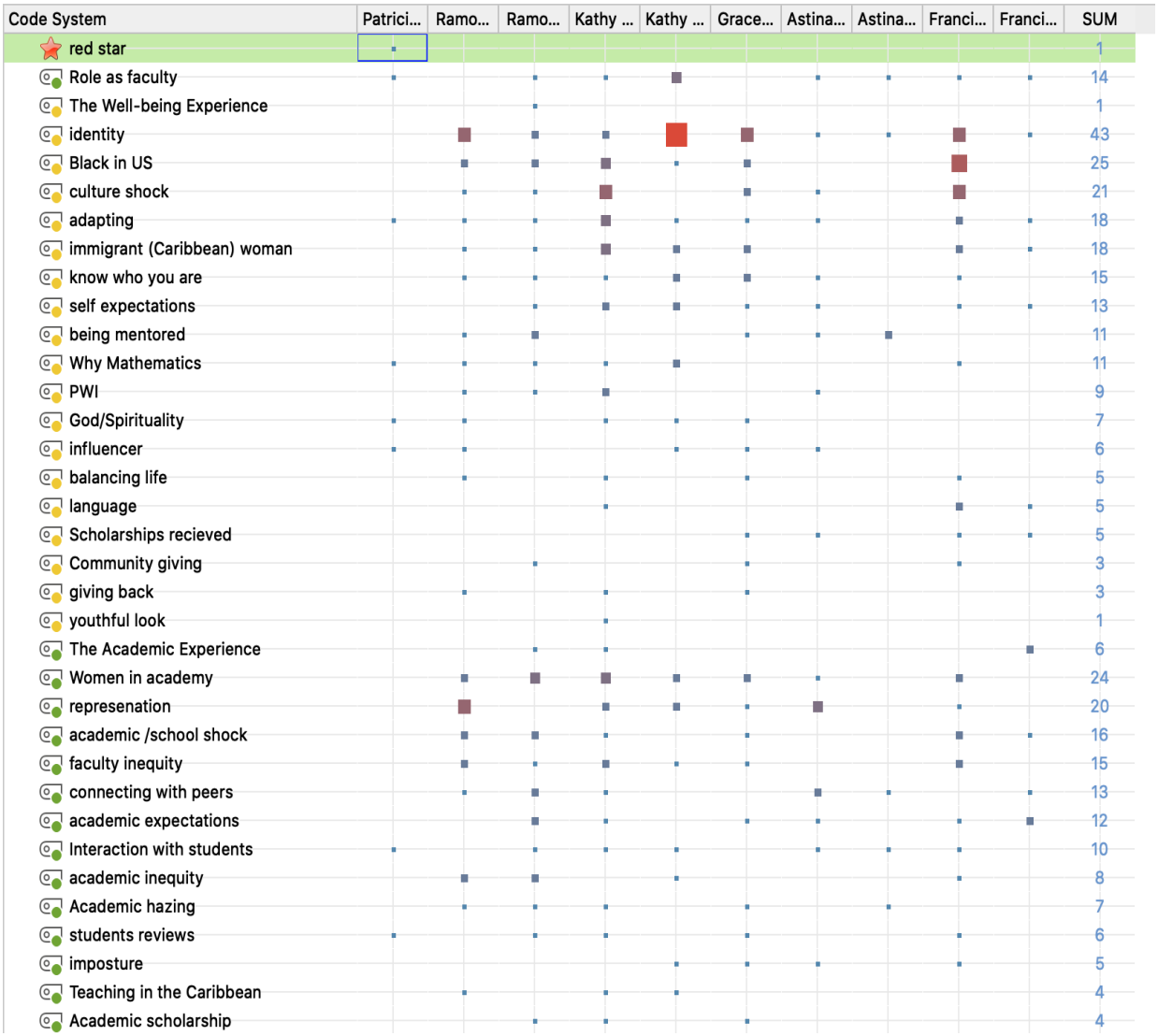

Figure 3. MAXQDA data display excerpt: phrases/words marked in yellow were data that fit into well-being experiences, the color green into academic experiences, and the color red (not shown) into mathematics experiences. Some of the participants experiences fell into more than one label.

First Cycle Analysis: Verbal Exchange Codes (i.e., the Dialogic Approach)

Although suitable for the study, I chose not to employ narrative coding. Saldaña (2016) contended that narrative coding is particularly suitable to explore subject positioning and representation of self while dealing with queries such as identity development and social, contextual, and cultural meanings and values. However, Saldaña also stated narrative coding requires "a three-dimensional rendering of the participant's life, with emphasis on how

participants' transformation progresses through time" (p. 157). Acknowledging that I might not have enough data to thoroughly represent a three-dimensional rendering of the participants' mathematics experiences, I decided to use the verbal exchange coding process for the study.

According to Saldaña (2016), verbal exchange coding is an "introductory approach for novices to closely examine the complexity of talk through focused parameters of conversation type and everyday cultural practices" (p. 161). Saldaña (2016) noted three stages of verbal exchange: written transcripts, coding, and reflecting. Verbal exchange coding, therefore, uses verbatim transcribed interview data for analysis to interpret the types of conversations, to find personal meanings of key moments during the interviews, and to use extensive written reflections (Saldaña). In other words, the verbal exchange coding process maintained a focus on the meanings and the content of key moments during the conversation and allowed me to add interpretive reflections on the meanings of the verbal exchange as they resonated with my experiences.

There is a first and a second level to the verbal exchange coding (Saldaña, 2016). The first level, as the coder, involved identifying five forms of verbal exchange units: phatic, ordinary, skilled, personal, and dialogue. The first unit of verbal exchange marked our phatic interactions, such as routine social greetings between the participants and me. The ordinary conversation involved the background information about the study, the participants, and me. I, however, only coded the data for the latter three units of verbal exchange: skilled conversations, personal narratives, and dialogue conversations.

These three units of verbal exchange coding—skilled conversations, personal narratives, and dialogue conversations—were used to identify key moments and to provide a reference to other key moments that occurred during our interviews. According to Goodall (2000), skilled

conversations (SC) would include: any in-depth level exchanges about our positions as mathematics professionals; and exchanges that represent a "higher" or "deeper" level of conversation about professionally trained information. Personal narratives (PN) would include information, stories, or events that the participants and I share; and conversations where the participant self-discloses pivotal events in personal or organizational life. Dialogue conversations (DC), rarely occurring, transcend the exchange of mere information; conversations that "can reveal a kind of spiritual or unordinary 'meeting' in which the talk moves from exchanges of information and the coordination of new understanding to a higher level of spontaneous mutuality" (p. 104).

The second level of verbal exchange coding was an opportunity for the researcher to play the role of the middle ground because it caused me to make meanings of the participants' mathematics experiences (Denzin & Lincoln, 1994; Kenny, 2012; Schwandt, 2015). In other words, an opportunity to explore the personal meanings of the key moments within our narrative exchanges by examining the speech, mannerisms, and cultural knowledge (Goodall, 2000; Saldana, 2016). I arrived at these meanings through interpretations, reflections, and as a participant experiencing the experience (Clandinin & Connelly, 2000). According to Goodall (2000), to interpret these meanings comes from answers to questions such as: What is the frame/context? What is being said? How it is being spoken? Where are you in the scene?

Finally, I concluded the coding process by identifying what Goodall (2000) called rich and turning points. Rich and turning points were "episodes or speech acts within the conversations that contain cultural knowledge; these are sources for deconstructing how cultures are understood from the inside" (p. 108). They were points were "those times when talk produces life decisions or ultimate interpretations of the meaning of persons, relationships, organizations,

and institutions" (p. 108). In the analysis, I refer to all rich and turning points as simply as turning points.

The turning points were to get "closer" or to provide a better "gaze" into the key moments that attribute meanings to the verbal exchanges (Denzin & Lincoln, 2005; Goodall, 2000). The participants' narratives were used to find understandings of their social and contextual mathematics experiences as learners and as educators. Turning points came from two sets of narratives, and assisted me in highlighting an interpretation of the times where the participants, as mathematics educators, defined the meaning of their mathematics figured worlds as learners and as educators. The first set of narratives provided a gaze of the historical context of the participants as learners, while the second set provided information about their current positions as mathematics educators. The narratives also represented their experiences in both regions: in the Caribbean and in the United States. I present the participants' narratives as mathematics learners and as educators through high school and in college while providing turning points from each.

Second Cycle Analysis: Focused Coding (i.e., the Categorical Approach)

Using Charmaz's (2014) focused coding, I coded the turning points to decide what narratives made sense to categorize based on the comparisons made with and between them. Focus coding, according to Charmaz, "requires decisions about which initial codes make the most analytical sense to categorize your data inclusively and completely" (p. 138). After gathering the turning points from the participants' narratives, I organized the data in a way that assisted in categorizing the narratives presented in Chapter 5: Data Representation and Reflection. I decided to present the participants' narratives in the form of a timeline that positioned their experiences from the past to the present and into the future (Polkinghorne,

1988). I searched the participants' experiences from learners to educators finding turning points for the most frequent and significant context or story to present the narratives in that timeline manner (Polkinghorne, 1988; Saldana, 2016).

Charmaz (2014) clarified that comparing code with code provides tentative categories, and gives a sense of direction for the analysis. I drew a comparison from each participant's turning points to create a collection of narratives of Afro-Caribbean women as past mathematics learners to present mathematics educators. I identified the following phrases upon completing the focused coding and comparison between the turning points to describe the participants' experiences: figuring out the mathematics, setting back our mathematics, fitting the mathematics script, being the only Black girl, finding mentorship in the academy, bearing experiences in the academy, reinventing and reforming mathematics identity, and what is your native language. These unique phrases were used to represent the reflections and results of their narratives as I heuristically provide meaning and assessment of their (our) experiences as mathematics learners and as educators.

Ethical Considerations

The Afro-Caribbean women mathematics educators in this study are empowering agents who will want to know that their experiences are represented accurately and ethically (Ibrahim & Alkire, 2007). According to Wilborn (2015), "researchers studying Black women are obligated to take great effort to engage in ethical research practices that promote a sense of trust and community between the researcher and the participants to facilitate honest and genuine participation" (p. 47). Part of my responsibility was to represent the participants' experiences, narratives, and perceptions carefully, truthfully, and respectfully in the study with a sense of mutual trust (Freire, 1970/2005). Part of describing the participants' experiences requires being

aware of necessary ethical considerations, such as storing the data securely, transcribing the interviews correctly, and thorough representation of their narratives. I have a moral and ethical commitment to the participants for making sure to represent them well as I (re)retell their (our) narratives (Schwandt, 2000).

Being an "insider" potentially means easy access to obtaining data. My role as an insider for this project did make me differently equip to be sensitive to particular dimensions of the data, to be familiar with the language used, and to be cognizant of both the unsaid and the said experiences of the participants (Ezzy, 2002; Marshall & Rossman, 2006). Berger (2015) contended, "[the] degree of the researcher's familiarity with the experiences of participants potentially impacts all phases of the research process, including recruitment of participants, collecting data via interviews and/or observations, analyzing and making meaning of the data, and drawing conclusions" (p. 229). My ethical sensitivities are heightened as the researcher because I too am an Afro-Caribbean mathematics educator. Therefore, I reported my personal beliefs, values, and interpretations through the heuristic process not only as a form of validation (Moustakas, 1990) but also as an ethical process.

Nevertheless, there are still concerns about my bias or inability to ask critical questions based on my closeness to the culture and being a mathematics educator, as well as lacking insights into specific experiences (Bishop, 1998). Although I may have had the ability to develop a rapport with the women quickly, some issues were keenly kept in mind. For instance, I maintained an awareness of assumptions with unfinished sentences during the interview process, where I needed to follow up with participants by asking them to finish their thoughts or explain phrases further. There were also risks of comparison and competition, as well as deliberate efforts to maintain separation of experience. That is, as the women came with their unique lived

experiences, although they may be similar to mine, we are different. Therefore, as the researcher, my reflexivity was paramount, demanding that my positionality and subjectivity, while integral to the study, did not overshadow or color the experiences of the participants (Frost et al., 2010; Moradi & Grzanka, 2017).

Ethical considerations for researching Afro-Caribbean women were intensely tied to my positionality. Positionality links to power, status, and rank, and "refers to the fact that personal activity (the identified action of a person) always occurs from a particular place in a social field or ordered and interrelated points or possible activity" (Holland et al., 1998, p. 44). There are three positionings of the researcher that might influence the interactions during narratives exchanges and analysis: fixed, subjective, and textual (Goodall, 2000). Fixed positions are factors that will not change throughout the research, such as my gender, ethnicity, age. The subjective positions are life history and personal experiences, those that are "deeply felt," deriving from self-defining moments or turning points during the interactions (p. 133). Textual positions are the language choices; that is, the tone of the researcher.

The fact that I identify as a Jamaican American is important to highlight, as that part of my identity may have impacted the interactions between the participants and me as well as the analysis. The stories the participants choose to share or not could be a result of my Jamaican American position and possibly my accent. That is, my Caribbean-ness is not fixed for all countries in the region. Had I identified as a Grenadian man, the stories shared most likely would have been different. But I honestly do not know if that would had been the case. Nonetheless, it is crucially necessary to clearly state that how the stories in this project were heard, interpreted, analyzed, and represented was through the lens of a Black Jamaican woman living in the United States for nearly 25 years. Who I am represented meanings for the participants—and vice versa. I

am fully aware that when I interact with other people (be it research participant or otherwise), the meaning of who I am, for that person, impacts our interactions. How they interpret my positionings affects the narratives they might provide and, in turn, how the narratives shared might resonate with me. Moreover, no matter what I intended to share in this study, the readers themselves are also freely positioned to make their own interpretation of the research (Goodall, 2000).

Limitations

Lather (1991) stated: "A science capable of grasping the continual interplay of agency, structure, and context requires a 'becoming space' where we can think and act with one another into the future in ways that both mark and loosen limits" (p. 101). Although my aim through this project was to create a platform for Afro-Caribbean women's mathematics experiences and to loosen limits on the omission of these experiences in the education literature, particularly mathematics education literature, there were areas of the study that might place limitations on my argument.

First, I did not specifically ask the same question to each participant for the second narrative exchange in Chapter 5. Soliciting mathematics perspectives from Afro-Caribbean women had different questions for each participant. For instance, I asked Astina, "If a new immigrant comes from Jamaica and decides to become an educator in this country, what advice would you give that person?" and I asked Francis, "If you were to advise a new immigrant woman from the Caribbean coming to teach mathematics in the U.S. in college, what advice would you give that person?" There were differences such as having the word "woman" or "college" that may yield different responses of the questions. The inclusion of woman and college might have given credence that the question is about advising women from the Caribbean

teaching in college, but I could not confidently say each participant understood that to be the case.

Second, the next concern was interviewing with professionals. This dissertation was my first, yet I was interviewing professionals who are well versed in academia. Clandinin and Connelly (2000) noted that it is possible that participants can control research interviews. At the start of the interview process, four of the participants interviewed me before I started my interviewing process. The participants in the study are professional mathematics educators and researchers who were intimately familiar with the process of doing dissertation research studies. They were familiar with the literature, topics, and interviewing process that can shape an account of their narrative experiences. The content of the stories could include words or stories situated around my framework or methodology, which I analyzed in the narratives. I do believe all the participants' interviews evolved into conversations where we mutually exchanged our experiences. However, there was no way to determine or measure the impact of the power relations within our conversations.

Third, Patton (2002) claimed there was no perfect research design as there are always trade-offs such as limited resources, time, and the ability to grasp the complex nature of the situation. Some trade-offs for this study could be data collection, data analysis, the write-up, the time constraints, or the sample of data. Data analysis could be a limitation for the study due to my inexpert effort at analyzing data for categories. Another trade-off could be the selection of the participants. The sample size for a qualitative study is to maximize the information from the participants. With a sample size of six plus the researcher, did I have enough narratives to grasp the complex nature of the experiences of Afro-Caribbean immigrant women as mathematics learners and educators?

Fourth, there were two items I considered but chose not to include: (a) a review of the literature on the U.S. born Black women in higher education, and (b) the use of observation as a data-gathering process. According to Borum (2010), U.S. born Black women faculty are of great rarity in mathematics, and they are needed to create a climate for which young Black women scholars can have mentorship as well as a visual representation to develop in the field. This study, however, was to distinctly highlight the Black Caribbean-born women in mathematics at U.S. institutions of higher education. Dill (2009) argued that universities pay an expensive cost and work hard to represent themselves as diverse at the expense of faculty of color whose numbers are often small and who tirelessly work to establish legitimacy and acknowledgment in their workplace. Thus, featuring Black Caribbean-born women as part of this small, diverse representation in the academy created a visual representation not only for Black immigrants but also for other immigrants.

I considered observation as a form of data collection, but I decided against doing so due to a combination of time, cost, and IRB factors. van Manen (1990) described the role of observation to recognize what parts of the daily teaching of the participants are noteworthy while studying it as it is happening. The process of observing Afro-Caribbean women as learners could not occur. But as educators in their mathematics classrooms, in meetings, and interacting with peers could have, but it would have required time and permission from IRB. Moreover, the participants' location would have required travel, money, extra time, and further IRB revisions that were not part of the research plan. These observations, I believe, would have reached beyond the scope of this dissertation, but may be revisited as an extension of a future sponsored or funded study.

Fifth, transcribing was a large part of the analysis for the study. As I was transcribing, I realized the difficulty in understanding where the participants' thoughts concluded from the beginning to the end of sentences. The difficulty was deciding where a sentence would end, which can alter the interpretation of the participants' narratives. One solution to this difficulty was for the participants to verify the interpretations of their narratives. Ezzy (2002) claimed that although participants' involvement in research varies depending on the researcher, it is vital to check with participants with respect to interpretations of the data. I invited the participants to verify their narratives for its intentionality and as a form of qualitative validity for the study. I believe having the participants verify their narratives solidified my interpretations of their data and lessened issues of intent being lost in transcription.

Lastly, one limitation, for some, could be the inclusion of my story as part of the study. Spradley (1979) noted that analysis of any kind is the methodical examination of something to determine its parts, the relationship among parts, and their relationship to the whole (p. 92). I considered myself a part of the phenomenon not only as the novice researcher but also as someone who shared, if not the same, certainly similar experiences as the participants. Thus, my experiences as an Afro-Caribbean mathematics educator was one of the many parts of the complete process of describing and interpreting how Afro-Caribbean women perceived their (our) mathematics learning and teaching experiences. Etherington (2004) argued, "a combination of heuristic and postmodern methodologies can balance the personal with the social and can become a way of bridging our internal and external worlds" (p. 62). Nonetheless, it is possible that adding a heuristic part to the study could create a balance and an imbalance in the reflection and results. But I was careful throughout the study about how my experiences were incorporated heuristically with those of the participants'.

Summative Remarks

Ultimately, narrative inquiry with a heuristic approach was a suitable methodology for this study. A study designed and executed to capture, value, and contribute to a body knowledge, with trustworthiness, about the experiences of Afro-Caribbean women as mathematics learners and educators living in the United States and working in institutions of higher education. Throughout the study, I was (re)re-scripting the participants' reflections of their (our) experiences based on narratives and documents exchanges. The narrative inquiry and analysis processes were used to understand contextual details that highlighted the nuances and shared understandings of the meanings Afro-Caribbean women make about their (our) mathematics experiences (Ezzy, 2002; Moustakas, 1994).

In the end, there were multiple constructs of their (our) realities shared, each giving some version of their (our) experiences as mathematics learners, and now as educators. Foucault (1986) stated:

> We do not live in a kind of void, inside of which we could place individual things. We do not live inside a void that could be colored with diverse shades of light, we live inside a set of relations that delineates sites which are irreducible to one another and absolutely not superimposable on one another. (p. 23)

The methods of data collection and data analysis used here were indeed sets of relations that allocated different representations of the participants' (our) mathematics experiences—experiences that were neither reducible to nor superimposable on one another yet somehow communal.

CHAPTER 5

DATA REPRESENTATION, ANALYSIS, AND REFLECTION

In this chapter, I present the data through narratives and provide a contextual analysis of those narratives. According to Polkinghorne (1988), "the gathering of narratives through interviews needs to be followed by an analysis that includes not only the answers of the respondents but also the characteristics of the interview situation" (p. 164). This chapter is organized in two parts: (a) the first part is a display of interview exchanges between the participants and me in the form of narratives, followed by reflective analyses; and (b) the second part is a display of analytical reflections derived from the earlier reflective analyses. These reflections, organized thematically, are my heuristic interpretations of the interview exchanges and reflective analyses. I close the chapter with some summative remarks.

Introduction

Drawing on Freire's (1970/2005) idea that dialogue is more than mere words between people but rather social encounters or exchanges that contain the elements of love, humility, faith, trust, hope, and critical thinking, here I present two sets of exchanges between the participants and me for analyses. These exchanges are becoming actions in giving voice as we are creating and re-creating our experiences, mediated by our worlds as mathematics learners and educators in the Caribbean and the United States.

The first set, Dialoging Mathematics Historical Context with Afro-Caribbean Women, re-presents the participants' historical context as learners. The narratives enrich the retelling of their experiences and render vivid accounts of their practices in their mathematics figured worlds (Florio-Ruane, 1991; Holland et al., 1998). The second set, Soliciting Mathematics Perspectives from Afro-Caribbean Women, represents data that positioned the participants in imagined

figured worlds as I asked each, hypothetically, to advise another Afro-Caribbean woman who plans to become a mathematics educator in the United States. The aim of the hypothetical question was to place the participants in a state of mind to reflect on their own experiences as mathematics educators.

Both sets were coded using verbal exchange coding (Goodall, 2000). Recall that this coding includes skilled conversations (SC), personal narratives (PN), and dialogue conversations (DC), where key moments throughout are coded as turning points that bring fuller meaning. In the next two sections, for each set and for each participant, I provide an interview excerpt and code it using verbal exchange (see Appendix J). I then collected all the turning points to conduct the focused coding (Charmaz,2014) to present the categories that came to light through the verbal exchange analyses. These categories are presented in the third section: Reflecting the Results of Afro-Caribbean Women's Mathematics Perspectives. The categories in this final reflection section of the analysis process came from linking the turning points that I presented heuristically, along with my own experiences.

Dialoging Mathematics Historical Context with Afro-Caribbean Women

The narratives included in this section represent the history of the participants' past social and contextual mathematics experiences as learners. According to Polanyi (1958), "all past mental strife can be interpreted today only in the light of what we ourselves decide to be the true outcome and lesson of this history" (p. 158). The narratives shed light on the participants' mental conflicts and successes and their beliefs and knowledge that they understand as outcomes of their mathematics learning experiences in the Caribbean and in the United States. (The narratives are presented alphabetically: Astina, Francis, Grace, Kathy, Patricia, and Ramona.)

The questions asked of each participant were all somewhat different because of the collaboration process of dialogical interviews (Kvale, 2007). This collaborative process requires an active listening and authenticity of engagement that cannot come from a scripted, structured interview process (Ravitch et al., 2017). When the participants and I engaged in dialogue, our mutual curiosity of each other as Afro-Caribbean women in similar mathematics spaces steered our conversations into different exchanges about experiencing mathematics as learners, and now as educators. The data therefore about the participants' mathematics learning experiences (either in the Caribbean or in the United States) are not from any specific set of interview questions. But rather, I carefully and repeatedly read and re-read the transcribed interviews and listened and re-listened to the audio-recorded interviews for excerpts that provided evidence of their experiences as mathematics learners.

Astina

Dialoging with Astina

> DIHEMA: You had said that you see your role as a faculty member, as a nurturer particularly toward female students of color. Why, and I can gather, but I want you to discuss, why you push them toward taking more math courses?
>
> ASTINA: Well one, I see the need for it. I see that this is an untapped discipline that at times we have been strategically left out of. And why I say strategic, if every time you go into a class you see nobody that looks like you, nobody that looks like you that's teaching it, that's a message, ya know. Maybe you're not accepted or maybe you're not good enough. And so, I see it as a gateway to opening a lot of possibilities. To me math is that one subject that causes you to think differently…. So, it became the gatekeeper, instead of using it as a pump, we used it as the filter—these are the ones, that strategic subject that we use to say, you get it, you don't, you're good, you're not. So, I became…I was the slave and the slave master on the other end too. And now at this level, I see that how dangerous or destructive that is and was. So, it's almost like trying to right a wrong, ya know.
>
> And then on the other end, I saw that even as I was in college like my calculus teacher couldn't care less about me. I was the only Black girl in those classes for every class. I went to a predominantly White school. And to every class I went to from in my major to those in my minor, I was the only Black girl. The only Black female. I may see one or

> two Black males but I was the only Black female. And none of my instructors, I would go for help, and I don't think that if they passed me on campus they would know me at all because there was no interest. There was no caring, there was no connection. And so, from this end, I could see how devastating that could be. Because, if no one pulls you aside and show you that you're welcome, you're wanted, and you do have a connection with this subject, and here is your connection. It may be me. It may be me helping you to find a connection. It may be me encouraging you to say, don't feel like this is that hard or that you can't do this. If nothing else, let me try and show you. Let me help you to break it down.

Coding with Astina

Astina's exchange represents skilled conversations, personal narratives, and dialogue conversations codes as she provided narratives of her experiences as a teacher and as a student. Our exchanges occurred over one Zoom interview and one telephone interview; I found both relaxed and friendly, as noted in my researcher's journal. (See Appendix J for an example of a journal entry.) The telephone interview promptly happened when our scheduled Zoom interview was canceled due to Internet issues. During the interviews, we realized that our paths might have crossed at some point, given that we have parallel backgrounds. These parallels included being from the same country and city, attending the same university for our PhDs, and surprisingly, both of us had briefly studied meteorology at the same midwestern university.

At the beginning of our first interview, Astina interrogated me, so to speak, asking me about my past and the study. Was this interrogation a possible demonstration of power, or her agentive persona of making a connection and encouraging me through the dissertation process? (Esin et al., 2014; Etherington, 2009). This first interview was an initial indication of the power relations that occurred during the interviews with the other participants. Collins and Bilge (2016) argued intersectionality, through the lens of mutual construction, works in understanding the power relations that exist. In the interview collaboration with Astina and other participants, an interpersonal display of power relations was coming from an encouraging perspective. I sensed

that the participants' acts of displaying power were not "over me," per se, but rather to seek ways in which they might encourage me through the dissertation process.

Turning Points with Astina

- Math is an untapped discipline and we are strategically left out
- There is a message when you do not see people like you teaching the subject
- Mathematics is used as a filter instead of pump
- The only Black girl in the mathematics classes in college
- The slave and slave master as mathematics educator
- Noting the danger and devastation for Black girls not to have support
- Astina became encouraging to students in her position
- Makes a connection with students because her professors did not connect with her

Francis

Dialoging with Francis

> DIHEMA: You taught in St. Kitts and Nevis. So, in teaching mathematics course in St. Kitts and Nevis versus teaching mathematics courses here, are there any distinct differences or similarities that ring a bell or that stay with you all the time?
>
> FRANCIS: Oh yeah. Like, I totally reinvented my teaching when I came here.
>
> DIHEMA: Why?
>
> FRANCIS: So, when I did math, I didn't do well in high school. I actually did it for A levels and I did better because I like, for some reason math kind of clicked for me better. But, I really had to kind of reinvent the way that I taught because at home there's an emphasis on procedures and shortcuts but not necessarily on understanding why stuff works. And I realized that I was good at that part, but then I struggled when it came to… like, did I understand what I was doing? Not really. I was just doing it. So, for me I realized that I had to kind of reinvent my teaching so I could emphasize more around conceptual understanding rather than focusing on the procedures.
>
> And so, I think that's the main thing. Like, there's an emphasis on procedures and not necessarily too much understanding. And I think because there's such an emphasis on preparing for CXC's [Caribbean Examination Council] or the exit exams for high

> school. Like again, it's just like not necessarily really learning the mathematics per se, just preparing for a test. Yeah. I think that's the main difference.
>
> DIHEMA: Okay, good. Are there any similarities?
>
> FRANCIS: I mean you still do still have an emphasis on results. Trying to get a particular grade or, you know. There's that. I mean also I'm teaching mostly adults here. So, I think it's just totally different. The adults are, well some, know why there're there, so you don't have to deal with some of the other stuff. But I think its maybe different challenges now. Not necessarily having to worry about keeping kids from fighting each other. But more like, are people paying attention. Are they engaged when they are supposed to be? That sort of thing.

Coding with Francis

Francis provided several statements that were coded dialogue conversations: interview exchanges that often transcended the ordinary boundary of self during the interview (Goodall, 2000). The exchange presented here provides experiences of Francis as a mathematics learner in the Caribbean and as an educator in the United States. Our exchanges were casual and in standard English, occurring over Zoom during her lunch break and office hours. Francis and I have similar students issue as mathematics educators. The challenge is determining how to "best" teach undergraduate students while also keeping them engaged and focused during class. Our students hold varying academic perspectives; some are aware of what it means to be a college student, while others are still figuring out why they are in college.

Francis's used the word "mainland" during one of our interviews, highlighting how language and culture were essential to understanding our mathematics experiences. One memo I wrote after speaking with Francis, asked: "Should I explore this 'mainland language' as one of my aspects?" The issue of language came up during the exchange below:

> FRANCIS: So, I went to college in the U.S. Virgin Islands for 4 years. From 2003–2007 and then I came to the mainland U.S. in 2007 so I've been there about 12 years almost. Mainland U.S for 12 years.

DIHEMA: And so, it's interesting that you use the word "Mainland U.S." I think that's language that maybe non-U.S. territory Caribbean people wouldn't use. Does that make sense?

FRANCIS: Yeah, because we could think of those other places as often the U.S. But often Americans don't necessarily consider them to be like part of the U.S. country so to speak.

DIHEMA: Interesting, okay. And how do you feel about that? In terms of many mainland U.S. citizens not recognizing territory spaces?

FRANCIS: I mean I think it's strange, but I know there are a lot of uh, like historical things that I don't necessarily understand. I mean it kind of goes both ways in a sense. Like the people see themselves as part of America but not really. Like they still, they consider themselves somewhat different than let's say someone who grew up in America, mainland…on the continental U.S., that's the word I'm looking for, yeah. And often there are things that again, they're a part of the U.S. but not quite. They don't get to vote for the president, that kind of thing.

Francis was born in St. Kitts and Nevis but attended college in the U.S. territory of The U.S. Virgin Islands. The U.S. Virgin Islands is one of the U.S. territories such as American Samoa, Guam, Northern Marina Islands, and Puerto Rico. These are territories where the people are U.S. citizens, pay taxes, and have house delegates but no vote in congress (Webber, 2017). Francis's use of the word mainland triggered an inquiry about her position on the global relations between countries and territories such as the mainland U.S. and The U.S. Virgin Islands.

Turning Points with Francis

- Reinvent my teaching
- In the Caribbean there's an emphasis on procedures and shortcuts
- The need to emphasize conceptual understanding
- The need to understand the *why* in mathematics teaching and learning
- Understanding the big pictures and looking from a different perspective
- There is still an emphasis on results (getting a grade)
- Challenge with teaching adults is people paying attention (student engagement)

Grace

Dialoging with Grace

DIHEMA: Alright, so, tell me about moving from Jamaica to the United States.

GRACE: …I came here in the 10th grade which was awkward because it was in the spring. So, it was like everybody had their friends. And I'm like, I used to go to the guidance counselor's office for lunch because I didn't have any friends. It was really awkward.

In my classes they tried to set me back because they look at Jamaica as low but they couldn't deny my math grades. Because it was so outstanding. It was like 90's and 100's. So, I think they placed me in Geometry, and my Geometry teacher after a while was like why are you sitting in here? She was like, why are you here? I was like, well, they placed me in here. So, she skipped me. I think I was supposed to go to trigonometry after, but she skipped Trig and sent me to, um, what was after that Calculus or Pre-Calculus. Yeah. So, she skipped me because at some point she had me teaching the class. She's like, you're done? Okay, go around and help other students and stuff. I would make over 100, cause you know they give extra credit, which I didn't have any idea of when I came here.

I remember one time she was like, oh, we're gonna re-do this test. And I was like huh? You're gonna redo the test? You know? So, it was very eye-opening. It was weird. Because I was just like, how come everybody doesn't have a 4.0 with all of what they, the material they have the extra credit, you can redo a test? Wait a minute? In Jamaica we're struggling to get a 70 and you're here like getting all of this opportunity and failing? So, it was really weird. I remember one time in English class. So, you know the students had trouble reading because they were like slurring their words and stuff. And so, I started reading. I was reading, I think, eloquently and they started laughing. And I'm like, what's so funny? Even the teacher was laughing. And I was like, did I say something wrong. And they were like, oh, your accent. I'm so sorry, your accent is just, we weren't ready for that.

Coding with Grace

This exchange with Grace is what Goodall (2000) described as personal narratives and dialogue conversations. Overall, the exchanges were causal, spoken mostly in standard English,

but were also mixed with patois[14] (Jamaican Patwa) words here and there. Grace not only shared mathematics experiences as a learner but also social activities and practices as a student. Grace and I met face to face and through videoconferencing to conduct our interviews. My journal entry after meeting with Grace stated, "a pleasant person, and she seemed ready to get moving forward [with participating in the research]."

Grace recalled pivotal moments during her high school years after moving to the United States. It was after Grace's interview that I started pondering the importance of relationships between the researcher and the participants. Throughout our interview exchanges, roles often interchanged for who acted as the mentor and who acted as the mentee as we reflected on our mathematics experiences (Agosto et al., 2016). During Grace's interviews, I started noticing the differences in power relations—power relations were evident not only in the interview exchanges but also in the content being discussed.

Turning Points with Grace

- Had a rough time transition to the United States socially in high school
- Was set back in mathematics class (mathematics placement)
- The school had to move her to a higher mathematics course
- Schooling in the United States was easy, easy to make all As in everything
- The opportunity to re-do test was weird
- Made fun of for accent

[14] Caribbean Creole "native languages" varies according to the county and its history in acrolect (formal speech), mesolect (midway speech), and basilect (informal speech) (Patrick, 1999; Smith et al., 2020). Each Caribbean country has its unique Creole, and Patois (Patwa) demonstrated here are Jamaican Creole basilect. Grace, Kathy and I exchanged dialogues in this unique relationship between two language types throughout our interviews (Patrick, 1999).

Kathy

Dialoging with Kathy

DIHEMA: Why mathematics, why did you major in mathematics in undergrad?

KATHY: Because math has always been fun and easy. Let me qualify easy. It's always been something that I could easily engage in even if the content was challenging. I didn't have to psych myself up to do math. I have to psych myself up to do English.

I'm not really inna di literature business. I can now. I'm packing a book that I read for pleasure. It's fascinating and stimulating but I don't what to read any of those literature books. And math I was always ready to go. Let's go! Let's do that, how many classes, how many problems you think we can work through? I will, I will work through grading papers and thinking about planning my class over writing any day. I will take that. So, and then, you know, and what I found really fun too? When I was, I think elementary school, once I had enough sense to know what I was doing was trying to figure out why the procedures. Cause you know, all we learn were procedures. Why the procedures worked because then I would not have to study right.

DIHEMA: Right.

KATHY: I figured out like what was the mechanics behind why's.

DIHEMA: the trick?

KATHY: I think I did, I wanted to be an engineer at one point. And then I did physics and computer science the 1st year at UWI [University of the West Indies] and I was like, oh hell no! And drop that. But math and math wasn't easy. Math was hard at UWI. Cause you know they just come and write from dem notebook. They don't really teach anything. But I don't know, I just kind of still liked it even though the teacher was horrible. And it was something that as I said I didn't have to always, I didn't have to punish myself to do. It always felt like fun. I was felt like yeah! It was always pleasurable. Oh, so that's, that and then when I left UWI I didn't quite know what I was going to do with that math degree. So, I was like let me go teach and find myself. And teaching was just the greatest thing ever. it was just, yeah. I liked everything about teaching it to me except the salary.

DIHEMA: Maybe we can figure out a way to fix that.

Coding with Kathy

The coding for this exchange was personal narrative and dialogue conversation codes, where Kathy self-disclosed pivotal moments for why she chose mathematics as a major in

undergrad. The exchanges were casual and included a mixture of Standard English and Patwa. My journal entry about Kathy, stated: “awesome in personality, in intellect, and spirit. Her ability to share her interesting perspective on mathematics is refreshing and powerful. She showed an authentic personality that did not seem forced and was genuinely powerful.” We further bantered about our high schools in Jamaica being academic rivals which also provided an ease within our exchanges. Our bantering reminded me of a Jamaican practice I have noticed after migrating to the United States nearly 25 years ago.

According to Devine (2008), there are three types of class relations: economic, cultural, and social. The area in Jamaica where I lived, was not considered upwardly mobile in any of these relations. The high schools Kathy and I attended, however, were classified as upwardly mobile in all three class relations. So I was caught in the dichotomy of economic class relations. Although in Jamaica racism is not a main approach to categorize people (who are majority Black), there is classism. Where a person lives and attends school often provides the means for determining class relations. Interestingly, since being in the United States, I have noticed those from the Jamaican diaspora continue to represent (via t-shirts, ball caps, etc.) their high schools after migration, similar to how U.S. citizens represent their colleges and universities even after they graduate. This Jamaican diaspora continues to provide academic and financial support for their high schools by forming alumni organizations in the countries they now reside. It is frequent that when two Jamaicans meet for the first time, there are two questions asked: Where are you from? and Where did you attend high school?

Turing Points with Kathy

- Mathematics was fine and easy, could easily engage even if the content was challenging

- trying to figure out why the procedures and making sense of why the procedures work
- professors don't really teach anything
- despite the horrible teachers still liked mathematics
- mathematics was always pleasurable, and teaching was just the greatest thing ever

Patricia

Dialoging with Patricia

DIHEMA: So why mathematics? Why not any other subject?

PATRICIA: Well, in high school I was good in mathematics and I don't know why because being a teacher now, students would say oh, I was never good at math. I have a math whatever, this that and the other. We just went to school. Our parents weren't strict or anything like that, we just went to school and did what we were expected to do. And it just happened I was good in math, math and science. We went to an all-girls school and girls were not supposed to be engineers back then— this was in the 70's—but one of my colleagues did follow through and pursued an engineering degree. And we were thinking about it as we grew up. And based on our academic performance they shuffled you into one of those areas. So, they put us into math and science. So, we said okay, if they put us into math and science then we can become engineers. But um, it's still didn't look quite appealing or possible at that time. I think too at that time I met my husband and he was a teacher and he kind of influenced me to go into teaching so when I had to choose I chose mathematics

DIHEMA: When you say shuffled, "they shuffled you," talk to me about that.

PATRICIA: Well, nowadays when you have counseling sessions students have an idea of what they want to be when you grow up. Back then we didn't have much say in the matter. They saw your ability and your talent, and they told you this is where you go.

DIHEMA: Okay, "they" meaning?

PATRICIA: Your teachers and administrators. I don't even think parents had very much say back then. The school did all the decision making for you.

DIHEMA: And that decision was only for girls or was it for boys as well?

PATRICIA: Boys as well, yes, it's just that we were at an all-girls school.

DIHEMA: Okay, was your all-girls school Catholic?

PATRICIA: Presbyterian.

DIHEMA: Presbyterian, okay. Um, when did you—well, you in essence told me when you knew that mathematics would be a part of your career?

PATRICIA: In high school, yes.

Coding with Patricia

Patricia's exchange, coded as personal narrative, situated her as a student at an all-girl high school in Trinidad and Tobago. Patricia's exchange was a brief historical display of the unequal gender power relations it seemed women experience in the Caribbean during their high school years. Patricia was "shuffled" into the area of mathematics and science by administrators, an indication that students did not have agency over their future occupation. I also attended an all-girls school in Jamaica, but my school was a Catholic school. I was curious to see if her all-girl high school was also of Catholic affiliation. It seemed that girls' schooling was often restricted to occupations such as nursing, teaching, and clerical positions with few accesses to scientific and legal occupations (Massiah, Leo-Rhynie, & Bailey, 2016).

One way that Caribbean women express their lived experience and daily reminders of subordinate positions to men is through calypso songs (Massiah, Leo-Rhynie, & Bailey, 2016). Calypso is a traditional art of singing to address issues, typical in Trinidad and Tobago, and Patricia did just that as she sang during our interview: Patricia stated that she would sing during class to inform students not to be afraid to come to her for mathematics and academic assistance. Art seems to be a vital part of Patricia's identity as she provided the artwork shown in Figure 4 from her portfolio during our interview. One piece of art is her version of the golden ratio and the other is a piece that she continues to work on from time to time.

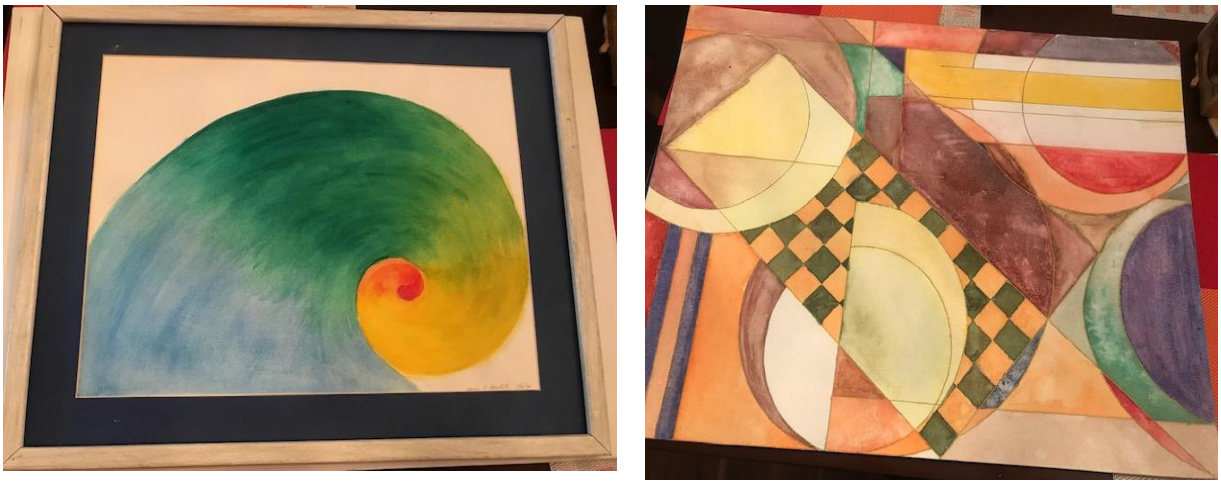

Figure 4. Patricia's artwork.

Turning Points with Patricia

- Didn't know why she was good in mathematics and science
- Teachers and administrators shuffled students in math or science areas
- All-girls, where girls were not supposed to be engineers back then
- Husband influenced her to go into teaching choose mathematics
- Students didn't have much say in the matter/parents didn't have much say in the matter
- Knew mathematics would be part of her career in high school

Ramona

Dialoging with Ramona

DIHEMA: Did you ever think of majoring in math at that time? [during college]

RAMONA: um not, really. I mean my cognate was in pure mathematics, so the four courses I choose to do was in math. Like while I was in [state], [Advisor's name], he was my advisor.

My advisor, he told me to take math courses as my cognate. So, I did lots of statistics class until the stats prof thought I was a math major. I was like nope. I'm an education

major. And it was fascinating that everyone automatically assumed because, I guess, in the stats class I got a perfect score. And typically, people don't get perfect scores. And when he realized, he smiled he was like…hmmm. I mean I understood the bias because he said, "I would have never guessed, you're a female who is an education major," and I laugh. I said there are lots of variable that we don't acknowledge. But it is real. I was the only Black female in the class. So, in his mind when you get a perfect score it wouldn't be the script of who he thought would get it. In fact, one of my faculty at one of the institutions– I wouldn't want to say–they literally said, "your scores are too high to be a Black female." And I was like, wow. Isn't that bit biased? "No, but typically you know national norms." And I said yeah, but I have never taught the average student, so be careful of these biases. And they were like yeah, I know but I was just saying. And I am like yeah but you be careful. So, they say okay. It is just highlighting how they took this notion of us to understanding these national norms perspective of students who is supposed to be the dominant. And so, they say you are not fitting that script. yeah but like it told, I said well I am never going to fit a script. I am just going to be uniquely me.

DIHEMA: So, do you encounter that a lot? Not fitting the script?

RAMONA: I like I would laugh about it because it was so obvious that they had some people have perspectives. Some people have a naïve to differences. But some do, because like I said sometimes we see the world based on our own interactions and our own realities. And so, harm may not be intended, but harm may occur. Based on someone's lack of insights.

Coding with Ramona

In this exchange, Ramona shared her experiences as an education major at a university in the United States, coded as personal narrative and dialogue conversation. Ramona's exchanges brought a sense of the importance of well-being and mindfulness of "who you are" to exist as a Black immigrant educator in U.S. higher education. Similar to Astina, Francis, and Kathy, who "interviewed" me before I conducted my interview of them, Ramona did the same. In my journal entry, I wrote that Ramona had a "powerful standing," and that she seemed to know the higher education research arena well.

Ramona and I had some funny and serious moments during our exchanges. Our serious moments involved reading an article about the issues that faculty of color experience in higher education. Ramona's narratives (as well as Francis's and Kathy's) indicated that some

midwestern states have a long way to go in terms of race relations. Students in these states seem to have little to no exposure to people of color, much less a Black immigrant woman. Ramona read an excerpt from an article about people of color who were formerly employed at a midwestern university and left due to overt acts and practices of racism that made work unbearable (French, Adair, & Cokley, 2016).

Turning Points with Ramona

- professors never guessed she would have perfect score in mathematics class
- only Black female in class, her scores are too high to be a Black female
- professors have naïve perspectives on certain students who are proficient in mathematics
- we see the world based on our own interaction and realities that creates unintended harm based on lack on insight
- faculty act with lack of awareness of students' differences

The narratives presented in this section shed light on the participants' historical social and contextual experiences as mathematics learners. These experiences, according to Holland and colleagues (1998), are sediments of the participants' pasts that "bring history to the present, an important aspect of which is usually an untidy compilation of perspectives" (p. 46). These sediments became compilations of untidy stories that were significant in framing their thinking about their mathematics figured worlds as learners (Short, 2012). The untidiness was also seen in the inconsistency of the interview questions in which the participants shared their experiences as learners. But not matter how untidy, these narratives became vital in making meanings of how they now teach and identify as mathematics educators in U.S. higher education.

Soliciting Mathematics Perspectives from Afro-Caribbean Women

The next set of narratives was derived primarily from one question I posed to all the participants (in some variation): "If you were to advise a new immigrant woman from the Caribbean coming to teach mathematics in a U.S. college/university, what advice would you give that person?" The question is a figured worlds activity of sorts that aimed to assist participants in creating new relations, new possibilities between fields of meanings in "the real" and in the imagined (Holland et al., 1998; Vygotsky, 1978). Holland et al. (1998) stated:

> It is the opening out of thought within the activity of play, what we might call the cultural production of virtualities, that allows for the emergence of new figured worlds, of refigured worlds that come eventually to reshape selves and lives in all seriousness. (p. 236)

In giving this advice, the participants often reflected on the complexities of their own experiences. Within these reflections, the participants shared habits and activities they developed to shape and reshape themselves in their mathematics and academic figured worlds. These different selves seem to have emerged in the collective experiences of these Afro-Caribbean women mathematics educators, and contributed to my understanding of their experiences that helped formulate the outcome of the study.

Astina

Soliciting Astina's Advice

> DIHEMA: If a new immigrant comes from Jamaica and decides to become an educator in this country, what advice would you give that person?
>
> ASTINA: I think my advice will be to find a way—and see now here's the thing; I think the bottom line is to understand who you really are and your purpose for being there. Because I can't always believe that just because you're a female and you're from Jamaica that your purpose was to encourage every single female in mathematics that's brown or from Jamaica. That may not be your mission. That may not be your heart. That

> may not be your purpose. So, my thing is to find your place, find your purpose. Find out why you are really there. Now, there's the professional piece that you're there for. You gotta do your writing, make sure you keep up your service, and your writing, and that type of stuff.
>
> But the other piece is to find out what your true purpose is and find a way to push your purpose without neglecting to do the professional pieces. Because I believe they can go hand in hand. And then find true allies. I think, I don't know if [name of an ally] is also in your study. And we're not from the same country, but just being from the Caribbean….For one, I'm a junior member in academia. I don't know the ropes. It is very difficult for operating in a public school to going into this community, this space. And so, you just have to find people who are willing to help and hear you out, and then utilize all of that to make it work for you.
>
> Go back to your question was, how would I advise them? Find their purpose. Know what their purpose for in being there, take care of the professional piece. Find that purpose, make sure you're attending to it but also make sure that both your purpose and your profession can work so you're doing it in sync, doing it together, and then find allies.

Coding with Astina

Astina's exchange provided encouragement, cautions, and suggestions for someone in her position. According to Astina, academia is a world where it is important to know yourself, your purpose, and your content as well as how to teach and to find allies such as mentors. These practices are essential because the world of academia is not an easy space and is a closed community, especially so if one looks and sounds different. But Black immigrant women can and do survive the intersecting issues around racism, sexism, and language that play a tactic role in their daily lives as faculty in U.S. higher education (Lee, 2004). Astina's exchange further stressed the importance of mentorship and a continued network of support given that Black women in the academy continue to have to fight for a seat at the table (Agosto et al., 2016; Tran, 2014).

Turning points with Astina

- Finding your purpose, understanding who you really are

- Finding allies, mentorship, people willing to help (someone from the Caribbean)
- Knowing your mathematical content and how to teach
- Academia is not an easy space, but a closed community
- You are still fighting for a seat at the table
- What they write does not necessarily match their belief

Francis

Soliciting Francis's Advice

DIHEMA: What advice would you give that individual coming from the Caribbean that's going to teach mathematics in higher Ed in the U.S.?

FRANCIS: I mean on the one hand I think it's a plus, because I think, just kind of interacting with people who are from here, people of color who are from here. I think we bring a different perspective to the American context than they do. And I think in some sense it gives us a plus because we don't bring the same experiences to bear, like in American context.

Before, I didn't understand why some people maybe had some concerns or attitudes around the academic environment being a person of color, but I understand it now. Kind of understanding the historic context or again, kind of studying equity and understanding the history of equity in this country a little bit. Kind of gives me a better understanding. It doesn't necessarily mean that I have to adopt the same attitude, but I can understand where that attitude comes from and can try to be supportive in that sense. How important it is to try and understand why some students may come into your class very unprepared and why other students from the same area don't come in as underprepared, come in more prepared. So, it kind of gives, it allows you to kind of, to me anyway, it allows me to see things both ways. So, it's a plus that we kind of see a different perspective and we should use that perspective to our advantage and to help our students.

What we're known for is our friendliness and our humility and our willingness to be of service to people. And I think that's a plus in my job and I think it would be a plus in any job so don't be afraid to kind of be yourself even in a context where there are not many people like you. But I think also there's, whenever you find someone who's from a similar context, you're always excited to see them and I think I've learned to treasure that a little bit. Even when I go to conferences, I'm like, oh, you're from the Caribbean too? And where are you from and blah, blah, blah. I think that's always exciting. And yeah…

Coding with Francis

Francis' exchange expressed that Afro-Caribbean women bring different perspectives to the U.S. context and the academic environment. She understood the importance of empathy toward her students and why they are often unprepared and often have negative attitudes toward the academic environment. Francis stressed the usefulness of a different perspective and empathy in understanding the history of inequality for people of color in the United States. She believed that Caribbean faculty can see things both ways, bringing different viewpoints that they can use as an advantage in helping their students.

Turning Points with Francis

- Bringing a different perspective to the American context
- Caribbean people can empathize and understand also being a person of color in the United States
- Caribbean people don't bring the same experiences to bear giving Caribbeans a plus
- Understanding why people of color have issues with the academic environment
- Understanding the history, equity and history of equity in this country for people of color
- Try to be supportive and understanding why students come to class unprepared
- Bringing our Caribbean sense of purpose and hard work
- Don't be afraid to be yourself even where there are not many people like you

Grace

Soliciting Grace's Advice

> DIHEMA: What advice would you give to a newly immigrant math educator moving to this country?

GRACE: Oh, okay college level. Depending on where you are what college you are because some colleges still baby the students…You will have to soften up a little bit, because if you speak truly how you feel, don't speak how you feel. You cannot tell them how you feel, you will be reported to the president. Um, you will have to do some adapting you will have to research what their curriculum is like and how they're taught, especially from high school coming to college. So that you don't just go in the classroom and you're just teaching your way and confuse them. Because they won't say outright, I'm confused—not everybody will.

So, you would have to simulate that way, meaning figure out how did they learn in high school and you can learn that in the classroom. But if you want to be prepared, be prepared to be talked bad to, be disrespected on different levels. And just know that it's not really you, it's they're broughtupsy… Um, so you can't really take everything that's done in the classroom by them personal. Yeah, you have to take yourself away because some students are going through something. So, you have to be careful how you communicate with them.

DIHEMA: Okay

GRACE: Um so, depending on who your superiors are there may be a race issue or not. You gotta be mindful of that as well. And if it's a female per se, gotta be very on your toes because sometimes we're not respected as the male counterparts are.

DIHEMA: In mathematics or in general?

GRACE: Oh, in math. Well I guess in general too, but heavily in math because it's not a lot African-American or Caribbean, if you may, females in the math field. And so, I know even for me, it wasn't in teaching…in my master's program, I shouldn't be so opinionated or you're smart? What. These things may not happen but there is a possibility that it can be, that you can experience that.

DIHEMA: And what advice would you give them if they do?

GRACE: Well, I think it's important to stand your ground and be very ethical in situations like this and know what your rights are. And if your rights are being violated then you have two things, you can either leave the place or you can take them up on it. You know. For us the chair is the highest you can go….I mean so, you have to kinda have an idea of what help you have or what resources you have to help you as a female. Cause there's a lot out there. So, you have to kinda be mindful—because for us in Caribbean or Jamaica we didn't have to deal with this so much. We didn't have to fight. It feels like you're fighting for your life as a woman or as a black person. It's like Jesus!

DIHEMA: And now add mathematics to it which is such a masculine subject.

GRACE: For myself it's like a triple…black, female minority, immigrant, from the Caribbean. Oh Jesus, it's like, where are you going? So you have to fight very hard….

> So you really have to come out of that bubble that we're in in the Caribbean where we don't have to deal with this but it's VERY prevalent here. It's right in your face. So yeah, I think if she can do that or he can do that, they'll survive.

Coding with Grace

Grace's exchange suggested that a Black immigrant woman would need to soften up, adapt, and stand up for herself to survive in her position as a mathematics educator in the United States. She advised trying not to take classroom situations personally and to be mindful of communication. Grace also suggested that adapting is important, not only to the curriculum but also to what it means to be a "triple": Black, woman, and immigrant. According to Grace, "It feels like you're fighting for your life as a woman or as a Black person." Within the academic figured worlds, while being in a position of privilege as an educator, there still exist the struggle to survive through the identity politics of being Black, woman, and immigrant; making meanings of these intersections is part of adapting as one prepares to fight to survive (Crenshaw, 1991). Identity politics, according to hooks (1994), is a place for "exploited groups to have a standpoint on which to critique dominant discourses, a position that gives purpose and meaning to struggle" (p. 88).

Turning points with Grace

- Soften up and adapt
- Prepare for differences in teaching
- Expect disrespect but don't take things personal
- Be mindful of race and gender issues and how to deal with these issues
- Be on your toe as Black woman teaching mathematics and stand your ground
- Know what resources you have to help as female in the academy
- You are dealing with a lot, you are fighting, and you are not sitting at the table

- Be confident and know who you are

Kathy

Soliciting Kathy's Advice

> DIHEMA: What advice would you give a new immigrant educator coming to this country to teach mathematics. And let's say, look at it from the perspective of they're coming to teach high school because you have had experience there or they are coming to teach college. Either way.
>
> KATHY: I think 1) you have to have a strong sense of who you are. If you are struggling with that you're gonna struggle a lot. And what I mean is knowing where you come from and be proud of it. Be open minded. They used to have a statement in the program. That's the program I came up on. "it's not good or bad, it's just different" I wouldn't holistically buy into that, but I think it's a good perspective. There are some things that are bad but they're not by because it's here, it's just I think it would be universally bad. And I think that that keeps you open minded. And to recognize that things can be different and still be fine. And you need to be able to carve out your own space to be yourself. If you think of code switching in terms of just language, I think we have to code switch in multiple ways. In terms of attitude, your presence. In terms of how you interact, your interaction style. So, if you think, as you would say code switching 'tun up', it's all of that.
>
> I think you have to also be OK with never being understood, and being fine with that, because and that's why it's important you have your own nation. Know who you are. So, you don't put expectations on people who can't ever meet those expectations. So, you don't live in a constant perpetual state of disappointment, and that is professionally and that is personally.
>
> I think another thing that's important in knowing who you are, is also that you can bring really good parts of who you are to a space, because there's no shame in it. And so, in this community it's a very independent minded community, and I can't say that Jamaica is completely collectivists culture, we are certainly far more collective than the North American culture….I think there is personal work that needs to be done. There is also intellectual work that needs to be done in terms of understanding. Again, there is assimilation thing were people are going to see you as African-American but you are not African-American. Our histories are different. And how you want to navigate that is your personal business. For me it's been important for me to know that because I have to honor their history as I honor my own.

Coding with Kathy

Kathy's exchange stated the importance of knowing yourself, carving out a space for yourself, and being knowledgeable about your profession. Kathy provided many practices during

our exchange while going in and out of Patois (Patwa). Kathy and Astina also shared likeminded sentiments about the academic space being a closed, independent-minded community. She believed that being competent in your profession as a mathematics educator is knowing your content and being the expert, again, similar to Astina. Kathy contended that it is essential to have a good sense of self, otherwise, it means putting "expectations on people who can never meet those expectations." As Black immigrant women, in a foreign land, teaching mathematics—a male-dominated subject—in the White-dominated space of U.S. higher education, it is imperative not to expect validation from those figured worlds which are intended on maintaining the current norm (Louis et al., 2017).

Turning Points with Kathy

- Having strong sense of who you are and be open minded, else you will struggle with a lot
- Recognize things can be different and still be fine, and be ok with never being understood
- Carve out your own space to be yourself
- Bring the good parts of who you are to the space
- Code switch in multiple ways (attitude, presence, interaction)
- This community (i.e., U.S. higher education) is a very independent minded community
- Be competent in your job and do it well

Patricia

Soliciting Patricia's Advice

> DIHEMA: I wanted to know if you encountered a new immigrant coming from Trinidad coming to teach mathematics in the classroom, what advice would you give that person as a new immigrant about to teach mathematics in a U.S. classroom?
>
> PATRICIA: Okay for one thing um, and this might be funny it might not be, but coming from Trinidad, we have a different accent. And it's not well received, it's not always well received by Americans. So, while I'm not advocating that you change your accent, I'm advocating that you try to speak and enunciate so that they will understand. Now there's the good the bad and the ugly. You have Americans, who up front, they hear you have an accent, they don't want to hear you, they ridicule you, they make fun of you, you know. But then we tend to think that in academia you have intelligent people, you know. But um, try to enunciate and try to speak in a manner that they will understand. Even if it means you have to slow down a little bit. You may also have to choose your words carefully. In the American classroom, you must adapt a little. You can be a Trinidadian in your home with your friends and that kind of thing but exhibit just a little bit of care and concern in how you communicate with your students. So that's one big piece of advice I would give them.

Coding with Patricia

Patricia's exchange discussed the importance of adapting and being aware of your language and accent in the mathematics classroom. She suggested that part of adapting as a mathematics educator was making sure to enunciate and slow down for effective communication because her accent is not well received. Caribbean accents are often a topic of conversation when interacting with both Black and White Americans, and is one of the ways that Caribbeans are distinguished from African Americans (Waters, 1999). According to Waters (1999), "Because the accent was such an important badge of identity, people were very proud of the accent and critical of those who tried to lose it or suggested they try to lose it" (p. 77).

Turning Points with Patricia

- We have a different accent and it is not received well
- Speak and enunciate so they will understand

- Have concern for how you communicate with students
- Get familiar with the mathematics methods they use as they may be slightly different
- Adjusting to doing mathematics with calculator
- to find a way to work without being targeted or pinpointed by the system
- if you must go against the grain there's a good way to do it and there's a bad way to do it

Ramona

Soliciting Ramona's Advice

DIHEMA: So, what advice would you give to a newly immigrant coming from the Bahamas who is about to start teaching mathematics at a university.

RAMONA: Um, trust your gut. I mean always remember there are people who mean you well and then people who do not mean you well. I mean people are people, and so long as you trust your gut, do what makes you feel comfortable. So, if something don't feel right, do not put yourself in a space to where you can't sleep at night. And so, be true to yourself so if something don't feel right and that's not who you are, don't do it to fit in.

The next thing is, don't get confused as what's important. Money can come, money can go, jobs can come, jobs can go. So, really assess what's important. Your faith in God, your love of family. A lot of people they get all these strained situations and they lose the ones they love. Or their family life or personal life that's so unstable and shaky it's almost dangerous because they put so much time into what they're doing. So, really find a balance as to keeping an eye on the story stable.

The third thing is, always do your job. Don't get caught up trying to help everybody and don't do what you're supposed to do. Because I think that's why… Like with service, I have not signed up a lot for all those extra stuffs. And you heard me said I'm not gonna do those. I'm not gonna lie and say, I'm gonna do this, I'm gonna do that. No, I realize I have little time. So, I cannot go and sign up for a hundred things and then never deliver on anything. So, choose wisely. Don't try to do more than two clubs or try to take on all those projects. Because if you're doing that, you're either not doing your job effectively or you're doing it and you're tired and you're draining yourself out. And you don't want to be become burned out over time.

And the fourth thing, was that three? I don't know, 2, 3, 4 whatever number…Keep your joy. I ran a lot of people off when I say, a lot of people lose their smile. No, if you have to…trust me, don't ever lose that smile because that's your strength it makes you, you.

> And so, when you lose your passion because you let people stress you, you gave them power, you're looking for their approval so keep your joy.

Coding with Ramona

Ramona's exchange shared advice of how to balance life in the academy. Her suggestions were trust yourself, have faith in God, take care of career responsibilities, and maintain life's joy. The practice of maintaining a balanced life as an educator in U.S. higher education is challenging for an immigrant woman in mathematics who wants to be taken seriously (NKabinde, 2004). As Ramona explained, however, burn out is possible if there is no conscious efforts to take care of both your personal and your professional well-being. Professional stress among higher education faculty has been shown to have a "debilitating impact on the personal and professional welfare" that affect the "quality of education and research produced in the university" (Gillespie, Walsh, Winefield, Dua, & Stough, 2001, p. 70).

Turning Points with Ramona

- Trust your gut and do what makes you comfortable
- Be true to yourself and do not put yourself in a space where you do not fit in
- Assess what is important, Family, love of God
- Find a balance between family and work
- Always do your job
- Don't take on too much else you will get burned out
- Keep your joy, don't lose your smile, your smile is your strength
- Don't look for their approval

In summary, narrative analysis, according to Patton (2002), "honors people's stories as data that can stand on their own as pure description of experience or be analyzed for connection between the psychological, sociological, cultural, political, and dramaturgic dimensions of

human experience to reveal larger meanings" (p. 478). As I honored the participants' narratives presented in the two previous sections, through coding and analyses, I searched for connections to provide collective meanings of the experiences of Afro-Caribbean women as mathematics educators in U.S higher education. Embracing these narratives as science was an essential method of acquiring unique knowledge (hooks, 1994). Table 5 provides the significant (i.e., similar) turning points (see Appendix K) that provided the collective categories from Afro-Caribbean women's social and contextual experiences as mathematics learners, and now as educators in U.S. higher education. The next section transitions from this coding and analysis process to theoretical reflections of Afro-Caribbean women's experiences, organized by these categories, and my interpretations of their (our) experiences.

Table 4
Significant Turning Points from Focused Coding

Recognized as mathematically able
Knowing oneself, having a purpose, trusting oneself
Being the only Black girl in mathematics spaces
Reinvented teaching
Encouraging and understanding students
Providing secure space for students
Knowing history of social inequalities
Adapting
Having allies and mentorship
Awareness of social aspects of race and gender
Doing one's job
Knowledge about profession
Awareness of accents and language
Balancing academic life and well-being

Reflecting the Results of Afro-Caribbean Women's Mathematics Perspectives

I, as the researcher, while presenting the meanings of the participants' narratives, was interpreting, negotiating, and constructing the story—our story, which comes with fixed positionings (Goodall, 2000; Skinner, 2001). Therefore, I (i.e., my voice) was forever present in

all aspects of the study in making meanings of Afro-Caribbean women's mathematics experiences. It is Goodall (2000) who stated:

> The journey of the writer is often foregrounded, and the research questions, the theoretical framing, coding, and analysis of data as well as the heuristic implications, unfold not by the dictates of textual formula but by the narrative weave of the tale. The journey of discovery, for the writer, becomes part and parcel of the story itself. (p.121)

This foregrounded weave of the tale shaped how I coded and analyzed the data—that is, the stories, the narratives—in the previous sections. The remainder of this chapter is a presentation of Afro-Caribbean women's experiences as mathematics learners and educators, supported with meaning-making recollections from the participants and me. This heuristic approach reveals my personal beliefs, experiences, and philosophies that inform my worldviews and how I related to the participants and their experiences and, in the end, how I created knowledge through this research project (Etherington, 2009).

I share my personal experiences were to situate myself in the study, to speak to my relationships to the participants, and to increase interest in the study as a whole (Clandinin, Pushor, & Orr, 2007). Doing so works well with the heuristic approach that Moustakas (1990) described as "a way of engaging in scientific research through methods and processes aimed at discovery; a way of self-inquiry and dialogue with others aimed at finding the underlying meanings of important human experiences" (p.15). Moreover, choosing to share particular personal experiences was essential to the process of contextualizing a sense of meaning as the researcher. These experiences, from the past to the present, facilitated responses to our collective social and contextual positions as well as the complicated axes of dominions of our everyday figured worlds as mathematics educators (Collins & Bilge, 2016; Holland et al., 1998).

The following collections of narratives draw together the Afro-Caribbean women's voices within their figured worlds of mathematics, higher education, and self. The narratives are organized by their experiences to find meaningfulness, including some of my experiences that contribute to the structure of the category. The first collection of narratives positions Afro-Caribbean women in the figured worlds of mathematics as learners both in the Caribbean and in the United States. The second collection of narratives positions them in the figured worlds of U.S. higher education as learners and as educators. And the last collection of narratives make meanings of how Afro-Caribbean women self-identify within their mathematics and academic figures worlds. My experiences are presented heuristically throughout, supporting and guiding the participants' narratives as well as providing brief reflections and interpretations of my experiences as part of our collective experiences.

Afro-Caribbean Women's Mathematics Figured Worlds

In this section, I present a collection of narratives about Afro-Caribbean women in their mathematics figured worlds as mathematics learners in the Caribbean and in the United States. As mathematics learners, the women experienced recognizing their mathematics agency, being mis-placed in mathematics courses, and realizing that their race, gender, or immigrant status were not the ideal image of mathematics doers. Here, I use and reflect on these experiences to make meanings of their (our) positionings in the figured worlds of mathematics.

Figuring Out the Mathematics

My mother was my first teacher from the time when I was a child in Jamaica, she laid the foundations for my mathematics identity. Identity, according to Holland and colleagues (1988), provides the traces of our agency when we participate in the activities of a socially produced

world. It was no coincidence therefore that as I reflected on my experiences as a mathematics learner, the first incident I remembered was the one I describe below.

The evening in Towerhill was warm as usual. When night fell, there were mosquitoes everywhere. My mother entered the bedroom, holding me in her arms. She turned on the lights and placed me on the bed. A swarm of mosquitoes reacted to the brightness of the sudden light. Clap! Clap! Clap! Immediately, my mother began clapping at them, and one by one as she clapped, they fell on the bed. Swatting mosquitoes was a familiar routine, but tonight there were quite a few more than usual. Gently, my mother gathered in a heap all the mosquitoes that fell on the bed. She pulled me closer to her side, smiled at me, and whispered: "We a go count dem. One, two, three, four, five…." We counted up to ten. Then she said, "Now inna Spanish. Uno, dos, tres, cuatro, cinco…." We counted up to diez. This exchange, of what I can remember, marked the beginning of my experiences with mathematics. During these experiences, I was practicing identity and agency. During these experiences, I am figuring out the world in a social and cultural aspect while gaining a sense of who I am as a learner of mathematics. This moment provides the foundation for the others that follow.

I go to the board to do the problem. I write out my steps diligently and carefully because I had practiced these types of mathematics problems before. Confidently, I finish my work with a smile and proudly look at the class as they watch me in awe. I always got the right answer. When Sir lifts his head from his paperwork, he slowly opens his drawer, takes out his belt, and proceeds to give me six lashings—three in each hand. I bravely take my beatings, walk back to my seat, and stare at the completed problem on the board, hoping to see where the error occurred. I am confused. "But how dat a nuh di ansa?" (But how is that not the answer?) I asked

myself as I caressed my hands now burning from the six lashings. I stared at the beauty of my work. Mi still caan see whah mi do wrong (I still cannot see what I did wrong).

Sir went on to other students asking the same question, and the students would look at me—the deputy head girl—who got whipped for her answer, and they wouldn't give the same answer. He beat them too. Afterward, Sir came back to me and apologized.

Sir: Dihema, you were right! If dem think you get it wrong, mi wonder if dem would give di same answer.

Me: Yes, Sir. [Bewilderingly wondering what just happened.]

Empowerment, the ability to gain power in spite of opposition with whom one interacts, offers people the opportunity to exert agency fruitfully in institutional environments (Ibrahim & Alkire, 2007; Fournillier, 2012). This experience made me realize, in its warped way, that Sir knew of my mathematics aptitude agency helping me to identify with empowerment from the 6th grade (Ibrahim & Alkire, 2007; Martin & McGee, 2009). I was "good" at mathematics. Sir and my mother helped with practices to exert agency and identity at school. My mother's introduction to counting was the developmental stage of my agency in mathematics as a powerful learner and deep thinker engaging in the subject, and that continued during my world in Jamaica as a youth (Basu, 2007).

"Mathematics functions as a feared and revered subject in our culture," Ladson-Billings (1994) claimed, "we fear it because we believe that it is too hard, and we revere it because we believe that it signals advanced thinking reserved only for intelligentsia" (p. 698). At an early age, the fear of mathematics in our world did not apply to me as I consciously recognized my mathematical agency as an empowering identity. This mathematical agency and empowering identity applied to each of the participants in this study.

Kathy, Patricia, Ramona, and Francis shared parts of their personal narratives affirming that they too developed mathematical agency and an empowerment identity of having no fear of mathematics in their learning experiences. As Kathy remarked:

> Because math has always been fine and easy. Let me qualify easy. It's always been something that I could easily engage in even if the content was challenging. I didn't have to psych myself up to do math. I have to psych myself up to do English. When I was, I think in elementary school, once I had enough sense to know what I was doing was trying to figure out why the procedures. Cause you know, all we learn were procedures. Why the procedures worked because then I would not have to study right. I figured out like what was the mechanics behind why's.

According to Kathy, mathematics was fine and easy; she could easily engage in it even if the content was challenging. Kathy explained that from an early age she enjoyed constantly weaving through and making sense of why the mathematics procedures worked because in her world, "all we learn were procedures." For Kathy, in this social context figuring out the mechanics behind why the procedures work meant she would not have to study.

Patricia was also good in mathematics, but unlike Kathy, Patricia does not know why:

> And it just happened I was good in math, math and science. We went to an all-girls school and girls were not supposed to be engineers back then—but this was in the 70's—but one of my colleagues did follow through and pursued an engineering degree. And we were thinking about it as we grew up. And based on our academic performance they shuffled you into one of those areas. So, they put us into math and science. So, we said okay, if they put us into math and science then we can become engineers.

Patricia knew given that she was good at mathematics and science she could become an engineer. In her historical social figured worlds as a mathematics learner, "girls were not supposed to be engineers." However, through exemplary academic performance, she found a loophole of sorts that allowed for girls to get shuffled into STEM areas, thus providing the opportunity for girls to become engineers.

Ramona recalled that from an early age she was always very strong in mathematics:

> From primary school I was always very strong in mathematics. And so like, even in our national assessment, our GLAT grade level assessment. In grade three and six you take it in the Bahamas, I scored perfect scores….And my math teacher was like your scores are really high so in 9th grade she put me in the 11th grade math class and what she did is said, "this is a book read it and I will assess you in it." So, she forced you to think and interpret. So, you literally teach yourself and make sense of it. It was weird but I actually liked it. I liked learning independently and with her she was very strict and stern, but she kind of motivated me because it was like, I didn't need her approval it was just I wanted to do it.

The GLAT, which stands for the Grade Learning Assessment Test, is the national assessment administered in grades three and six in the Bahamas. In Ramona's social figured worlds as a mathematics learner, her mathematics teacher, whom Ramona referred to as a "stimulus," forced Ramona to think, interpret, and learn independently as a student. Ramona from an early age experienced positive reinforcements and high expectations in the area of mathematics.

Figuring out mathematics occurred a bit later in school for Francis:

> Well, for one, so the thing is when I was in high school, I did not do well in math, but I wanted to be…the thing is, I liked math, I just, I think there was a part where it just didn't click for me. But then I really wanted to be good in it. I think it was something people were scared of and I'm like no, I'm not gonna be scared of this. So even though I didn't do quite well in high school, I studied it for my A- Levels. I did okay in it, not that great. But then A-Levels is extremely hard and it prepared me for college. And so, in some sense I was good at it in that sense but then um what I wanted to do with that was to become an engineer or to do something where I could use that math to impact people. But I've always, you know, since I taught first, I always was interested in mathematics, I just think I had a bad experience the first go around and then I've always been kind of involved with teaching math.

In Francis' mathematics learning figured worlds of high school, mathematics did not click although she wanted to be good at it, but did not do well in mathematics until beyond high school. Nonetheless, she did not fear the subject and studied extremely hard because she really wanted to be good at it so that she could use mathematics to become an engineer and help people.

According to Martin and McGee (2009), mathematics identity is the "dispositions and deeply held beliefs that individuals develop about their ability to participate and perform effectively in mathematical context and use mathematics to change the conditions of their lives" (p. 150). The participants in the study at some point in their schooling, developed the deeply held beliefs in their ability to perform effectively in mathematics. Some of these attributes included an understanding of why the procedures work, the confidence to perform well in mathematical content independently, and a lack of fear of mathematics. These beliefs occurred despite the procedural way of learning, or the lack of access to studying mathematics because of gender, or an appreciation for self-agency in mathematics as a learner at a later stage in life as experienced by Francis.

The interpretation of their mathematics learning came from their social interactions in mathematical contexts with teachers, administrators, and taking assessments. The personalities such as 9th grade teachers, administrators, and acts such as assessments and tracking ("being shuffled") in mathematics and science demonstrated how Afro-Caribbean women were positioned as mathematics learners based on gender, power, and inequality. Contextually, the participants' experiences in learning mathematics were all different, yet we conveyed a similar sense about the subject such as being "good," having the "ability to figure out," or coming to "like" mathematics, regardless of the politics of our teaching and learning environments.

Setting Back our Mathematics

My high school experiences in the United States affected my identity and agency as they were vastly different from Jamaica. In U.S. schools, I was continuously reforming contextual practices and pedagogical activities that shaped my identity as a learner of mathematics in Jamaica. My reformation was in the world as a teenage student, where there were social and

environmental modifications with the students, the school system, and the mathematics instruction all of which contributed to a potential loss of self.

According to Waters (1999):

> West Indian students encountered the best and worst aspects of the American school system, with both happy and tragic outcomes. Instead of the restricted and structurally elitist British system they left behind, the immigrant students encountered the free-flowing, unrestricted, democratic, yet also deeply flawed American system. (p. 279)

The Jamaica process I was accustomed to was different than the "free-flowing" high school system that Waters (1999) described in the United States. For instance, in Jamaica, students stayed in their classrooms and the teachers came to their room. In the United States, however, the teachers had classrooms and the students moved from room to room. A process that was confusing because you had to know where multiple teachers were located at different times of the day. Additionally, this process created opportunities to waste time with chatter and conflict in the hallways as students were exchanging materials by their lockers going from class to class.

Some of the best and worst aspects of the U.S. schooling system involve the students who display their identity and agency in clothes, their cars, and their interactions with teachers. We wore uniforms to school in Jamaica. But in the United States, what students wore to school was now a decision factor. In Jamaica, I took three busses to school. In the area of the United States where I lived, the bus came to the students' neighborhood for free or more privileged students drove their cars. Plus, the student–teacher interaction in the United States showed a lack of respect in comparison to the student–teacher interaction I was accustomed to in Jamaica. Clearly, there were cultural and ethnic differences at play in the student–teacher communicative interactions that were initially unsettling for me (Vernon-Jackson, 2009). But there was more.

I was initially set back in mathematics because it took some time determining the correct mathematics course placement. When the teachers and administrators finally positioned me in the correct course, I was learning the mathematics concepts categorically. In Jamaica, it was just mathematics, there was no algebra, geometry, pre-calculus, or calculus. As such, when the high school in the United States asked what mathematics I took, telling them I already knew algebra did not come to mind. They wasted time placing me in beginning and advanced algebra only to determine my academic level was more advanced. Finally, I was placed in a precalculus/trigonometry course, a foreign word for what I thought was foreign mathematics.

Astina, Grace, and I started our academic career in the United States at the high school level; Francis and Ramona, in college; while Kathy and Patricia migrated as educators in the mathematics classroom. Holland and colleagues (1998) claimed that reforming figured worlds requires detaching from significant everyday events that are tied to past experiences. The two narratives below retell high school experiences of Grace and Astina that were similar to my own. It was during high school where Grace, Astina, and I were all initially "set back" in our high school mathematics classes. Grace shared:

> In my classes they tried to set me back because they look at Jamaica as low but they couldn't deny my math grades. Because it was so outstanding. It was like 90's and 100's so…I think they placed me in Geometry and my Geometry teacher after a while was like why are you sitting in here? She was like, why are you here? I was like, well, they placed me in here. So, she skipped me, I think I was supposed to go to trigonometry after, but she skipped Trig and sent me to, um, what was after that Calculus or Pre-Calculus, yeah so she skipped me because at some point she had me teaching the class.

Grace shared her perspective about the global power inequality between the two regions. She stated, "they look at Jamaica as low" and that is the reason "they" tried to set her back, although they could not deny her mathematics grades. The school administrators and educators played significant roles in her context for being set back in mathematics as a newly arrived immigrant to

the United States. White supremacy has established certain markers of status in the world, yielding such terms as third world, fourth world to mark countries as "low" (Mills, 1997). However, Grace's mathematics aptitude displayed in her grades and her agency was so outstanding that they had to skip her a class because at some point she was teaching the class.

Astina's experience was similar to Grace's after arrival to the United States. The global inequality aspect of Astina's narrative resulted in the form of her academic transcript:

> Then because they did not see on my transcript the specific discipline like trigonometry, algebra, calculus all of that, they at that point decided to put me in trigonometry, that was it! Which at that point, I didn't quite know what it was, but I was like okay fine. And so, I took trigonometry, physics, civics one of those language arts or literature it was something like that geography. I kept saying I loved geography because I wanted to do geography and another subject. Anyway, those were the ones I remember the most for that time. And it wasn't as bad as I thought because I was actually doing, I was like oh, I like America because I was doing real good here because the stuff was things that I'd done already.

The specific discipline Astina mentioned would not show up on Caribbean transcripts and so there was no way for students to know what class was next in the mathematics sequence in the United States. The meaning Astina assigned her experience of being set back was the power relations among transcripts. Astina's identified that she "liked America" because she was "doing real good" despite the politics of her social positioning after migrating to the United States.

Mathematics placement is one of the ways of racializing and marginalizing Black students in U.S. educational systems, no matter their origin or level of assimilation (King Miller 2017; Gutierrez, 2016; Waters, 1999). The practice, whether intentional or unintentional, of misplacing new immigrant children in mathematics courses below their performing standard has been going on for years. Neither immigrant students nor (maybe) their parents know how to inform administrators what they already know mathematically, and it seems that the education

systems are globally unequal in translating mathematical competence based on grade level or transcripts.

Afro-Caribbean women are not the only ones experiencing misplacement after migrating, nor are such experiences limited to high school. While I was attending a presentation about how community resources can help promote and foster STEM disciplines at the county library, the presenter—a Guyanese immigrant man—shared personal experiences of mathematics misplacement after migrating to college in the United States. Guyana is the only English-speaking country in South America considered part of CARICOM due to historical, cultural, and political relations. The presenter recalled that after following a college advisor's recommendation he registered for precalculus, a course that was three levels below his actual mathematics aptitude. The precalculus professor's observation of the college class resulted in advising the presenter to change to a Calculus III course. This advisement, however, occurred after some time passed, and money already spent.

Hutchinson and Wiggan (2009) noted that while the immigrant population struggles with adapting to new educational environments, the host country also struggles with effective teaching—and I will add, correctly placing—the immigrant student. I realized through Grace, Astina, and my own experiences that U.S. high schools' administrators have been ignoring the appropriate placement for immigrant students in mathematics courses for a long time, increasing the national and global inequality in mathematics. Relationality takes the form of immigrant students allocated to mathematics courses in high school based on age in certain U.S. areas rather than on their knowledge or competency of the subject matter.

The United States and the Caribbean, despite their proximity, have yet to devise a system where a test instrument (e.g., CXC, GLAT, or other Caribbean aptitude examinations) that

measures students' cognitive ability in mathematics (and other subjects) could be used when a student migrates (Ernest, 1984). Students who have already completed Caribbean high school face the same issues in colleges/universities that have no national or international means to assess students' mathematical proficiency based on Caribbean assessments. If Astina and Grace were experiencing the same issue with mathematics course mis-placement in high school, given the number of years between the period when both women migrated, then why is there not a standard statewide, nationwide, let alone an international system to assist in finding an appropriate fit for immigrant students in U.S. mathematics courses? There needs to be a connection, a relationship between the regions in such proximity, or at least a discussion on assessing immigrant students' mathematical placement in high school and in college in the United States and vice versa.

Fitting the Mathematics Script

A possibly reason why (many) administrators' mis-place immigrant students in lower-level mathematics courses is because they receive and believe societal discourses about Black students' powerlessness in mathematics and then project those discourses onto every Black student (Ladson-Billings, 1994; Martin & McGee, 2009). This projection is evidenced by one of my experiences during my senior year in high school in the United States—

He, the next-door mathematics teacher, entered the room, greeted my teacher, and nodded his head in my direction. I smiled and nodded back. He started having a conversation with the teacher while I tried to avoid hearing them as I continued with my work. The chair my teacher was sitting in moved, and she said: "let me check and see." She immediately got up and left the room. I stayed focused on the difficult mathematics problem my teacher was helping me solve.

The male teacher stared at me working, paused for a moment, cleared his throat, then asked: So, what do you plan to do after high school?

Me: I don't know. I was thinking of majoring in mathematics.

Male teacher: You know that's going to be hard for you.

Me: You think so?

Male Teacher: Yeah, mathematics in college is really hard. I don't know if you'd be able to handle mathematics as a major.

Me: Really!? How do you know that?

Male Teacher: Mathematics in college is not like in high school. You will have to work extra hard to do that as a major.

I shrugged, then said: We will see.

The exchange between the next-door mathematics teacher and me was different than what I was accustomed to experiencing. One privilege I carry as a student of mathematics is that most people encouraged and validated me for being a hardworking individual. Therefore, his assessment of my ability to major in mathematics at college was a challenge to my mathematical and personal identity and agency. He did not know me, and he did not know my story. Also, I recognize now that this was my first glimpse of the social division in mathematical activities and pedagogical practices where there exists separation and inequality in gender, race, class, and ethnicity (Daramin, 2000; Holland et al., 1998; Hottinger, 2016). My ability in mathematics was part of my identity and agency, and so I took that conversation with the next-door mathematics teacher as a challenge—one that propelled me to go ahead and major in mathematics in college.

I viewed the challenge from two perspectives. One perspective was that he did not believe I—the individual—could successfully complete college as a major in mathematics. The

other perspective was that the barriers of societal identity politics would make it difficult for me –Black, woman, or maybe immigrant—to successfully complete a college program majoring in mathematics. He essentially perpetuated the dominant Western ideology that Blacks lacked the acumen, were not gifted, and therefore were incapable of performing in spaces not historically open to them. Essentially, I did not fit the script. Most educators rarely see their daily decision and interactions with students as political or as reifying social constructs. Therefore, because that exchange was our first interaction, his assessment had to be that I just did not fit the cultural representation, or simply, I did not fit the mathematics script.

Ladson-Billings (1994) noted that "our cultural portrayals of the mathematically adept are White males with horn-rimmed glasses and plastic pocket protectors" (p. 699), then maybe the next-door mathematics teacher and Ramona's professor in the narrative below had that image of students who fit the script in his mind. Afro-Caribbean women experiencing the politics of their social positioning as mathematics doers is discussed below. My narrative of not fitting the script occurred in high school, however, for some of the participants in the study, their similar experiences occurred in college.

I searched the narratives of Ramona's, Astina's, Francis's, and Grace's college years for exchanges where they talked about their social positioning as mathematics learners and educators. Ramona stated:

> So, I did lots of statistics class until the stats prof thought I was a math major. I was like nope. I'm an education major. And it was fascinating that everyone automatically assumed because, I guess, in the stats class I got a perfect score. And typically, people don't get perfect scores. And when he realized and he smiled he was like…hmmm. I mean I understood the bias because he said "I would have never guessed, you're a female who is an education major" and I laugh. I said there are lots of variable that we don't acknowledge. But it is real. I was the only Black female in the class. So, in his mind when you get a perfect score it wouldn't be fitting the script of who he thought would get it. In fact, one of my faculty at one of the institutions—I wouldn't want to say—they

> literally said your scores are too high to be a black female. And I was like, wow. Isn't that bit biased?

Ramona was socially positioned by her professor as not fitting the script of students who are normalized as the image of being mathematics doers because of her race and gender. While in college, Ramona's mathematics experience was a form of dysconscious racism that challenged the status quo her professor had accepted as a societal norm (King, 1991). Ramona shared that some educators have perspectives and were "naïve to differences" because of her race and gender—that is, "the only Black female"—did not fit the script of who her professor thought would get perfect scores in statistics.

In Astina's narratives, the characters are the PWI she attended and the professors who made no connections to her as the only Black girl in her mathematics figured worlds:

> I saw that even as I was in college like my calculus teacher couldn't care less about me. I was the only Black girl in those classes for every class. I went to a predominantly white school. And to every class I went to from in my major to those in my minor, I was the only Black girl. The only black female. I may see one or two black males but I was the only Black female. And none of my instructors, I would go for help and I don't think that if they passed me on campus they would know me at all because there was no interest, there was no caring, there was no connection. And so, from this end I could see how devastating that could be because if no one pulls you aside and show you that you're welcome, you're wanted and you do have a connection with this subject and here is your connection.

In this social context, Astina's narrative positioned her as a student whose instructors did not even bother to form a professor–student connection with her. This connection did not happen despite her being a mathematics major and the only Black girl in the courses. From this perspective, she saw how devastating it was for professors not to pull promising mathematics students aside and make those connections, especially if that promising student is a Black woman. It was for this reason that Astina made sure to connect with Black female students that she came across in her current position as mathematics educator.

In the following exchange, Grace highlighted that gender is a factor to consider as not fitting the script:

> GRACE: And if it's a female per se, gotta be very on your toes because sometimes we're not respected as the male counterparts are.
>
> DIHEMA: In mathematics or in general?
>
> GRACE: Oh, in math. Well I guess in general too, but heavily in math. Because it's not a lot African-American or Caribbean, if you may, females in the math field. And so, I know even for me, it wasn't in teaching…in my master's program, I shouldn't be so opinionated. Or you're smart. What? These things may not happen, but there is a possibility that it can be that you can experience that.

These positional identities being Black, whether it is Black Caribbean or African American, and "female" do not fit the script of the image of the mathematics doer, because there are only a few. According to Grace, in her master's program, she dared not be opinionated or smart, "What?" as expressing how dare you? You, the individual being in the social position you are—a Black gendered person being smart in mathematics? Positional identity in figured worlds, according to Holland and colleagues (1998) "is how one identifies one's position relative to others, mediated through the way one feels comfortable or constrained" (p. 127). The participants as immigrants came to the United States with mathematical and identity agency, yet they have found themselves constrained in identity political spaces where they are not fitting the script of who Western society assumes can do mathematics.

In Francis's narrative during her career as an educator, the characters socially positioning her as not fitting the script have been her students:

> So, I knew, I'm not teaching high school or middle school because I mean, yeah but then also like I teach freshmen and sophomores. They are a little better, but they're different challenges. There are other challenges that I'm still learning to navigate. For one, I think teaching in graduate school, again working at a huge public university a lot of the students weren't used to like a Black person teaching them. So, I don't think it was, I don't think I realized anything overt. But in some sense, I thought there was some, I think I had to deal with some things that other people didn't have to deal with.

Racism was the word that came to my mind listening and re-reading this narrative from Francis, but she did not say that that was the case. It is important to note that it may take a while for many Caribbean people to immediately identify a situation as racist. Caribbean nationals often first try to figure out other reasons why the behavior or situation is happening before they conclude experiencing racism (Treitler, 2015; Rogers, 2006). According to Davies (2013), "the way that racism gets masked in the Caribbean includes being located historically in the larger worlds context in a series of racialized frameworks" (p. 178). She further explained that people from the Caribbean occupy an "exotic space, racialized, under a variety of colonial and global marketing practices," so confronting racism in the United States must come from a perspective of knowledge actualized through experience (p. 178).

Therefore, Francis, socially positioned in a large public PWI, who was engaging with students who "weren't used to like a Black person teaching them" was experiencing her positional identity. Francis did not fit the script as a mathematics educator in her students' world based on her social constructs of race, gender, and immigrant status. A particular race, according to Davies (2013) "occupies the position of dominance and then constructs its world as normative and then subordinates all others, on the basis of superficial biological characteristics, socially and institutionally, so that one's entire life is held hostage to those constructs" (p. 184). Therefore, as Francis explained, she had to deal with things that maybe her counterparts did not have to deal with as mathematics educators. I do still wonder if Francis actualized her figured worlds of mathematics to identify other racialized practices and actions in efforts to create tools to safeguard against these social inequalities.

The participants were reacting in defense of their identity and agency after encountering people who challenged them by putting their social position on "trial" (Holland et al., 1998).

Mathematics is a discipline where our social positions cause people to question our authority or deny the reverence they easily give to maybe an Einsteinish looking man. Some experiences such as the one with the next-door mathematics teacher in high school, and now my own classrooms sometimes, made me realize that Afro-Caribbean women are not socially positioned in this world as the ideal image of a college mathematics educator. It is typical to walk into a classroom hearing gasps from students after learning that I am the professor. Upon inquiring, the reason for their gasps are: "you look like a student" or "I didn't think that is what you would look like." Or my least favorite, "are you sure you know what you are doing?"

Davies (2103) contended that people of color in the United States, who are located in racialized structured societies, are often given daily reminders of their "racial location and identity so there can be no forgetting" (p. 179). Francis told of another similarity about the challenges of not socially fitting the script when she deals with disrespectful students who try to intimidate her, or "push boundaries." As one exchange with Francis revealed:

> But I think often people associate a particular personality with someone who teaches math, and so, that was often like a challenge for me. I mean I've never had any issues…I have had some students who are disrespectful for whatever reason. It could be because I'm female or it could be because of other things, but that doesn't necessarily change how I interact with my class. For one, right now, I have a class with mostly males and I think that often they think that I could be intimidated because I am relatively young and I'm a woman and so they could try to kind of, push boundaries. But I make sure not to let that deter me, particularly in terms of we have things to do, we have goals to meet, and so, I mean, I don't always handle it well, but I make sure we accomplish what we set out to do.

Here it is evident that the message or "daily reminder" about not fitting the script is not only applicable to experiences as students but also as faculty. According to Francis, students think it is easy to "intimidate" her because she is "relatively young" and "a woman." Despite those challenges, Francis made "sure not to let that deter" her from accomplishing tasks and goals. An

effective exercise of identity and agency entails overcoming significant institutional and informal obstacles where we are constantly exercising our agency (Holland et al., 1998).

In navigating mathematics figured worlds, Astina explained:

> Well one, I see the need for it. I see that this is an untapped discipline that at times we have been strategically left out of. And why I say strategic, if every time you go into a class you see nobody that looks like you, nobody that looks like you that's teaching it, that's a message, ya know. Maybe you're not accepted or maybe you're not good enough.

The messages received, according to Astina, are "maybe you're not accepted" or "maybe you're not good enough." Astina also opined that mathematics is an untapped discipline that we are at times strategically left out through the message of seeing "nobody that looks like you that's teaching it." The strategy of excluding the image of certain types of people out of the discipline of mathematics ties back to the privilege of mathematics being feared and revered, being White male-dominated, but our social positionings as Afro-Caribbean women with accents disrupts those discourses. This exclusion is not only in classrooms but also in textbooks and media as well (Hottinger, 2016).

Holland and colleagues (1998) stated, "When individuals learn about figured worlds and come, in some sense, to identify themselves in these worlds, their participation may include reactions to the treatment they have received as occupants of the positions figured by the worlds" (p. 143). Afro-Caribbean women position themselves to react according to the treatment of their mathematics figured worlds. Some of these reactions are, according to Astina, "[to] help them find a connection," or as put by Francis, make sure "not to let that deter me." The participants' social positionings as a Black immigrant woman in a foreign land, teaching mathematics constantly requires exercising their mathematical agency by remaining focused. We have to author our spaces by becoming agents on behalf of ourselves and a representation of Black immigrant women in mathematics. Part of defending that we belong in those spaces means we

must know our content and know how to teach. Not that our mathematics knowledge and professional competence are a guarantee of acceptance from our students and peers or opportunities from our institutions, but it helps with guaranteeing that one is doing her part to restructure the socially accepted message for the normalized image of the mathematics doer, one's presence sometime speaks for itself (Journal of Blacks in Higher Education, 2001).

Hottinger (2016) claimed that we continually assert that women and people of color cannot be mathematicians through repetitive discourses. Western society has not yet normalized seeing an image of a Black immigrant woman, an individual who is situated within three social constructs, as a legitimate, capable, and competent source of knowledge for mathematical subjects or as mathematics doers. Identities take an intimate form in a political process (Holland et al., 1998), and it was during college where Ramona, Grace, Astina, and Francis experienced they too might not fit the political identity of the image for who Western society views as mathematical doers. From the narratives, it appears that the participants' experiences of not fitting the script in their mathematics class during college and as mathematics professors were related to the intersectionality of their race, gender, and age (Collins, 2000). The image of who gets the benefit of the doubt to be a mathematics educator in Western society lacks a racial and gendered identity.

Afro-Caribbean Women's Academic Figured Worlds

In this section, I present a collection of narratives about Afro-Caribbean women as mathematics learners and educators in the academy. In their academic figured worlds, Afro-Caribbean women experienced being the only Black girl or women in mathematics spaces, learning the importance of mentorship, and gaining an empathetic educator stance while advocating for self. Afro-Caribbean women used these experiences as spaces of authoring in

response to the messages they receive about their positioning in mathematics figured worlds (Holland et al, 1998).

Being the Only Black Girl

In this collection of narratives, Afro-Caribbean women share their mathematics experiences while being socially positioned in PWI as the "only Black girl." Thus far, I have guided the reader through the participants' narratives starting with my own experiences; I do not do so here. That is not to say that I have never experienced mathematics figured worlds in which I was the only Black person, because I have. But five of the participants have had such experiences at PWI in which they either attended as students or worked as faculty, demonstrating the lack of diversity that still exists in most mathematics figured worlds. These experiences of limited diversity are highlighted in the following collection of narratives:

> Astina: I was the only black girl in those classes for every class.
>
> Grace: I was like the only black girl in my classes.
>
> Francis: I didn't talk about the fact that, in terms of my department that I was in, in math when I started in the department like I was maybe one of two black females and there were a couple of other black people but not many.
>
> Kathy: Our school is not very diverse. The school of education here is not very diverse. There is very few African Americans actually and if we extend that to the broader category of people color the it's a very, very ill proportioned.
>
> Ramona: I was the only black female in the class.

Within the context of the participants' experiences in academic figured worlds, at some point, they were the single representations of individuals at the intersections of race and gender. Diversity initiatives in the United States fail when Afro-Caribbean women represent the individual of color and/or gender either as a student or as a faculty. This failure is an indication that there has been limited progress in increasing diversity in colleges/universities despite the

promises and positive benefits to students, faculty, and staff, and the overall environment of colleges/universities in general (Krupnick, 2018; Newkirk, 2019).

In the narrative below, Francis expressed feeling like an imposter (Clance & Imes, 1978) due to the intersections of her race and gender as well as her naivety to the college academic culture:

> But in terms of diversity, it was not a comfortable place and the culture there in terms of everything. Well, for one I felt that. Okay, so even though everyone there is smart, I felt unprepared. And so maybe in some sense I felt like I was an imposter. But then there was also, again, there was a sense of superiority or like, all of the students get to work with this person and this person only accepts the best students. And you're not going to be able to work with this person. And like, again, I wasn't even aware that was a thing, but then I learned that on the fly when I got there. I just felt like I work hard, but I didn't feel like, what's the purpose of all of this, of doing all of this. Understandably, that what doing for me which was not really where I wanted to go. In that sense, maybe Academic culture was a shock.

Immigrant students are often not aware of the U.S. academic culture where there exists a sense of elitism, competition, and/or, as Francis expressed, a "sense of superiority." In these positions, students lack awareness and are being forced to show their worth as that ability to "work with" particular professors. This lack of awareness often brings a level of shock or feeling like an imposter for either not knowing the "game" or feeling "unprepared" (Bothello & Roulet, 2019; Gluckman, 2017; Parkman, 2016).

In some cases, the only Black girl was applicable to Afro-Caribbean women's mathematics experiences not only as learners but also as educators. For instance, Kathy was one of her campus's "representatives for diversity":

> It's interesting, because I think one of the things is whenever there's a Black candidate that comes on campus, they come to my office for multiple reasons. 1) I am one of the directors of our research center. And 2) I think they need a fresh, they want somebody who is considered to be a minority to talk to the students to tell them that the place isn't racist. They look to me as a minority to talk to them about this being a good place to do research. Even though they don't say that explicitly…I don't think, they know that I will ever give them the reality of, my reality. I give them my reality of the situation, but I also

> try to be fair. And I think they also want to show that our minority candidate also accelerates. So, they have mobility in the professoriate. I think it's some ways that this gives them to some extent I represent that, I think. So, what I do tell, I say to people as well. Just what I say to you that I'm not African-American and it's important that you understand what that means when I say that. I said, I don't have an orientation to this world as a minority. I don't know what that means. I don't embrace that. I don't, I don't even know what it means to feel that you don't belong.

Kathy was socially positioned to represent diversity for the institution where students might get a realistic perspective from her of whether the institution is a "good place to do research." Tillman (2004) stated that Black teachers "represented distinguished contributions to the long history of Black education" (p. 283); Afro-Caribbean women, such as Kathy, continue contributing toward that effort. U.S. Higher education benefits from international faculty like Kathy who use either culture, resilience, or agency not to be bothered by her institutions ill-proportioned diversity and lack of Black representation, particularly in the field of mathematics. Kathy seems unbothered by her experiences maybe because her strong sense of self was not tied to the job given that she can judge her job according to comparisons with opportunities in her home country (Waters, 1999). She has the ability to resist "not having an orientation to this world as a minority." Kathy was often positioned in her institution to address its lack of diversity and representation while providing mentorship for its students of color, and, if they existed, other faculty of color.

Astina explained that it was because of academic elitism that she wanted to remain in the K–12 education arena:

> ASTINA: My idea was to stay in K–12 and work until my retirement kicked in…in my mind, academia was a place that I think is elitist and more and more I saw it as only certain people were allowed in. And I did not think I fit that bill.
>
> DIHEMA: What certain?
>
> ASTINA: So, most of the times what I saw and what I heard people who were constantly doing research, especially in mathematics I saw these white males. And even if they talked about the marginalized population, it was almost like their entry into the academy was accepted because here was a white male talking about females, or a white male

> talking about those children that are brown skinned or whatever or those poor children. So, almost like the savior type of mentality. Here they are they're here saving these children, these little pets. And so, that's how I saw it. And so, my piece was well, what if I stay in K-12 and help directly with the children that I wanted to help with and bring more students that look like me, more children that sound like me, more young ladies that look and sound like me, into liking mathematics more and more.

In Astina's perspective of academic figured worlds "only certain people were allowed in," and here *certain* was defined for Astina as "White males." Astina thought to remain in K–12 was to "bring more young ladies that look and sound like me" to mathematics. With the staggering number of only 2% of full professors who are Black women, there is a need for those who have "beat the odds" to guide those who still have to face their career being "threatened—from the classroom, to the conference room, and from the publishing house to the foundation world—by everyday racists and discriminatory behaviors for which there is still no mitigating policies" (Daut, 2019, p. 2). The lack of diversity in U.S. higher education slows down Black scholarship and resources that expose the experiences of Black learners and educators in the academy.

For years, institutions of higher education in the United States have committed to improving the diversity of their faculty (and staff), but no significant increase in diversity has been realized (French et al., 2015; Krupnick, 2018). According to Bell (2003), policymakers and courts use "diversity distractions" to avoid directly addressing the barriers of race and class in U.S. higher education. In other words, "diversity initiatives" are often used as distractors from addressing racialized inequities and injustices in U.S. higher education directly (Bell, 2003; Newkirk, 2019).

Moreover, there is added pressure placed on faculty of color to help diversify their institutions, a form of "service" in addition to their already taxing research and teaching responsibilities. The lack of diversity also results in a lack of access to mentors of color for students of color, which impacts their success; research shows that having higher rates of faculty

diversity are associated with higher rates of student success (Witherspoon, Vincent-Ruz, & Shchunn, 2019). Furthermore, it is difficult for faculty of color to get hired at prestigious colleges and universities, which, in turn, limits becoming part of "the network" that expands publication, funding, and employment opportunities (hooks, 1994; Krupnick, 2018). The odds are especially long, according to Newkirk (2019), for faculty whose research and scholarship challenges the status quo.

Bearing the Experiences in the Academy

For one semester while attending college, I did not have stable housing, which impacted my academic work, causing me to fail Topology. I sought out tutoring from a young man, Hamish (a pseudonym), who had migrated from Trinidad and Tobago on a scholarship to attend an HBCU in the state. Hamish was whom I thought to be a brilliant mathematics major and student, and who was excellent at helping me to successfully pass Topology the second time around. After graduation, Hamish went on to get his master's from a PWI in the same state. A little after a year, Hamish committed suicide in his dorm room. I think that Hamish, coming from a country and a HBCU that safeguarded his best interests as a Black male mathematics learner, was still in a "bubble" when he attended that PWI for his master's in mathematics (Taylor, 2007). I think Hamish's bubble burst when he was no longer in mathematics figured worlds that safeguarded his interests, but in a space where he was given little to no attention.

In the narrative below from Grace, I was reminded of Hamish:

> It was like a weed-out process if you understand. It's like you sink or you swim. It's not much help for you. Predominantly White. I was like the only black girl in my classes and you know I remember going for help and they were like come on [Grace] you gotta get it together. And I'm like, Oh, okay. Ya know, whenever an instructor came into the class and he was like well, I'm known for giving good grades but now I have tenure. And I'm like I came when you got tenured what does that mean? He was horrible to the female students in that cohort, he made some of them cry. You know, it was horrible. I guess I was depressed in [State]

Grace, as the only Black girl in her class, was told to "get it together." Grace viewed that statement as a means to "weed out" the mathematics students into one of two groups: those who would sink and those who would swim. The main character in this narrative was a professor who Grace described as being "horrible" to the women students because he made them cry. The women in Grace's classroom were subjugated by the male ego of this professor. The intersectionality of power and social context of this man, who was a tenured professor, created a tenuous classroom environment. Grace stated that the environment made her feel "depressed."

Ramona and Astina authored themselves by being a mentor for students. Mentoring included connecting more with students and helping to "right the wrong" of the discourses that people of color receive about mathematics:

> Because too often people get caught up in what I call the academy. The hazing in the academy. Academic hazing is real. Where we keep raising the bar making your life miserable just because we can. And I said that's not my goal. My goal is to make you the best person possible. So, I try to make sure that they succeed based on what they bring to the table. When we work with what you have, see how we can support you forward. And so, I think that was something. And I would use a rubric to think about how far are you away from being excellent on the standard. Rather than trying to figure out what other people are doing. This is where you are at, this is where you need to be. Let's think about what we can do. (Romana)

> And so, from this end I could see how devastating that could be because if no one pulls you aside and show you that you're welcome, you're wanted and you do have a connection with this subject and here is your connection. It may be me. It may be me helping you to find a connection. It may be me encouraging you to say, don't feel like this is that hard or that you can't do this. If nothing else, let me try and show you. Let me help you to break it down. (Astina)

Ramona discussed academic hazing as real and it is up to us to work with students by understanding where they are and then supporting them moving forward. Astina was acting in an agentive manner, becoming the professor that encourages and tries to show the connections for students in mathematics. Astina shared that her mathematics learning experiences in college

were that mathematics professors couldn't care less about her although she was the only Black girl in her classes. From this point, from Astina's mathematics educator perspective, she sees how "devastating" it is for Black girls not to have someone who supports them. Afro-Caribbean women in their mathematics figured worlds author themselves and their spaces to provide that connection and support.

Kathy carved out a social position at her institution where students have a space to gather, a safe space for safe discourse (Collins, 1991):

> Like I can I start to have that dynamic again like my research group is international mission of United Nations. And then we have one white student, one from India, one from China, one's from Turkey, one from Saudi Arabia, one is from Jamaica and then one is white but I don't think that she knows she is white. And I think they there in my research group not only because they're interested. Some of them are really not interested in teacher education. But I think because they feel is like it is comfortable. Yeah. So, we talk about we share culture. We talk about food. We talk about where we are going. And just things that are just completely irrelevant.

Kathy, similar to Ramona and Astina, authored herself as a representative for her students. With few faculty of color on PWI campuses, mentoring students of color, regardless of whether they or the students are in the same discipline or interest, becomes their responsibility (Geleta, 2004). Astina, Kathy and Ramona positioned themselves for students to see representations of oneself in mathematics positions whom one can seek for guidance and alliance in the journey through the academy.

Moreover, a vital part of surviving the figured worlds of academia, as a faculty member, is not only being a mentor but also finding a mentor. Official university mentorship programs, if they exist, are designed to guide and support faculty through processes such as tenure or promotion, but most often do not consider immigrant experiences as a basis for such paring. Mentors are a form of support who assist and lift the level of energy needed to focus on teaching, research, and the space to write outside of the damaging purview of those who are constantly

opposing or degrading one's worth (Daut, 2019). Mentors also assist with figuring out ways to balance occupational stress while maintaining well-being in the academy (Agosto et al., 2016; Gillespie et al., 2001; Sy & Cruz, 2019). But successful participation in mentoring relationships relies on having similar cultural, positional, and subject narrative experiences (Agosto, et. al 2016). Geleta (2004) argued, "immigrant faculty of color, who share the least commonality with the traditional senior faculty members suffer from limited opportunities for mentorship" (p. 29).

Finding Mentorship in the Academy

One day while returning from one of my mecca trips to Jamaica, I had to prove to an immigration officer that I knew the quadratic formula. I stood behind the yellow line patiently waiting to hear "Next?" combined with my eyes locking with the immigration officer's eyes to verify it was indeed my turn to approach the desk. We went through a series of questions and answers, such as "Where are you coming from?" "How long did you stay there?" and "Is [state] your final destination?" "What do you do here in the United States?" The last question is what prompted the following exchange:

Immigration officer: What do you do here in [state]?

Me: Do you mean, where do I work?

Immigration officer: Yes, what is your profession?

Me: I am a college professor.

Immigration officer: Really? Where do you teach? [with raised eye brows and a curious look.]

Me: [gave the name of my institution]

Immigration officer: Hmm! What do you teach there?

Me: I teach mathematics.

Immigration Officer: Really? Mathematics, huh,? [Again, with raised eye brows and this time, eyes wide open.]

Me: Yes.

Immigration Officer: So, if you teach mathematics, then you can recite the quadratic formula to me?

Me: Is that the proof you need? [Bewildered that entry back into the United States was this easy while wondering did he believe me.]

Immigration Officer: Sure, tell me the quadratic formula.

Me: I see. [I gave the immigration officer the quadratic formula.]

I am unsure whether knowing this information was proof the immigration officer needed to verify I am indeed a mathematics professor at a college. Also, I am unsure whether knowing the quadratic formula was relevant information for entry or his curiosity. I am also unsure whether the immigration's officer knew I gave him the actual answer. I, however, felt at that moment that providing this formula to the immigration officer was what determined my entry back into the country. The negative experiences immigrants endure not only occur outside academic figured worlds but also inside, including the classrooms. Black immigrants endure the same racial experiences as U.S.-born Blacks, but with added weight of linguicism and xenophobia (Rong & Preissle, 2009). As such, we have to be aware and knowledgeable about our positionings and the worlds we represent and in which we interact.

In learning the historical, political, and social relationships between the academy and people of color, Afro-Caribbean women adopt a supportive attitude toward the powerful dynamic. Our immigrant status allows us to perceive and understand these relationships differently so we can become empathetic. The intersections of the historical and political

academic relationships with persons of color means Afro-Caribbean women have to be supportive but not necessarily adopt the same attitude, as reflected in Francis's narrative:

> And I think I had one hair stylist tell me, I don't think you have the same—you don't have the same anger that other people do and it's because you didn't grow up in this country.…Probably that is true, but I can empathize, and I can understand because, again, I'm a person of color too. And I don't think I'm better than anyone it's just that maybe my perspective is very different. And I think in some sense it gives us a plus because we don't bring the same experiences to bear, like in American context. Before, I didn't understand why some people maybe had some concerns or attitudes around the academic environment being a person of color but I understand it now. Kind of understanding the historic context or again, kind of studying equity and understanding the history of equity in this country a little bit. Kind of gives me a better understanding. It doesn't necessarily mean that I have to adopt the same attitude, but I can understand where that attitude comes from and can try to be supportive in that sense.

Francis conversation with her hairdresser about the unequal historical and political contextual academic figured worlds gave her a better understanding of the attitudes of people of color and the academy. Although being an immigrant will not protect Francis or any of us from having experiences to bear, she understands the different attitudes of U.S academic institutions. In the end, there is an added weight of "experiences to bear" that Afro-Caribbean women must learn to manage.

Managing these experiences to bear requires navigating daily survival tactics and underscores the need for mentors to teaching these daily survival tactics (Sy & Cruz, 2019). As Astina remarked:

> You may think you know it—they know the game. They have been there. They can hopefully help you around the detours. Let you know who you better not mess with and who you just choose to ignore and how to ignore them without stepping on the stones that are really the ones who will propel you to your next level. Especially if you're tenure track. It is not an easy space to be in and it's, again, it is a very closed community and especially if you look and sound different, you are still fighting for a seat at the table in this space.
>
> I don't care how many of them come with, oh, I'm talking about identity and gender and dah, dah, dah, their belief is their belief. What they write does not necessarily often match with their belief. And so, someone that's there that's been there that has gone through the

> pit-holes and can help you to navigate that to the best of their ability…Find a mentor, I guess that's it. I believe in mentorship so find a mentor.

Astina discussed her experiences with these survival tactics in the academy. She claimed that finding people in positions who know the game can help with navigating the detours; finding mentors is essential in the closed community of academic figured worlds. In this social context, one must know who not to mess with and who to craftily ignore because we are socially positioned outside the closed community. According to Astina, "what they write does not necessarily often match with their belief."

Grace expressed the same sentiments about having to fight hard while positioned as Black, women, and immigrant from the Caribbean in academic figured worlds:

> For myself it's like a triple…black, female minority, immigrant, from the Caribbean. Oh Jesus, it's like, where are you going? So, you have to fight very hard. I feel like I've even experienced something of that nature. I can't really say for sure where the person over our checks she treats me one way, but she treats my white counterparts a different way. She didn't want to pay me my money but it's okay…It's a lot. So, you really have to come out of that bubble that we're in in the Caribbean where we don't have to deal with this but it's very prevalent here. It's right in your face. So yeah, I think if she can do that or he can do that, they'll survive.

This triple positioning means that Afro-Caribbean immigrants have to come out of the Caribbean "bubble" and deal with the too often negative consequences of these social constructs—race, gender, and immigrant status—that are so prevalent in the United States. These social constructs are right in your face, and if you can fight, then you will survive, but most do not because they fear retribution not knowing how or who to go to for support.

Knowing who to go to for support means having mentors of color, but mentors of color would require U.S. higher education to not only be aware of the need of diversity but to actively reform the culture and policies by actually becoming diverse. Nonetheless, according to Ramona, make it work:

> So, you do your best and make it work. So, as an educator, I see myself as an advisor, I see myself as a teacher. I see someone who is sensitive and culturally aware. I have seen myself as an advocate on issues of equity and diversity. I have seen myself as—someone tried to make me a token, but I had to call them out, don't play me like that. But um, there were instances where you see a lot of stuff with race and racialization and probably even racism that is becoming more evident. And so, you have to try to help educate people that what actions can be and cannot be accepted. And even the microaggressions being aware of these experiences that could be intentionally created and hidden curriculum and it's implication. And so, that's why I said I was becoming more aware of the need for advocacy.

Ramona shared that we have to become culturally aware and advocate on behalf of inequity and diversity and take actions for ourselves. To advocate for ourselves in our social positionings means we make self-directed improvisations (Holland et al., 1998). As a collective, we document our own experiences and stories; we author ourselves, and we support ourselves. "Agency lies in the improvisations that people create in response to particular situations" (p. 279), which comes from the experiences that we bear as Afro-Caribbean mathematics learners and educators. To create change, it is clear that we take a stand, we engage in the fight, we learn the tactics, and we become agents who mentor those who look and sound like us. We have to understand the complex nature of our positionings to educate students and peers effectively, whether that is in our teaching or in our research, we must become agents of change, and bring awareness to these damaging societal vices.

Therefore, it means consistently remaining vigilant, focused, showing work so that the next generation of mathematics educators will understand the issues—historical, political, and social—facing U.S. higher education, mathematics teaching and learning, and immigrant positionings inside and outside institutions of higher education in the United States. So Black immigrant women positioned as mathematics educators in U.S. higher education need to work in institutions where they have support, programs, and opportunities that will purposefully target discriminatory behaviors from administrators, faculty, students, and staff (Daut, 2019). The

participants shared their experiences to bear, as such, support the importance of having mentors who can help them fight because they know the game: the survival tactics needed to be successful in academic figured worlds.

Afro-Caribbean Women's Identity Figured Worlds

In this last section of Chapter 5, I provide a collection of narratives about Afro-Caribbean women reshaping or refiguring yet retaining themselves in their mathematics and academic figured worlds. Afro-Caribbean immigrant women refigured themselves as mathematics educators through the "art of teaching" and learning and by retaining linguistic markers of their culture. As Davies (2013) argued, being a migrating woman means understanding one's identity through a consciousness of self-knowledge.

Reinventing and Reforming Mathematics Identity

According to Holland and colleagues (1998), "improvisation can become the basis for reformed subjectivity" (p. 18). Afro-Caribbean women have valued the notion that "formal" education is a qualification for a better life, and that idea has been the driving force behind many Afro-Caribbean women since the time of colonization (Alfred, 2003). The proximity and open doors of the United States provide Afro-Caribbean women the means and opportunity to pursue the goal of obtaining a formal education and remaining in the educational arena to aide future students. It is for this reason that many mathematics classrooms in U.S. colleges and universities (and K–12) are likely to host women educators from the Caribbean. When migrating across international borders, however, educators are "likely to experience salient and peculiar issues, including differences in communication styles, teaching styles, teacher–student's relationships, school organization, and assessment. Such differences can create insurmountable challenges for effective teaching" (Hutchison & Wiggan, 2009, p. 11).

In the narrative below, Kathy shared her experiences of what it means to reinvent her approach to "effective" mathematics teaching:

> I think at the time I really had a sense of how students should understand math from my own perspective. This was how I connected ideas, this was how I made sense of ideas. So, this is how you should make sense of ideas. Which of course as we know is not, is not the best approach to getting kids to be powerful mathematical thinkers. And so, one thing that it pushed my curiosity to try to figure out how they were thinking that was clearly different than the way that I was thinking.… At that point, I didn't really know that there was a better way. I thought that was of course the best way. As you know, I had these really interesting ways of bringing concepts together and seeing the connections between concepts. And of course, I can help kids to see that cause my teacher never helped me see that. And I felt like if they had done that then I would be much better at math than I was now.

Initially, Kathy's approach to teaching mathematics was for students to see mathematics from her perspective, which she "figured out" was not the best way for students to become "powerful mathematical thinkers." She stated that she "didn't really know that there was a better way" to get students to think of mathematics as she did, which she believed was the universal way of making sense of the ideas in mathematics. As hooks (1994) argued, "Let's face it: most of us were taught in classrooms where styles of teaching reflected the notions of a single norm of thought and experience, which we were encouraged to believe as universal" (p. 35). Through the experiences of teaching, however, Kathy recognized that her approach to mathematics was not the best. These experiences pushed her curiosity "to try to figure out" mathematics teaching in a different way, thus positioning her to learn the art of teaching mathematics.

Similarly, Astina shared her experiences of reinvention. Astina, as a learner in the Caribbean, experienced mathematics teaching with a focus too often on mere procedures:

> Um, in some aspects. In some cases, I think, and it could be two-fold, I think how I teach mathematics now it's, I think we have evolved. When [Sir] taught us math it was very at times, there were things that were very procedural, and also, it was also at the high school level too. So, all of the manipulative aspects of teaching mathematics—because they—I think he had the idea that our foundational pieces were secure. So, going from the concrete to the abstract was no longer needed.… So, [Sir] was the type of teacher that at

> times depending on what he was teaching it was very procedural but there were times when he went back to give more information to make sure those foundational pieces were secure and I think at times I find myself being more diligent at it now. And I think it's because my level of mathematics has become a little bit more, I'm not saying it's there, I'm saying a little bit more sophisticated and I seek to know more about it.

Astina recalled evolving as an educator despite limited conceptual or abstract learning of mathematics. She stated that although there was not much time for manipulatives in her early learning, there were times when the teacher did some of what she called "abstract" mathematics. The abstract way, as Astina described, made those foundational pieces or concepts of mathematics more secure; she is more diligent at teaching that way now. Because of her U.S. teaching experiences, Astina believed that her current teaching practices are more sophisticated as she continuously seeks "to know more" of the art of teaching.

Similarly, Francis also claimed that she has experienced teaching mathematics from a different perspective since her time in the United States, causing her to reinvent her approach to knowing the subject. For Francis, reinvention is focused on "emphasiz[ing] more around conceptual understanding rather than focusing on the procedures":

> I really had to kind of reinvent the way that I taught because at home there's an emphasis on procedures and shortcuts but not necessarily on understanding why stuff works. And I realized that I was good at that part but then I struggled when it came to like, did I understand what I was doing? Not really. I was just doing it. So, for me I realized that I had to kind of reinvent my teaching so I could emphasize more around conceptual understanding rather than focusing on the procedures.

Francis stated that in the Caribbean that there is an "emphasis on procedures and shortcuts" in mathematics, but "not necessarily understanding why stuff works." Francis believed that her positioning as a mathematics educator required her to change her emphases of how she teaches mathematics and how she understands mathematics.

The learning and teaching of mathematics in the Caribbean, according to Kathy, Astina, and Francis seemed to be more focused on procedural knowledge, requiring the participants to

adjust their teaching styles as U.S. mathematics educators. The teaching of mathematics that the participants experienced as learners required them to reinvent how they developed their art as mathematics educators who now explore the "why" of mathematics.

Afro-Caribbean women's traditional understanding of learning mathematics was replaced by a reformulation of the art of teaching mathematics. This reinvention required understanding what students are not making sense of and developing strategic methods or classroom practices to facilitate not only procedural learning of mathematics but also conceptual learning. Reinvention, as defined by Law (2013), is the "involvement of action that encourages the production, as well as reformulation, of knowledge" (p.102). For reinvention to occur mathematically, Afro-Caribbean women had to experience teaching mathematics themselves to learn how to reconstruct their mathematical understandings. These experiences encouraged a reformulation of both their mathematics understandings and classroom teaching practices to provide better future learning experiences for their students.

The reformulation process for Afro-Caribbean women is not only in teaching mathematics as a subject but also as a professional in the academy. Although Black immigrant women face more social barriers in the academy than their European immigrant counterparts, there is still an expectation that they will effectively complete their professional tasks, which include teaching, research, and service to their professions and institutions (Hirshfield & Joseph, 2012; Kessel, 2014). The participants provided contextual and personal perspectives for accomplishing their professional tasks; Kathy, Astina, and Ramona shared:

> KATHY: I think you need to know, to be knowledgeable about what you say is your profession. That you have to be highly competent in your, if you're a mathematician, then you have to be highly competent and know mathematics education and have your place, and be. If you are going to call yourself an expert, then be an expert. So, there are multiple facets of what I mean by that. Of being an expert also means that you know what you know what you don't know. And either choose that's not something that I am trying

> to be an expert in or you get up to speed. So, and that's a part of being a professional too I think.
>
> ASTINA: You have to also know how to teach and focus on those mathematical practices which I think should've been the pivot of mathematics ever since. Having students talk about their reason, explaining specific models that you're utilizing, which tools will be best how can you push people to persevere even when they're struggling. What are some of the questions that you can ask to ensure that you're getting them back on track, ya know, those type of practices.
>
> RAMONA: Always do your job. Don't get caught up trying to help everybody and don't do what you're supposed to do…Don't try to do more than two clubs or try to take on all those projects. Because if you're doing that, you're either not doing your job effectively or you're doing it and you're tired and you're draining yourself out. And you don't want to be become burned out over time.

The narratives from all three women, who teach at large, predominately White, research extensive institutions and hold leadership positions, express that attending to professional tasks is vital to their positions as mathematics educators.

Nonetheless, in entering institutions of higher education, Davies (2013) argued that for new faculty "meeting the professional demands often led many to quiet contemplation, as they met the specter of not getting tenure and were cautioned to keep their heads low, finish a book, and stay out of the way" (p. 188). But in keeping new faculty too busy on professional tasks (specifically service), it breaches knowledge production between theory and practice (Davies, 2013). A new self-understanding of our positions as mathematics educators causes us to emotionally invest in our academic figured worlds and participate in tasks that are relevant. That participation includes understanding our obligations as mathematics educators in our institutions as well as accomplishing tasks in our professional communities.

People are "always (re)forming themselves as persons and collectives through cultural materials created in the immediate and more distant past" (Holland et al., 1998, p 18). The participants had to experience the art of teaching to understand that *how they learned*

mathematics had to be reinvented *for them to teach mathematics*. Teaching mathematics content and education courses created unique intersections with characters and actors that are consciously and unconsciously navigated on a daily basis both inside and outside the classroom, within the institution and from their pasts (Holland et al., 1998). The participants had the agency to reformulate their knowledge on the art of teaching from how they learn to how they teach. In the end, the participants reformed their past learning in response to their positions as mathematics educators in the present.

What is Your Native Language?

Language,[15] according to Richardson and St. Pierre (2005), is the "place where one's sense of self—one's subjectivity —is constructed," which is historically and locally specific (p. 961). Growing up in the city of Kingston, the only worlds I knew were in Kingston, Jamaica, including my surrounding community and people who spoke and acted like me, like my family. Recall, however, that the high school I attended and its surroundings were different from my communities as a child. I had to take three buses to get to and from school every day. My high school was the first place which informed me that coming from "those neighborhoods" meant that we were "poor," we were from the "ghetto" or the "garrison," and socially, I learned that that was not a good thing (Jaffe, 2013; Patrick 1999). This "not good thing" was news to me prior to high school; I was unaware of these social and class constructs. This consciousness is important because it is how I developed my relationship with mathematics and formed my mathematics agency (Basu, 2007).

[15] I am referring to language in this case such as accents. According to Waters (1999) "language is not usually regarded as a key factor in [immigrants] adjustment or identity. But the accents and the type of patois or Creole slang or language spoken by the immigrant were important markers of identity for them" (p. 76).

In developing and forming my mathematics relationship and agency—that is, my mathematics identity—language became key, given that language is a device that allows reality to show up in our experiences (Polkinghorne,1988). You see, it was my language that exposed me—mi chat Patwa, mi chat too bad. In Caribbean figured worlds, it seems that language is a relevant tool for upward mobility, and I did not possess that tool entering high school (Patrick, 1999). I began to lose my voice, my agency, by not wanting to speak or write, and I have carried that sense of silence with me about language and speaking ever since those high school years in Jamaica. I did not want people to hear me talk "bad," and I did not want people to know I was poor through my writing. But my voice—speaking or writing—did not matter when I was doing mathematics. We were all going to get the same answer, no matter how we spoke. I think, in that way, in my mind, I related more to mathematics than any other subjects. It was through mathematics, to me, that all students and I were equal. Through mathematics, I was not different, and our voices were the same. We had the same story. Through mathematics, my origins, socioeconomic status, gender, immigrant status, and accent did not matter. Mathematics, the subject, was for me the great equalizer.

According to Ibrahim (2020) "language allows us to re/present ourselves, and while doing so, we come to form ourselves" (p. 93), and in this forming we author our social positionings in our figured worlds (Holland et al., 1998). Upon migrating to the United States, Black immigrants decide what cultural norms to retain or discard from their homeland, and for Afro-Caribbean immigrants, one cultural norm to keep, consciously or unconsciously, is their mother tongue (Ibrahim, 2020; Mills 1997). Afro-Caribbean women seem to remember the native tongue of their home—their language, giving them an accent—despite the length of time after migration. In the United States, "standard English," according to hooks (1994), is not the

speech of exile, but the language of conquest and domination that masks the loss of so many diverse tongues which we will never hear.

The topic of diverse accents came up during the exchanges with Astina, Grace, Kathy, Patricia, and Ramona. Each participant discussed the ways that their accents have become relevant in various ways of communicating. The participants also shared the diverse ways they choose to use their language and accents to manage and express themselves in their figured worlds. Ramona recalled an incident from college after the professor learned about her Bahamian heritage:

> Some people have perspectives. Some people have a naïve to differences. But some do. Because like I said sometimes we see the world based on our own interactions and our own realities. And so, harm may not be intended, but harm may occur. Based on someone's lack of insights.
>
> Cause when I went to [State University], it was really comical. In front of the whole class, like cause the teacher heard I was from the Bahamas. She said "W-H-A-T I-S Y-O-U-R N-A-T-I-V-E L-A-N-G-U-A-G-E? so I turned my head back M-Y N-A-T-I-V-E L-A-N-G-U-A-G-E I-S E-N-G-L-I-S-H. And the whole class laughed. She was like oh I'm so sorry. I said, I don't know why would you turn your head?

This retelling is a suggestion of relationality where there exists global social competence as well as incompetence (Collins & Bilge, 2016). According to Ramona, the professor was asking "what is your native language" as though she was incapable of speaking or understanding English. This actor in Ramona's world illustrates that there is some level of ignorance associated with or rejection of people's "undesirable" accents from a global perspective. Ramona believed that in the United States that there is a "naïve" perspective on the knowledge and understanding of people from other countries. This lack of insight could create harm even if not intended, but with naïve perspectives, harm most often occurs.

Because of naïve perspectives, accents are not always a different form of language that is socially accepted when spoken in the United States (hooks, 1994; Hutchinson et al., 2009). Grace expressed that she had a "rough" time in high school with students and teachers:

> And so, I started reading, I was reading, I think, eloquently and they started laughing. And I'm like, what's so funny? Even the teacher was laughing. And I was like, did I say something wrong. And they were like, oh, your accent I'm so sorry, your accent is just…we weren't ready for that.

Similar to Grace's narrative, upon my arrival to the United States, my accent fascinated some people, so my speaking became for their amusement. I had yet to master the idea of "code-switching," given that I had not yet developed the double consciousness necessary to navigate U.S. classrooms where U.S. English rather than West Indian English is the preferred norm. These linguistic challenges forced me to question my own confidence; speaking became an irritant and added to the many challenges I (and maybe Grace) was already experiencing after migrating (Lobban, 2013).

A form of self-silencing is withholding one's perspective or not participating in spaces where one might perceive one's language as a challenge (Smith, Warrican, & Alleyne, 2020). Immigrant educators are forced to articulate their ideas differently causing them to code-switch or experience the "process of assuming a new linguistic identity; a parallel to the process of identity development" (Hutchinson et al., 2009, p. 170). Self-censoring therefore appears necessary as a reshaping or refiguring of one's identity as a strategy to maintain one's agency (Holland, et al., 1998; Mills, 2007).

Patricia suggested, in the narrative below, that when teaching mathematics with an accent it is important to enunciate:

> Okay for one thing um, and this might be funny it might not be. But coming from Trinidad, we have a different accent, and it's not well received, it's not always well

> received by Americans. So, while I'm not advocating that you change your accent, I'm advocating that you try to speak and enunciate so that they will understand.

Patricia did not advocate changing accents but rather speaking so that students can understand, stressing the importance of enunciating when communicating with students as a mathematics educator.

In Astina's narrative below, she recalled her experiences teaching with an accent and its impact on her students' learning:

> They were so hung up on listening to my accent they weren't um trying to understand the concept. So, I find myself saying to them, oh, good so you got something from what I said. You heard exactly what I said. So now let's talk about the concept that you didn't understand because I think they're so focused on my accent at times.

Astina believed that her students get so "hung up" on her accent that although they hear what she says, they are not trying to understand the concept. Astina then repositions herself so as to refocus their attention by talking about the concepts.

Kathy's narrative below spoke of her perspective on language and communication where she makes a choice to "code-switch" to be an effective communicator:

> If you think of code switching in terms of just language, I think we have to code switch in multiple ways. In terms of attitude, your presence. In terms of how you interact, your interaction style. So, if you think as you would say code switching 'tun up.' It's all of that…I don't, I don't sound Jamaican all the time but I can. And I, the way that I speak for me is about effective communication. Mi just tired fi people ask me wey yuh say? wey yuh say? Now I am in no way ashamed of patwa (Patois). I am in no way ashamed of my language. It is a conscious decision and its conscious. At this point it is kind of unconscious now, but you know what I mean. I don't feel the need to have to justify that to anybody.

Kathy easily weaved in and out of Jamaican Patwa during our interviews. Our exchanges included a form of mesolect—the mixture of our Caribbean dialect of Patwa and standard English (Patrick, 1999). So when Kathy said "Mi just tired fi people ask me wey yuh say? Wey yuh say? [I was tired of people asking what you say? What you say?] she was expressing her

frustrations of continually repeating herself, similar to how I did or Grace probably did during high school.

I consciously speak with the use of mesolect when interacting with people from the Caribbean; I also use mesolect when teaching mathematics or communicating with a stranger. Patricia, Kathy, and I make a conscious effort to make sure our words are clear. Enunciating with prosody when communicating and code-switching makes space for highlighting our culture. Hutchison and colleagues (2009) claimed that "nonstandard accents are often thought of less favorably than what is considered 'standard' accents, even when both accents are articulated with correct grammatical content" (p. 172). They suggested that it is not likely for people to ask someone speaking a "more admissible" English to change her or his accent, but the converse is probable. That is to say, Afro-Caribbean women as mathematics learners and as educators are positioned within the historical, social, and political power structures where the intersections of not only their race, gender, and immigrant status in mathematics classrooms are less favorable but also their language (Hutchison et al., 2009; Ibrahim, 2020).

Astina expressed similar sentiments about language acceptance in the United States:

> And so, my piece was well, what if I stay in K–12 and help directly with the children that I wanted to help with and bring more students that look like me, more children that sound like me, more young ladies that look and sound like me, into liking mathematics more and more. Sound like me meaning different, they may not speak the English that is often accepted by most. So, they may not sound, they may have a southern drawl. They may have from another country and it may not be countries that are accepted like a European country. It may be Haiti, it may be Haitian it may be someone from the Caribbean or someone from Africa so their dialect was different and not accepted either.

There are variations in language that impact global relationality and the nature of language, leaving room to incorporate multiple perspectives for what it means to speak internationally accepted standard English (Smith, Warrican, & Kumi-Yeboah, 2016). Afro-Caribbean women as learners and as educators actualized an awareness to this variety that they use as a tool when

heuristically reproducing their linguistic identity while helping others better understand their culture.

Rong and Preissle (2009) argued that Caribbean immigrants "not only emphasize their accents, cultural traditions and ethos, and work ethics" but also that Black Caribbean immigrants show optimism toward their future while maintaining their immigrant nationality (p. 197). Francis and Ramona reminded the characters and actors in their figured worlds where they are from in the following narratives, exposing their culture to people:

> FRANCIS: I'd also say that, I think that, I think for one, I think too I saw it as a privilege to kind of explain to people where I was from. Because they never heard of it often. People never hear of this place but it's exciting for me to kind of share that. And I wish I was a little bit more, I guess, willing to share my culture, where I grew up and have people learn more about where I'm from. I think it's helpful because some students again, don't get that experience unless they interact with some person from that place. And I would say too that I think bringing our Caribbean sense of, what's the word I'm looking for here, um, sense of purpose and hard work.
>
> RAMONA: A lot of people or even like my friends in [State University]. She was a Black female. She thought we had huts. And I am like what? Yeah, well cause what she saw on TV for the commercials for the Bahamas. And I said no, we don't live under huts. As much as they show the beaches and the palm trees, we do have houses and we have AC. And she laughed. But it highlighted that. But like I said, I used moments to help educate. Because sometimes as people try to connect they miss the moment. Or even when I was teaching in [state] one of my undergraduate students. She was a freshman. She grew up in rural [state] never interacted with anyone of color prior to coming to the university. And so, she was staring at me, staring at me—
>
> And I was like, "What happened?"
> And she was like, "You're different."
> I said, "What do you mean?"
> And the class giving her the dirty look, like she better not say something stupid.
> Am I like, "No, say it."
> Cause you know [the students] are trying to cue her.
> But I am like, "No, say it."
> She was like, "You're not like the people on TV."
> And I laughed. I was like, "No."
> Cause what happened was, I said: "No, every Black person is not going to be a comedian, and they are not going to act like that. That is a show. There are many educated, very variance," and you know.
> She said, "Ok, cause that is all I ever saw."

Francis and Ramona's narratives identified students both Black and White who lacked cultural competence from global, international frames of reference. Both women positioned themselves to educate others about their culture, their Blackness or immigrant-ness, maybe, by interacting with students or peers to make a connection about their ethnicity, race, or immigrant status. The shift in the global landscape in U.S. higher education means that the figured worlds of academia must improvise, increasing knowledge and understanding of the cultural, linguistical, historical, and social competency of its immigrant population. Afro-Caribbean immigrants as mathematics learners and educators are doing their part by increasing global awareness through their presence and educating others about their language and culture—their Caribbean-ness (Fournillier et al., 2013; James, 2001).

The U.S. higher education system is responsible for globalizing its students, faculty, and staff to deepen their knowledge about and perspectives of the world. But sadly, in some of the higher education institutions in which the participants work, they have become the Black representation, the social and global corrector of misinformation about non-White people, communities, and countries. But students need a global perspective to be informed citizens, faculty need a global perspective to be effective educators, and staff need a global perspective to be compassionate service providers.

Summative Remarks

In this data representation, analysis, and reflection chapter, I employed the dialogic and categorical approaches of coding to represent, analyze, and reflect on Afro-Caribbean women's narratives in this study. I applied Goodall's (2000) verbal exchange coding process to each participant's narratives for the dialogic approach. This approach involved coding the type of narratives (i.e., skilled conversations, personal narratives, and/or dialogic conversations) using

key moments to identify turning points, as well as reflecting on the meanings of the participants' narratives as they resonated with my experience. For the categorical approach, I used Charmaz's (2014) focused coding process to produce the categories that provided my reflective analyses of Afro-Caribbean women's experiences. The next phase was to illustrate who were the characters/actors and what were the key moments in the participants' stories and how did race, gender, and immigrant status positioned and re-positioned them differently in their mathematics and academic figured worlds.

Modern social constructs do not offer equal power, legitimacy, and authority to all voices and positionalities (Lather, 1991). Therefore, at the nucleus of this study are Afro-Caribbean women in U.S. institutions of higher education (re)telling, through narratives, their experiences as mathematics learners and as mathematics educators. Clandinin and colleagues (2007) stated, "narrative inquiry is a kind of inquiry that requires particular kinds of wakefulness" (p. 21), an alertness of the participants' and researcher's past, present, and future stories. The interpretations, the meanings of those stories are up to the researcher (me) given that the sense-makings of data are always already influenced by who does the analyses (Andrews, Parekh, and Peckoo, 2019). From a heuristic approach, I have presented here my interpretations, my meanings of the experiences of Afro-Caribbean women as mathematics learners and as educators in U.S. higher education. Given the current U.S. and global politics surrounding immigration, my efforts in highlighting the intellectual contributions of Afro-Caribbean women to mathematics, mathematics education, higher education, and to U.S. culture and society, in general, are more vital now than ever.

CHAPTER 6

SUMMARY, DISCUSSION, AND RECOMMENDATIONS

> You, as a White man, you're not going to tell me and you're not going to create structures to prevent me or try to shape my path. You're just not. You try it, you failed, and you gonna continue to fail. And so, you don't have a hold over me, nor do you have a hold over my child. What that means for me, is that I have to be vigilant. I am not in Jamaica. I am here. They create structures to create barriers and to make this more challenging and it just more of a struggle. And so, I have to be observant, I have to be informed, and I have to be vigilant about continuously, and yes, deliberately trying to break those barriers.
>
> –Kathy

Summary

This study was about the experiences of seven Afro-Caribbean women as mathematics learners and as educators who teach mathematics and mathematics education courses in U.S. institutions of higher education. This study was also about convincing readers that these experiences are necessary to shape and reshape the current literature on mathematics, mathematics education, and higher education, and ultimately, shape and reshape educational discourses in general. The geographic locations that formed and re-formed the participants' perspectives and experiences occurred in the Caribbean and in the United States. These geographical spaces inform how the participants perceive social and conceptual experiences in the context of being mathematics learners, and now mathematics educators. The research questions that guided this study were:

1. How do Afro-Caribbean women experience mathematics as learners, and as educators in the Caribbean and in the Unites States?
2. How do race, gender, and immigrant status position Afro-Caribbean women differently in mathematics as learners, and as educators?

3. How do Afro-Caribbean women make meaning of their social and contextual experiences that shape their mathematical identities (i.e. personas) as learners, and as educators?

Afro-Caribbean women's experiences in mathematics are artifacts of social science. As members of the Caribbean diaspora, Afro-Caribbean women have been integral contributors to the United States, specifically as educators. Their contributions, however, are hidden in the existent education research literature. In that, there is limited research that focuses purposefully on Afro-Caribbean women educators' experiences, in particular, or foreign-born educators' experiences, in general, resulting in limited knowledge about the experiences of educators who work outside of their home country (Beck 2010; King Miller 2017; Sy & Cruz, 2019). Similarly, in the existent mathematics education research literature, Afro-Caribbean women are again hidden figures. This body of research has yet to include in any meaningful way foreign-born or Afro-Caribbean women's mathematics experiences as learners or as educators.

Davies (2013) argued, "the decades of scholarship by black women, including the most recent accumulation of intellectual work in this generation on the intersections of systems of dominations—race, class, gender, sexuality, and so on—remain conceptually distant from the majority of scholarly endeavors" (p. 198). In my refusal to be conceptually distant, the scholarly endeavor presented here used figured worlds (e.g., Holland et al., 1998) and intersectionality (e.g., Collins & Bilge, 2016) as theoretical frames to make meanings of the unique experiences of these Afro-Caribbean women as mathematics learners and as mathematics educators. The figured worlds frame highlighted the shared social experiences, contextual meanings, and activities of Afro-Caribbean women that surrounded their pasts, presents, and futures. The intersectionality frame highlighted the domains of power and social inequalities in relation to

their positioning with respect to the intersections of race, gender, and immigrant status in their mathematics figured worlds.

Narrative inquiry was the methodology employed in the study. Narratives are meaning making structures that organize events and human actions into a whole (Polkinghorne, 1988, p. 18). The participants' narratives were a (re)retelling of the key moments that provided connections between how Afro-Caribbean women experience mathematics as learners and as educators. Data collection included dialogic interviews and documentary data. Data were analyzed for everyday experiences from the participants' positions as mathematics learners and educators using dialogic and categorical approaches via verbal exchange and focused coding, respectively. Heuristically, as the researcher, I included my mathematics experiences as learner and educator in the analysis as well. These processes in total allowed for constructions of individual yet collective meanings of the participants' (our) experiences within their (our) mathematics figured worlds.

The results of the study were a presentation of meanings that followed a timeline of the participants' (our) experiences from mathematics learners to mathematics educators. The meanings making of Afro-Caribbean women's experiences came from intersectional analyses of their (our) social and contextual positions in their (our) mathematics figured worlds. Establishing a collaborative relationship with the participants throughout the study encouraged a sense of individual and collective agency; using their (our) voices and their (our) experiences to create a sense of self and communal empowerment and authority that is absent in the current academic research and literature. In the end, I aimed to help readers understand why it is essential to have Afro-Caribbean women mathematics educators' experiences included in the mathematics

education literature (and education literature broadly) while highlighting one unique aspect of the immigrant experience in the United States.

Discussion

Responses to the research questions were provided in three different sections in Chapter 5. The narratives in the Dialoging Mathematics Historical Context with Afro-Caribbean Women section and in the Soliciting Mathematics Perspectives from Afro-Caribbean Women section portrayed varying ways in which the participants' experienced mathematics as learners and as educators in the Caribbean and in the United States. In maintaining a focus on what the Afro-Caribbean women participants *said* were their experiences, the narratives also addressed how race, gender, and immigrant status positioned them in the figured worlds of mathematics, both as learner and as educator.

The narratives reflected each Afro-Caribbean woman's historical, personal, and poignant stories that expressed the meaningfulness of her part of the whole perspective for what it means to experience mathematics as Afro-Caribbean immigrant women. The accuracy of data representation was vital given that Afro-Caribbean women rarely get to tell their stories—no matter how profound or unique the stories might be. At the micro-level, each participant possessed the core inclusion criteria (see Appendix B); therefore, appeared somewhat similar. But at the macro level—that is, the contexts, the politics, the cultures, the institutions, the birth countries, and so on—each participant was distinctively different. In the same way that the participants' experiences were scattered across different countries in the Caribbean, so too were their experiences scattered across different regions in the United States.

In the third and final section of Chapter 5, Reflecting the Results Afro-Caribbean Women's Mathematics Perspectives, are thematic subsections that represent reflective gazes into

specific experiences of Afro-Caribbean women as mathematics learners and educators (including some of my own). The categories in the mathematics figured worlds subsection included *figuring out the mathematics, setting back our mathematics*, and *fitting the mathematics script*. In these categories, Afro-Caribbean women recognize their mathematics passions and abilities as learners in the Caribbean, (re)tell experiences of mathematics mis-placement after migrating as learners to U.S. high schools, and reflect on their social positionings as students in higher learning settings. The academic figured worlds subsection, which included the categories *being the only Black girl*, *bearing the experience*s, and *finding mentorship in the academy*, presents narratives in which Afro-Caribbean women come to understand their social positionings at the intersections of race, gender, and immigrant status as mathematics learners and educators; narratives that share the daily survival tactics needed in U.S. institutions of higher education; and narratives that speak about the usefulness of mentorship. In the final subsection identity figured worlds, which included the categories *reinventing and reforming mathematics identity* and *what is your native language*, are narratives that show Afro-Caribbean women's agentic actions in becoming effective educators while exposing students, faculty, and staff to their culture and language.

The forever present and often mentioned "they" found throughout the narratives played a significant role in understanding how Afro-Caribbean women experience mathematics as learners and as educators in the United States. The they are the characters and actors of their storied narratives: administrators, teachers, professors, students, peers, and family and community members. Interactions with these characters provided the meanings to their mathematics experiences as learners and now as educators in U.S. higher education. That is, understandings of how their social and contextual interactions positions and re-positions them differently in their mathematics (and academic) figured worlds.

Within these social and contextual interactions, Afro-Caribbean women, as learners and as educators, shape their mathematical identities at multiple levels. Within their mathematics figured worlds, mathematical identities are shaped and reshaped by positioning characters and actors as well as by themselves. These multi-level mathematical identities are professional, linguistical, and self. How positioning characters and actors perceive Afro-Caribbean women's mathematics identities versus how Afro-Caribbean women self-perceive their mathematics identities creates a continuous shaping and reshaping of their identities within their mathematics figured worlds.

When Afro-Caribbean women enter the figured worlds of mathematics as learners, an actualization of their social positioning, based on practices witnessed, creates spaces for authoring their self-in-person now as mathematics educators. As the now actualized mathematics educator, Afro-Caribbean women become advocates in mentoring people who look and sound like them and use key moments as learning and teaching opportunities to educate others about their Caribbean figured worlds. Afro-Caribbean women shared moments of action that safeguard them against oppressive forces that contribute to praiseworthy and reproachful experiences. Being a triple Western minority is challenging. But as demonstrated by the participants' narratives, having a strong sense of self, knowledge, and purpose are useful in making oppressive moments teaching and learning opportunities rather than sources of distress in mathematics figured worlds.

Finding Purpose and Having a Voice

Through embarking on this journey, I endeavored to understand the experiences of Afro-Caribbean women in mathematics spaces, to expose our unsolicited narratives, and to highlight our presence in mathematics in higher education. However, participating in the study, in many

ways, framed my purpose and identity. These six Afro-Caribbean women through their narratives became my mentors through a collaborative journey of sorts. Their narratives and the analyses assisted me in finding my purpose. The participants and their narratives were an integrally part of that endeavor. As the successor of their imagined figured worlds of mathematics, these six Afro-Caribbean women have passed down unto me (and other immigrant woman) a sense of self to formulate agency. To actualize my agency, through these Afro-Caribbean women, as the novice researcher and mathematics educator, I have to confidently produce my own passage not only in the figured worlds of mathematics but also in the figured worlds of the United States.

If the imagined worlds are where Afro-Caribbean women's identity and agency are actualized, then the intersecting commentaries or guidelines from each participant's answer to the hypothetical question are essential. Here, I share the collective voice that resonated throughout the responses to the imagine question: If you were to give advice to a new immigrant woman from the Caribbean coming to teach mathematics in a U.S. college/university, what advice would you give that person? Afro-Caribbean women recognized the significance of the intersections of a strong sense of self, knowledge, and purpose in the figured worlds of mathematics. No matter how they are positioned, based on their social identities in mathematics figured worlds, they figure out their purpose and find ways to maintain their well-being. I believe the resounding advice found in the following phrases (and excerpts below) are all results of the actualization of the figured worlds of mathematics where Afro-Caribbean women find themselves now as educators: find your purpose, do not be afraid to be yourself, know yourself, a strong sense of who you are, work without being targeted, and trust your gut:

Astina: Find their purpose. Know what their purpose for in being there, take care of the professional piece. Find that purpose, make sure you're attending to it, but also make sure that both your purpose and your profession can work.

Francis: I think that's a plus in my job and I think it would be a plus in any job so don't be afraid to kind of be yourself even in a context where there are not many people like you.

Grace: So, you have to really know yourself. And that's one thing that most Caribbean people kind of know themselves but you do have those few who is kind of iffy. So, really have to do that. You have to be strong in yourself and know who you are.

Kathy: You have to have a strong sense of who you are. If you are struggling with that you're gonna struggle a lot. And what I mean is. Knowing where you come from and be proud of it.

Patricia: And that they would have to find a way to work without being targeted or pinpointed by the system. And I didn't allow the system to dictate in that way.

Ramona: Um, trust your gut. I mean always remember there are people who mean you well and then people who do not mean you well. I mean people are people, and so long as you trust your gut, do what makes you feel comfortable.

No matter the social capital one gained after migrating to the United States, social contexts including race, gender, and immigrant status became overpowering discourses to navigate. As Davies (2013) succinctly stated: "at the center of each narrative is the need for economic and personal well-being and a definable better life" (p. 2013). So, in an attempt at carving out my own space, while doing my best work as well as seeing the need for advocacy, is a form of self-actualizing to know how and why to be. Therefore, I am creating a world in the mathematics literature, my/our own space to be myself/ourselves while doing the best to advocate on behalf of women who look like my children and me. Presenting Afro-Caribbean women mathematics perspectives is my way of advocating for women like us through this research project.

I struggled with coming up with an "answer" for this project. There was no single answer for these Afro-Caribbean women's experiences, but being charged in the PhD program to conduct unique research, I was under the impression that there had to be an "it." What was it? What were the answers to the questions from their narratives? I found, however, that the solution was not what is the answer, but rather how did their experiences inform me, the discipline of mathematics, the academic research and literature. This research project, therefore, is for the researcher—for me. As one participant stated, part of being highly competent as a mathematics educator in the United States is to "have your place and be." But what if that place does not exist yet? Does one create it? I want to find my figured worlds, a space of authoring, a community, to be myself, to be competent, to get support, to do research, to have a strong sense of self, to work without being pinpointed, to trust my truth. According to Polanyi (1958), our stories—

> bring to light and affirming as my own, the beliefs implied in much of my thoughts and practices as I believe to be valid; that I must aim at discovering what I truly believe in and at formulating the convictions which I find myself holding; that I must conquer my self-doubt, so as to retain a firm hold on the programme of self-identification. (p. 267)

The participants' experiences validate that what I experienced as a mathematics learner, and now a mathematics educator, is true. My thoughts and practices are valid; this research supported formulating my voice. I began the project to attend to the omission of our voices from the mathematics education research literature. But before I could do so, I had to reclaim my voice by finding a collection of our voices, so that Afro-Caribbean women together could speak about the many facets of mathematics learning and teaching as immigrants in Western academies. A mere theory was not sufficient.

Nevertheless, before now, there was no existing literature to provide me with this validation. Thanks to this study and others to come, there will no longer exist a void of our presence, experiences, and contributions in the U.S. master narrative (Lather, 1991). Therefore, to develop future scholarship, we needed to create knowledge of our experiences for others in mathematics and similar spaces to identify with and to discover (Nkabinde, 2004). I agree with Trahar (2009), "in the context of the total episode (my research), the contribution of the stories and my understanding of them help me to understand the new episode (my experiences as a practitioner researcher in my current environment)" (p. 205). The stories represented here are neither the context of the total episode of the experiences and meanings making of the participants' nor are they a comprehensive representation of all Afro-Caribbean women in our positions. These stories, however, do help in understanding the next step as an Afro-Caribbean scholar in the disciplinary mathematics environment. This collaborative study projected a climate of mutual trust that included love, humility, authenticity, and faith that led to us naming our truths, to name our experiences—to write and rewrite our worlds (Freire, 2005; Tarditi, 2017). The naming of our experiences and the representation of those experiences are done in a humanizing manner. In my next episode, as a scholar, I can improvise knowing there now exists a collection of our experiences, a collection of Afro-Caribbean women voices in mathematics—an Afro-Caribbean woman's mathematics perspective.

This research is also for the general public, for immigrant women, and for the larger mathematics and mathematics education communities. Human agency is made through improvisation and self-directed symbolizations that offer different possibilities. As Holland and colleagues (1998) claimed: "If improvisations are significant means of renovation, which even the most powerful and hegemonic of social regimes cannot preclude, they are even more

significant when paired with another form of human agency: agency through self-directed symbolizations" (p. 277). This research is a form of self-directed agentive action in response to the sparsity of Afro-Caribbean women's experiences in the mathematics literature, turning unsolicited narratives into refigured figured worlds of mathematics. Our stories, our experiences will not become part of the academic research and literature unless we put it out there!

Honoring a community of Black immigrant women in the United States means acknowledging the overlooked power the community holds and exposing their narratives. Doing so is empowering not only for Black immigrant women but also for immigrants in general (Andrew et al., 2019). Fournillier and Lewis (2010) asked, "how did we consciously and unconsciously turn our gaze to the islands for the knowledge and strength to accept differences that serve to define and empower us as we developed into scholars with whom we could live?" (p. 155) A research project on the experiences of Afro-Caribbean women in mathematics learning and teaching spaces is my attempt at addressing the unnoticed immigrant Other. Therefore, to create a platform through this dissertation to share our experiences as well as to celebrate, highlight, acknowledge, and define the unnoticed immigrant Other is fulfilling work by which I can live.

Recommendations

The personal participation of the knower in the knowledge she believes to possess takes place with a flow of passion (Polanyi, 1958). The knowledge gained from Afro-Caribbean women passionately sharing personal past mathematics experiences and offering advice to another Afro-Caribbean woman about being part of the academic world is intellectual power that the mathematics community should possess. The master narrative of the U.S. education system in mathematics and mathematics education is not thorough (Lather 1991). The system benefits

from Caribbean immigrants as educators, but rarely offers exposure to their experiences in the academic research and literature. A lack of background of race and ethnicity in studies makes it impossible to answer questions about various ways of knowing, especially about the experiences of those born outside the United States (Banks, 1999; Hutchinson et al., 2009). Afro-Caribbean women's mathematics intellect and experiences are available, but only when purposefully emphasized by studies such as this one. We need more immigrant scholars studying immigrant issues and experiences in the United States.

Furthermore, institutions of higher education need to ensure that their faculty, staff, and students have a global perspective and competency on mathematics and mathematics education, and that the faculty who work in those spaces are beyond the normalized representation. According to Sy and Cruz (2019), "While there is little data about faculty and staff who work outside their home country, it is more important than ever for educational professionals to understand diverse perspectives" (p. 1207). When faculty are teaching mathematics to future teachers on how to teach mathematics, they need a global perspective about the ways mathematics is learned and taught across the globe (Young, 2003). When faculty are aware of cultural differences, then students may have less "shock" when the person in charge of the room has a diverse perspective and understanding. The following sections provide three closing recommendations of the study: expand the research perspective, increase positive immigrant representation, and create a legacy for our children and immigrants.

Recommendation 1: Expand the Research Perspective

Lather (as cited in Hassan, 1987) claimed that we make new knowledge of our disorders by becoming an "access route to a whole rethinking of the educational enterprise" (p. 41). To create a better world for all through knowledge, a neutral position with respect to social values is

no longer sufficient for transforming outcomes for human solidarity across cultures and for counteracting inequities of the monocultural hegemonic ideology (Lather, 1991; Wit & Leasky, 2019). One means of transformation and counteraction is through producing research for and by people who look like me and my children.

Afro-Caribbean immigrants in the United States must create our own spaces in research, regardless. We need to, according to Collins and Bilge (2016)—

> ensure that initiatives are chosen and reworked from the bottom up, in the case of people of color, by people of color who engage in dialogue with one another about the meaning of their experiences and how it fills out the term. (p. 186)

Many scholars consider research on such a small group of women too "narrow." But only when one is willing to "dig deep" can we begin to recognize the rich and unique yet too often hidden intersectional experiences that Afro-Caribbean women bring to the STEM fields, generally, and the discipline of mathematics, specifically (Fournillier, 2017). In digging deep, we come to learn that Afro-Caribbean experiences are noteworthy; and here, from the bottom up, we can narrate our work to find meaning and thus make our voices heard—refiguring research spaces.

Nkabinde (2004) noted that immigrant women scholars in the academy "must be able to identify a passion for some set of issues that will make a difference and explore those issues in order to benefit their communities, even in the face of opposition and critique" (p. 52). I have identified our missing narratives in the research literature, and I am using this dissertation to expose our mathematics experiences, to transform outcomes across cultures, and to counteract hegemonic ideology. To create a world where sharing talent, promoting cultural competency, and fostering intercultural understanding and respect will require a change in the way research

programs and projects are designed, whose knowledge counts, and nurture the values that are vital in a social inclusive learning and teaching process (Mills, 1997; Wit & Leasky, 2019).

An inclusion of the intersectional experiences and narratives of Afro-Caribbean women's social and contextual positions as mathematics educators in the figured worlds of higher education is a reworking of the academic research and literature from the bottom up. Our mathematics experiences as learners, and now as educators in the United States, bring new meanings to the structures of social and cultural positionings in mathematics learning and teaching. The quest for more globally integrated and conscious academic communities and literature will have to start with advocating for a holistic appreciation of the varying Black identities in the United States. Only when the United States comes to appreciate all the idiosyncrasies of Blackness, in all its forms—people, history, culture—will the value of Blackness truly be appreciated (Davies, 2013). But first the many narratives that exist in the experiences of Blackness will have to be solicited and exposed. Those experiences are only truly exposed when their value is not determined by any ruling domains of power but rather by mere existence as part of the human race. How many Black immigrant mathematics experiences exist that researchers have yet to solicit and add to the STEM, mathematics, and mathematics education literature?

According to Andrews and colleagues (2019), mainstream or majority (White) perspectives shaped the research that informs issues among racial and ethnic groups. They argued, "research that incorporates a racial and ethnic equity perspective could help reveal a community's power and dismantle power differentials that currently exists" (p. 8). The experiences of Black women with accents as mathematics educators in U.S. higher institutions are an essential message about the benefits of Black immigrants in the U.S. education system.

Documenting these experiences not only provides data to alter the current discourses about particular immigrants in the United States but also addresses the omitted narratives on the varying unique experiences within STEM fields. The literature on higher education or in mathematics has omitted the narratives, experiences, and perspectives of those who, if included, would offer a more enriching comprehensive knowledge about mathematics learning and teaching. Besides, these experiences broaden cultural competency among intuitional stakeholders.

Recommendation 2: Increase Positive Immigrant Representation

Positive representations of immigrants—particularly, immigrants of color—in U.S. institutions of higher education through cultural competency and mentorship needs to increase; it has yet to do so due largely to the current politics sounding immigration and because many colleges/universities simply do not have any real interests (Mills, 2007; Sharma, 2019). The current political climate that has created a rift on the political views about immigration curtails the possibilities of U.S. higher education focusing on issues that highlight the positive contributions of immigrants to U.S. higher education and beyond. Transformation in political influence can change how groups of people are positioned in society, and thus how persons view themselves and the world as they live it (Levya, 2016). People of color across the globe are positioned in situations where Whites can benefit by using, studying, profiting, and exploiting the very circumstances and lived experiences of people of color.

At the start of this project, I mentioned that the president called certain countries shitholes and by the end of the project, the president was telling four extraordinary congressional women of color to “go back.” Specifically, according to the president’s Tweeter feed, “why don’t they go back and help fix the totally broken and crime-infested places from which they

came" (Trump, 2019). Furthermore, our peers—faculty, staff, or administrators—who may have hidden yet similar sentiments are also given ammunition and implicitly encouraged to publicly and boldly articulate a go-back message. For instance, more than 1,000 students signed a petition calling for a University of Pennsylvania law professor to be relieved of teaching duties. The professor at the center of the petition had made statements such as immigrants are causing an increase of litter in U.S. communities; distancing of cultures so that the United States does not sink into third-worldism; giving applicants preference based on their ethnonational background; and "our country will be better off with more whites and fewer nonwhites" (Cohen, 2019; Flaherty, 2019).

The professor's statements and the president's Tweet about the congressional women—who are all citizens of the United States, three by birth and one by naturalization, and who are all considered Western minorities—are examples of why it is essential to solicit the learning and teaching experiences of Black women immigrant educators. We need more unsolicited narratives from immigrants of all diasporas who are integral parts of U.S. society and U.S. education systems. The solicitation is calling for positive representation, exposure, and inclusion—for Black women of immigrant status, more so in mathematics, now than ever before. Amid the Trump presidency, it is evident that there is a need to capture and share the experiences of immigrants in the United States in enlightening positions to counter the ignorant propaganda spreading in our society (Chen & Lawson, 2018). In other words, the solicitation matters to counteract the rhetoric of influential people trying to shape society's perception. If the most powerful person in the United States can say go back to U.S. citizens, then what will our mathematics students say to us as we teach?

In addition to conceal and carry gun laws on some college/university campuses, there is now the added open bigotry and xenophobia that faculty with accents must face within their work worlds. These issues further burden faculty of color with extra weight, adding to other "experiences to bear" such as macro- and micro-aggressions and workload and pay inequities. Afro-Caribbean women can add to the litany of issues: being a person of color in the United States, students having access to guns on campuses, and now add the possibility of dealing with peers and students who not only think but also are now not afraid to say, go back. This worry is not unfounded as a recent *Washington Post* study has shown a 226% increase in hate crimes in counties that hosted Trump rallies in 2016 (Feinberg, Branton, & Martinez-Ebers, 2019). Other than political leaders or professors, how many doctors, judges, police officers, or those who impact people's daily lives carry negative sentiments about people of color? Teaching mathematics in and of itself without any of these weighted experiences to bear is stressful enough.

The United States and what it stood for is no longer welcoming for Black immigrants. Not when the president refers to a country in the Caribbean region of the world as "shithole," while expressing the desire for more (White) immigrants from European countries like Norway (Solsvik & Knudsen, 2018). If one's knowledge of the United States is coming from the propaganda relayed successfully to the rest of the world, they are already misdirected. There is a need to educate oneself about the reality of being an immigrant in the United States and what social, political, and financial gives and takes result from one's position as a person from a Black populated third- or fourth-world country (Mills 1997). Davies (2013), a Caribbean woman, argued that it is essential to learn ways of "refuting normative understandings, especially the

ways that dominant racial discourses seek to naturalize themselves and incorporate new arrivals to help execute dominant projects" (p. 201).

Newly arrived immigrants entering racialized societies quickly learn their place in that society and either reify the system or find ways to dismantle those systems that are grounded in White supremacy (Treitler, 2015). Rong and Preissle (2009) argued, "because of the fourth wave of immigration, Black immigrants are becoming more visible in the United States, as their presence and activity increasingly reshape the social, cultural, and political landscape of this country" (p. 202). White supremacist ideology forces the perceived Westernized minority to know about the social and cultural practices of the perceived majority, but that majority is not responsible for being open to understanding and accepting of the Other (Hutchinson et al., 2009; Young, 2003). As the fourth wave of Black immigrants reshapes the social, cultural and political dynamic of the United States, this research project, and others to follow, about the mathematics experiences of immigrant women is one way to increase understanding and acceptance of other cultures while dismantling systems that reifying the omission of these experiences from knowledge (Davies, 2013).

Our narratives are vital not only to offer fuller and more positive representations of our experiences in the discipline of mathematics but also to combat the attack and ugly messages about immigrants coming out of the mouths of influential people whose ignorant ideologies spread quickly and cause subsequent harm. The idea of omission is more significant than learning and teaching in mathematical spaces; it is woven intentionally into and apathetically tolerated throughout the foundations and institutions of the United States.

Recommendation 3: Create a Legacy for Our Children and Immigrants

I am not fighting for a mere seat at the table, my humanity, mathematics prowess, and intellect already satisfied the prerequisites for my seat in the academy. Instead, I am fighting for a better world for my children. A socially equitable future so that when my children enter and complete college, they not only graduate with a degree but also have become more aware of their worlds' history as Black Americans with Caribbean parentage. Our children should have access to an education that addresses, examines, and postulates about national and global issues, complete with seeing an accurate representation of different faces and spaces throughout their education. How are educators and academic institutions prepared to take on the task of educating our children, when they still have issues with inclusion, equity and justice, omission of faculty's and students' experiences, "being the only Black girl," limited mentorship for faculty and students, inadequate globally consciousness, or issues in appropriately placing brilliant immigrant children and youth in mathematics courses?

My mission is to help our children understand how critical awareness serves them as Black women. I do not walk around with a PhD stamped on my forehead, hoping that people will see me as one of the "good" Black people; they only see my skin. The United States can make certain people feel like they must wear a sign of sorts to be seen, to be valued, but my humanity should be enough. It seems beyond belief that almost two centuries later, I must follow the example of Sojourner Truth, bare my breast and boldly ask White America a poignant and damning question: Ain't I a woman? Can my humanity not be recognized? For instance, California and other states should not have to pass laws for agencies not to discriminate against me for my locs. A PhD does not make me "a good Negro." It is atrocious to think that accolades,

money, or status buys one the benefit of the doubt about one's humanity, less than lethal force, or the presumption of innocence that many Blacks are denied based on our skin.

A message to our children and to newly-arrived Caribbean immigrants is to be wary of romanticizing the imaginary fantasy of what it means to be part of the United States. According to Grace, you will have to come out of your "Caribbean bubble" when you leave your country and drain it of precious resources—you. Davies (2013) proposed: "Nations and civilizations like to construct pretty narratives that mask ugliness because the national narrative comes to represent the founding aspects of the constructed national identity" (p. 179). The unknowingly buy-in to these pretty narratives hides the ugliness of White supremacy; there is an exchange with added experiences to bear. This exchange is the affordance of economic advantage in the United States but the costs include a peace of mind of one's intellectual ability, a strong and secure sense of one's belonging, and a volume of conscious and unconscious messages of one's worthiness.

To migrate here in the United States and work as an educator, especially in the subject of mathematics, means becoming an omission, an unsolicited representation. We fill the gap for the shortage of inclusion in U.S. higher education, but without the recognition, without "a seat at the table." As a Black woman—yes, Black, a color in the United States—whether or not one chooses to be, at least until the creation of a Caribbean American category on the census (Ibrahim, 2019) —we are part of the most educated demographic group in the United States (Osborne, 2016). In our immigrant Blackness, there exists power, voice, and influence. Our social and contextual positions as mathematics educators puts us on trial, but that is due to a lack of others *seeing* Black women in these positions. Thus, from Afro-Caribbean women's mathematics perspectives, have a strong sense of who you are, find your purpose, and trust your gut.

Therefore, educate, teach, learn, engage, but do so with compassion while building on and honoring the knowledge and awareness of self, the people we teach, the country we lived in and the country we now live, and master the game of which we are now a part (Anzaldúa, 1999; Davies, 2013). If our knowledge is embedded in White colonial ideology, then at least be conscious of it. Then become an advocate, not only in the figured worlds of mathematics but also in literature, in research, in higher education. What does all this have to do with learning and teaching mathematics? Whether or not one chooses to be a part of the game, we are in the game of being in a capitalistic White supremacist world while being Afro-Caribbean women with accents teaching mathematics in one of the most law and policy-driven parts of the U.S. government: institutions of higher education. Be aware of unrecognized exploitation masked in the virtuousness of education. Be ready to continually tune out the imported noise and confidently become an advocating agent who is not afraid to be a supporter of yourself, your children, and your people who look and sound like you while being a mathematics educator.

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APPENDICES

APPENDIX A

Email sent to Organizations, Mathematics Departments, and Persons of Interest

Hello,

I hope this email finds you well and best prepared for the start of a new year and semester. As a college and university mathematics organization, I think you are in a position to help me get to the next step in the doctoral process. My name is Dihema Longman—a Ph.D. student at Georgia State University. I am seeking participants for my research — your assistance is needed in identifying faculty members that are part of your organization who may fit the criteria of my study. The document in the attachment is a list of requirements for the research.

Do you know anyone who may fit these criteria? Do you have someone else in mind I could use as a reference?

Let me know. I appreciate any help you could offer on the matter.

Thank you.

Dihema R. Longman
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Participant Criteria:

- The participants must be born in the Caribbean region.
- The participant self-identifies as a Caribbean woman of African descent.
- The participants will have completed at least two years of high school in their country of origin.
- The participants will have earned at minimum a Bachelor of Science (or Arts) degree in Mathematics or the Mathematical Sciences, either in their country of origin or the United States.
- The participant is currently employed, holding their U.S. higher education teaching position for at least two years.
- U.S. higher institution includes any technical colleges, 2-year colleges, 4-year colleges, and universities in the southeast region of the country.
- The participant's primary responsibilities are teaching mathematics content courses, (including statistics and mathematics for elementary teachers), not mathematics education courses.

APPENDIX B

Participant Criteria and Acceptance Notice

Dear X,

You seem to meet the criteria for my research study titled: A Hermeneutic Phenomenological Exploration on the Experiences of Afro-Caribbean Women Teaching Mathematics in U.S. Colleges and Universities.

Here is a list for the criteria:

- The participants must be born in the Caribbean region
- The participant self-identifies as a Caribbean woman of African descent
- The participants will have completed at least two years of high school in their country of origin
- The participants will have earned at minimum a Bachelor of Science (or Arts) degree in Mathematics or the Mathematical Sciences, either in their country of origin or the United States.
- The participant is currently employed, holding their U.S. higher education teaching position for at least three years.
- U.S. higher institution includes any technical colleges, 2-year colleges, 4-year colleges, and universities in any region of the country
- The participant's primary responsibilities are teaching mathematics content courses, (including statistics), not mathematics education courses.

If you indeed meet these criteria and you would like to participate in this study, then please indicate by responding to this email.

Once I receive notice, you will get an email providing more details for how you will participate and start the communication process.

Thank you for your time and consideration.
I look forward to hearing from you.

APPENDIX C

Georgia State University
Informed Consent

Title: A Hermeneutic Phenomenological Exploration on the Experiences of Afro-Caribbean Women Teaching Mathematics in U.S. Colleges and Universities.
Principal Investigator: Dr. Janice Fournillier
Co-Principal Investigator: Dr. David Stinson
Student Principal Investigator: Dihema R. Longman

Purpose

The purpose of the study is to examine the experiences of Afro-Caribbean women mathematics educators in U.S. colleges and universities. You are invited to take part in this research study because you are a Caribbean born woman teaching mathematics in a U.S. college or university. A total of 8 people will be invited to take part in this study.

Procedures

If you decide to take part, three areas require your participation. The 3 activities are: written descriptions, interviews, and documents. You are required to provide written descriptions on 3 of your experiences as a mathematics educator; you are asked to participate in 3 interviews; you will also be asked to provide 4 pieces of documents that support your experiences as an Afro-Caribbean woman teaching mathematics in a U.S. college or university. Your participation in the study will span the course of the study, it will take up 7 hours of your time, and will be conducted during the Spring 2019 semester during January–May.

Interviews

Your first and ongoing activity for this study will be three interviews. These interviews will occur during the 5-month process.

Interview 1: This first meeting will serve as the first interview. This interview is an introductory session to provide the informed consent form, to ask you to provide the four items of documents, and to explain the written descriptions. It will last no more than 1-hour. You will not interact with any other person other than myself during these interviews.

Interviews 2 and 3: These next two interviews will each last 1-hour to answer questions about your experiences in teaching mathematics.

An email will be sent requesting an appropriate date, time, and place for each of these meetings. One week after this agreement is the scheduling of our meetings. The interviews will be conducted in a space such as a library (in a private room), a park, or the participant's home.

The interviews will be recorded with an audio recorder as well as a personal iPhone for back up. These interviews will be transcribed verbatim. You will not interact with any other person other than myself during these interviews.

Written Descriptions
Your second and ongoing activity requires you to provide two written descriptions. You are required to provide 1 or 2 pages of a narrative describing or reflecting on an event you experienced as a mathematics educator:

- Each description is a type 1 or 2-page narrative of the experiences on the written protocol.
- Each description should take 1 hour to complete

You will have 1 month to complete all 3 written descriptions. You can complete these narratives at your pace in a place that is at your comfort. I will collect these narratives either during the second or third interviews or via email. No other individual is involved in this process.

Documents
The participants will be required to submit four pieces of documents that support their experiences as Afro-Caribbean mathematics educators in U.S. colleges/universities. Participants will have one month to gather the items. Participants will be asked to provide the documents during the second or third interview meeting. No other individual is involved in this process.

Risks
In this study, you will not have any more risks than you would in a normal day of life.

Benefits
There are no direct benefits for people participating in this research study. The study may help us understand the perspectives Afro-Caribbean women who are mathematics educators in higher education institutions in the United States.

Alternatives
The alternative to taking part in this study is not to take part in the study.

Voluntary Participation and Withdrawal
You do not have to be in this study. If you decide to be in the study and change your mind, you have the right to drop out at any time. You may skip questions or stop participating at any time. You may refuse to take part in the study or stop at any time, this will not cause you to lose any benefits to which you are otherwise entitled.

Confidentiality
We will keep your records private to the extent allowed by law. The following people and entities will have access to the information you provide:
Dr. Janice Fournillier, Dr. David Stinson, and Dihema R. Longman
GSU Institutional Review Board
Office for Human Research Protection (OHRP)

We will use a pseudonym rather than your name on study records. The information you provide will be stored on a password- and firewall-protected computer. Documents will be stored in a

locked cabinet in my personal home office. When we present or publish the results of this study, we will not use your name or other information that may identify you.
The code sheet that links the name and data to identify you will be destroyed three months after the data has been collected and analyzed.
The audio recording will be stored in the locked cabinet in my home office. These recordings will be kept during the data analysis and three months after the study is complete.

Contact Information
Contact Dr. Janice Fournillier at 404-413-8262 or jfournillier@gsu.edu if you have questions about the study or your part in it or if you have questions, concerns, or complaints about the study.

Contact the GSU Office of Human Research Protections at 404-413-3500 or irb@gsu.edu if you have questions about your rights as a research participant and/or if you have questions, concerns, or complaints about the research.

Consent
We will give you a copy of this consent form to keep. If you are willing to volunteer for this research, please sign below.

_____
Printed Name of Participant

_____ _____
Signature of Participant Date

_____ _____
Principal Investigator or Researcher Obtaining Consent Date

APPENDIX D

Written Descriptions Protocol

Lived experience descriptions (LED) is an account of an experience as you lived through it (van Manen, 1990). These are descriptions done as though you are writing in a journal. The purpose is for gathering your thoughts, sentiments, narratives as you think of the sequence of activities that you experience. When you reflect on each experience, try to think of an example that stands out for its vividness. As you write please keep the following in mind: What are you doing? What are the students doing? What are your peers doing? What are you feeling? How did you handle that situation? What was the outcome?

Instructions: Provide a 1–2 pages reflection on any two of the given scenarios based off your lived experiences:

- Think of a mathematical concept that you learned in the Caribbean but also taught in the United States. Provide a detailed description of your experience when you learned this concept and then provide a detailed description of when you taught that same concept in the United States.
- A student makes an appointment during your office hours to discuss the topic that you taught in class. Describe in detail the exchange between you and the student.
- Reflect on a mathematics department meeting or event. Describe in detail your experience at this event.
- Describe in detail one of your experiences during a job performance review as a mathematics educator.
- Describe in detail your experience as you apply for tenure or promotion.
- Describe in detail your involvement in a mathematics or any professional organization.

APPENDIX E

Documents Database

A Hermeneutic Phenomenological Exploration on the Experiences of Afro-Caribbean Women Teaching Mathematics in U.S. Colleges and Universities

The documents you provide for this study will operate in different ways. My focus is to examine the materials not only based on what they contain but also on how they are manufactured and how they function in your world as an Afro-Caribbean woman teaching mathematics in a U.S. college/university. The following list of items are examples of what to provide that will serve as data for analysis. If you have other documents than what is listed that you would like to share, then you are welcome to supply those instead.

Possible documents to share:

(a) Syllabus
(b) Curriculum Vitae
(c) Project(s)
(d) One piece of publication (such as a book chapter or journal article)
(e) One presentation piece
(f) Any piece of artistry possibly from your home country

APPENDIX F

Interview Protocol

A Hermeneutic Phenomenological Exploration on the Experiences of Afro-Caribbean Women Teaching Mathematics in U.S. Colleges and Universities

Date: Time:

Institution:

Interviewee (Title and Name): Interviewer: Dihema Longman

A: Interviewee background information

B: Afro-Caribbean women perception about mathematics

C: Afro-Caribbean women perception as immigrant professional educators

D: Follow-up questions

Introductory Protocol

To facilitate my note-taking, I would like to audio tape our conversations today. For your information, only researchers on the project will be privy to the tapes, which will be eventually destroyed after they are transcribed. In addition, thank you for signing the informed consent devised to meet our human subject requirements. Essentially, this document states that: (1) all information will be held confidential, (2) your participation is voluntary and you may stop at any time if you feel uncomfortable, and (3) we do not intend to inflict any harm.

Thank you for your agreeing to participate.

I have planned this interview to last no longer than one hour. During this time, I have several questions that we would like to cover. If time begins to run short, it may be necessary to interrupt you in order to push ahead and complete this line of questioning.

Introduction

Thank you for agreeing to share some of your stories. The research is to explore the experiences of Afro-Caribbean women teaching mathematics in U.S. higher institutions. These experiences will highlight the perceptions of Caribbean born educators, as Black immigrant women, teaching in the field mathematics. Your perception might inform the research community about Caribbean born women's presence in the field which can include some of the impact, rewards, challenges, and influences that you experience as a STEM educator. The study is to broaden the body of knowledge on Caribbean faculty teaching STEM subjects, whose experiences are not well represented in the literature, particularly in the field of mathematics.

A. Interviewee Background

1. What is the range of your age? 20–29; 30–39; 40–49; 50–59; 60–69.
2. Are you single, married, divorced, in a relationship?
3. Which country in the Caribbean is your origin on birth?
4. How long have you been living in America?
5. How often do you visit your country of birth?
6. What is your highest degree?
7. What is your field of study?
8. How long have you been in your present position?
9. How long have you been at this institution?
    - Did you teach anywhere else?
    - Are you tenured, tenure-track, part-time?
10. Tell me about your moving from your birth country to the United States?

B. Afro-Caribbean women experience teaching mathematics

1. Tell me about your experience as a mathematics educator in higher education
2. Why mathematics, why not any other subject?
    Probe: Tell me about your relationship with the subject of mathematics
    Probe: How is mathematics different for you than other subjects?
3. When did you notice mathematics would become part of your career?
4. Tell me about any differences or similarities between how you were taught mathematics and how you teach the subject now?
    Probe: Explain what you mean by?
    Probe: What was that experience like
5. Did you teach mathematics in your country of birth?
    Probe: Tell me what that experience was like for you.

C. Afro-Caribbean women experience as immigrant professional educators

1. Briefly describe what you think is your role as an educator.
2. How would you describe as your teaching style?
3. Tell me about your students.
4. Describe a typical day in the classroom.
5. Tell me about some of the activities you engage in outside the classroom. Off campus. In your community.

D. Following up question

1. What advice would you give to newly immigrant educators moving to this country?
2. What name would you like to be called in the study?
3. Is there anything else you would like to share?

APPENDIX G

Participants' Communication Log

Patricia

• Patricia was suggested by myself as I recalled working with her
• Contacted P1 by email
• Contacted P2 by email to set up first interview 01/29/19
• Met with P3 at 5:45 at Wesley Chapel Library on 2/12/19
  o We signed the consent form
  o Provided P1 with the Written Descriptions
  o Provided P1 with the Documents to gather
• Sent out a thank you email for first interview
Will send email to meet again in March
• Schedule to meet March 18th at 1 pm for 2nd interview
• Competed Second interview on March 18
• Contacted Patricia for thank you and update on research March 25, 2019

Grace

• Grace was suggested by a professor at GSU
• Contacted P2 be email on ….
• Contacted P2 by email to set up first interview 02/11/2019
• Will meet for first interview at Clarkston Library on 02/19/10
  o We signed the consent form
  o Provided P2 with the Written Descriptions
  o Provided P2 with the Documents to gather
• Sent out a thank you email for first interview
• Email to set up 2nd interview on 03/04/2019
• Will meet again in 03/26/2019 library

Kathy
• First contact on • Sent consent form, written descriptions, and document on 2/19/2019 • Communicated via email to meet on Zoom on 02/26 • Conducted Phone interview on 02/26 (Participant was in car coming from a meeting) • 03/13/2019 email to set up 2nd interview • Sent out a thank you email for first interview
Ramona
• Received Ramona from a dissertation committee member • First contact on 2/18/2019 via email about participating • Sent consent form, written descriptions, and documents on 2/18/2019 • 02/18/2019 set up a meeting for first interview on Friday February 22nd at 5 pm on Zoom

- Provided informed consent
- Sent out a thank you email for first interview

Astina

- Received Astina from a dissertation committee member
- First contact on 2/18/2019
- email P5 to see when is good for Zoom
- Send consent form, written descriptions, and documents on 02/28/2019
- Meet on hangout video conferencing on March 2, 2019
- Sent out a thank you email for first interview
- Sent communication email 03/13/2019

Francis

- Received Francis from a person of contact at a conference
- First contact on 02/15/2019
- Sent email to meet and include consent form, written descriptions, and documents in the email on 03/04/2019
- Set up first meeting on Zoom for March 19th at 12 noon

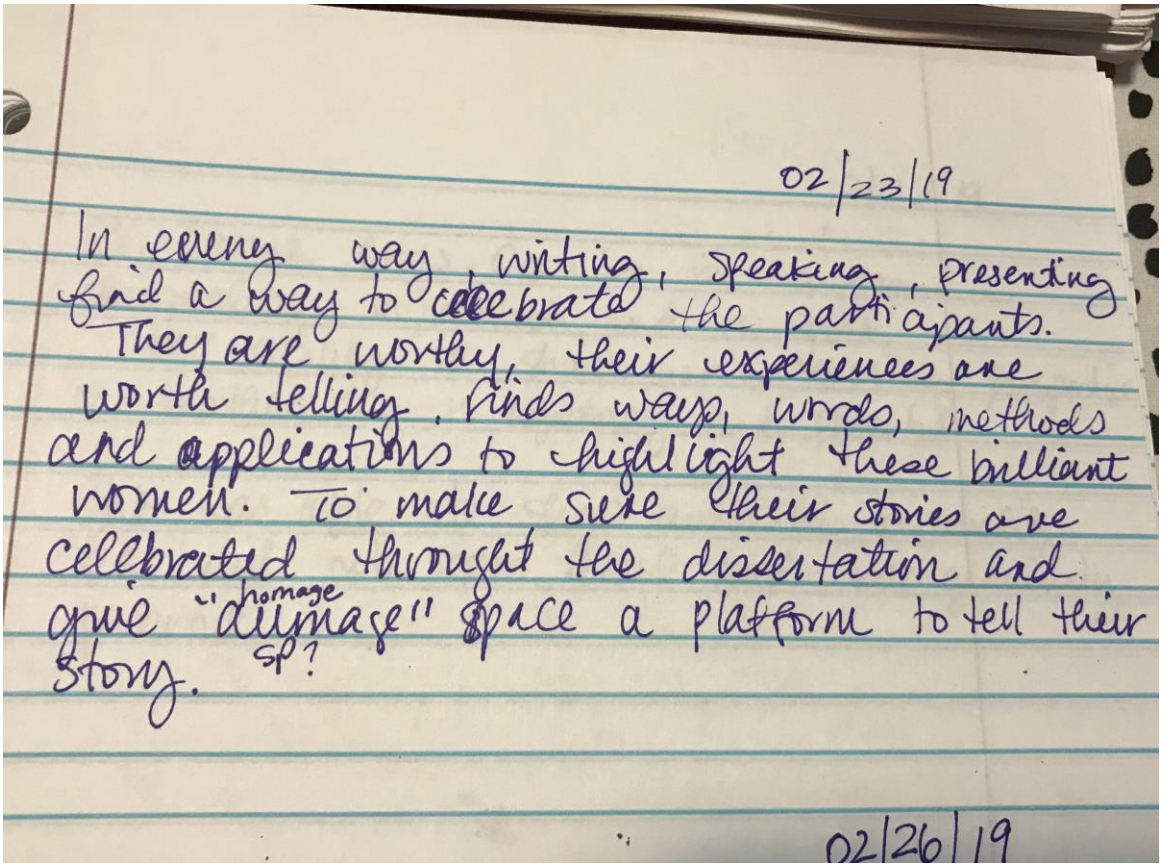
APPENDIX H

Participants' Document Log

Participant	Signed Consent	Documents
Patricia	Yes	CV Art work WD (Written Descriptions) Article (masters) Syllabus
Grace	Yes	CV Presentation Worksheets Art Poster Syllabus
Kathy	Yes	CV Syllabus Journal article PP presentation Class project Class activities
Ramona	Yes	CV Syllabus Presentation Article WD (done in video for each scenario)
Astina	Yes	CV Bio Article Syllabus Art Poster
Francis	Yes	CV Class Projects Syllabus

APPENDIX I

Example of Research Journal Entry



This photo is a page in my dissertation diary. I wrote this during data collection to remind myself of how important it is to represent the participants' stories in a celebrated manner.
The spelling of the word homage, as you can see, caused some trouble for me. Language, including grammar and phonic with terms despite my mathematical ability, is still an issue. This issue is particularly evident because I am in a world where hearing how the word is different than how it is spelled phonically. For instance, the word water, pronounced with a 't,' I hear 'wader' pronounced with a 'd.' In the same manner, 'aumage' is how I hear the word being said, though it is pronounced 'homage' as home. These thoughts might be another dissertation.

APPENDIX J

Interpretations of the Participants' Turning Points

Participant	Historical Context	Soliciting Perspectives
Astina **PN, SC, DC**	• Math is an untapped discipline and we are strategically left out • There is a message when you do not see people like you teaching the subject • Mathematics is used as a filter instead of pump • The only Black girl in the mathematics classes in college • The slave and slave master as mathematics educator • Noting the danger and devastation for Black girls not to have support • Astina became encouraging to students in her position • Makes a connection with students because her professors did not connect with her	• Finding your purpose, understanding who you really are • Finding allies, mentorship, people willing to help (someone from the Caribbean) • Knowing your mathematical content and how to teach • Academia is not an easy space, but a closed community • You are still fighting for a seat at the table • What they write does not necessarily match their belief.
Francis **PN, SC, DC**	• Reinvent my teaching • In the Caribbean there's an emphasis on procedures and shortcuts • The need to emphasize conceptual understanding • The need to understand the *why* in mathematics teaching and learning • Understanding the big pictures and looking from a different perspective • There is still an emphasis on results (getting a grade) • Challenge with teaching adults is people paying attention (student engagement)	• Bringing a different perspective to the American context • Caribbean people can empathize and understand also being a person of color in the U.S. • Caribbean people don't bring the same experiences to bear giving Caribbean a plus • Understanding why people of color have concerns and attitude toward the academic environment • Understanding the history, equity and history of equity in this country for people of color • Try to be supportive and understanding why students come to class unprepared • Bringing our Caribbean sense of purpose and hard work • Don't be afraid to be yourself even where there are not many people like you
Grace **PN, SC, DC**	• Had a rough time transition to the United States socially in high school • Was set back in mathematics class (mathematics placement) • The school had to move her to a higher mathematics course • Schooling in the US was easy, easy to make all A in everything • The opportunity to re-do test was weird • Made fun of for accent	• Soften up and adapt • Prepare for differences in teaching • Expect disrespect but don't take things personal • Be mindful of race and gender issues and how to deal with these issues • Be on your toe as black woman teaching mathematics and stand your ground • Know what resources you have to help as female in the academy • You are dealing with a lot, you are fighting, and you are not sitting at the table • Be confident and know who you are

Kathy **PN, SC, DC**	• Mathematics was fine and easy, could easily engage even if the content was challenging • trying to figure out why the procedures and making sense of why the procedures work • professors don't really teach anything • despite the horrible teachers still liked mathematics • mathematics was always pleasurable, and teaching was just the greatest thing ever.	• Having strong sense of who you are and be open minded, else you will struggle with a lot • Recognize things can be different and still be fine, and be ok with never being understood • Carve out your own space to be yourself • Bring the good parts of who you are to the space • Code switch in multiple ways (attitude, presence, interaction) • This community (U.S. and higher education) is very independent minded community • Be competent in your job and do it well
Patricia **PN, SC, DC**	• didn't know why she was good in mathematics and science • teachers and administrators shuffled students in math or science areas • all-girls, where girls were not supposed to be engineers back then • husband influenced her to go into teaching choose mathematics • students didn't have much say in the matter / parents didn't have much say in the matter • knew mathematics would be part of her career in high school	• We have a different accent and it is not received well • Speak and enunciate so they will understand • Have concern for how you communicate with students • Get familiar with the mathematics methods they use as they may be slightly different • Adjusting to doing mathematics with calculator • to find a way to work without being targeted or pinpointed by the system • if you must go against the grain there's a good way to do it and there's a bad way to do it.
Ramona **PN, SC, DC**	• professors never guessed she would have perfect score in mathematics class • only black female in class, her scores are too high to be a black female • professors have naïve perspectives on students who are dominant in mathematics • we see the world based on our own interaction and realities that creates unintended harm based on lack on insight • faculty act with lack of awareness of students' differences	• Trust your gut and do what makes you comfortable • Be true to yourself and do put yourself in a space where you do not fit in • Assess what is important, Family, love of God • Find a balance between family and work • Always do your job • Don't take on too much else you will get burned out • Keep your joy, don't lose your smile, your smile is your strength • Don't look for their approval • They may make you feel obligated, don't shuffle your life to please people