

**MYSTORY/OURSTORY: USING HEURISTIC INQUIRY AS A TOOL FOR
EXAMINING THE RESEARCHER'S ROLE IN THE STUDY OF
CARIBBEAN-BORN WOMEN IN THE FIELD OF MATHEMATICS IN THE
UNITED STATES**

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Abstract: *This paper focuses on the researcher's journey of be-coming a mathematics educator. The reflection on the process is an integral part of a broader dissertation research study with which this paper does not deal. It however provides an outlet for the dialogue with one of the advisors and co-author and the resulting paper. Using heuristic (Moustakas, 1990) as the methodology and figured worlds (Holland et al., 1998) as the conceptual framework, the authors examine stages of the mathematical experiences and pedagogical practices that contribute to the student researcher's identity and agency. This paper is important to the process of learning about self as one goes through the dissertation research process.*

Keywords: *mathematics education, Caribbean women, teaching and learning, figured worlds, heuristic, agency, identity*

INTRODUCTION

Throughout this paper, we discuss stages in the student researcher's life that we call "moments". The stages include primary school, high school, graduate and post graduate school. It is indeed the writing process (Richardson & St. Pierre, 2005) that allows us to examine issues related to identity, agency and the journey toward be-coming a mathematics educator. Certainly, an understanding of the process of learning about self

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is important to a heuristic methodology (Moustakas, 1990) that is an essential aspect of the ongoing dissertation research process. In this paper we describe and discuss the social and cultural practices and activities that contributed to the student researcher's understanding of identity and mathematical agency during the dissertation process.

We agree with Holland et al. (1998), who argue that identity gained within figured worlds are historical developments that are defined by social activities that contribute to agency. Holland et al. (1998) define figured world 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). Through figured worlds one can share historical and current experiences involving people and social interactions in one's life. They facilitate the unfolding of significant moments of mathematical experiences and spaces where one becomes aware of one's personal identity and agency (Holland et al., 1998).

In these worlds (spaces), the student researcher was able to mediate for herself and others acting not only as the agent, but also as the beneficiary of the acts of others agents in social encounters. These social interactions and activities became valued aftermaths and contributed to her journeying to become a mathematics educator. The dialogic moments allowed for discussion and a sense of self-discovery into the social experiences and pedagogical practices in the 'figured worlds' that "*happen* as social process and in historical time" (Holland et al., 1998, p. 55). Heuristically, through dialogue, this paper guided the reader through stages of life and included immediate and distant past practices and activities that influenced the researcher's identity and mathematical agency (Holland, et al., 1998; Basu, 2007).

"Figured worlds" fits well with heuristic methodology that Moustakas (1990) describes as "a way of engaging in scientific search 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). Furthermore, heuristic methodology supports sharing the researcher's personal experiences in the dissertation research on Afro-Caribbean women mathematics educators. The heuristic process also allows for dialoguing about self to understand the collective experiences of the participants in the dissertation study (Longman, 2020) that the researcher is currently implementing.

We all have stories; and the products of those moments 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). Choosing to share these particular moments is essential to the process of contextualizing the researcher's sense of meaning on the journey to be-coming a mathematics educator. Indeed, Holland, et al. (1998) argue that, "One's history-in-

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person is the sediment from past experiences upon which one improvises, using the cultural resources available, in response to the subject positions afforded one in the present" (p. 18). We therefore agree that human agency comes through authoring these moments presented below. It is these moments that facilitates the researcher's response to the social, contextual, and cultural positions in her everyday world (Holland, et al.,1998).

#Moment 1: The Journey Begins in a Kingston Town

At home in Jamaica from a young age, my mother, my first teacher, laid the foundations for the development of my identity and agency. Identity, according to Holland et al. (1998), "traces our participation, especially our agency, in socially produced, culturally constructed activities" (p. 40). It was no coincidence, therefore, that as I reflected on my journey to be-coming a mathematics educator, 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. Immediately, my mother began clapping at them. 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 dialogue is the beginning of the Jamaica moments when I realized that I was practising identity and agency. During these experiences, I was figuring out the world in a social and cultural aspect of the world while gaining a sense of who I was as learner of mathematics. It is clear that this moment provided the foundation for the other moments that followed.

#Moment 2: I Will Take No Excuse

I go to the board to do the problem. I write out my steps diligently and carefully because I had practised 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 answer right. 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 wha 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 my 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.

According to Ladson-Billings (1997), "Mathematics function as a feared and revered subject in our culture. 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 (Ibrahim & Alkire, 2007). Sir knew that if the other students thought "I" got it wrong, then they would want to give a different answer. He wanted the students to be confident when they know that they are correct. I was the guinea pig! I got a whipping for no reason at all! My answer was correct, but I was used as an example to test the class. However, this experience also made me realize, in its warped way, that Sir knew of my mathematics subject agency, and helping me to identify with empowerment from the 6th grade (Ibrahim & Alkire, 2007; Martin, 2009). Empowerment, conceptualized in this paper as the ability to gain power in spite of opposition from those with whom one interacts, offers people the opportunity to exert agency fruitfully in institutional environments (Founillier, 2012; Ibrahim & Alkire, 2007). Sir was a very strict teacher with a no-nonsense reputation and an "I will take no excuse" attitude known for getting students into "good" high schools (Cross et al., 2011). He named his belts, and "him lick dem hot". His approach meant that no matter the circumstance or situation of our lives at home, he had expectations of us in the classroom and we had better not disappoint.

Outside of Sir, my mother helped with practices to exert agency and identity at school. According to my mother, "yuh naw go waste mi hard-earn money fi come inna di house wid nuttin pass C." (You are not going to waste my money coming into the house with a grade below a C). My mother was the only source of household income, and she had to pay for all schooling. Therefore, to come home with mediocre grades would be unforgivable and ungrateful. Just like Sir, she had a no-nonsense attitude and high expectations of me in school with all subjects. Nonetheless, mathematics remained my favorite subject to learn in school despite the strict school environment and high expectations from my mother. My introduction to counting by my mother and

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experiences such as the one with Sir were the developmental stage of my agency in mathematics as a powerful learner and deep thinker engaging in the subject that continued during my world in Jamaica (Basu, 2007).

#Moment 3: Coming from the Garrisons

My high school in Jamaica is where I developed an awareness of my social positioning in relation to others and the environment. The high school had great expectations too, as its motto “Through Difficulties to Excellence” framed the all-girl Catholic school’s high demands as its motto. Although I knew the privilege of attending that school – considered one of the best all-girls school in the country –at times, there was a sense that I did not belong. The only worlds I knew were in Kingston, Jamaica, and these included my surrounding community and people like my family who spoke and acted like me, like my family. My summer highlights and social encounters included running around barefoot outside in the road with other kids, playing dandy-shandy (a game), making sure that the house was clean when my mother got home from work, and going shopping downtown. To one growing up within the city of Kingston, the high school and its surroundings were different from my communities. I had to take three buses to get to and from school every day.

Holland et al. (1998) state that figured worlds “provide the context of meaning and action in which social positions and social relations are named and constructed. They also provide the loci in which people fashion sense of self – that is, develop identities” (p. 60). Positional identity in figured worlds, according to Holland et al. (1998), is how one identifies one’s position relative to others, mediated through the way one feels comfortable or constrained (p. 127). I realized now that my high school was the first place where I recognized that coming from those neighborhoods meant we were poor, we were from the “ghetto” or the “garrison,” and that was not a good thing (Jaffe, 2013). This was news to me, as prior to high school, I was unaware of these social and class constructs. This consciousness is important because it is where I germinated my relationship with mathematics as my subject matter agency (Basu, 2007).

Additionally, in my development as a mathematics learner, I believe that my dialect exposed me – mi chat Patwa, mi chat too bad. Language, 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). It was in high school that I began to lose my voice, shutting down, and not wanting to speak or write. One girl playfully called me “ghetto” girl. I did not want those with whom I learned to hear me talk “bad” and I did not want them to know from my writings that I was poor. The thought that I was smart did not matter anymore; every student there was smart, some even brighter. Nonetheless, I recognized then that I was getting the same education that they were getting, so calling

me that didn't matter. However, those moments explain why I relate to mathematics so well. With mathematics, we were speaking the same language. Holland et al. (1998) explain:

The dialect we speak, the degree of formality we adopt in our speech, the deeds we do, the places we go, the emotions we express, and the clothes we wear are treated as indicators of claims to and identification with social categories and positions of privilege relative to those with whom we are interacting (p. 127).

My voice – speaking or writing – did not matter when I was doing mathematics; we were going to get the same answer. I think that, in that way, in my mind, I related more to mathematics than to any other subjects. According to Martin (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). It was through mathematics that all students and I were equal; through mathematics, I was not different, and our voices were the same. We had the same story. And so, mathematics became what I enjoyed doing, and mathematics became part of my identity.

The three levels of mathematics education I received in Jamaica were basic, primary, and high school. My mother and other educators played the most influential roles in introducing memorable and poignant activities and pedagogical experiences I encountered on my journey of be-coming a mathematics educator. These early school experiences were practising moments for my identity and sense of self, including my belief in my mathematical agency (Holland et al, 1998). I learned to exert agency and its expansions such, as empowerment, self-efficacy, autonomy, and self-confidence whereby I practised the ability and freedom to act on behalf of my values to achieve goals (Fournillier, 2012, Ibrahim & Alkire, 2007). I therefore brought with me a strong sense of mathematics agency with the foundations and joy of learning the subject mathematics when I migrated to the United States at 15 (Basu, 2007; Martin, 2009).

#Moment 4: Getting the Sense of a New World

The "sense" I developed over time about my world in Jamaica and the subject matter agency in mathematics was challenged when I migrated to the United States (Holland et al., 1998; Basu, 2007). The challenge was due to a difference in context with the students, the education system, and mathematics pedagogical practices. As an immigrant, I struggled with the reality of all the worlds I was trying to figure out. My high school experiences in the United States affected my identity and agency as they were vastly different from those in Jamaica. I was reforming contextual practices and pedagogical activities that shaped my identity as a learner of mathematics in Jamaica (Holland et al.,

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1998). There were social and environmental modifications with the students, the school system, and the mathematics instruction which all 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).

Some of the best and worst aspects of the US schooling system involved the students who displayed their identity and agency in clothes, cars, and interaction with teachers. We wore uniforms to school in Jamaica. However, in the United States, what students wore to school was now a decision factor. In Jamaica, I took three buses to school. Here, the bus comes to your neighbourhood for free, or more privileged students drove their cars. Plus, the teacher-student interaction in the United States showed a lack of respect in comparison to the teacher-student interaction I was accustomed to in Jamaica.

Also, the school system was different. Holland and colleagues (1998) explain that reforming figured worlds requires detaching from significant everyday events that are tied to past experiences. The Jamaica process I was accustomed to was different from the “free-flowing” high school system in the United States. For instance, in Jamaica, students stayed in their classrooms and the teachers came to their room. However, in the United States 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. In addition, this process created opportunities to waste time with chatter and conflict in the hallways as students were exchanging materials at their lockers as they moved from class to class.

Again, my dialect socially positioned my immigrant status. For individuals to understand, I had to speak only English, but now it was with a heavy accent. The mere hint of a dialect made individuals confused and added to my being conscious of my accent and speaking clearly. Hence, I was constantly repeating myself for them to understand (or try to understand). My accent fascinated some individuals, so repeating things was for their amusement. I did not master the idea of “code-switching”, and so speaking was an irritant and added to the many challenges I was already experiencing (Sadao, 2003). Figuring out these new worlds challenged my sense of self, and again, I wanted to lose my voice.

Finally, finding the appropriate mathematics class took some time. Mathematics placement is one of the ways of racializing and marginalizing Black students in United States educational systems, no matter their origin or level of assimilation (King Miller,

2017; Gutierrez, 2016; Waters, 1999). In Jamaica, the subject was just called mathematics; there was no algebra, geometry, precalculus, or calculus. As such, when asked what mathematics I took, telling administrators I already knew 'algebra' did not come to mind. The school wasted time – half a semester – placing me in Beginning and Advanced Algebra, determining later that my mathematical level was more advanced and then placing me in Precalculus & Trigonometry.

I think Pre-calculus & Trigonometry class was the first challenging experience to my mathematical identity and agency. Pre-calculus & Trigonometry, typically the last class for students, was my first class shortly after migrating, and I was learning the concept of two courses in one. A high-ranking instructor taught the class and she expected me to rise to the standard of the class with students who were not dealing with half the challenges I was as an immigrant. In that space, the subject that I loved and I thought I knew so well all of a sudden changed. The woman who taught me pre-calculus and trigonometry would sit at the overhead projector with her markers, a roll of paper towels, and a spray bottle to teach the class. I needed help adjusting to the mathematics teaching style and space. However, my knowledge agency – the desire to learn new ideas – was the one factor that I had some control and power over (Basu, 2007). Therefore, when trigonometry class became demanding, I went for tutoring every morning with my teacher.

Nevertheless, at the end of the semester, the teacher said, "You know, Dihema, you are such a hardworking student, I am recommending you to Calculus". The next semester I took Calculus with the same teacher and continued my early morning extra lessons. In the same way that I operated in Pre-calculus and Trigonometry, I would practise every problem in the book, learning the variety of problem sets and operations. I regained confidence in myself. I was understating better how things operated, and I was adjusting to life in the United States. Calculus was less challenging than Pre-calculus and Trigonometry, so I think my identity and agency in mathematics returned, and I got an 'A' in Calculus. Mathematics returned to the figured world as I imagined it, and I was regaining a sense of a vigorous mathematical identity and agency (Holland et al., 1998; Basu, 2007; Martin, 2009).

#Moment 5: Challenging My Mathematical Agency

He 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 on 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 to solve.

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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 from what I was accustomed to experiencing. One privilege I carry as a learner of mathematics is that most people encouraged and validated me for being a hardworking student. Therefore, his assessment of my ability to major in mathematics at college was a challenge to my mathematical agency 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 exist separation and inequality in gender, race, class, and ethnicity (Damarin, 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. And here I am again still addressing this challenge as I design and implement a research study about Caribbean women as mathematics educators in higher institutions.

I viewed the challenge from the next-door mathematics teacher 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 societal barriers would make it difficult for me –black, woman, or maybe immigrant – to successfully complete a college programme majoring in mathematics. Identities take an intimate form in a political process (Holland et al., 1998). Most teachers rarely see their daily decision and interactions with students as political or as reifying social constructs (Gutiérrez, 2016; Ladson-Billings, 1997). Ladson-Billings' (1997) statement that "our cultural portrayals of the mathematically adept are White males with horn-rimmed glasses and plastic pocket

protectors" (p. 699) may be the image that the next-door mathematics teacher had in mind. Therefore, since that dialogue was our first interaction, his assessment had to be that I did not fit the cultural representation of someone who could do mathematics.

#Moment 6: A Master's Student Acting as a Teacher

With the practicum semester for the master's programme, I was preparing to enter the world as a mathematics educator. Already earning a Bachelor of Science (B.S.) on my birthday, I started a Master of Education concentrating in Mathematics Education. The master's programme introduced me to mathematics in a vastly different way. My figured world perception of the subject changed; mathematics became more complicated when I learned that it was a tool used to deny people like me access to specific spaces. In the master's programme, learning mathematics did not involve rules, procedures, and solving problem sets in the back of the book. Academically understanding the social aspects of learning mathematics, it was no longer purely a subject for schooling, but also it involved race, gender, prison pipeline, language, privilege, diversity, access, and gatekeeping (Hottinger, 2016; Ladson-Billings, 1994; Stinson, 2004).

The programme required understanding how mathematics was socially constructed and the ramifications of how mathematics is used as a subject in schools and society. The master's programme highlighted the many pitfalls involved when people are denied access to the knowledge of mathematics and the many opportunities this knowledge can offer. I loved learning the subject mathematics because it helped in forming my identity and agency, but through my master's programme, I understood that I had unrequited love. I learned that mathematics was one of the activities and practices used to exclude people like me – black, gendered, immigrant – a form of Western marginalization from certain spaces or from gaining certain knowledge (Holland, et al., 1998). In this moment, I returned to the figured world of high school, not as a student, but as a practising mathematics educator.

Bravely and confidently, I stood alone in front of the class, without my practicum teacher, discussing the mathematics problem of the day. The door swung open; it was not the teacher returning; instead, a young man entered the classroom. Is he coming to see me?

Me: "May I help you"?

I guess not, since he went directly to the young lady who was the focus of his attention. They started having a conversation. Did he not see me? I know I look like the rest of the students at 24 being 5' 2" and 126 pounds. But did he not see me?

Me: "Excuse me", I said, hoping to get his attention from his conversation to notice that I was trying to teach a class. He continued his conversation as though I did not exist or as

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though I had not said anything to him. I went over to where they were sitting to interrupt the conversation, pointing to the door for him to leave.

Me: "Will you please leave, I am teaching a class here".

He immediately stood up and came directly to my face.

Young man: "You can't tell me what do".

The class, now keen and quiet, looked on curiously.

Me: "I am asking you one more time to please leave".

To continue with his story, he turned his back on me. After asking several more times for him to leave, I yelled at him, "Get out now"! However, that only escalated the situation further. He would not move, and I was determined to get him out. We ended up in a shouting match until he eventually left the classroom.

As Rhone (2007) explains, "Caribbean-immigrant educators do not realize until they either arrive in the United States or begin teaching there that issues with the race, class, and gender impact any given United States classroom" (p. 45). The next-door mathematics teacher during my United States high school and the master's programme gave a glimpse of the existing inequity relating to how mathematics as a subject is used as a means to oppress certain people. My misconception in this world was a disadvantage despite my agency, knowledge of mathematics, and willingness to teach. I learned that teaching mathematics to individuals involved complicated racial, social, economic, and historical factors and required building relationships and sharing my mathematical agency. I was informed theoretically as a new teacher, but practically, the classroom world and dealing with the complex construct of the students did not come from books and articles. It came from lived experiences that I did not possess at that time.

Essentially, it is necessary to learn about the history, struggles, and social positions that prevent students from merely concentrating on learning mathematics (Holland et al., 1998). According to Moschkovich and Nelson-Barber (2009), it is through understanding these issues that we can begin to connect with individuals and to transform what it means to learn mathematics and demonstrate its relevance in their lives.

Moment 7: Authoring Our Mathematical Agency

After completing the master's degree, I had the opportunity to teach mathematics in both face-to-face and online environments at a 2-year college. The student body consisted of diverse individuals from multiple social, economic, and racial backgrounds who perceived mathematics from different academic perspectives. As such, I occupied this

figured world as a teacher, mentor, advisor, consultant, and sometimes a counsellor. I also encounter individuals who challenge me, put my social position on 'trial', causing me to react in defense of my identity and agency (Holland et al., 1998). According to Holland et al., (1998), "[w]hen 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).

It is typical to walk into a classroom hearing gasps from students after recognizing that I am the teacher. Upon inquiry, the reason for their expressions is always, "You look like a student". Or, when solving mathematics problems, I am asked: "Are you sure"? Experiences such as the one with the next-door mathematics teacher in high school, the young man during my master's programme, and now my own classrooms sometimes, make me realize that I am not socially positioned in this world as the ideal image of a college mathematics educator (Damarin, 2000; Hottinger, 2016; Ladson-Billings, 1997). As a Black woman with a Caribbean accent teaching mathematics, a subject that is considered masculine, there have been moments, more than I would like to admit, when I have to defend belonging to those spaces. I had to become an agent on behalf of myself and a representation of Black women in mathematics.

The researcher's social positioning as a Black immigrant woman in a foreign land, teaching mathematics is one that constantly requires exercising agency. Hottinger (2016) claims that we continually assert through constant repetition and discourses that women and people of colour cannot be mathematicians. In a sense, in Western society, who gets the benefit of the doubt as the ideal image of a mathematics educator lacks a racial and gendered identity. I argue that for Black immigrant woman, an individual situated in three socially constructed worlds, Western society has not yet normalized seeing that image as the source of knowledge for mathematical subjects. Therefore, for that individual, an effective exercise of mathematical identity and agency entails overcoming significant institutional and informal socially constructed obstacles (Holland et al., 1998). One way to help other women of colour who also have to overcome these socially constructed obstacles is by providing a space where they can get encouragement.

There was a knock on my office door. I had to swallow the bite of curried chicken I had just taken to respond to the knock. "One second". Why do they always come while I am eating? I thought. An infectious smile greeted me as I opened the door. I had to smile back. She quickly glanced in the office then immediately started apologizing for interrupting my lunch. "It's all right", I responded, "What is going on"?

"Well, I wanted to talk to you about being my mentor", she stated.

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"What do you mean"? I asked. "What am I supposed to do as a mentor"?

Like, you know, someone I can talk to about stuff", she explained.

"Stuff"? I chuckled. "Can we talk about them in class"? I demanded.

"I don't know. I have never had a mentor before", she declared.

"OK. We will probably have to figure this out when the semester is over", I explained.

"That is fine. I appreciate that", she gently stated.

"No problem", I said skeptically.

Mathematics is a male-dominated subject, and institutions of higher learning are White-dominated spaces (Hottinger, 2016; Louis et al., 2017; Miller, 2017). As someone socially positioned at the intersection of being an accented Black woman teaching mathematics, I represent multiple social spaces for students who too receive messages of not belonging in certain worlds or having to defend their mathematical identity. Mathematics as a subject eludes many of us because we receive the message that our identity and agency are not good enough. And, unfortunately, many believe these messages. As a Black woman and mathematics faculty member I am orienting myself as an agent to mediate and use that social position acting as representation for students. These acts include helping students to develop their own identity and messages, and convincing them not to allow social constructs to deter them from accomplishing their academic goals (Holland et al., 1998; Hottinger, 2016; Shalka et al., 2019). Therefore, as a collective, we author ourselves by discussing ways to examine and recognize ourselves as mathematics doers versus the discourse forced upon us about our mathematical identity and ability (Holland et al., 1998; Hottinger, 2016).

#Moment 8: To Imagine Having a PhD.

*Why are you behaving like this?
As if you've got doubts inside
Baby, there's no reason to hide
Oh me, oh my
Pretty baby, don't be shy
Oh me, oh my
I'm gonna tell you why
Not only good looking
You'd like to taste so fine cuisine
For you, they'd make vacancy
Baby, you've got your Ph.D.
(Garnett Silk, 1993)*

Garnet Silk, a 90s reggae artist from Jamaica's most popular musical era, was the catalyst through this song, "Oh Me Oh My", for my wanting to get a PhD at 12 years old. Holland et al. (1998) explain that "through play imagination becomes embodied, proprioception as much as conception, experienced in activity, moved as much as mapped. Through play our fancied selves become material" (p. 236). At 12, the message in this song allowed me to play, to imagine, having a PhD. And now I journey towards making that fantasy materialize. The PhD journey, however, is obliging me to reclaim the voice I wanted to lose in moments 3 and 4. One of the ways of repossessing my voice is writing. The PhD process of refiguring my world is forcing me out of the habit of mathematics practice and into the activity of writing (Holland et al., 1998).

I am refiguring my world through this PhD, and writing is part of the process of making this new world. Writing, as Colyar (2009) explains, is a process and a product, and is the currency we pay for academic acceptance. Be-coming a "mathematics educator", my historical conditioning facilitated the "mathematics"; now the PhD is supplementing with the "educator" aspect. The writing activity forces a refiguring of my identity and agency. According to Holland et al., (1998), "activity predicated upon a figured world is never quite single, never quite pure. It is dialogized figured against other possible positions, other possible worlds. Our habitual identities bump up against one another" (p. 238). With mathematics, I could hide behind the numbers, but, in writing, I have to face the fact that it reveals my integrity, my identity, and a degree of self-consciousness I carry so that for me it requires effort to form a proper complete sentence or thought (Van Manen, 2006). My identity will not be revealed in the content; my identity will be revealed in the infrastructure of the process of writing that I find subjective.

#Moment 9: Writing Dead

We woke up at 4 a.m. in anticipation of a full day of conference presentations. I was still waiting on my advisor's response to the first manuscript draft of my mathematics experiences I had emailed two days before. Finally, I get the courage to ask: "So what do you think of the first draft?"

Advisor: "I like what you are saying, but how you tell it, sounds dead"

Me: "What do you mean 'dead'?" I was flustered by such a word.

Advisor: "Your writing is dead. Show the audience the story, not tell".

Me: "How do you show it in writing? This is not like mathematics to show a proof".

Advisor: "Make the work active".

Me: "So, how can I bring my dead writing back to life"?

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Advisor: "We will have to figure it out".

Me: sigh!

Advisor: "Trust yourself".

According to van Manen (2006), "to write is to be driven by desire" (p. 721). At this stage of preparing the dissertation, I have decided not to make peace about the process of writing but to use my desire to tell ourstory/mystory of black women from Caribbean countries as mathematics educators in the United States (van Manen, 1990; 2006). The desire to give the STEM field the voice and tone of Afro-Caribbean women fueled refiguring my identity and agency in mathematics to include writing (Holland, 1998; van Manen, 2006). The desire and responsibility of sharing the experiences of mathematics educators from Caribbean countries reshaped my identity and agency to include the writing process.

Fournillier and Lewis (2010) ask, "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). As part of the figured worlds that carry dispositions, social identifications, and personification, I wanted to understand the experiences of being a Caribbean immigrant, a mathematics educator, Black and a woman in the United States and how all these social positions and their many intersections define and empower us (Holland et al., 1998). A research topic on Afro-Caribbean women in mathematics spaces is an attempt at addressing a space that is not well known, and to create an opportunity or a platform through this dissertation to share our identity and agency. In order to address that space, I have to embrace writing as an activity is part of the process.

#Moment 10: A Practising Researcher

Historically, due to the underrepresentation of women, Blacks and Hispanics in science technology, engineering, and mathematics (STEM), recruitment by government, industry and academic institutions has focused on increasing the workforce to bring some diversity to these occupations (Blackburn, 2017; Ladivar, 2013). Despite the increase and growing support for women in STEM, the literature suggests that there are still biases and stereotypes in campus culture, classroom, and lived experiences in respect of their social positioning of gender and race (Blackburn, 2017; Hottinger, 2016; King Miller, 2017). The statistics on women mathematics educators indicate inequity. Women are underrepresented in faculty positions; they have fewer resources, lower salaries, more workload, less job satisfaction, shorter retention, and receive service awards more than awards for scholarship (Blackburn, 2017; Hirshfield & Joseph, 2012; Kessel, 2014; Landivar, 2013; Saye, 2002).

Furthermore, according to King Miller (2017), “Literature had not yet considered the inclusion of immigrant women in STEM who are of African descent” (p. 2). For Afro-Caribbean women within the academy, we operate under the oldest hierarchal instructional unit in the United States where we experience not only the double consciousness but also the “double invisibility” of being Black and foreign (Corra & Kimura, 2009; Beck, 2010; Louis et. al, 2017, p. 686). The double invisibility of being Black and foreign can expand further to include gender, given that mathematics is perceived as a masculine subject (Damarin, 2000; Hottinger, 2017). Furthermore, as mathematics educators, Afro-Caribbean women experience this invisibility despite having a “positive dual frame of reference” to use their “back home” lived experiences to influence their mathematical teaching (Ogbu & Simons, 1998, p. 170; Rogers, 2006).

I am researching these experiences to attend to the exclusion of our voices from STEM research literature (Holland et al., 1998). But before I could do so, I had to reclaim my voice and/ or find voices like mine to speak about the many facets of mathematics teaching and learning in higher education spaces. Our West Indian culture provided us with social capital. Yet I was curious to understand how our identity and agency were refigured in the process of be-coming a gendered Westernized minority teaching a masculine subject (Alfred, 2003; Hottinger, 2016). Holland et al. (1998) explain that human agency is made through improvisation and self-directed symbolizations. My research is a form of agentive action in response to the scarcity of Afro-Caribbean women experiences in the STEM literature. The inclusion of our narratives and experiences would not become part of the research literature unless we put it out there.

CONCLUSION

The moments described and discussed in this paper are the set of agents in whose worlds I engaged and which continue to form and re-form my identity and agency (Holland et al, 1998; Basu, 2007). My context and social positioning have influenced how I think about my identity, agency, and mathematics capability as I continue the journey of completing a dissertation and be-coming a mathematics educator. In Jamaica moments I share my experiences as a practising agent figuring out my identity and orientation to my social and cultural environment. My mother, my primary school teacher (Sir), and early schooling in Jamaica are the foundations of my mathematical identity. After moving to the United States, as I considered entering mathematics spaces, the next-door mathematics teacher in high school and the young man from my master's programme gave me some insight into the inequity that exists in mathematical spaces. These inequalities are linked to my image as black and gendered that did not align with the identity that is socially given permission in mathematics spaces.

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Finally, in the dissertation journey, I share my experiences as a refiguring agent accomplishing the process of making a new world. The subject matter – mathematics teaching and learning – helped to produce each of these moments. Moreover, it is hoped that in doing the dissertation research, there is the possibility of bringing together a collective of agents who can help orient our world and begin to make meaning of these spaces.

Heuristic inquiry as methodology allows for including my/story and experiences in the broader dissertation study, and this paper serves as such. Additionally, the heuristic process, reporting my personal experiences, can serve as another form of validation for the study. The qualitative validity of the research is worthy of thoughtful discussion, given my role in the study as both the researcher and a participant. It is meant to highlight who I am and my mathematics identity as an insider examining the experiences of the participants while experiencing them (Clandinin & Connelly, 2000). Teaching mathematics content and pursuing a doctorate are helping me to understand how my mathematical identity and the reactions of others to it are tied to be-coming a change agent.

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