CULTIVATING RACIAL SOLIDARITY AMONG MATHEMATICS EDUCATION SCHOLARS OF COLOR TO RESIST WHITE SUPREMACY

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Abstract

In this paper, we propose a *racial solidarity praxis* in mathematics education grounded in Black-, Latinx-, and Indigenous-led scholarship and their respective communities' joining efforts to combat White supremacy. Increased solidarity across racial groups in mathematics education could illuminate new ways of nourishing and affirming Indigenous, Latinx, and Black students' racial identities and cultural strengths. We leverage four frameworks: (1) Whiteness as property (a tenet of critical race theory) and (2) Tribal critical race theory; (3) Latino critical theory; and (4) pedagogy of solidarity, to conceptualize the interdependence required for solidarity work and to expose how White supremacy is maintained overtly and covertly in mathematics curriculum, policies, and practices. This study outlines the nuances across each community of scholars drawing on their strengths to combat oppressive educational structures for students. The authors conclude in solidarity, focusing on the ways our communities have

sought to challenge White supremacy and deficit framings of our students, families, and communities. Our hope in bringing these bodies of literature together is to invite others within (and outside of) the field of mathematics education to co-imagine how we might engage our work synergistically. It is through a collectivizing of efforts that we imagine a racial solidarity praxis that begins to erode the power of White supremacy in math education because of the unique and unassimilable strengths and priorities of each community engaged.

Keywords: mathematics education, students of color, race/ethnicity, critical race theory, White supremacy

> When our pedagogy or scholarship involves challenging the status quo, especially on behalf of students who are Indigenous*, Latinx, and Black**, some people will go to extreme measures to silence us. (Gutiérrez, 2017, p. 8)

The cultures, languages, and identities of students of color are regularly devalued in schools. Howard and Navarro (2016) assert "that many students of color are expected to learn in schools where content, instruction, school culture, and assessment are often racially hostile, exclusive, and serve as impediments for school success" (p. 255). Aims of cultural extinguishment and linguicide have sometimes been more explicitly articulated in North American policies toward Indigenous students than toward Black and Latinx students. However, this underlying goal is evident at many layers of policy for Black and Latinx students, such as English-only policies in school hallways (López, 2002) and rejections of Black cultural expressions in schools as "unprofessional" (Morris, 2016; Ridgeway & Yerrick, 2018).

Increased solidarity across racial groups in mathematics education could illuminate new ways of nourishing and affirming Indigenous, Latinx, and Black students' racial identities and cultural strengths. To this end, we argue for the cultivation of racial solidarity through mathematics education research conducted by Black, Latinx, and Indigenous scholars. Efforts to bring these groups together have gained traction in recent years, such as the 2018 volume of the National Council of Teachers of Mathematics' Annual Perspectives in Mathematics Education (Goffney, Gutiérrez, & Boston, 2018). Similarly, the Annual Mathematics Education Scholars of Color

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* We use the term "Indigenous" to refer to persons from Native nations in North America, including Native Alaskan and Native Hawai'ian populations. We acknowledge that Indigenous identity is determined by tribal nations themselves rather than by colonial notions of race while recognizing the racialization that shapes Indigenous peoples' experiences and governs so much of societal organization.

** Following Gutiérrez (2018), we change the order of the three groups throughout this manuscript, so as to resist homogenization and centering one group over the others. Additionally, we acknowledge that there are many people who identify with two or more of these groups.

Conference (MESOC) brings together scholars of color in mathematics education

> to leverage our individual and collective expertise in mathematics education; voice our ideas and concerns related to the field; conceptualize and locate ourselves in anti-oppressive and humane mathematics education agendas; and, share self-care and leadership strategies to sustain and nourish ourselves in this justice struggle. (MESOC, 2018, p. 1)

Building on these efforts, we aim to identify the specific ways that White supremacy operates in each of these groups and to strategically engage in research to transform mathematics education spaces for marginalized students of color. In this paper, our overarching goal is an expansive solidarity effort in mathematics education that will contribute to a collective resistance against the oppression of students of color, towards a culturally affirmative education (Marshall, 2018; Paris & Alim, 2014; San Pedro, 2017).

MATHEMATICS EDUCATION: A HISTORY OF MARGINALIZING STUDENTS OF COLOR

Mathematics fields in the United States (US) were developed to preserve the elite status of White, upper-middle–class men (Castro, 2014; Leyva, 2017; McGee, 2016). Mainstream mathematics education plays a central role in this preservation and, consequently, in the marginalization of people of color (Battey & Leyva, 2016). Consistent racial ordering of mathematical achievement reifies a racialized hierarchy of mathematical ability, maintaining this status and effectively marginalizing Black, Indigenous, and Latinx students. We see this appear in White-normed measures such as the National Assessment of Educational Progress (NAEP) and college readiness exams (e.g., SAT) with little to no change across decades of school reform efforts. This hierarchy squarely places Black, Latinx, and Indigenous students on the bottom, and White and Asian students at the top (Deyhle & Swisher, 1997; Gholson & Wilkes, 2017; Martin, 2009, 2013). The racist underpinnings of this hierarchy are revealed by its inconsistency: Martin points out that when White students

lag behind Asian students, such as in the Trends in International Mathematics and Science Study, the discourse suddenly shifts—it is no longer called an achievement gap, but a teacher or curricular gap. Thus, the discourse about "achievement" in mathematics serves to uphold White supremacy.

The racialized hierarchy also creates a master narrative about students of color that recreates itself. White-normed standardized measures work to portray students of color as disadvantaged (Martin, 2009), producing disparate mathematics outcomes for Black, Indigenous, and Latinx students that perpetuate deficit portrayals. These performance measures are coupled with negatively fueled stereotypes that lead to "shortcuts in thinking about [students' of color] mathematics achievement and participation in racial (and gendered) terms" (Gholson & Wilkes, 2017, p. 41). These stereotypes produce racialized scripts and subject students' identities to "being confused or confiscated…in order to perpetuate persistent narratives of criminality or general ineducability and, concomitantly, sustain the prestige of mathematical knowledge" (Gholson & Wilkes, 2017, p. 41-42). One salient example is the consistent framing of Black girls as loud and expressive. Viewing Black females in this light obfuscates their learning potential and, subsequently, their learning opportunities (Fordham, 1993).

In response to the deficit framing of students of color, scholars of color have worked with their respective communities to chronicle examples of success to challenge the pervasive nature and function of racist and settler-colonialist practices and policies. Building on this work, we aim to shift our gaze from White-normed metrics (e.g., norm-referenced tests) to culturally- and racially-affirming measures to center the brilliance of Latinx, Indigenous, and Black students. In this paper, we accomplish this by featuring contributions of various scholars of color and imagining a path forward to replace the national narrative about students of color. Through critical race theories, we propose a *racial solidarity praxis* in mathematics education that (1) identifies ways White supremacy operates in each community and (2) draws on the strengths and expertise of each community.

CONCEPTUAL FRAMEWORK

In highlighting often silenced scholarship from the three communities of color, we aim to inform and (re)imagine a racial solidarity praxis grounded in collective resistance efforts. Critical theories—specifically critical race theory (CRT), Latino critical theory (LatCrit) and Tribal critical race theory (TribalCrit) provide a robust lens for developing a solidarity framework because they account for the complex and nuanced ways that racism operates in different spaces. They highlight how people are racialized differently at different times in order to maintain White supremacy (Beydoun, 2013; Chen & Buell, 2018; Stovall, 2013).

TOWARDS A RACIAL SOLIDARITY PRAXIS

To outline our racial solidarity praxis, we draw on four frameworks: (1) *Whiteness as property,* a tenet of CRT; (2) TribalCrit; (3) LatCrit; and (4) a pedagogy of solidarity. Together, these provide important context for challenging the centrality of Whiteness within mathematics education and synergizing some of the contributions by Indigenous, Black, and Latinx scholars. In bringing together multiple voices of oppressed peoples in conversation, we seek to understand the varied responses of each community in order to build a solidarity praxis that addresses the shifting nature of oppression.

Whiteness as property illuminates how White supremacy operates. Harris's (1993) conceptualization of Whiteness as property describes the race-based laws that allowed White people to buy and sell property in the United States. This continues to be the model by which White people in the United States maintain privilege and power in the educational system (Bullock, 2017; Ladson-Billings & Tate, 1995; Mensah & Jackson, 2018). Bullock (2017) points out that public education

> is a property-based game in which those who benefit from whiteness hoard real property to gain intellectual property. The danger is that, as with physical property, real property is a limited resource. Those who claim an entitlement to quality education as

> intellectual property also necessarily claim the same entitlement to the real property that supports it. (p. 633)

Bullock argues that public education, in general, and mathematics education in particular, is a form of intellectual property that, despite the rhetoric "for all," is treated as a limited resource, an illusion that serves to create winners and losers. Whiteness in education functions to maintain Whites as the perpetual winners (Nelson, 2016; Ridgeway, 2019) through speciously objective metrics (e.g., test scores). Conversely, we argue that by hoarding intellectual property, Whites control access to real property: access to high-ranking colleges and high-paying jobs. Intellectual property is limited by restricting access to advanced mathematics courses, and by privileging particular, culturally based ways of knowing, doing, and speaking mathematics. Mensah and Jackson (2018) make this case for science education. *Whiteness as property* is an appropriate lens for understanding why policies and practices in mathematics education are in place that continue to marginalize our communities.

TribalCrit offers an important perspective not captured by CRT alone; settler colonialism operates similarly to racism but has important distinctions. For example, Brayboy (2005) highlights how US educational policies toward Indigenous peoples "are intimately linked around the problematic goal of assimilation" (p. 429). This goal of assimilation has taken distinct shape in educational policies toward Indigenous peoples, with Native cultural genocide an explicit purpose of schooling (Lomawaima & Ostler, 2018). Furthermore, TribalCrit points out that colonization is endemic to US society, and that undergirding this colonization is "imperialism, White supremacy, and a desire for material gain" (p. 429). We draw on TribalCrit along with Whiteness as property to account for the unique ways settler colonialism has impacted Indigenous peoples.

Latino critical theory or LatCrit was conceptualized in relation to the particular intersectional experiences of Latinx pushing on the Black/White paradigm undergirding CRT to include issues such as language, immigration status, phenotype, ethnicity, culture, and colonization, "incorporating a fuller, more contextualized analysis of the cultural, political and economic dimensions of White supremacy"

(Dávila & Aviles de Bradley, 2010, p. 42). Taken together, these race-based frameworks allow us to examine the insidiousness of White supremacy within schools, exposing the ways our young people of color are institutionally subject to marginalization.

As we conceptualize our work, we borrow from Gaztambide-Fernández's (2012) vision for a *pedagogy of solidarity* that "hinges on radical differences and that insists on relationships of incommensurable interdependency" (p. 47). Gaztambide-Fernández's notion of solidarity prizes interdependency over "similarity and a rational calculation of self-interests" (p. 49). Arguing that privileging independence stems from and reinforces European colonial structures, Gaztambide-Fernández proposes a pedagogy based on a commitment to equity and justice through relationship with others, creating conditions that "seek to heal the social, cultural, and spiritual ravages of colonial history" (p. 42) through (1) relational solidarity, (2) transitive solidarity, and (3) creative solidarity. Relational solidarity represents a call for deliberate commitment to a relational stance on the part of scholars of color from marginalized communities. Transitive solidarity means to solidarize with; it is an active praxis rather than a static position. Finally, creative solidarity represents creatively engaging with others in both unexpected and sometimes inopportune ways. Thus, under a pedagogy of solidarity, different racial and cultural paradigms, as well as circumstances within and responses to White supremacy, can serve as strengths in producing new knowledge.

MATHEMATICS SCHOLARS OF COLOR

To outline a racial solidarity project, we present analyses of work done in each community by identifying the ways youth of color are framed in deficit lenses and then pinpointing some of the ways Indigenous, Latinx, and Black mathematics scholars have worked to challenge these forms of White hegemony. Our work was guided by the following questions: *How do Black, Latinx, and Indigenous scholars leverage the strengths of their communities and resist White supremacy separately and collectively? How might a solidarity praxis, focused on interdependence and resistant to homogenization, leverage*

the various resistance efforts made by Latinx, Indigenous, and Black scholars?

We first present scholarship from Indigenous researchers because this marginalized group is often ignored (Shotton, Lowe, & Waterman, 2013). Indigenous scholars leverage the strengths of their communities by maintaining a connection between past, present, and future in their work. They resist White supremacy by maintaining this past-present-future connection in building on local communities' knowledges to challenge settler-colonial epistemological hegemony and centering cultural sustenance for each of the 573 federally recognized (and more not yet recognized) tribal nations in what is currently the US. Next, we outline the ways Latinx scholars have reconceptualized how mathematics educators can build on the cultural and linguistic resources of Latinx learners in order to inform curricular innovations and pedagogical practices that support and recognize robust mathematical participation. Finally, we highlight how Black mathematics education scholars have continuously and strategically drawn on critical frameworks centering systemic issues of racism that Black mathematics learners experience on macro and micro levels. We conclude by imagining how we might work strategically as a collective force to resist Whiteness in mathematics education fields.

INDIGENOUS SCHOLARS

To understand how Indigenous scholars in mathematics education resist White supremacy, we must first understand some of the epistemological and material violence inflicted on Indigenous students, historically and presently. From the beginnings of mandatory schooling in what is currently the US, education was expressly designed to strip Indigenous students of their Indigeneity through residential schools meant to "civilize" Indigenous children (Kickingbird & Kickingbird, 1979; Lomawaima, 1993; Lomawaima & McCarty, 2006). Though few boarding schools are still in operation (cf. Martin & Hill, 2016), the mission of assimilation retains widespread influence in public schooling (Brayboy & Castagno, 2009; Lomawaima & McCarty, 2002). In mathematics in particular, Eurocentrism—in both epistemology and pedagogy—dominates, requiring students to conform to White ways of knowing and learning.

This is Whiteness as property operating to "enshrine the status quo as a neutral baseline, while masking the maintenance of white privilege and domination" (Harris, 1993, p. 1715). Just as Indigenous linguicide and cultural genocide were committed to confer property rights of Whites on Native land, these same principles still operate to confer the property rights of economic access to Whites, by elevating Eurocentric notions of mathematics and denying status to Indigenous knowledges. Eurocentrism silences Indigenous mathematical knowledge systems, creating the illusion that mathematics arrived to this continent with the European invaders. For these reasons, many Indigenous scholars emphasize challenging Eurocentric knowledge systems—with attention to past, present, and future for people- and place-specific communities.

Past. Indigenous scholars leverage strengths of their communities by celebrating the past. For many, grounding pedagogy in the past means teaching and valuing ancestral knowledges, allowing for nourishment from ancestors and authentic understanding of where we've been, to better appreciate where we are (Kame'eleihiwa, 1992; Kaomea, 2011; Mould, 2003). Kaomea (2011) says that Indigenous students "need a firm grounding in the accumulated wisdom of our ancestors" (p. 293) in order to be prepared to solve future problems. This entails authentic honoring of the mathematical contributions of Indigenous students' specific communities. For example, Lipka, Andrew-Ihrke, & Yanez (2011) show how traditional practices for crafting Yup'ik ceremonial headdresses, handed down for generations, use symmetry and proportional measuring to create a square, then transform the square into a circle—two shapes that are generally considered unrelated in Western geometry. Kaomea (2011), similarly, points out that Indigenous civilizations, "including Native Hawaiians, achieved a high level of mathematical sophistication that allowed them to classify, order, count, measure, and otherwise mathematize their environment" (p. 295), and that Hawaiian students would "benefit from explicit lessons in the rich mathematical heritage of our Hawaiian ancestors" (p. 295). Kaomea (2011) roots mathematics lessons in ancestral calendars, which aligned planting and fishing patterns with the lunar cycle in order to optimize yields, developing "intricate

systems for sustainable resource management that would rival any system of resource management in existence today (Friedlander et al., 2000)" (p. 295). By continuing to pass on the mathematical innovations of their ancestors, Indigenous scholars deliberately uplift and build on Native elders' and community knowledges to create pedagogy that challenges dominant mathematics education and helps sustain the cultures of a multiplicity of Native nations.

Present. Indigenous scholars also work against present challenges: decentering the current hegemony of White mathematics by challenging how students should come to know. Pedagogies should be rooted in the practices and beliefs of specific communities. For example, Lipka and colleagues (2011) illustrate how the creation of Yup'ik ceremonial products can offer a more holistic view of mathematics, integrated with culture. They use mathematical properties, including symmetry and geometrical verification, reflecting "the reciprocal relationships between the spirit world, animals, and people" (p. 164). The finished headdress represents Yup'ik values and beliefs, "particularly the importance of worlds within worlds" (p. 165). This project, in other words, is an instantiation of mathematics that is holistic—inseparable from the spiritual and cultural lives of students and their families. Similarly, Caswell and colleagues (2018) use Ojibwe traditions and spatial reasoning to introduce geometric topics before number sense—a disruption of the Eurocentric sequence of topics which introduces number sense prior to spatial reasoning. These scholars challenge the very pedagogical approaches to learning, showing that learning can be holistic and rooted in Indigenous students' own cultures.

Future. Indigenous scholars also challenge White supremacy by looking to the future. As one example, Caswell and colleagues (2018) invoke a concept learned from Ojibwe elders, gaa-maamiwi-asigaginendamowin, an Anishnaabemowin word that loosely means "gathering to learn and do mathematics together, collectively performing useful action" (p. 85). By bringing Anishnaabemowin language into the mathematics classroom, they foreground the future: both sustaining language and highlighting how this mathematical action is useful. Useful, future-oriented mathematical action must

be people- and place-specific (Smith, 2012; Tuck & McKenzie, 2014). For many tribal nations, useful mathematical action has a nation-building focus (Brayboy, Castagno, & Solyom, 2014), but can also include a much broader scope: Kaomea (2011) points to the importance of preparing students to craft "sustainable, culturally appropriate solutions to global and societal problems that no one yet knows how to solve" (p. 293). Pedagogically, this means that mathematics education should invoke and prepare students to solve problems that their local communities see as valuable.

These approaches—knowing where we are in relation to history, squarely facing the present, and keeping the future in sight—require pedagogies that honor students' own specific communities' epistemologies, cosmologies, and ontologies, to work toward cultural sustenance for students at all levels of mathematics. Drawing on the power of local, community-based systems of knowledge of both the past and the present, as well as equipping students to engineer a future world, helps them to reverse the tide of White supremacy in mathematics education.

LATINX SCHOLARS

Although the group label of Latinx encompasses a range of Latin American nationalities with varied political histories with(in) the US, educational patterns for all Latinx groups have historically substantiated an assimilationist model that sustains a culturally and intellectually deficit framing. For Mexicans and Puerto Ricans, two of the largest groups, US education practices and policies have ensured their marginalization through "limited access to separate, inferior, subtractive and non-academic instruction" (San Miguel & Donato, 2010, p. 29). Latinx students experience some of the highest push-out rates, overrepresentation in special education labeling, (Artiles, 2003) and various forms of subtractive schooling (Valenzuela, 1999). In education broadly, and mathematics education specifically, White hegemony functions to maintain a racial hierarchy with Latinx learners consistently relegated to the margins. This is accomplished through practices and policies constructed on deficit framings

and institutionally sanctioned biases (e.g., resistance to support bilingualism).

One way Latinx scholars have resisted ideologies rooted in White Supremacy is by revealing the dynamic resources possessed by Latinx communities. Many scholars have drawn heavily on the concept of funds of knowledge (FoK) (Moll & Gonzalez, 1994), an explicitly anti-deficit stance that unearths and leverages knowledge produced in the lived and cultural-historical experiences of Latinx students' families and communities. In response to the racist, anti-immigrant, and English-only political context, Latinx education scholars argue that low-income, marginalized communities have, over time, accumulated "bodies of knowledge and skills essential for household or individual functioning and well-being" (Moll & González, 1994, p. 443). Recognition and leverage of this knowledge can subsequently serve to (1) challenge deficit models of marginalized learners by focusing on their cultural and social competencies and (2) substantiate pedagogical resources for teachers in linking classroom learning to students' lives.

Mathematics as a cultural process. Civil (2016) inspires us to think specifically about colonial logics through her work with project Bridge in examining the funds of *mathematical* knowledge present in the home-, occupational-, and community-based practices of Latinx, borderland families. This research builds upon a field of mathematics (ethnomathematics) that recognizes the non-Eurocentric mathematical ways of cultural knowing as one "practiced among identifiable cultural groups such as national-tribe societies, labour groups, children of certain age brackets and professional classes" (d'Ambrosio, 1985, p. 45). By foregrounding the knowledge, experiences, and histories of families and communities in doing mathematics, Civil has explored the ways that everyday mathematics knowledge is acquired, practiced, and learned in family- and occupation-situated contexts such as in cultural practices (e.g., sewing and gardening) and vocational trades (e.g., construction and baking). In these authentic learning environments, Civil noted several characteristics of engagement: learning through observation, learning in interaction with others, taking pride and being passionate about their work, having desire and persistence in

becoming good at their practice, and the need to feel challenged. This research challenges deficit-notions of Latinxs by bringing to light the mathematical competencies embedded in cultural-historical practices.

Issues related to poor mathematical engagement are not inherent to Latinx communities. Rather, the issue lies in how mathematics classrooms are structured, the values that are upheld, and the rationale for doing mathematics. For example, research conducted in a non-selective high school mathematics classroom in Chicago, Black and Latinx students were inspired to work through rigorous mathematics problems when the context of the problems involved issues of socio-political importance (e.g., displacement in their communities) (Buenrostro, 2018). Moreover, many of the same characteristics noted in Civil's work were also present in the high school classroom. In post-class interviews, students underscored similar facets of learning critical to their engagement and commitment: learning in interaction with others and a strong desire to understand socio-political issues impacting their communities. These examples point to the need to design mathematics learning environments in which norms for participation and learning outcomes align better with those whose interests they aim to serve.

Language. Another looming concern pertaining to Latinxs is the role of language in learning. U.S. public schools continue to increase in linguistic diversity with a growing demand in mathematics classrooms to have students engage in multiple forms of communication: reasoning, arguing, explaining, and justifying. Despite these shifts, "decades of research have revealed that U.S. schools have served [emerging bilinguals] poorly" (de Araujo, Roberts, Wiley, & Zahner, 2018, p. 2) by design, not coincidence (Rodriguez, 2015). Notwithstanding, a great deal of scholarship on language use in mathematics classrooms at an interactional scale has expanded our notions of language from a purely cognitive phenomenon to sociocultural and sociopolitical phenomena "by relating languages, mathematics learning, identity development, and relationships of social power" (p. 23).

Latinx scholars whose research is grounded in bilingual classrooms challenge the traditionally and narrowly bounded nature of academic

language in mathematics classrooms such that educators may recognize, value, and build on the varied ways language learners engage in mathematics. One particular example highlights how emerging bilinguals might use imprecise or informal language to indicate precise claims. As opposed to taking their understanding at the level of the words they use, a more complex and accurate depiction of students' proficiency must take into consideration how they coordinate what they say with what they are doing or gesturing. For emerging bilinguals, providing opportunities for students to communicate their understanding as they learn English without penalizing them for using words imprecisely is an important step toward creating learning opportunities. This shift from viewing language solely as competence with words (e.g., acquiring vocabulary) to one that accounts for the differing, situative meanings of language as spoken in practice has serious implications for practitioners' ability to recognize bilinguals' competencies or emerging understanding. Moreover, broadening the notions of language to include multi-modal forms of communication such as gesturing and other non-verbal behavior opens up pathways for educators to recognize and capitalize on how emerging bilinguals construct and demonstrate mathematical meaning and understanding (Dominguez, 2005).

Latinx scholarship in mathematics education contributes to pedagogical advances that leverage the linguistic and cultural strengths of Latinx learners. When teachers hold deficit views of Latinx children and are not equipped to recognize the nuances of language in mathematics instruction and student discourse, emerging bilinguals suffer the consequences, thereby limiting their learning opportunities. From a cultural standpoint, teachers need the time and the resources to build relationships with families and communities as a springboard for uncovering the rich and varied forms of mathematical engagement that current classroom norms and practices do not support. Latinx scholars in mathematics education situate much of their work in the micro-processes of classroom interaction, and we stand to learn and create new models for bolstering students' participation and mathematical identities as a result.

BLACK SCHOLARS

Black mathematics education researchers unpack ways in which racism impacts the experiences of Black students in P-20. Authors of this paper, Ridgeway and McGee (2018), previously analyzed the scholarship of Black mathematics education scholars researching Black students. They determined that Black scholars were strategic in how they approached their research; for example, they cited other Black scholars as germinal to their understanding about Black students. Black scholars operated with the premise that Black students are brilliant and demonstrated how external factors, such as racially biased testing and stereotypes that mathematics teachers hold and operationalize on students of color, can explain some of the disparate performance outcomes. These scholars have taken a direct stance to call out the inaccuracies of deficit narratives about Black students (Gholson, Bullock, & Alexander, 2012) and illuminate narratives related to Black brilliance (Martin, 2009, 2012; Jett, 2011). They recognize the structural injustices that shape the mathematical contexts for Black students' learning, such as the lack of quality mathematics instruction provided to Black students (Moses & Cobb, 2001). Black mathematics education scholars tend to leverage CRT and other race-based theories (e.g., Black Feminist Thought; Gholson & Martin, 2014) to uncover how racism is enacted through policies and practices (Ridgeway & McGee, 2018). For example, in her study in Memphis, Tennessee (a predominantly Black school district), Bullock (2017) found that high-quality STEM education instruction and materials were denied to Black students yet granted to White students. She used Whiteness as property to reveal a "2-phase process in which middle-class Whites…participate to secure STEM education by repurposing *failed* Black schools and…maintain[ing] it by institutionalizing selective strategies" (p. 628). That is, as Whites' desires to "take back the city" dominate urban planning projects, strategies are enacted to ensure their children's' access to high performing schools through entrance requirements based on standardized tests. Black scholars have outlined how racist policies and practices limit Black students' full participation and access to quality instruction (Berry & Thunder, 2015). Black students can also be marginalized through advanced placement or gifted education where students, who are typically White, receive access to high quality mathematics instruction and

materials (Berry & Thunder, 2015; Bullock, 2017). This leaves the false impression that White students are more intelligent than students of color (Leonardo & Broderick, 2011). Scholars have also illuminated the phenomenon of Black students being disproportionately identified for special education by connecting Whiteness as property and disability studies to explain how "smartness" is typically reserved for and defined by White students (Berry, 2005; Leonardo & Broderick, 2011). Consequently, racialized hierarchical structures are maintained in mathematics education by denying access to advanced placement labeling in mathematics and presuming Black students are mathematical deficit (Battey & Levya, 2016; Berry & Thunder, 2015; Leonardo & Broderick, 2011).

For the few Black students who are identified as gifted or advanced early in elementary school, this labeling can have long-term impacts on their mathematics trajectories throughout K-12 and higher education on having greater access to quality instruction and support (Berry & Thunder, 2015). For example, Ellington and Fredrick (2010) investigated eight high-achieving college junior and senior mathematics majors and found that all of their participants were placed in advanced or gifted programming by third grade and had access to quality mathematics instruction that is not typically afforded to Black students. All of the participants were selected to participate in scholarship programs that provided these high-achieving Black students with access to mentoring, peer study groups, internships, and caring college faculty/staff that aided in their success as college mathematics majors. Students who were considered high achieving were more likely to receive additional support, which can increase success in mathematics (Ellington & Fredrick, 2010). However, this takes a toll: many Black students feel isolated in these advanced courses because there are often one or very few students of color in the class. While this placement does provide Black students with access to intellectual property, it does not change the fact that they are Black and operating in a White-normed paradigm (Jett, 2011; McGee & Martin, 2011).

Berry (2008) described how parents of high-achieving Black boys believed that advanced placement would aid their child in future

success in spite of the resistance they receive from school personnel to have their children be tested for advanced placement. In response to their request, teachers, usually White, would refer back to the students' behavior before proceeding with whether they would have the child tested or not. Black students have their behaviors under constant criticism (Berry, 2008; Gholson & Martin, 2014; Gholson & Wilkes, 2017). These discriminatory standards, which are imposed by the racialized stereotype script, can be exhausting to endure. Black students have to assimilate into White culture, with White ways of thinking and being, which often contrasts with their homes and communities (McGee, 2016).

We believe, within a racial solidarity framework, Black scholars bring robust research that has been connected to historical and contemporary issues of race and racism. At the same time, many Black mathematics scholars leverage critical theories and utilize interdisciplinary approaches to unpack mathematics policies and practices which connect back to the society at large. Beyond revealing systems of oppression to help with illustrating how racism operates, they offer strategies to resist marginalization by indicting education institutions and other larger systemic structures as the site of change.

DISCUSSION

While these bodies of literature may differ at their core, they all challenge notions of what is valued within the White-normed paradigm and counter notions of White supremacy.

The racial solidarity praxis we imagine is a marked shift from current scholarship. Many pressures in the academy lead to the balkanized work that is dominant in mathematics education, even among scholars of color who have common aims. We have seen that Indigenous, Black, and Latinx scholars are resisting White supremacy and drawing on the strengths of their communities to do so, but their work—often out of necessity—takes shape in seclusion from other groups' work.

We bring our scholarly communities in conversation with one another as a first step toward creating a collective response toward marginalization within mathematics education. Gaztambide-Fernandez

(2012) argues for any education solidarity project to take seriously the issue of "reclaiming and redefining human relations...by constructing the conditions for a different kind of encounter" (p. 42). Specifically focusing on **"***recasting* the difference that difference makes," how do we read across the three examples of scholarship such that we are intentional not only about decentering Whiteness but shaping our collective encounters in ways that honor our own humanity through interdependence of our differences.

As one point of encounter, we provided a snapshot of the different scholarships as an initial effort to conceptualize a framework of solidarity. Building on the notion of interdependence, we see each group offering an important dimension to a solidarity praxis. Indigenous and Latinx scholarship contributes to pedagogical innovations that draw on cultural-historical ways of knowing. We see this particularly in how Indigenous scholars foreground doing math together for the purpose of solving current and future problems. Latinx scholarship offers us a deeper and more nuanced understanding of the inextricable link between language, culture, and mathematical learning whereas Black scholars have paved the way for our thinking about institutional and structural forms of racism. These various dimensions are certainly present across communities, and our sacrificial offerings are just that.

What would it mean for Black, Latinx, and Indigenous scholars to *solidarize ourselves with* one another? The transitive mode of Gaztambide-Fernández's (2012) pedagogy of solidarity calls us to action. In our work, we see points of commonality across all three groups: resistance to assimilation is one such example. However, there are also points of difference in the way that White supremacy has affected each community, and therefore, different priorities for resistance to it. For example, one priority of Indigenous scholars is self-determination in education (Brayboy, 2005): having local communities not only wield power in what and how mathematics is taught, but also honoring and valuing local community knowledge. Committing to strengthening and supporting these efforts, even when they do not reflect the highest priorities for Black and Latinx scholars, is an example of transitive solidarity that can bolster tribal sovereignty

efforts. Similarly, as Latinx and Indigenous scholars, we commit to illuminating and vigilantly weeding out anti-Blackness in education systems.

This promising and yet precarious encounter inspires us to deliberately seek solidarity with groups that face forms of marginalization unfamiliar to us. This type of solidarity is not something that can be sought and achieved; the shifting nature of White supremacy means that it must be continually sought and re-evaluated. We have begun this process, and we invite others to join us in this never-ending, crucial work.

While we focus on mathematics education in this paper, it is our hope that others move forward in their respective disciplines to demand and inform what learning environments look like for our students based on our own cultural norms and values as the measure. At a fundamental level, we envision classrooms in which interdependence is valued. Drawing on the Anishinaabemowin concept of coming together for useful, future-oriented mathematics, we imagine the discourse, the curriculum, and forms of assessment modeling and achieving this end. While it might take time for groups that have historically been racialized by schools to think about how the learning and interactions can differ from the White-normed measures that have been ingrained, this might be a place for a racial imagination (Kelley, 2002) and creative solidarity (Gaztambide-Fernández, 2012) to resist White supremacy in ever-evolving ways.

CONCLUSION

In this paper, we offer a glimpse into the mathematics education research by Black, Latinx, and Indigenous scholars on their respective communities focusing on the ways our communities have sought to challenge White supremacy and deficit framings of our students, families, and communities. We offer this praxis not to dismiss past and current solidarity efforts, but as a call to action to create adaptive solidarity praxis among scholars of color in mathematics education to subvert the constantly evolving nature of White supremacy. Our hope in bringing these bodies of literature together is to invite others within (and outside) the field of mathematics education to co-imagine

how we might join our work synergistically. How might we imagine a racial solidarity praxis that grows stronger even as groups maintain their distinctive identities, cultures, and aims? This interdependence does not mean homogeneity of purpose or identity; rather, we learn important and transformative lessons from one another's efforts. It is through a collectivizing of efforts that we imagine a racial solidarity praxis that erodes the power of White supremacy in math education *because* of the unique and unassimilable strengths and priorities of each community engaged. Indeed, we are stronger together.

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