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Rehumanizing Mathematics for Black, Indigenous, and Latinx Students

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The Need to Rehumanize Mathematics

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Our field has experienced a heightened focus on equity-based school reforms that seek to help students “play the game” of mathematics (e.g., addressing access and achievement). Yet we have not sufficiently interrogated how such reforms can ignore the need to “change the game” of mathematics (e.g., address students’ identities and power dynamics inside and outside of schools) (Gutiérrez 2009, 2012). Beyond being seen as a legitimate participant (a “doer” of mathematics), a student should be able to feel whole as a person—to draw upon all of their cultural and linguistic resources—while participating in school mathematics. That is, every student should be provided with windows and mirrors (Style 1996) onto the world through mathematics (Gutiérrez 2007); they should see aspects of themselves reflected back (mirror) as well as obtain views of new worlds outside of their own (windows). Unfortunately, for many students, mathematics classrooms are experienced almost exclusively as windows. We are in need of research-based illustrations of teachers’ and researchers’ initiatives that promote forms of what I refer to as *rehumanizing mathematics*.

■ Why a Focus on Indigenous, Latinx, and Black?

Teaching and learning are not universal or neutral endeavors; the identities of teachers and students, as well as the contexts in which they work, all matter (Aguirre, Mayfield-Ingram, and Martin 2013; Anhalt et al. 2018; Berry 2008; Brown 2009; Celedón-Pattichis and Ramirez 2012; Gutiérrez and Irving 2012; Larnell, Bullock, and Jett 2016; Turner et al. 2013). Not only do teachers need to develop specific knowledge of the mathematics they will teach, they also need to connect that knowledge with an understanding of their own privileges (Goffney 2016), the students they seek to serve (Aguirre, Mayfield-Ingram, and Martin 2013; Berry and Thunder 2015; Goffney 2010; Myers 2014; Myers et al. 2015), and the social justice goals they hold (Anhalt, Cortez, and Smith 2017; Brown 2016, 2017). In fact, standards documents and reform initiatives that emphasize “mathematics for all” or that implicitly perpetuate a universal view of teaching and learning miss the point that many of the structures that exist in mathematics education are the very things that have created the inequities for historically marginalized students in the first place (Berry, Ellis, and Hughes 2014; Bullock 2017b; Martin 2013, 2015; National Council of Supervisors of Mathematics and TODOS Mathematics for ALL [NCSM and TODOS] 2016). As I have noted elsewhere:

... knowledge and power are inextricably linked. That is, because the production of knowledge reflects the society in which it is created, it brings with it the power relations that are part of society. What counts as knowledge, how we come to “know” things, and who is privileged in the process are all part and parcel of issues of power . . . Without an explicit focus on issues of identity and power, we are unlikely to do more than tinker with the arrangements in school that contribute to the production of inequities in the lived experiences of learners and educators. We must be willing and able to embrace the socio-political turn. Such embracing will help us better understand the current situation in its moment in history as it has been constructed so we can open the door for other possible arrangements. (Gutiérrez 2010/2013, p. 8, pp. 26–27)

In fact, mathematics education cannot truly improve until it adequately addresses the very students who the system has most failed. As such, merely tinkering or basically repeating the same approaches is not likely to produce different results (Gutiérrez 2017c). Instead, we need a central focus on students who are Latinx, Black, and Indigenous in ways that build upon their strengths (Aguirre and del Rosario Zavala 2013; Celedón-Pattichis, Musanti, and Marshall 2010; Turner et al. 2012) and consider intersectionality (Bullock 2017a; Gholson 2016; Gholson, Bullock, and Alexander 2012; Morton and Smith-Mutegi [chapter 2, this volume]). This central focus does not mean simply supporting students who are Indigenous, Black, and Latinx to do well by Whitestream standards. It means developing practices and measures that feel humane to those specific communities as a means to guide the field.

Throughout this introduction, I change the order of the terms Black, Indigenous, and Latinx so as to maintain the importance of each. Moreover, changing the order discourages the reader from thinking this group of three can be reduced to a single acronym (e.g., BIL) and thought of as a homogenous entity. Varying the order also encourages the reader to consider what is highlighted when one begins with a different group first, as well as how the groups relate to and intersect with one another, even while recognizing there is often more variation within a given group than between groups. For similar reasons, the sections of this volume are not divided by racial/cultural identities but by conceptual focus.

This volume begins with the assumption that people throughout the world already do mathematics in everyday ways that are humane (Carraher, Carraher, and Schliemann 1985; Lave 1988; Masingila 1994, 2002; Nuñez, Schliemann, and Carraher 1993; Saxe 1998). Yet schooling often creates structures, policies, and rituals that can convince people they are no longer mathematical. In this way, those structures, policies, and practices can be experienced as dehumanizing. Take the notion of students’ misconceptions. Many teachers have been trained to anticipate the misconceptions that students have so that they can address them in their lessons. Yet, students don’t have misconceptions. They have conceptions. And those conceptions make sense for them, until they encounter something that no longer works. They are only “misconceptions” when we begin with the expectation that others need to come to *our* way of thinking or viewing the world. For too long, that expectation has meant that the teaching and learning of mathematics continues to support an agenda of White supremacist capitalist patriarchy and settler colonialism (Leyva 2017; Martin 2008; Stinson 2013; Tuck and Yang 2012; Warburton 2015, 2017). Not until we seek to stand in the shoes of our students, to understand their conceptions, will we be on the path toward recognizing and embracing their humanity. When I have asked students and teachers across the nation what kinds of practices can feel dehumanizing in mathematics education, among other things, they report—

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- measuring categorizing bodies (e.g., tracking, mathematics as a filter);
- evaluation that does not honor complexity, context, or individuals' own goals (e.g., high-stakes and standardized testing, value-added modeling);
- being asked to leave one's identity at the door (e.g., color-blind teaching, strict pacing guides, being unable to use "foreign" algorithms from one's home country, being unable to use one's native language);
- rule following as opposed to rule breaking or creation (e.g., following what seem to be arbitrary rules developed by others);
- speed valued over reflection (e.g., get the answer quickly, cover the curriculum regardless of whether students understand); and
- separation of mathematical practice from politics/values/ethics (e.g., perpetuating the myth that mathematics is objective and culture free, being expected to teach/learn without bringing in politics).

It is striking how many of the aforementioned practices that feel dehumanizing for students are experienced similarly by teachers. I use the term *dehumanizing* to highlight the fact that although each of these individual practices might only be felt as a microaggression or frustration in the moment, there is a kind of slow violence (Nixon 2011) that occurs when one is subjected to such practices over twelve to thirteen years of compulsory mathematics education (K–12) or a career of teaching. Moreover, when students and teachers are treated as if they are interchangeable with others—with little or no attention to their identities—it can feel dehumanizing. As such, we should ask ourselves why are we complicit with a set of practices that fail to serve our needs. Instead, we need to seek ways to rehumanize mathematics teaching and learning.

This volume features evidence-based examples of theorizing and practicing what I refer to as *rehumanizing mathematics* with students and teachers who are Indigenous, Black, and/or Latinx. As a whole, the volume is built upon a set of guiding principles that include not just identifying dehumanizing practices but offering rehumanizing ones; privileging the voices of teachers, students, and communities; attending to intersectionality where possible; and positioning the authors as humans.

■ Why Rehumanizing?

Given that there is a long history of conceptualizing and seeking to address equity, one might ask why the field needs a new term. Elsewhere (Gutiérrez 2017a), I have argued that equity might not be so useful because it is bogged down in history. That is, equity tends to retain simplistic or superficial definitions, even when mathematics education researchers have tried to be explicit in their theorizing (Gutiérrez 2002). In addition, many people believe they are speaking of the same thing when, in fact, they have different definitions of equity in their heads. As such, the term fails to promote greater dialogue or clarification about the concept when individuals or groups are setting goals in their workplaces. This lack of consensus on what equity means, paired with the tendency in our field to view teaching and learning as universal, means that we often only know we are addressing equity when we are still very far from our target.

Unlike "equity," which can seem to represent a destination, "rehumanizing" is a verb; it reflects an ongoing process and requires constant vigilance to maintain and to evolve with contexts. Moreover, rehumanizing is an ongoing performance and requires evidence from those for whom

we seek to rehumanize our practices that, in fact, the practices are felt in that way. For example, teachers cannot claim their pedagogy is rehumanizing without obtaining recurring evidence from their students that they agree and without giving students opportunities to offer additional approaches for rehumanizing. I use the term *rehumanizing* as opposed to *humanizing* (Paris and Winn 2013; Rosa and Orey 2016; San Pedro and Kinloch 2017) to honor the fact that humans (and other living beings) have been practicing mathematics for centuries in ways that are humane. Among other things, women in India create elaborate and symmetrical floor patterns (rangoli) with rice that adorn the doorways of homes and get swept away with the daily entry and passage of feet (Mahalingam 2000); Black women throughout the world create complex curves and spirals through cornrow designs in hair (Eglish 1999; Gilmer n.d.); Latinx jazz, mambo, and salsa musicians produce a five-stroke son clave rhythm based on geometry and least common denominators (Toussaint 2013); and young break dancers and students of capoeira use their bodies to perform geometry and calculus through various rotations in the air. In many ways, we do not need to invent something new; we simply need to return to full presence that which tends to get erased through the process of schooling.

Partly because it departs from a Western view of mathematics (Bishop 1990), rehumanizing mathematics seeks to not only decouple mathematics from wealth, domination, and compliance (O'Neil 2016); it also recouples it with connection, joy, and belonging. When people are encouraged to express themselves through the practice of mathematics, they are more likely to draw upon an innate sense of aesthetics and intuition and to seek ways that are pleasing to them. In fact, under certain conditions, rehumanizing mathematics could be considered a form of decolonizing mathematics, but only when issues of land, sovereignty, and erasure of culture and language are taken seriously (Gutiérrez 2017b; Tuck and Yang 2012).

Readers who are familiar with the Rehumanistic Mathematics movement of the 1990s (Brown 1996, 2004) may wonder how rehumanizing mathematics differs. Although these two perspectives share the goals of solving problems in society, understanding properties of objects in the world, and posing new questions, rehumanizing mathematics also squarely addresses the politics of mathematics and of mathematics education. That is, rather than assuming a neutral response or failing to attend to power dynamics, rehumanizing mathematics recognizes that challenging the status quo will likely be met with great opposition from those with privilege and high status who benefit from the system remaining the same. It also seeks to highlight where power dynamics have played out in the history of mathematics and where mathematics might come to serve the people as opposed to vice versa. Furthermore, whereas the Rehumanistic Mathematics movement tended to privilege an individual's view of the world and their relation to it so they could understand themselves better, rehumanizing mathematics begins with the power of communities and assumes a relational view is important (recognizing oneself in others and others in oneself) so that we might better understand and live alongside of one another and so that we might practice mathematics in ways that transform reality in emancipatory ways (Gerdes 1985).

■ What Might Count as Rehumanizing Practices?

Although many concepts can contribute to rehumanizing mathematics for students and teachers who are Latinx, Black, and Indigenous, eight dimensions stand out for me. They include:

- (1) participation/positioning,
 - (2) cultures/histories,
 - (3) windows/mirrors,
 - (4) living practice,
 - (5) creation,
 - (6) broadening mathematics,
 - (7) body/emotions, and
 - (8) ownership.
- Rehumanizing

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mathematics with respect to *participation/positioning* involves recognizing hierarchies in classrooms and society and shifting the role of authority from teacher/text to other students. That is, in terms of mathematics classrooms, we might see students responding more to each other, rather than seeking approval or evaluation from the teacher. Rehumanizing mathematics with respect to *cultures/histories* acknowledges students' funds of knowledge, algorithms from other countries, the history of mathematics, and ethnomathematics. In terms of classrooms, we might see students reconnecting with their own histories or ancestors and roots as they are learning the histories of mathematics. In this way, *cultures/histories* opens the door for providing students with *windows and mirrors*. That is, students can come to see themselves in the curriculum and also others or a new way of viewing the world. The Mayan concept *In Lak'ech* (You are another me; I am another you) helps illustrate the fact that students are not just seeking to know themselves with respect to mathematics; they are seeking to understand themselves and others in relationship. In this way, students are learning about different cultures and histories, but also taking into account particular histories that may relate to those in the classroom. Moreover, *windows and mirrors* takes up the idea that students can be taught to appreciate (not just critique, as is promoted in the mathematical practices of the Common Core State Standards) the view of others.

Recognizing mathematics as a *living practice* is another important dimension of rehumanizing mathematics, as it underscores mathematics as something in motion. When students can see mathematics as full of not just culture and history, but power dynamics, debates, divergent answers, and rule breaking, it highlights the human element and helps promote a version that is a verb rather than a noun. Moreover, seeing mathematics as living practice means individuals can recognize modern mathematics as relatively young and look to practice it in different ways, for their own purposes (not just for school or credentialing). This notion of *creation* is important, as it can encourage students to invent new algorithms or forms of doing mathematics that are consistent with their own values. In this sense, doing mathematics can mean more than simply reproducing what has come before oneself or that which has been sanctioned by mathematicians in the past, though it does not mean a kind of "anything goes" mathematics. Moreover, understanding mathematics as arising from individuals breaking rules can be a powerful incentive for forms of teaching that encourage such rule breaking. Another dimension of rehumanizing mathematics involves *broadening mathematics*. That is, currently, the mathematics to which citizens are exposed in K-12 classrooms involves primarily algebra, calculus, number sense, symbolic representation, and favoring the general case. Rehumanizing mathematics would expand that view and make room for other forms of mathematics that can allow students to see more qualitatively. Rather than viewing mathematics as culture free or value free, a more rehumanized mathematics would depart from a purely logical perspective and invite students to draw upon other parts of themselves (e.g., voice, vision, touch, intuition). By attending to emotions, individuals would be encouraged to be more in tune with themselves and less likely to succumb to pressures to ignore their senses and "just pretend" in order to do school mathematics. A critical aspect of evidence that mathematics is more rehumanized is that it conjures up feelings of joy. In a related manner, the final dimension of rehumanizing mathematics is *ownership*. When students view mathematics as something one does for oneself, not just for others, there is greater likelihood for "play," "invention," or simply "expressing oneself" through mathematics. One sign that students are feeling that mathematics is more rehumanized is when they choose to continue to grapple with mathematical problems long beyond the school bell or when they pose new questions for community problems they face and that can be addressed either partly or fully through mathematics.

■ Looking Forward

The pieces in this volume highlight different aspects of these eight dimensions. They open up a conversation about how we might move forward as a field if we care deeply about the mathematical experiences of Indigenous, Latinx, and Black students who are in our care. The chapters range in topics from emergent bilinguals who are Latinx preparing for a Thanksgiving meal to girls who are Black learning in a STEM institute. The concepts featured in this volume arise not through a set of pre-scripted practices but organically from professionals (many who share identities of their students) who put students and their needs first. Although each chapter is situated within a section topic (e.g., attending to students' identities, professional development that embraces community, and principles for teaching and teacher identity), there is great overlap. That is, each chapter has elements that could fit within other sections. For example, although the chapter by Winger, Young, Stovall, Sword, Badertscher, Gates, MacDowell, and Cuoco models a form of professional development whereby mathematics faculty educate each other as well as practicing teachers, it also showcases important principles for teaching and teacher identity. Moreover, each chapter speaks to others by highlighting recurring themes or identifying differences based upon context. For example, the chapters by Barajas-López and Bang; Caswell, Jones, LaPointe, and Kabatay; and Bunton, Cook and Tamburini all take seriously the voices of community members who are Indigenous and the power of attending to worldviews, but each location highlights how those views play out differently.

As you read through this volume, consider the following questions:

- In what way(s) does starting with students and teachers who are Latinx, Black, and Indigenous alter what counts as mathematics education or how the field might change in response?
- In each of the chapters, from whose perspective is the work rehumanizing? How do we know?
- What are some of the similarities and differences that cut across the chapters?
- How does a focus on intersectionality highlight what might otherwise be invisible?
- In what ways, if any, might these practices that are rehumanizing in their local contexts be applicable to other contexts? To other kinds of students or teachers?

Many of the rehumanizing practices we witness here—both inside and outside of school—offer a glimpse into the taken-for-granted ways in which students and teachers are repeatedly subjected to dehumanizing experiences in mathematics as well as the radical work that will be required if we intend to take seriously the lives of students and teachers who are Indigenous, Latinx, and Black. After listening to the voices of students and teachers who offer more humane practices, are we prepared to carry on as if business is usual? Or, are we up for the challenge of continuing to put Latinx, Indigenous, and Black students first in order to guide the field?

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