

“We Made Math!”: Black Parents as a Guide for Supporting Black Children’s Mathematical Identities

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Black parents are often presumed to be uninvolved in their children’s education, especially in mathematics. These stereotypes are arguably sustained by White, middle-class expectations for parent engagement. This qualitative study challenges the dominant narrative by exploring the ways eight Black parents support their elementary-aged children’s mathematical identities. Although many scholars have examined the relationship between mathematics identity and academic outcomes, few have explored the role parents play in this identity development. Drawing on Martin’s (2000) mathematics identity framework and McCarthy Foubert’s (2019) Racial Realist Parent Engagement framework, the author argues that Black parents’ experiential knowledge of race and racism in mathematical spaces positions them to teach their children about the everyday importance and usefulness of mathematics. Using parent interviews and family observations, the author’s findings suggest the parents supported their children’s mathematics identities using four approaches: 1) pragmatic (emphasizing financial literacy and basic life skills), 2) aspirational (promoting math-intensive careers), 3) affirmational (sharing words of encouragement), and 4) race-conscious (applying mathematical concepts to lessons in Black history, culture, and anti-Blackness). Implications for educators are discussed, as parent identity support strategies may be useful for reform-oriented teachers seeking to foster positive mathematical identities in Black children.

KEYWORDS: Black parents, elementary mathematics, informal mathematics learning, mathematics identity, parent engagement

My dad, he was really good at math. He didn't even graduate from high school, but he's a musician, so I know that helped in his math somehow... he always had pride in his math. So, when he would teach me stuff, those were my best experiences.

– Lola, Parent Interview

The excerpt above was taken from an interview with Lola—a nontraditional college student and mother of three—who was reflecting on her childhood experiences learning mathematics. She proudly shared how her most memorable experiences in mathematics were not tied to her formal schooling but instead experienced with her father. As a Black man who did not complete high school, many would deem him an unsuitable mathematics teacher. However, Lola saw his career as a musician as providing sufficient qualifications. Specifically, she acknowledged the relationship between his identities as a musician and as a “math person.” In listening to her story, I could not help but recall my childhood and how my father instilled a love for mathematics that brought me to this work. When I was in elementary school, my father would challenge me to determine change due at the cash register in the grocery store or to calculate a 15% tip at restaurants—a routine that bolstered my confidence in my mathematical abilities. Both Lola’s story and my own signify the essential role Black parents, regardless of career or education level, play in shaping their children’s mathematical identities.

Background

Over the past two decades, critical scholars have pushed to center identity in mathematics education research. Traditional notions of mathematics as a bias-free field have been challenged with evidence of *racialized experiences*, where race and racism define Black students’ learning experiences (Martin, 2006). These racialized experiences include structural impediments, from being denied access to upper-level mathematics courses (Bryant, 2015) to low teacher expectations (Copur-Gencturk et al., 2020). Additionally, Jackson et al. (2020) found that poor school climate, including a lack of teaching materials and resources, partially mediated the relationship between Black male high school students’ mathematics identities and mathematics outcomes. These findings suggest structural racism in schools impacts how Black students see themselves as doers of mathematics as well as their ability to perform in mathematical settings.

Critical scholars have also challenged mainstream ideologies in mathematics education (Civil, 2018; Martin et al., 2010), including what counts as mathematics, who is good at mathematics, and when mathematics is useful. With an emphasis on student identities in the classroom, many researchers have argued that students’ mathematical identities do not develop in isolation but rather are co-constructed in the context of other salient identities, such as race, gender, and social class (Aguirre, Mayfield-Ingram, & Martin, 2013; Nasir & de Royston, 2013). For example,

English-Clarke et al. (2012) interviewed 28 Black youths and found that one-third of the participants shared racial-mathematical stories or messages they received from peers or adults. These stories included messages about racism and discrimination in mathematical settings, persisting in mathematics courses with few Black students, and beliefs about Asians being good at mathematics. This exemplifies how messages students receive about mathematics, and other social constructs such as race, carry implications for how they perceive their mathematical abilities relative to others.

Despite the growing body of literature on mathematics identity, many Black students continue to be taught mathematics with little attention paid to their identity formation. Mathematics classrooms in predominantly Black schools are often teacher-centered (Waxman et al., 2010) and test-driven (Davis & Martin, 2018), as teachers rely on rote memorization techniques to help students grasp mathematical concepts (Ellis & Berry, 2005). However, research suggests learning is optimized when students are active co-constructors of mathematical knowledge (Boaler, 1998; Boggan et al., 2010; Franke & Kazemi, 2001). As such, when Black children learn mathematics in classrooms void of context and cultural relevance, their mathematical identities are stifled. Consequently, students who learn mathematics in rigid, decontextualized environments lose the opportunity to draw mathematical connections to their everyday lives, including understanding how to use mathematics to critique and challenge social inequalities.

With growing interest in identity in mathematics, many scholars have urged teachers to develop curriculum and pedagogy around the history and culture of Black children (Tate 1995; Taylor, 2012) and other similarly marginalized students of color. The literature on funds of knowledge (González et al., 2001), teaching mathematics for social justice (Bartell, 2013; Gutstein, 2012), and culturally relevant pedagogy (Leonard et al., 2009; Tate, 1995), for example, has underscored the importance of teaching mathematics with attention to social justice, student culture, and community-based/informal mathematical knowledge. Arguably, these approaches can lead to improved mathematical outcomes because students are fully engaged when teachers value who they are outside of the classroom.

Yet some teachers report challenges with implementing these pedagogical approaches, as tensions arise when teachers attempt to balance social justice and/or cultural goals with mathematical goals (Bartell, 2013; Civil, 2018). Additionally, teachers must be careful to incorporate student culture in curriculum without relying on essentialism or stereotypes that present Black culture as monolithic (Leonard et al., 2010). Perhaps including parents in the decision-making process may help teachers learn about their students' specific cultures and local communities, thus avoiding the pitfalls of essentialism. However, few scholars have explored parents as potential resources to inform such curriculum and practices (Civil & Bernier, 2006).

In this paper, I argue that Black parents possess a wealth of experiential knowledge—including knowledge of what it means to be a Black student in a

mathematics classroom as well as what it means to be Black in America broadly—that makes them uniquely positioned to foster their children’s mathematical identities. I also argue that teachers can, and should, use Black parents as a guide to model meaningful mathematics curriculum and pedagogical practices that support Black children’s mathematical identities.

Decolonizing (Black) Parent Engagement

Centering the knowledge and experience of Black parents is important in critical scholarship given that they are often presumed to be uninvolved in their children’s education (Cooper, 2009; Latunde & Clark-Louque, 2016; Powell & Coles, 2021), especially in mathematics (Martin, 2006). Critical scholars have argued these stereotypes are sustained by White, middle-class values that dominate parent engagement expectations (Howard, 2020; McGee & Spencer, 2015). This deficit narrative is supported by “traditional” expectations of parent engagement, which focus on school-centered activities such as providing homework assistance, volunteering at schools, and attending parent-teacher conferences. Knowing that these activities often present substantial barriers to participation for Black parents, particularly those from low-income backgrounds who have rigid work schedules (Cooper, 2009), educators and researchers have used interventions such as parent workshops to help “increase” parent engagement for Black parents and other similarly marginalized parents. Although these efforts may be well-intended, there remains an underlying assumption that Black children’s academic success is dependent on their parents’ ability to engage with schools in these prescribed ways.

However, some scholars have argued that these expectations limit the scope of what counts as parent engagement, reflecting White and middle-class values and expectations of parental involvement while Black parents’ educational contributions go unnoticed (Cooper, 2009; Howard et al., 2019; Jackson & Remillard, 2005; McGee & Spencer, 2015). For example, Jeynes (2010) found that Black parents often use encouraging behaviors and affirmations to support their children’s academic self-confidence and success. Schnee and Bose (2010) also found that while some Black parents provide direct homework assistance, others chose not to help their children in order to instill the values of perseverance and independence. These examples underscore the ways Black parents’ educational practices are often overlooked or misinterpreted as disengagement, highlighting the need for more asset-based research on Black parent engagement.

Furthermore, many Black parents’ educational contributions go unnoticed when we conflate *schooling* with *learning*. Jackson and Remillard (2005) distinguish between parental involvement in *learning* and parental involvement in *schooling*, as the authors found that the low-income Black mothers in their study provided various learning opportunities for their children, including both planned and spontaneous informal mathematics activities. Furthermore, Eloff, Maree, and Miller (2006) found

that Black parents in South Africa employed various strategies to facilitate their children's mathematical learning in informal settings, including engaging in dialogue with their children about mathematics as it pertained to everyday activities. These examples suggest that Black parents' mathematical support may be overlooked by schools when they are not directly tied to school-related activities.

Another component of Black parent engagement that is often disregarded is racial socialization. In navigating their children's education, Black parents are also tasked with racial socialization, as they help their children develop an understanding of what it means to be Black in society and in schools specifically (Martin, 2006; White-Johnson et al., 2010). With this comes the challenge of instilling dignity and pride in Black children while also bringing their awareness to racial injustices. In interviewing Black parents, Martin (2006) found that many experienced racial discrimination while learning mathematics and consequently found it important to provide their children with role models in mathematics to overcome negative beliefs about the subject. Given that mathematics classrooms remain highly racialized contexts, Black parents' lessons on race and racism in school provide their children with essential knowledge, yet these lessons are rarely captured by traditional notions of parent engagement.

Conceptual Framework

Mathematics identity. Here, I draw on Martin's (2000) conceptual framework for mathematics identity, which the author describes as "the dispositions and deeply held beliefs that individuals develop, within their overall self-concept, about their ability to participate and perform effectively in mathematical contexts and to use mathematics to change the conditions of their lives" (p. 206). In other words, mathematics identity consists of both beliefs about mathematical ability as well as understanding its usefulness in the real world. Developed from an ethnography of Black students specifically, this framework captures the ways racialized experiences in mathematics classrooms (e.g., low teacher expectations, stereotypes, etc.) can shape beliefs about one's own mathematical abilities and the application of mathematics. Given this, having a strong, positive mathematics identity is particularly important for Black children, as it affords them access to power associated with mathematical competence and analytical skills to critique and change social injustices, such as racism, that impact their daily lives.

Racial Realist Parent Engagement. This study also draws on Racial Realist Parent Engagement (RRPE; McCarthy Foubert, 2019) as a theoretical framework that reveals the silenced narratives around Black parents' contributions to their children's education broadly but can be applied to mathematics education specifically. The RRPE theoretical framework provides a critical lens to examine how Black parents' relationship with schools might impact the ways they support their children's mathematical identities. Drawing on Derrick Bell's (1992) notion of racial realism,

which contends that race and racism are a permanent part of the structure of American society, RRPE acknowledges the anti-Black racism inherent in school policy and expectations of parent engagement. For too long, Black children's mathematics education has been hindered by discriminatory practices such as low teacher expectations (Copur-Gencturk et al. 2020) and tracking (McCardle, 2020). Black parents, in turn, have been blamed for the outcomes (e.g., low test scores) resulting from these anti-Black policies and practices.

Despite this, Black parents "have been committed to and are engaged in their children's education by surviving and resisting anti-Black racism in schools" (McCarthy Foubert, 2019, p. 15). In acknowledging Black parents' contributions to their children's education, RRPE a) exculpates Black parents who have been unjustly blamed for the so-called "achievement gap" and b) challenges anti-Black school policies (e.g., tracking, discipline) and expectations for parent engagement that have impaired Black parents' relationships with schools. Here, I argue that Black parents are not uninvolved in their children's mathematics education. Rather, the ways they choose to navigate their children's education broadly—and in mathematics particularly—are informed by their beliefs in the permanence of anti-Black racism in schools.

Drawing on these frameworks, this study is guided by several assumptions about Black parents and their role in their children's mathematical identity development: a) Black parents' contributions to their children's education are often disregarded, b) Black parents' experiential knowledge of anti-Black racism in school and society inform the lessons they teach their children, c) Black parents possess mathematical expertise in real-world settings, and d) Black parents should be used as a model to support student identities in critical mathematics education.

Methods

The study presented here is part of a larger study that examined Black children's out-of-school mathematical learning. In this qualitative, narrative inquiry (Bhattacharya, 2017), I asked, *How do Black parents support their children's mathematical identities?* Using a snowball-sampling method (Noy, 2008), I recruited eight Black families with children who attended public elementary schools in southern California (for details, see Figure 1). Although I initially sought socioeconomic diversity, the snowball sampling method resulted in a sample of college-educated parents (mostly mothers). I collected data through semi-structured parent interviews, family observations (including field notes) in the home, and artifacts and photographs gathered during observations. Mothers were my main point of contact and were often the only caregiver present during data collection. I observed parents and their children during everyday activities (e.g., cooking, cleaning, homework, and leisure time). During interviews, I asked about their daily family routines, educational aspirations

for their children, and the ways they supported their children mathematically. Following up on our interviews, several of the parents offered evidence of their day-to-day activities by sharing artifacts such as mathematics workbooks, games, and cooking recipes, which I photographed for triangulation purposes. Interviews were later transcribed and coded, along with field notes, in two coding cycles. I first employed an open coding technique (Emerson et al., 2011), recording all emerging themes, and later reduced the data in a second, focused coding cycle. In second-cycle coding, I followed a codebook guided by my theoretical frameworks.

Table 1
Study Participants*

Participating Parent (Occupation)	Participating Child(ren) (Grade Level)	Other Household Members	Data Collected	Total Home Visits
Ashley (Doctoral student)	Ada (3 rd grade)	Father (Veteran) Brother (14yo)	Parent interview Family observation Artifacts (photos)	3
Ayo (Hip-hop artist, community activist, doctoral student, teacher)	Ajani (2 nd grade)	Brother (12yo)	Parent interview Family observation Artifacts (photos)	1
Dana (Doctoral candidate)	Devon (4 th grade)	None	Parent interview Family observation	1
Eshe (Nurse)	Elijah (Kindergarten)	Sisters (1 and 3yo)	Parent interview Family observation	1
Ezra (PhD candidate)				
Jamel (Research consultant, writer)	Jordan (2 nd grade)	None	Parent interview Family observation Artifacts (photo)	1
Kia (Educator)	Keon (4 th grade)	Father (Retired police officer) Brother (6yo)	Parent interview Family observation Artifacts (photos)	1
Lola (Undergraduate student)	Leila (4 th grade) Liana (4 th grade)	Stepfather (Musician) Sister (12yo)	Parent interview Family observation Artifacts (photos)	3
Mona (Chiropractor)	Mya (Entering 1 st grade)	Father (Assistant Director) Brother and sister (5 and 2yo)	Parent interview Artifacts (photos) Family observation	3

Note. Pseudonyms are used to protect identity of participants.

Findings

Collectively, the Black parents in this study provided evidence of their mathematical identity support aligning with Martin's (2000) mathematics identity framework. However, there were some differences in their approaches to supporting their children's mathematical identities: While some parents were more focused on building confidence, others were more concerned with showing their children the practical use of mathematics or promoting mathematics-intensive careers for their children. In the following section, I describe four themes in the approaches parents took to help foster positive mathematical identities in their children: a) an affirmational approach, b) a pragmatic approach, c) an aspirational approach, and d) a race-conscious approach. These themes are not mutually exclusive, as several parents used multiple approaches to support their children's mathematical identities.

The Affirmational Approach: “We got this, we can do this!”

The affirmational approach—the most common form of mathematics identity support—could be seen in six of the parents (Ayo, Ashley, Dana, Jamel, Lola, and Mona) in this study. During interviews or informal conversations, these parents described the ways they supported their children's mathematical identities, with a focus on building their child's confidence in their mathematical ability. They verbally supported their child through words of praise when they were successful and words of encouragement when they were struggling in mathematics. Jamel, the mother of 8-year-old Jordan, shared that she and his father “do a lot of praising of him, and just encouraging him and letting him know that he's smart and he has within him what he needs to excel.”

Three parents (Ayo, Jamel, and Lola) described specific routines they performed to support their children's overall self-esteem, which they hoped would also translate to positive beliefs in their mathematical abilities. They all shared that they use “affirmations,” or chants that promote positive self-talk, as part of their daily routine with their children. The extant literature has well documented the benefits of parental encouragement as seen in the affirmational approach (Jeynes, 2010), especially in improving persistence and interest among young girls in science and mathematics (Alliman-Brisset et al., 2004; Gunderson et al., 2012; Howard et al., 2019). In this study, I similarly found that parents of girls (Mona, Lola, and Ashley) were especially concerned with their daughters' confidence in mathematics. However, as the examples above show, parents of Black boys have also relied on encouraging behaviors, as affirmational support has been documented as a common form of academic engagement in Black parents (Jeynes, 2010).

The Pragmatic Approach: “When it comes to money, when it comes to money!”

When using a pragmatic approach, parents would emphasize the instrumental importance of mathematics by reinforcing its everyday application to their children. Specifically, four parents (Ashley, Ayo, Dana, and Lola) were concerned with their children’s financial literacy and used conversations and activities about spending and saving money to show the usefulness of mathematics outside of the classroom. Ashley was particularly concerned with sharing the importance of everyday mathematics with her daughter, Ada, who has a neurodiverse older brother.

Ashley: I worry about things, like will they be financially stable... I guess the everyday math-type things... the use of money, time, can you financially plan... We are hyper aware of that because... we have a 14-year-old [Ada’s brother] who can’t tell the difference between a dime and a nickel, because he doesn’t have those discrimination skills. So those are part of the reason [Ada] will have to care for him her whole life.

Ashley emphasized the importance of mathematical competence in everyday life to Ada because she knew Ada would eventually be her brother’s caregiver. Thus, the consequence of her lacking these skills is greater because it would not only affect herself but also her brother.

Lola similarly shared the risk of being mathematically incompetent with her daughters by explaining to her daughter the importance of financial literacy.

Lola: Leila mentioned before she wanna be in the WNBA, so she even thought school’s not that important. I’m like ‘wait a minute!’ You don’t wanna have to pay someone to read contracts... or letting someone mismanage your money. All these factors play in no matter what you decide to do... You wanna be the main person saying ‘yes’ or ‘no,’ not having to pay someone cause you’re not good at math.”

I noticed that when parents employed a pragmatic approach to sharing the instrumental importance of mathematics, they seemed to take a defensive stance. In both of these examples, there is a theme of protection, whether it be protecting assets (Lola’s quote) or protecting family members (Ashley’s quote). In other words, they shared the importance of mathematical knowledge by detailing the consequences of lacking said knowledge. Teaching their children about financial literacy is important to Black parents, who are well aware of racial wealth disparities (Darity et al., 2018). As Dana stated in the parent interview, she wants her son, Deon, to be financially literate because, as Black people, “...that’s a big thing in our community. We often don’t know how money works, and it is reflected in the generational wealth, oftentimes, we don’t have.”

The Aspirational Approach: “I want him to be an engineer!”

Five parents (Mona, Jamel, Kia, and Eshe/Ezra) expressed specific mathematical aspirations for their children pertaining to their future careers. Like the pragmatic approach, parents were interested in helping their children see the utility of mathematics; however, here the focus was on future careers rather than the everyday use of mathematics. For example, Jamel shared the types of extracurricular activities she would like her son Jordan to become involved with.

Jahneille: Where, if at all, do you see learning math fitting into the vision you have for [Jordan] as an adult?

Jamel: I see it playing a really big part actually... I want him to get involved in—his school has a robotics program, they also have an engineering program—I want him to get involved in some extracurricular activities around math that will help him... His dad would like him to learn coding.

In this example, Jamel showed more interest in Jordan learning mathematics to prepare for potential careers (e.g., robotics, engineering, or coding) rather than everyday mathematics or basic life skills (e.g., money management or grocery shopping). Other parents expressed a similar desire for their children to pursue careers in science, technology, engineering, and mathematics (STEM).

Eshe, an Ethiopian immigrant, explained that mathematics and science expertise are highly valued in her culture. Because of this, she bought toys for her five-year-old son, Elijah, to foster an interest in these subject areas. During our interview, she explained that “[she] want[s] him to be [an] engineer, so [she bought] him Legos, Magna-tiles, blocks, anything for building.” Mona, a mother of three, also expressed that it was important for her eldest daughter Mya to understand mathematics well because “that’s gonna set her up well for [a] future in math and science, which will hopefully set her up well if she wants to go into engineering or [information technology].” As seen in these examples, parents who use the aspirational approach share the instrumental importance of mathematics through a career-focused perspective. Given the dearth of Black professionals in the STEM fields (Flynn, 2016; McGee, 2016), these parents may be emphasizing these high-earning-potential careers to their children at an early age to encourage their matriculation into STEM professions. As the literature on Black STEM college majors and professionals has suggested, parental encouragement and motivation in early mathematics play an important role in children’s successful STEM trajectories (Flowers, 2015; McGee & Spencer, 2015).

The Race-Conscious Approach: “We made math!”

Four parents (Ayo, Ashley, Dana, and Lola) used a race-conscious approach to support their children’s mathematical identities. This method was marked by its focus on collective Black identity in the context of mathematics learning. In other words, parents would incorporate their knowledge of contemporary or historic Black issues to support their children’s mathematical identities. This approach was often used in combination with one of the previously described methods. Below, I describe how Ayo, an educator and activist, used a race-conscious approach alongside an affirmational approach when her son was discouraged with mathematics.

Ayo: I went to a private school, all-black, pro-black, private school... So in my mind, *we* made math... so we gon’ do math at a whole ‘nother level... I cannot help but bring that to the table as a parent... That’s always in my tone when I’m talking to them about whatever the affirmation is. Nah we got this, we can do this... break it down, slow it down... but all that foolishness and that nonsense, that don’t have no place up in this house.

Here, Ayo references the collective Black identity to encourage her children, reminding them that “*we* made math.” She mentions that this specific approach was motivated by her own experience learning mathematics at an Afrocentric school where Black history and identity were incorporated across the curriculum. She recalled having a classmate who would “do [math] problems in hieroglyphics” and that all of the students took advanced mathematics courses at an early age.

Ayo: If you challenge children, especially Black children, to do certain things at an early age, you will be surprised how they could actually... adhere to that. So doing calculus in the 6th grade would sound crazy to somebody else, but at my school, they believed that they were all brilliant and capable of doing that.

Ayo comes from an educational background that simultaneously bolstered her mathematical and racial identity, a strategy she now employs as a parent. Here, Ayo shows confidence not only in her own ability or even her son’s but in *all* Black children. It is this level of confidence that she hopes to instill in her children, which is why she is adamant that “all that foolishness and that nonsense [self-doubt] have no place...in [her] house.” Her affirming behaviors serve as a form of resistance against the anti-Blackness her children have experienced in schools that have set low expectations for Black children, a sentiment that was echoed in other parent interviews and that has been well documented in the literature (Cooper, 2009; Delpit, 2012). Ayo’s race-conscious approach to mathematics support is well aligned with the philosophies of the post-civil rights, Afrocentric movement that motivated the start of Afrocentric schools and interventions such as the Algebra Project (Moses et al., 1989).

Lola, a non-traditional college student and African American Studies major, similarly supported her daughters' mathematical identities by centering their Black identity; however, in doing so she highlights the instrumental importance of mathematics. In the excerpt below, Lola combined a race-conscious approach with a pragmatic approach by using the board game Monopoly to explain the harmful neighborhood effects associated with gentrification and rent increases.

Lola: So I like to tell them, like, our society is basically like a monopoly... Property is everything... I show them the different neighborhoods and why they cost different prices... Let's say if this was like our neighborhood we grew up in... and somebody comes in and puts up these hotels, the rent increases and you'll collect more. So when you're deciding if you wanna win, you gotta buy up everything and raise the rent. But if you wanna be a good human being, you gotta... see what you wanna do."

Here, Lola showed her daughters the utility of mathematics by applying their knowledge of number sense to a real-world situation. However, this was no ordinary game of Monopoly, as she utilized the game to explain to her daughters how gentrification relies on anti-Black racism to dismantle communities like her childhood neighborhood. A native of the predominantly Black neighborhood of South Central Los Angeles, Lola used her experiential knowledge of gentrification to raise a moral dilemma in the game: a) buy hotels, raise the rent, and win the game by forcing other players into bankruptcy or b) forgo buying hotels and be "a good human being" but risk losing the game. Lola's "mini-lesson" on gentrification is well aligned with Ladson-Billings' (1995) recommendations for culturally relevant pedagogy, which included teaching practices that help students develop a "critical consciousness through which they challenge the current status quo of the social order" (p. 160).

In both examples, the parents' race-conscious approach appears to be motivated by their background—Ayo's experience of attending an Afrocentric school and Lola's predominantly Black childhood neighborhood. Combined with their present-day experiences (Ayo is an educator and activist and Lola is an undergraduate student majoring in African American Studies and Sociology), their collective Black identities and commitment to fighting against anti-Black racism permeate their parenting concerning their children's mathematics identities, similar to the parents in Cooper's (2009) study, whose parental involvement included political activism.

However, other parents in this study were similarly race-conscious but did not necessarily incorporate this perspective in the ways they supported their children mathematically. Jamel, for example, is a community organizer who works with Black grassroots movements to support food-insecure and prison populations. Yet, a clear connection between her community organizing and parenting around mathematics did not emerge from the data in the way that it did with Ayo and Lola. As such, what

leads some parents to incorporate race-consciousness in supporting their children's mathematical identities warrants further exploration.

Discussion

Despite the scholarly significance of these findings, this study has its limitations. First, the parents in this study were all college educated—ranging from one participant completing a bachelor's degree to another with a doctoral degree. Although I initially sought greater socioeconomic diversity, the snowball sampling method, which allowed participants to be active agents in the research process, resulted in participants that were very similar in education level. Another limitation of this study was the limited participation of fathers. Although both mothers and fathers were invited to participate in the study, many fathers were unavailable due to work schedules. Perhaps fathers would have exhibited alternative forms of mathematical support. Additionally, the amount of time spent during family observations varied across participants. Although I only visited some families once, others I visited on multiple occasions. This decision was made out of respect for participants' time because they were not compensated for their participation in this study. However, considering that I spent varying hours with participants, this gave me a deeper knowledge of some families compared to others.

Mathematical Identity in Black Children

The mathematics education literature is dominated by achievement gap research aimed at fixing Black children, and other similarly marginalized children, with a focus on test scores and classroom performance. However, in the past two decades, scholars like Gutiérrez (2008) and Martin (2000), among others, have pushed the field to think past academic performance and to consider examining issues such as identity and power. Here, I have highlighted the contributions Black parents have made to their children's mathematics education by supporting their identities as doers of mathematics. Scholars who examine mathematical identities in Black children specifically argue that a critical component of mathematical identity is the ability to use mathematical knowledge to critique the world around them and to transform their daily lives (Davis & Martin, 2018).

The parents in this study, irrespective of their beliefs about their mathematical abilities, were concerned with supporting their children's mathematical identities. They affirmed their children's mathematical abilities in formal and informal ways and reminded them of the usefulness of mathematics—from becoming financially literate to gaining access to high-paying, math-intensive careers. Some parents even employed a race-conscious approach in supporting their children mathematically, as they simultaneously tended to their children's racial and mathematical identities by

challenging anti-Black racism in the context of mathematics learning. These findings support the growing body of literature aimed at challenging deficit views of Black parent engagement in general (Fenton et al., 2017; Howard, 2020; Howard & Reynolds, 2008; Jackson & Remillard, 2005; McCarthy Foubert, 2019) and provide an alternative perspective to view Black children's mathematics education, shifting the discussion away from the so-called achievement gap and toward mathematical identity, a crucial yet underexamined component of mathematics education.

Bridging Home and School Learning: Implications for Educators and Parents

The findings from this study suggest that educators can better support Black students in mathematics by drawing connections to their everyday lives. McGee and Spencer (2015) asked what educators can learn from Black parents while examining parental influence on college-aged STEM high achievers. I raise the same question here for elementary educators who seek to bridge the gap between home and school mathematical learning for their Black students. Many of the parents in this study were "highly-involved" by traditional standards—they attended parent conferences, communicated with teachers, and were highly visible in their children's schools. However, other parents in this study may have easily been mistaken for being uninvolved due to their alternative support strategies. Their forms of support and involvement often go unnoticed, and in this study I have presented an alternative perspective on parents who employ subtle forms of academic support, as have other scholars (Jeynes, 2010). Most, if not all, of the parents in this study were concerned with their children's safety and well-being in a highly racialized society. Although teaching their children mathematics was not always their primary goal as parents, they provided their children with opportunities to simultaneously learn about race and mathematics.

Black parents' awareness of racism and discrimination has been well documented in the literature on parental racial socialization. However, the dominant discourse around Black parent engagement has focused on how to increase their involvement concerning school-based goals with the assumption that they lack the resources or interest to support their children's education (Fenton et al., 2017; Howard & Reynolds, 2008; Jackson & Remillard, 2005). Educators must understand that for Black parents what it means to be successful in school, and in mathematics in particular, is not simply a matter of their children's academic and future career prospects. Many Black parents are preoccupied with their children's safety; beyond the typical parental worries of their child's well-being, Black parents must also teach their children about racism and discrimination. As such, educators must consider the context of Blackness when communicating with Black parents about their children's school success. The key to bridging the home-school connection may be for teachers to align their classroom goals with parental goals rather than expecting parents to passively comply with school expectations for parent engagement.

Considering that Black parents, and other parents of color, already have the added burden of racism and discrimination, educators can build rapport with Black parents by showing that they too are interested in their community-based knowledge, including issues that affect the Black community in particular. In addition to helping students master mathematical concepts, educators can teach mathematics for social justice (Leonard et al., 2010) and prepare lessons that explicitly address systemic social inequality that has disenfranchised Black people. Educators can also use as a guide the parents in the present study who employed race-conscious approaches to support their children's mathematical identities in order to contextualize their students' mathematical knowledge in ways that are meaningful to the Black community. Several parents in this study simultaneously supported their children's mathematical and racial identities, using the game of Monopoly to teach about gentrification or affirming their children's mathematical abilities by reminding them about the legacy of Black mathematicians. Educators can show Black children that mathematical knowledge is a tool that can be used to disrupt the racial hierarchy. Just as many parents in this study reinforced their children's mathematical knowledge and identities in the context of Black history and contemporary social issues, teachers of Black children should not be afraid to similarly affirm their students' culture in the context of mathematics learning. As other scholars have noted, teachers can, and should, use social justice approaches (Moses et al. 1989; Wager & Stinson, 2012) to teach mathematics.

Of course, incorporating a cultural and/or social justice lens into mathematics is a difficult task, as, generally, educators refrain from addressing issues of race because they can be difficult to implement effectively. Scholars have acknowledged the tensions that may arise when social justice and cultural approaches are introduced to mathematics curriculum, as they might overshadow content knowledge (Civil, 2018). Aguirre, Turner, et al. (2013) also demonstrated how superficial attempts to connect to children's cultures can encourage stereotyping and promote harmful narratives about children and their communities. To avoid these scenarios, many educators rely on seemingly "race-neutral" teaching examples, such as pizza slices to teach about fractions, but these contexts do not represent authentic connections to students' lives outside of school. If, as scholars have argued, mathematics learning is already a racialized experience, to ignore students' racial identities in the context of mathematics learning is only reinforcing systemic inequality, as failure to address race in mathematics education by maintaining a color-blind curriculum only further alienates Black children in mathematics classrooms.

Additionally, teachers might be concerned that discussions about race/racism may be inappropriate due to the age of the children. However, as seen in this study, parents are already having conversations about race with their children; perhaps Black parents may serve as a resource for teachers in this regard. Regardless of the racial composition of a particular school, social justice approaches to mathematics

education can be employed successfully and can benefit all students, as the effects of racism and discrimination impact all members of society. As Davis and Martin (2018) have noted, teachers of Black students can and should help students use mathematics as a tool to evaluate and critique historical and current events to increase understanding of their position in society, individually and collectively. In fact, elementary school classrooms may be an ideal setting for a race-conscious curriculum, as the multi-subject classroom settings create natural fluidity between content areas; teachers can connect mathematics to areas such as history and English/language arts, content areas where cultural connections may be drawn more easily.

Parents and teachers alike should also help protect children's mathematical identities from harmful influences and be mindful of the ways mathematical identity is shaped by not only views of the self but also by the beliefs of others (Nasir, 2002). In other words, school-based measures of mathematics success, such as grades, test scores, and teacher expectations, do not have to be the only factors that shape children's mathematical identities. When children face challenges in school mathematics, parents and teachers can remind them of their mathematics successes outside of school by showing their children the many other ways they use mathematics, even when mathematical knowledge is not being assessed. For example, parents can talk to their children about measurements while cooking a family recipe together, reminding their child that a delicious meal that results from balancing flavors is evidence that the cook is good at mathematics. Teachers can also emphasize mathematics as they pertain to other subjects; for example, teachers might highlight the rhythmic patterns in music to discuss ratios and proportions. Such messages, although subtle, can help bolster children's mathematical identities by increasing their confidence and understanding of the real-world importance of mathematics.

This point is of particular importance now, as we are witnessing the bridging of home and school learning amid the novel coronavirus (COVID-19) global pandemic (although data collection and analysis for the current study were completed prior to school closures in the United States). In a matter of weeks, parents were suddenly forced to homeschool their children in compliance with social distancing mandates. In a way, the pandemic has forced the bridge, as "home" and "school" have merged, even temporarily. This pandemic could potentially shift the structure of schools and further blur the boundaries between teachers and parents. I hope the findings presented here will encourage parents to trust that their life experiences have prepared them to teach their children mathematics and apply them to real-world settings. Even if we operate under the optimistic assumption that schools will return to operation as usual post-pandemic, I hope that the time parents have spent in the dual role of parent/teacher will empower them in future interactions with teachers and school staff as they advocate for their children and support them as doers of mathematics. I also hope that teachers will begin to appreciate the contributions Black

parents make to their children's education, even if they are not the contributions that are expected.

Conclusion

Reflecting on my identities as a Black parent and mathematics education researcher, I am mindful of how the culmination of this study coincides with a moment in history where a global pandemic has forced many children out of physical classrooms. In this time, I have had the opportunity to spend more time with my sons, recalling my own childhood experiences in search of ways to create an educational but exciting environment to distract them from the chaos our global health crisis has ensued. However, I am also mindful of the surmounting pressure Black parents are facing, juggling work and family all while supporting children with distance learning. In some ways, the call to acknowledge Black parents' contributions seems ironic, as distance learning has forced us to engage with schools in unprecedented ways. However, this does not mean that Black children, or their parents, are any more protected from the anti-Black racism they are subjected to in face-to-face classrooms. The biases and stereotypes about Black children and their families are likely resurfacing in virtual classrooms. Whether Black parents' contributions continue to go unnoticed is dependent on education researchers' and teachers' willingness to expand the scope of parent engagement.

In this study, I have demonstrated the various ways Black parents support their children mathematically. To date, few researchers have examined Black parents' contributions to their children's mathematical learning, particularly to their identity as doers of mathematics. As we continue to push for Black children to be seen in mathematics classrooms, I hope the findings from this study will also encourage education researchers and teachers to keep parents involved in mathematics reform efforts. We must remember that Black parents are also teachers and will continue to teach their children well after they step foot out of the classroom. Thus, if we make efforts to strengthen the relationship between schools and Black families, we will have a better understanding of the pedagogical practices that are both mathematically rigorous and applicable to the everyday lives of Black children.

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