

Exploring Race, Children's Mathematics Learning and Parental Participation: Counternarratives of African Immigrant Families

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Abstract

In this study, I present counternarratives of six African immigrant parents and their children (10–15-year-olds) living in Canada, to elucidate what it means for them to participate in the mathematics learning of their children. The study's finding indicates that families' support for their children's mathematics learning was based on the popular neoliberal configuration of mathematics as a gatekeeping subject for future economic prospects and workforce. However, beyond immigrants (parents' dyad children) desire to participate in the workforce, supporting their children's mathematics fluency is yet another means of counterbalancing their social exclusion and positioning themselves as people of intellect especially in an environment where academic excellence in mathematics is racialised. The study challenges the majoritarian assumptions about immigrant families as disengaged and uninterested in their children's mathematics learning.

Keywords: Counternarratives, African Immigrant families, Children's Mathematics Learning, Family Support, Racialized Experiences

Background

The migration trend in Canada since the early 1990s has remained relatively high, with an average of approximately 235,000 new immigrants per year (Statistics Canada, 2019), highlighting Canada's commitment to welcoming people from diverse cultures. According to 2016 Census data, 41.1% of the Canadian population was reported to have more than one ethnic and cultural origin, with over 250 different ethnicities recorded (Statistics Canada, 2019). Canada's population indicates the country's richness in terms of ethnicity and cultural diversity. The cultural diversity of Canada's population calls on researchers and educators to be interested in the experiences and perspectives of various ethnicities and cultures to inform inclusive education policies and pedagogies in various subject areas including mathematics.

As a result, there is the need for mathematics teachers to know their students beyond their cognitive functioning to include the cultural and linguistic resources they might each bring to classrooms or the dispositions they may hold towards mathematics and how these might influence

their mathematics learning in school (Gutiérrez et al., 1999; Yaro, Amoah, & Wagner, 2020; Wagner, & Herbel-Eisenmann, 2009).

Although many studies have documented linguistic and cultural diversity and community resources as an asset in multicultural classrooms (de Abreu & Elbers, 2005; González, Moll, & Amanti, 2006; Jorgensen, 2016a; 2016b; Meaney & Lange, 2013; Planas & Setati-Phakeng, 2014), it appears that there is still a deficit perspective that appear to position Black/African immigrants and people of colour as disengaged or uninterested in their children's education (Butler 2021; Martin, 2009).

Recent mathematics educational reform documents such as the National Council of Teachers of Mathematics (2020) and the New British Columbia Curriculum (2016) have called for increased parental involvement through school and community collaboration as an important step in enhancing children's education at *all* grade levels and across disciplines (BC Ministry of Education, 2016, Curriculum Overview para. 18).

I claim that underlying these calls is a normative notion of Western middle-class parents as *all parents*. I make this claim knowing that extant mathematics education research, with a few notable exceptions, has failed to present sufficiently detailed characterizations of the mathematical experiences, home practices of African immigrant parents and how they draw on their cultural understandings in supporting their children's mathematics learning. In this paper, I aim to report counter-narratives of African immigrant families (parents and their 10-15year olds) to illuminate what it means for them to support their children's mathematics learning in racialised contexts like Canada. Understanding parents' perspectives and experiences with their children's mathematics learning is an important step towards providing a mechanism for schools and teachers to increase parental involvement among African immigrants and other culturally marginalized families.

The Role of Mathematics in Immigrants and Refugees' Aspirations

Despite the deficit views portrayed in the popular media about Black/African immigrant and low-income families and their children's education, there is also substantial literature that espouses

a counternarrative about this marginalised group (Kumi-Yeboah, 2018; Li, 2018). For instance, Li's (2018) study with refugee families and their children indicate families' effort to re-establish themselves in the US. The author concluded that although refugee families came to the US because of war in their home countries, they also share "similar expectations for the value of what Western education might bring to their future, with 'copious aspirations for post-secondary education and prestigious careers' in order to better themselves, their families, and those left behind in their societies of origin" (p. 473).

With reference to mathematics as a subject, it is perceived as a gatekeeping subject needed to build a strong national economy and a means for children to brighten their future career prospects in the Science, Technology and Engineering (STEM) job market. This perceived role of mathematics is evidenced in both national and international mathematics education policies. The following excerpts exemplify the positioning of mathematics as a "gateway" subject:

- ...poor performance in mathematics in primary and secondary schools is seen as a significant barrier to improved economic and social outcomes both at the level of the individual and of the nation (Bethell, 2016, p. 13)
- ...mathematical competence opens doors to productive futures. A lack of mathematical competence keeps those doors closed" (National Council of Teachers of Mathematics, (NTCM), 2020, p. 1)

The above configuration of mathematics in both national and international educational policies contribute to shaping the social and political discourse including parental perceptions on the relevance of mathematics to their children's educational and career pursuit (Valero, 2017). Black parents' recognition of the gatekeeping role of mathematics has been reported in studies investigating parents' agency in supporting their children's mathematics learning in the United States (Martin, 2006; McGee, 2015; McGee & Spencer, 2015). However, research on Black/African parental involvement practices have not sufficiently documented other factors that might shape Black/African immigrant parents' agency in supporting their children's mathematics learning in the host country.

Mathematics Learning, Participation and Family Involvement as a Racialized/Class Project

The positioning of mathematics literacy in the school curriculum as a gatekeeping subject or “critical filter” for higher education and enhanced economic access has also led to questions of equity and access to mathematics based on race (Stinson, 2004). In referencing race, I follow other critical race theorists (e.g., Bonilla-Silva, 2001; Martin, 2009 etc.) to engage with the concept as “a social construction that is created and re-created through both institutional structures and everyday interactions and experiences and is not a biological characteristic of an individual” (Morton & Riegel-Crumb, 2019, p. 532).

Issues of race cannot be essentialized. As such, it is important not to assume that the educational experiences of African/Black immigrant children are the same or comparable to one another or constant across the school or home contexts. Martin (2009) conceptualized mathematics learning as *racialized forms of experience*, claiming that mathematics “experiences are shaped and structured by the meanings and representations of race and racial groups that exist in the larger society” (p. 32). These racialized experiences manifests in various forms from lowering expectations and underestimating the mathematics capability of the minority groups (Dumenden, 2012), to denied access to higher mathematics education (Rubel & McCloskey, 2019), reducing mathematics instruction in predominately Black and Hispanic schools to mostly drills as opposed to problem solving (Anyon, 1997) and the deficit views of some school administrators and schools about racialized families and their contributions to their children’s learning (Peterson & Heywood, 2007). These studies have suggested how structural racism in the school contexts impact how Black students see themselves as doers of mathematics and ability to excel in the subject. Given that mathematics learning is racialized space, it is important to understand how issues of race and racial stereotypes shapes African immigrant parents’ agency in supporting their children’s mathematics learning in Canadian context.

Counternarratives and Critical Race Theory (CRT) As Theoretical Frameworks

Ladson-Billing and Tate (1995) provided a theoretical lens in discussing issues of educational inequity in the United States shifting the conversation from deficit perspectives that characterise a community of colour to a one of a community strength (Miller, Liu & Ball, 2020). In general, CRT offers researchers insights into data gathering and analysis of educational experiences of marginalised population in bid to advocate for equity in the educational systems. This underlining principle of CRT is salient in discussing the mathematical schooling experiences of Black/African immigrant children (Jett, 2019). Central to CRT is counternarratives or counter stories, which serves as a method of telling the “stories of those people whose experiences were not often told (i.e., those on the margins of society)” (Solórzanna & Yosso, 2002, p. 32). Solorzanna and Yosso (2002) proposed four ways of creating counter-stories: “(a) the data gathered from the research, (b) the existing literature on the topic(s), (c) one’s own professional experiences and (d) one’s own personal experiences” (p. 34). In this research, I use counternarratives to examine the mathematical schooling experiences and participation of African immigrant children and their families in Canadian context by generating narratives both through interview and homes-observation data gathered and the extant literature in the field to offer a deeper conceptual understanding of participants’ experiences.

The Research Context and Positionality

This study was carried out in Metro Vancouver, a western middle-income city and one of Canada's most ethnically and linguistically diverse cities, with about 40% of its population being immigrants. Six African immigrant families – parent and their children (10–15-year-olds) participated in the study. At least each family had lived in Vancouver for the past seven years at the time of the study. Families self-identified their countries of origin (e.g Tanzania, Ghana, Kenya, Uganda, Somalia and Burundi) and self-identified as either middle class or working-class families. All parents (4) mothers and (2) fathers in the study had at least Bachelor’s degrees ranging from

humanities, social sciences and sciences with four parents having master degrees. Children in the study attended different schools across the metro-Vancouver region in Grades 4, 5, 6, 7, and 8, respectively.

As an African immigrant who have lived in Vancouver for the past seven years, I have developed a strong bond with the African communities across the metropolis. This shared identity offered me a trusting, ethical spaces for which participants willingly shared their mathematical schooling and participating experiences. My closeness to the African community offered some advantages in expediting access to participants “away from home” due to shared racial and ethnic backgrounds (Merriam et al., 2001). However, I was mindful of the multi-dimensional nature of our power relationships between myself and the participants; my own gender (an adult male), age of the children 10-15 years old and their parents. I therefore advanced steps to address all related power issues as the research progressed.

Data Collection and Analysis

To better understand how African immigrant families from Sub-Saharan Africa support their children's (10–15-year-olds) mathematics learning, a case study design (Merriam, 1998) employed separate individual semi-structured interviews of parent-dyad child and home visits observation over a 12-week period. The semi-structured interviews were designed to elicit parents’ perceptions and how they participate in their children's mathematics learning in Canada. One on one interviews with children were also designed to elicit students' mathematics learning experiences in Canadian classrooms. All semi-structured interviews with parents and child participants were audio-recorded and transcribed verbatim. In addition to interviews, I conducted five observational home visits (at least one visits every two weeks) to each immigrant family in addition to scheduled interviews with parents and children. Such visits enabled me to observe the mathematics-related supports and interactions with which African immigrant parents engage their children over 12 weeks. Each observation lasted 2-3 hours depended on the family’s availability. During observational home

visits, I made field notes in short phrases/sentences to document key happenings and events of the day.

Data Analysis

The analysis drew on phronetic iterative analysis, “which alternates between emic, or emergent readings of the data and etic use of existing models, explanations, theories in the field” (Tracy, 2019, p. 209), rather than dwelling solely on the emergent ideas from the data. For instance, the theoretical concept of counternarratives (Solórzano & Yosso, 2002) drawn from CRT (Ladson-Billing and Tate, 1995) enabled me to ponder on how African immigrants’ experiences counters the dominant narratives.

I conducted two iterative phases of analysis, drawing on Boyatzis (1998) data analysis process. Since parents were my primary respondents for this research, I first coded two of the six parents' interviews transcripts (sub-samples) and the corresponding field notes from the home observational visits. Boyatzis' (1998) definition of code "a short phrase or word that symbolically assigns a summative, salient, essence-capturing, or evocative attribute for a portion of language-based or visual data" (p. 3) guided our coding process. To determine a code, Boyatzis (1998) suggests that a “good code” should capture the qualitative richness of the phenomena and what the data segment represents. Questions such as ‘what is surprising or intriguing’ or ‘what is happening here?’, ‘what does this mean for this research study?’ guided the determination of how I coded each data segment (i.e., codable moments). Drawing on Boyatzis (1998), I compared the codes across the two selected subsamples of the interviews and field notes, checked for commonality in the meaning, and generated common ones to iteratively code the entire data set.

The second phase of the data analysis involved a close examination of the codes generated in the first phase of analysis, organising, synthesising, categorising and transforming them into interpretive concepts (Tracy, 2019) in the light of the research questions and the epistemological underpinnings of my study.

Findings

Parents Perceived Mathematics as a Gatekeeping Subject

Informed by parents' prior school mathematics experiences, participants revealed the importance they attached to mathematics as a subject. This was evident through their shared educational experiences from their various home countries, in which both the education system and the society place a high premium on school mathematics success as an avenue to higher education and future career prospects. These parents continue to hold onto this prominence of mathematics after immigrating to Canada. The following interview excerpts highlight parents' perspectives of mathematics as a gatekeeping subject:

Irrespective of whether you are majoring in sciences or commerce or arts, mathematics was mandatory. You cannot drop it until today. You need it to go to the university or college. (Kata – mother of Amy)

Parents also pointed to how math as a gatekeeping subject is used as a “critical filter” (Stinson, 2004) at all levels of education in many educational systems, especially in most Sub-Saharan African countries where gaining access to higher education and future academic prospects depends on one's success in mathematics.

In Kenya Mathematics is a required course for every day. Five days a week, five days I had mathematics. It's mandatory for all levels. I did some courses in statistics: introduction. Mathematics was still mandatory and had to pass to get my degree. (Mashy – mother of Hakeem)

Indeed, the gatekeeping function was further reinforced when personally experienced by some of the participants. For instance, a low score in mathematics exams at the national level shattered the hopes of some parents to pursue their "dream" programs such as engineering or medicine at the university or college level. As one of the parents expressed:

... If you fail twice in Grade 10 math, you cannot take science major again, so you cannot study any engineering or medicine which is like a dream field for many people...I wanted to become a medical doctor, but could not pass the entrance stage...so moved into doing Bachelor of Science, Master of Science, Master of Philosophy... (Leticia- Princess' mother)

Having experienced "shattered" career dreams due to a low score in mathematics, some of the parents still expressed high expectations for their children's mathematics learning. Parents believed

that being inadequately prepared in mathematics has future career ramifications as children might not be able to pursue the career choices that would have otherwise been available to them. As one parent said, *"I don't want them to be struggling later in their career like I'm struggling now."*

Since parents attach importance to mathematics due to its gatekeeping role and have high expectations for their children, they invest effort in ensuring that their children excel in the subject to gain access to higher education in Canada and globally. For instance, they perform a monitoring role, as one parent said, "to understand his ability to learn math" and believe that they would lack a deeper sense of their children's mathematics performance if they did not monitor. As Joseph (Jones' father) put it:

"If the term report says, 'Jones is acquiring, or Jones is developing'. How developing? These things are easy, and he is still developing'."

To support children in meeting the high expectations in mathematics that they have for them, parents create enabling mathematics environment and provide different forms of supports. For instance, a scan of Joseph's home environment during my observation visit reveals a "home" that is well-resourced with mathematics reading materials, worksheets, and other related math literature ranging from lower to high grades, all stacked in shelves in the corner of the living room. Walls in the living room were decorated with mathematical formulas on posters, an indication of the school math literacy environment of this family. When asked how such an open display of posters might help in his child's math learning, Joseph believed that as the child always sees the poster and formulas, he will always be able to "recall or visually picture" these formulas whenever it becomes necessary to use them in math problem-solving.

Acknowledging the gatekeeping role of mathematics appears to lead parents to set high expectations for their children and work with them towards achieving these expectations, as they believe success in mathematics has the potential of unlocking doors of opportunities for their children to pursue their dream of attaining high earning/in-demand careers, associated with medicine, engineering and other science-related programs at the university. However, it is unclear

as to the extent to which these African immigrant parents' high education contributed to the press for high status careers, and high expectations for their children, that they expressed.

Parents Perceive Mathematics as an Empowering Subject

Analysis across the data sets from parents and their children revealed that African immigrant parents perceive their children's mathematics learning as empowering. This perception appears to be informed by parents' own experiences as Africans living in the diaspora and, more especially, being Black Africans in racialized communities who might have experienced or heard different forms of racist comments questioning Black children's intelligence or academic ability. For instance, participants shared the view that showing or exhibiting mastery in mathematics gives them a sense of accomplishment as they feel "valued," "show of smartness," "feeling special," high "self-esteem" among their peers. The excerpt from one of the fathers in the study illustrates the empowering role mathematics plays in the lives of these African immigrants:

... I think math is being used a measure of smartness so in this society where we [African immigrants] are not considered to be that smart. Is good to show them that you [African] can also do what smart people do (Agalga – Evans' father)

Evans corroborated what his father (Agalga) said in an earlier interview as he expressed joy for being among one of the students his teacher had selected to participate in the Gauss² mathematics and computing contest that he believed is reserved for "the kids who understand math more than other students." With smiles and shows of excitement, Evans described the Gauss contest he was studying to participate:

She [the teacher] only does it for the kids who understand math more than other students. It is more challenging questions in math to really test what you can do in math. My Dad has downloaded some practices questions from the Gauss website and has been teaching me. [Evans- Agalga's son].

² Gauss contest is a mathematics and computing contest designed by the Centre for Education in Mathematics and Computing at the University of Waterloo, Canada for Grade 7 and 8 students across Canada. The centre awards certificates to all participants and schools who enrol their students in this contest. Special recognition is given to highest achieving students in their schools and nationwide in the form of medals.

Indeed, considering the gatekeeping function of mathematics, knowledge of mathematics is often used as a proxy for intelligence and is often associated with white, middle-class and wealthy students, and in other cases, Asians (Martin, 2009). For parents in this study, they opine that one way to dispel the “deficit thinking” about their children (African immigrant children) is to support them to gain mastery of mathematics content to be able to demonstrate their math excellence in the Canadian classroom and to show the smartness and academic prowess of their children.

For instance, Joseph (Jones’ father) shared that their children have indeed benefitted from regular mathematics support they give them, and they feel “happy” to learn that their children could serve as resources for supporting struggling children in their classes. Joseph reported a memorable instance when his son came home with excitement, saying that his teacher had complimented him for solving a math problem that everyone in the class found challenging, and the teacher had asked him, the child, to support other struggling peers in his class.

I feel happy and comforted when he shows them he could do math. We did algebra way before they started learning algebra. Now, when he came back home, he [Jones] said; "Daddy, today we did algebra and guess what? Man, I was the first person in the class to finish." The teacher was like, "What? How did you do it so fast?" "Then some other students were still figuring out ...the teacher had to ask me to go and actually tutor them and help them." (Joseph – Jones’ father)

Although not stated directly, Joseph’s response indicates how such compliments from his son's teacher boost his child's self-esteem in the mathematics classroom and gives him, as a parent, the reason to continue supporting his child’s mathematics learning at home since he is “comforted and happy” to know that his effort is paying off. In another example, Zahara, the daughter of Malee, expressed similar feelings during a separate interview. Zahara added how she now has many friends in school because of what she believes is her mastery of mathematics concepts. Just like Jones, she shared that her teacher sometimes calls on her to help others who struggle with math concepts. Zahara appeared somewhat happy, while at the same time humble and modest in her words:

It always feels like I know more. I don't know how to explain it but it's just that I know I know a little bit more whenever the teacher teaches a lesson in math. I wouldn't say it has a feeling, it's more like the teacher sometimes makes you teach other students what you know.

I'm the only black girl in the class... now I have many friends than before because they want me to teach them (Zahara- Malee's daughter).

The excerpts are indication that parents and children believe that in a racialized environment, knowing mathematics appears to be "a currency" to gain respect in a dominant culture where many students seem to be struggling with the subject. Bourdieu (1990) described similar experiences as a form of "capital" in that knowledge in mathematics for Black African immigrants is a valued resource underlying how they interact and relate with the society. Framed differently, knowing mathematics is a way to gain acceptance into the dominant culture. The feeling of being valued and respected for what one knows means a lot for African immigrant children, especially in a white-dominated environment where many might have experienced, or have seen others experience, some forms of racial bigotry.

Discussion and Conclusions

The Gatekeeping Function of Mathematics and its Role in Reproducing or Disrupting Race or Class Hierarchies

Broadly, African immigrant parents in this study viewed their children's mathematics learning in the Canadian context, parents in this study perceive mathematics as "a gateway" to their children's future higher education and career prospects. Their perception of mathematics as a gatekeeping subject appears to be informed by their cultural models of education or prior educational experiences (Anderson et al., 2017) growing up in Sub-Saharan Africa where mathematics excellence paves the way to higher educational institutions and future economic prospects. In contrast, failure in mathematics at the high school level in most of Sub-Saharan Africa means one's dream of pursuing college or university education is shattered. While for Canadians, mathematics is also a gatekeeper, the impact for immigrant children especially Black/African immigrants is further complicated by issues of race. Although these parents find themselves in a new educational context, they seem to hold on to the relevance of mathematics as a gateway to a post-secondary institution.

African immigrant parents in the study perceive their children's mathematics learning as vital for their upward social mobility in Canada, where excellence in the subject could pave the way for Science Technology Engineering Mathematics (STEM) - related careers, which appear mostly preserved for “smart” people. Parents’ personal experiences with mathematics’ gatekeeping role was also evident and what “befell” the parents, seemed to inspire them to take a keen interest in, and support their children to excel in mathematics learning. According to Bourdieu (1990), habitus is a product of history and past experiences, which produces individual and collective practices, which become the lens through which people view their "worlds". Here we see parents' mathematics habitus (dispositions) playing a role in their interest and support for their children's mathematics learning in Canada. Similar to the perceptions of Martin’s (2006) African American parent participants, all African immigrant parents in this study expressed the belief that lack of mathematical fluency, coupled with their children’s devalued Black/African immigrant status could sing into the popular narrative about their children’s academic incapability and this could further relegate them to a second-class status in the society.

It is important to stress that attributes such as smartness and sense of value which African immigrant recognise in their children counter the deficit narrative or the misconception that Black and working-class children are less capable or “less smart” in terms of excelling in mathematics (Dumenden, 2012; Rubel & McCloskey, 2019). Therefore, the gatekeeping role of mathematics enabled African immigrant families to resist racial stereotypes within a racialized geo-political, socio-economic, and educational context by supporting their children’s mathematics learning.

Conclusions and Implication

The aim of this paper was to document the counternarratives of African immigrant families to articulate how racial stereotypes shapes their agency in supporting their children’s mathematics learning. First, African immigrant parents demonstrated knowledge about what their children do in school with regards to mathematics learning and provided specific examples of what they do in support of their children’s learning, contrary to the long-held deficit assumption that seems to

project immigrant families as people who lack interest in their children's education. African immigrant parents and their children were aware of the deficit narratives in the public discourse that seem to suggest that African immigrant children are mathematically incapable. Supporting their children to excel in mathematics was a means to counter such racial stereotypes. The current study therefore implies that future research proceeds from an asset point of view (positioning parents as experts of their children's education) of families.

The home visits hinted practices families use in support of their children's math learning that deserve more longer term investigation than this study did. Since the current study drew on interviews corroborated through home visits, future ethnographic research with diverse immigrant populations is recommended to document the nature of mathematics instruction immigrant families engage in with their children at home. Ethnographic study will provide a detailed account on "real-time" practices (over a long period of time) that occur on in immigrant families' homes in providing mathematics support for their children.

Considering that this study was conducted with highly educated and somewhat middle class African immigrant families, as educators, there is need to be cognisant that people of colour, immigrants, refugees are heterogeneous, just as Euro-centric populations. Thus, immigrant children do not all fit the stereotypical demographic of coming from poor, low educated, possibly dysfunctional or struggling families as people might think. This study therefore reminds educators adopt asset-oriented views about immigrant children by acknowledging and finding ways of using cultural capital to enrich their classroom mathematics learning.

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