

CHAPTER 1

Unmasking Inequities in Mathematics Education

At the core of this book is the embedded belief that all people are equally worthy of dignity and seen as human. When we refer to disrupting injustices, we mean actions that interrupt beliefs, policies, or structures that demonstrate that one group (e.g., race, gender, class) is inherently inferior or less deserving of human dignity or conversely that a group should be considered superior (e.g., white supremacy, patriarchy). Unfortunately, white supremacy and patriarchal constructs show up in mathematics education through cultural or media-driven narratives as well as the microlevel person-to-person or classroom interactions. There is a plethora of societal messages that elevate the groups perceived as superior as more worthy and intelligent. They are so frequent and normalized that they become invisible, akin to air pollution. For our purposes, we define these terms in Table 2 with an example within mathematics education on how they might appear.

Table 2. *Social Injustices in Mathematics Education*

TERM/DEFINITION	EXAMPLE IN MATH EDUCATION
White supremacy refers to a system that maintains white economic, legal, political, educational, and social privilege (Kendi, 2019).	Textbooks (or an internet search) do not recognize many mathematicians of color despite their crucial contributions to mathematics (Sleeter & Grant, 2017).
Patriarchy is a social and political system that gives men privileges, which results from a socialization process that teaches people heterosexual men are superior to women (hooks, 2004).	To prove they are capable and exceptions to the rule; women and girls feel they have to work independently on math projects (Sassler et al., 2017).

During a math department meeting in my first year of teaching, I (Esther) along with the rest of the math teachers at a racially diverse school near Chicago listened as our department head/supervisor shared the latest achievement data by race. He pointed to the gap between Black, white, and Asian students. The trend lines showed decreasing gaps for Black students at our sister school in the district. And though our own school's data showed that while everyone's scores were increasing, gaps between races remained the same.

One veteran teacher in a department of mostly white veteran teachers raised her hand and asked curiously, "Why do you think these gaps exist? Do we have a sense of the

underlying reasons? Why are our Black students consistently at the bottom?” Other teachers, none of whom were Black, seemed equally interested in the answer. Our department head thought for a moment and responded, “I’ve noticed that my Black students have a culture that isn’t helpful for academics. They’re always trying to get each other to goof off and do other things instead.” I looked around at the rest of the math department, waiting for someone to say something. Mostly I saw a few nods and people seemed ready to move on to the next agenda item.

It may seem like a typical mundane meeting, but it’s one of many examples of how racism is embodied in our education system. When people think about racism in education, scenes of an old white teacher throwing derogatory racial slurs at a Black child might come to mind. It could also look like a Black third grader in handcuffs dragged out by police officers while a white teacher looks on approvingly. These clear examples of racism are real and harrowing. It can be easy, then, for math teachers to look at their own context and believe racism does not affect their content or classroom given no such explicit evidence. But there are many more subtle ways that racism is weaved into the fabric of mathematics education.

In the example of the math department meeting, we could unpack several layers of how racism affected that moment in historical, structural, and interpersonal ways. I surface some questions regarding them:

1. What historical laws and social influences have made it more difficult for Black students to receive high quality education? How have these affected Black populations in generations past and today?
2. What gatekeepers exist in mathematics that prevent POC from becoming math teachers? In a district that serves a population with majority students of color, why are 90% of the math teachers white?
3. Do teachers treat Black students with the same hope and expectation as students of their own race?
4. Why was it acceptable that the department head could treat Black students as a monolith? Would he have been able to say that white students have a culture of academic excellence and push one another to try harder without another teacher saying that we can’t categorize all white students that way?
5. What kind of pressure would a Black math teacher have felt in a conversation like this?

These questions are not meant to be accusatory, but to serve as a lens for seeing how racism, patriarchy, and cultural bias can affect mathematics classrooms and professional interactions.

In the United States, racism is embedded both in structures at the macrolevel (institutional) like Questions 1 and 2 above, and in moment-by-moment interactions, questions asked, or even facial expressions at the microlevel (interpersonal) like in Questions 3–5. While mathematics educators may not immediately feel that they have the power to respond to macrolevel injustices, we contend that there are many opportunities to disrupt at the microlevel. Teachers can address microaggressions in various ways in the classroom.

Sue et al. (2007) define microaggressions as “brief and commonplace daily verbal, behavioral, or environmental indignities, whether intentional or unintentional, that communicate hostile, derogatory, or negative racial slights and insults toward persons of color” (p. 271). Disrupting microaggressions is essential and has long-term effects on how people of color view themselves.

Pause and Reflect

See Table 3 for some examples of microlevel and macrolevel injustices and the unintended messages they can have on students. Several of these injustices are supported by research. Citations are listed in case you want to learn more about that injustice. The list of examples in the table is not exhaustive. As you read through the examples below, consider whether these or others occur in your context and determine whether there are opportunities for disruption.

While many can assume that the work of teachers occurs just in their classrooms, their work is not small. The microlevel interactions described in this book can greatly impact how teachers engage with students and impact macrolevel change, which is drastically needed in education. Table 3 contains examples of various microlevel and macrolevel injustices and how they can happen in the classroom, with research citations to learn more about the injustices. Read through the examples and reflect on ways injustice can occur at the micro and macro levels.

Table 3. *Injustices at Macro and Micro Levels*

LEVEL	DESCRIPTION OF INJUSTICE	UNINTENDED MESSAGE
Macro	Historically marginalized students are over referred to and overidentified in subjective special education mathematics classes (Ford & Russo, 2016).	Misdiagnosing students with stigmatizing labels can negatively affect their self-esteem and achievement in mathematics.
Macro	Underrepresented historically marginalized students are not placed in gifted mathematics classes (Whiting & Ford, 2009).	Because of continual underrepresentation, it is believed that historically marginalized students are incapable of performing at a high level in mathematics.
Micro	Black students, especially Black boys, are more severely and frequently punished in the classroom than their peers (Woodward & Howard, 2015).	Black boys receiving more frequent and harsh punishment can damage students' perceptions of their school and negatively impact their academic success.
Micro	Teachers shorten a student's name that is perceived as too difficult to pronounce.	Names can have powerful meanings. This tells students they are not welcome unless they assimilate with the teacher's cultural and linguistic expectations.
Micro	Ask a student of color to represent their entire racial group when discussing sensitive topics during mathematics.	This assumes that people of color are a monolithic group and every person of color has the same lived experiences.
Micro	Give students of color backhanded compliments, such as “You are so articulate,” or overly compliment them for comparatively simple computations.	These types of compliments send a signal that the students did not seem smart to begin with.

The narratives in this book empower and encourage mathematics teachers to disrupt injustice by first providing examples that include behind-the-scenes processing of mathematics teachers who have responded to these injustices in their mathematics classrooms. A commentary follows each narrative to offer the research perspective that situates significant themes within literature. Before we can move towards solutions, it is beneficial to name the injustice and get a better understanding of how it connects to larger systemic issues. Next, we include a list of resources to support classroom teachers who face similar challenges. Finally, we include guided reflection questions that can be answered individually or during a professional learning and development session to process how disrupting injustice looks in the reader's context.

The idea that mathematics has anything to do with race and racism is particularly difficult to believe. The myth is that math is the most neutral or unbiased subject. We offer further examples to give insight on how racism plays a role in mathematics education.

- Nationally and historically, education leaders have focused on achievement gaps in mathematics between Black and white students, often using white student achievement data (e.g., standardized testing, honors or Advanced Placement enrollment, etc.) as the benchmark for other racial groups. The underlying message is that the real learning standard is whiteness.
- Media images of people who are good at math are often Asian or white. And, of course, even with mathematics achievement of specific Asian American groups, they still are not the standard—thus, ignoring the higher performances of these students and firmly entrenching the privileges of whiteness.
- Mathematical prowess is used as a proxy for intelligence and access to coveted career tracks yet remains a gatekeeper for people of color in industries focused on data and computer science.

Even for teachers who are convinced that racism is a problem in mathematics education, they may believe that nothing can be done without changes from the top. In short, it's a job for policymakers, superintendents, or government officials who need to amend laws and dismantle oppressive structures. Teachers can feel helpless in the throes of political whiplash while waiting for change. After all, a single teacher's influence in national, state, or even their own school's policies can seem insignificant compared to what happens inside their classroom. Others may focus their attention to changing structures in their schools like creating revised recommendation processes for honors courses or detracking math classes altogether. These kinds of changes align more with addressing the macrolevel injustices described earlier.

However, the most difficult kind of change for teachers to make is in the frequent messages they send to students through almost imperceptible interactions (i.e., the microlevel interactions). For example, a Black student loudly exclaims, "Math is so boring!" or a Latinx student puts their head down to sleep through class. A simple move could be for the teacher to ask kindly, "How are you? Is everything okay?" It's easy to dismiss this response as obvious, but after the 6th student or the 3rd time, a response like this can be more difficult to sustain than any structural change. It challenges a deeply ingrained belief

that these students are lazy and don't want to put in any effort. Truthfully, many teachers would reply to the question, "Do you think students are inherently lazy?" with an effortless handwave saying, "Of course not. I believe they need safe and creative spaces to grow." But when their student has nothing on their paper after 5 minutes and simply says, "I don't get it," that same teacher might begin with, "Did you even try?" rather than to smile knowingly and say, "What could help?" These moments, however, are the very building blocks of a safe classroom and warm community. They are the moments in action to see students as complex human beings and not caricatures of their race, gender, class, or home life. They are the moments that disrupt dehumanizing beliefs about who students are, what they are capable of, and their purpose in society.

Empowering Educators

Mathematics educators face the additional challenge of their content area being perceived as neutral or cultureless. Despite published works that point to the political nature of mathematics (e.g., Gutiérrez, 2013; Gutstein, 2006), topics like race, gender, oppression, and justice are seen as relevant only for social sciences or English class. A particularly motivated math teacher might insert a project analyzing social injustice through mathematics in between a packed curriculum filled with standards unrelated to the issues of today. But with pacing concerns and expectations for growth in standardized testing, math teachers may not feel like they have the time to prepare or facilitate these lessons.

It's not that there aren't teachers who have been successful in this work. Several examples of amazing programs, classrooms, and educators that truly build rehumanizing mathematical spaces but feel out of reach for the everyday educator already exist. Indeed, the stories in the book titled *Rehumanizing Mathematics for Black, Indigenous, and Latinx Students* (Goffney et al., 2018) are inspiring, filled with chapter after chapter of teachers who've partnered with their community for students to learn and love mathematics. Unsurprisingly, the educators in the text have worked hard to develop spaces, structures, and narratives that celebrate the strengths of students from underrepresented backgrounds in their schools or classrooms.

One of our intentions is to build the capacity for educators to take steps toward these kinds of efforts rather than feeling daunted by them. A mathematics educator who learns about social injustices and even develops a desire to act can still feel a sense of powerlessness enveloping them. An educator can attend social justice and mathematics education conferences, read books about racism in mathematics teaching and learning, and listen to inspiring speakers with calls to action. Still, the following Monday in front of students, it is difficult to know how to disrupt oppressive structures or transform the classroom. Although a multifaceted approach that includes structural and curricular reforms is important, racism and oppression are not limited to these structures. Math educators must realize that disrupting injustice is also necessary in daily and common social interactions.

We look to exhibit the internal processing that educators must grapple with instead of displaying the results of the implementation of a successful program. Traditional definitions of success hinge on if there is achievement growth on standardized tests and if there

is an increase in the number of students who attend college, or some similar metrics. Here, we pose a different set of questions:

- How does an educator consider their own identity and how it affects their actions?
- What fears or risks does an educator assess when considering disrupting injustice?
- How does an educator respond to injustice given their context and social, political, or cultural influences?

It may seem counterintuitive, but we want to highlight the mathematics teachers' stories that may seem too insignificant to be noticed and spotlight the internal tensions they are experiencing.

These chapters provide real-life examples of mathematics teachers disrupting injustice. Moreover, we want to showcase how every mathematics educator can engage in action within their context. The purpose of this guide is to empower educators by sharing decisions and thought processes of educators that are rarely emphasized in professional development. These educators make a real, sometimes underappreciated, impact with their students or community. This book takes a deeper dive into the micro moments that reveal beliefs, biases, and our lived philosophy more honestly than any classroom structure, assessment, or curricular change can.

We offer no simple 5-step action plan to being a social justice math hero. Even if such a plan existed, each step would feel unachievable. We ask each reader to take a philosophical shift with us. Building on the work of Aguirre, et al. (2013) on identity, instead of simply focusing on the *what* (the lesson plans, the procedures, structures, or even the pedagogy), we also shift our attention to the *who* (the educator, their beliefs, and invisible influences). We assert that our identity is both in constant evolution and deeply rooted. We begin to truly confront ourselves in small, consistent, and difficult decisions that ultimately pave the path to the educator we hope to be.

Defining Critical Moments

Our deeper purpose is to encourage and sustain critical hope for change for mathematics educators of all kinds. We live in a society with injustices that have a domino effect over time and even across generations and can lead to unintended consequences. For example, a domino effect with tracking refers to the phenomenon where a student's initial placement in a specific mathematics track can significantly impact their mathematical trajectory, opportunities in the future, and self-perceptions. Therefore, it is essential for teachers and other stakeholders to be aware of the potential negative impacts tracking and other injustices can create for students.

All too often, passionate teachers ready to tackle the injustices of society burn out after a few years, feeling more hopeless than before. On the flip side, overly enthusiastic teachers can respond with cheery confidence that "everyone's a math person" to students who feel out of touch with the discipline. We need more than feelings of optimism with no action, which Duncan-Andrade (2009) describes as false hope. At the same time, we must be able to sustain for the depth of the challenge ahead.

Duncan-Andrade (2009) defines critical hope as teaching in ways that connect the outrage of young people to actions that relieve the suffering they experience in their schools and communities. For our context, critical hope lives in truly addressing unjust systems through meaningful reflection and dialogue with students and colleagues. The role of critical hope can play a central function in education because it acknowledges that there are systems that favor a dominant society at the expense of others. When we work towards dismantling unjust systems through meaningful and reflective dialogue, often-times disruption happens, and this is where critical hope can manifest and ultimately foster change and transformation in our mathematics instruction as well as with our students and colleagues.

We believe these narratives will give mathematics educators critical hope through examples of how they can begin to make moves toward justice today. Even more so, we want to encourage the educators that have been working moment by moment toward social justice but feel like they are making no progress. These stories are meant to be like a balm for the tired educator's soul. Lastly, we bolster the legitimacy of the importance of these narratives in disrupting injustice through a researcher's lens on how they relate to larger, systematic challenges. We remind educators that the path toward rehumanizing mathematics education happens one moment at a time, and they have the power to begin.

Critical hope described above sparks courage in critical moments. We define critical moments as moments of opportunities for impactful change. In other words, a time when an educator decides to make potentially difficult but brave decisions to disrupt unjust structures or attitudes in the classroom or school that affect students learning mathematics. A critical moment can be an event that explores the possibility of transformation or affirms the dominant/oppressive narrative. Transformation here refers to how the status quo is interrupted (individually or collectively). Interrupting the status quo provides an opportunity for change and transformation that can be extended beyond the moment it occurs for a greater impact.

Educators disrupting injustice must do more than recognize critical moments; they also need to move these critical moments into deeper levels of transformation. The critical moments described here showcase moments of courage and resistance that demonstrate an understanding of social justice. Furthermore, this book connects to pedagogical questions or moments and broader challenges associated with educators' identities and institutional barriers. The goal is to weave educators' perspectives and experiences and surface how disrupting injustices at the microlevel connect to macrolevel injustices.