

Equity, Access, And Justice in Mathematics Education Research: A Personal-Professional Journey of Perspective

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I argue that we are morally obliged to consider the significant privilege of our lives and the whiteness of mathematics education institutions. Further, to determine implications for our work will require: (i) questioning things we've long taken for granted; (ii) developing means for stepping outside our training and standards; and (iii) learning to work together and in communities of those who are not like us but with whom we find alignment. Failing to take up this imperative confirms that we are the problem and existing injustice is our choice, not a reality imposed on us. I mean to argue this with both fervour and humility, using my own personal and professional journey to raise possibilities for us to consider, as a community, in charting the future of mathematics education research.

Attention to issues of equity, access, and social justice in mathematics education has increased in recent years, but justice is not a topic just to add to a list or raise up as a major domain in the field. It is a fundamental reorientation, for most of us individually and for the mathematics education research community collectively — for us. A challenge we face is that it is profoundly context dependent. Social groups, cultural histories, and political power differ from place to place. Concerns are different in Ireland than in Britain, different in South Africa than in China. They are different within countries — among regions and among communities. Attention to equity, access, and justice also depends on the scholar and scholarship. It is different for each of us, as people with personal histories and as professionals with our training and scholarly niches.

I am a white man from the United States. I taught mathematics, kindergarten to university, for about 10 years, and have been studying teaching and mathematical knowledge for teaching for another 25. I have my own context and scholarship. Although not an expert, I have spent several decades trying to understand the issues of equity, access, and social justice, their relationships to each other, and their significance for mathematics education. I would like to share my story of bringing these concerns to bear on my research and invite you to reflect on your own story, that we may reflect on our collective story, both past and future. I begin with background about myself and the evolution of my thinking. Then I describe how my concerns have re-shaped my own and my colleagues' mathematics education research, in both obvious and, for me, surprising ways. I close with reflections and questions to help us continue the conversation.¹ I apologize if my talking about myself seems self-indulgent or

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uninteresting, but my aim is to use my experience to make visible some of the terrain we need to traverse, challenges we need to face, and possibilities ahead.

My privileged well intentioned whiteness

I grew up in a farming community in western New York State, where my mother taught English and my father taught mathematics at a small liberal arts college. We built a house, without electricity, and cultivated a farm with 40 sheep, 150,000 Christmas trees, and smaller numbers of other plants and animals. People of diverse backgrounds sojourned comfortably in our home. I grew up as a post-1960s universalist Quaker — relatively naïve about the world but committed to peace, education, community, simplicity, integrity, and equality. As a young adult, I drafted a statement of conscientious objection to war, attended a Quaker Meeting for Worship at a maximum-security prison for several years, and engaged in *Alternatives to Violence Project* workshops.²

Who was I? I grew up comfortable and safe in rural, white America. My childhood was unusual in many ways, but it was also a version of white-liberal normalcy. I carried this background with me as I moved professionally into mathematics, teaching, teacher education, and education research.

Working collectively with Deborah Ball, Hyman Bass, and a shifting group of graduate students and colleagues, I have studied teaching, learning to teach, and the mathematical demands of teaching. In 2003, we presented a paper at the annual conference of the American Educational Research Association titled, *In Attention to Equity in Teaching Elementary Mathematics*. We argued:

- Inequality is routinely reproduced inside instructional practice.
- Breaking this cycle depends on joining concerns for equity with the daily and minute-to-minute work of teaching.
- Teachers can have leverage at strategic points in the intersection of concerns for equity and the work of teaching.

Reception was tepid. Colleagues who generally engaged enthusiastically with our work at the time seemed to think we had lost our way. They knew us for our research on the work of teaching and mathematical knowledge for teaching. Many colleagues either did not attend or were disappointed and left quietly. Others who attended due to interest in equity did not seem to understand our work or were sceptical of our motives and methods. Grant proposals to further this work did not review well. We were uncertain how to interpret reactions and came to realize that the issues and politics were subtle. I have come to understand how reasonable these responses were given my underdeveloped understanding of privilege, our research group's positionality, and the history of education research with marginalized groups.

² For information on AVP, see <https://avpusa.org/>.

Three additional experiences influenced my awareness of justice issues in important ways. Each represents my well-intentioned engagement with justice, yet with a lack of understanding of race and racism and the nature of privilege and power. The ways I took them up may reflect my privileged whiteness, which often goes through the motions without achieving meaningful change.

First, I began working with 1960s civil-rights activist Bob Moses and the Algebra Project to extend earlier work on political access (voting rights) to economic access (through success in mathematics).³ I collaborated with the Algebra Project on its launch of a dozen cohort classrooms across the country. To support the community's efforts to learn to teach, I designed and documented an intensive two-week summer public teaching program. For three summers, Bob taught young people who had scored in the bottom quartile on state exams, students whom the system and the country was treating as disposable.

Second, the University of Michigan School of Education where I worked sought to change its culture. It launched a speaker series to support greater attention to diversity, inclusion, and equity. It developed a strategic plan aimed at changing practice, for example via hiring protocols, diversity training, and community conversations.

Third, I took part in peace work my sister was doing in Indonesia.⁴ She has split her time equally between the United States and Indonesia since the early 1980s. After the tsunami of 2004, she worked in East Aceh, which other non-profits avoided because of the ongoing civil war. Over time, she developed an approach that combined nonviolence training, trauma recovery, building economic opportunities, and education. In my notes, I found the following minute. It conveys the importance of building connections among people, in which people work with mutual investment and benefit:

We believe that the establishment of right relationships among people provides a powerful means of gaining personal and national security — ours, and others'. We seek to make the military obsolete by increasing efforts to meet people's basic needs around the world. We believe that to effectively meet people's needs, these efforts must simultaneously provide needed resources and build connections among people despite their differences.

Each of these experiences gave me clearer notions of challenges and foundational orientations for addressing injustice. At the same time, in retrospect, they seem simply additions and elaborations of what I carried with me from childhood. I incorporated them into my life without changing course.

³ See <https://algebra.org/> and Moses and Cobb (2002).

⁴ See <https://consciencestudio.com/> and Hoover (2018).

Insights from more invested and challenging consideration of race and racism

In the past five years, I have invested more actively in understanding racism — in part due to circumstance (personal, professional, and societal idiosyncrasies) and in part due to a sense that I was not understanding something important. In 2016, I worked with others to plan a retreat, *Quakers and Race: A Spiritual Journey*. Nine of us formed a bi-monthly discussion group. I began to read more widely about racism and talk with others about what I was learning. I offer four insights that have profoundly reoriented my thinking.

Race results from exploitation; it is not the cause

I came to understand that a common underlying line of thinking in white society is backwards. In this thinking, race and racism start with prejudice, where people see others who look or act different and look down on them. This perceived inferiority then makes it okay to exploit them. This leads to thinking that the solution is to overcome negative attitudes, to value difference, to see the good in everyone. The idea is that doing so would end race and racism. I do not remember explicitly thinking this way, but I see that my actions, largely unexamined, were consistent with this thinking. Several sources convinced me that the cause-and-effect relationship is the other way around. Racist ideas and stereotypes result from exploitation and systemic oppression: they do not cause them. Race and racism rationalize exploitation. I read in Ibram Kendi's (2016) well-researched history of racist ideas, *Stamped from the Beginning*, that the use of "black" as a racial category was introduced in the 1400s by a biographer of Prince Henry of Portugal to lump together and paint as inferior ethnically diverse African groups in an effort to make the lucrative slave trade palatable and that "white" as a racial category first appears in legal documents of the United States in the late 1600s to maintain available labour, undermine collective resistance, and limit access to land and rights. I came to understand that race and racism are social constructs designed to justify and protect ongoing exploitation.

Racism and other forms of oppression are systemic

A second point reiterated in what I heard and read was that the historic and systemic nature of racism is fundamental but often overshadowed by attention to attitudes and behaviours. Chenjerai Kumanyika (2017) argues that discussions about race and oppression tend to focus on individual attitudes as if racism were a disease (who has it?) or a puzzle to solve (what do we do to avoid it?). I came to realize that the focus needs to be, instead, on how racism permeates our institutions — how whiteness is established as the norm and how racism is produced and reproduced in everyday interactions and in who has what rights and how resources are distributed. As Kumanyika puts it, racism is not about your distant cousin being a bigot; it is about housing policy, educational funding, credit scores, hiring practices, skewed representation, and misrepresentation that we participate in and accept as normal. I came to see how systemic racism is baked into my life and the world. It is differential access to goods, services, and opportunities that becomes common practice and integral to institutions. It dominates public bodies, private corporations, and public and private schools and universities and is reinforced by the actions of conformists and newcomers. Writing in

1967, Stokely Carmichael and Charles Hamilton drew attention to this distinction between vicious, ugly acts of prejudice and the structural, systemic character of racism:

When white terrorists bomb a black church and kill five black children, that is an act of individual racism, widely deplored by most segments of the society. But when in that same city — Birmingham, Alabama — five hundred black babies die each year because of the lack of power, food, shelter and medical facilities, and thousands more are destroyed and maimed physically, emotionally and intellectually because of conditions of poverty and discrimination in the black community, that is a function of institutional racism (Carmichael and Hamilton, 1967, p. 4).

Yes, the systemic nature of racism is, in a sense, obvious. I had heard ideas about institutional and systemic oppression throughout my life and nodded with a degree of understanding. Yet, I was in my fifties before realizing how profoundly central this baked-in character was — in institutions, laws, policies, cultural stories, and worldviews — and consequently how blind and complicit I was, simply by growing up white. Most black people in the United States, without my privilege are forced to face social realities and become aware of all of this and more at an early age.

Investment in white privilege maintains a system of exploitation

I also came to understand that, analogous to privilege afforded to men, white privilege is an institutional set of benefits that affords disproportionate power and resources to white people. I could see what Cory Collins (2018, p.3) meant when he says that the term inspires pushback because the word *white* creates discomfort among those not used to being defined or described by their race and the word *privilege* gets interpreted as suggesting they have never struggle. Collins identifies three forms of white privilege: (i) where “normal” is defined by white characteristics; (ii) where white people are extended greater compassion and benefit of the doubt; and (iii) where white people receive greater opportunities to accumulate and inherit power. George Lipsitz (2006) takes the analysis of white privilege further, identifying an ongoing investment in being white — a possessive investment, literally and figuratively. White supremacy then is a system for maintaining differentiated benefits. Lipsitz argues that there is an investment of time and energy given to the creation and re-creation of a system designed to protect the privileges of whites by denying communities of colour opportunities, including opportunities for asset accumulation. Again, this leads me to see my world and myself in a new light, where good intentions and white benevolence that does not fundamentally alter the system is as much the problem as is bigotry and racist hatred.

This first set of three ideas, that racism results from exploitation, is fundamentally systemic, and is actively maintained by people and institutions, represents a paradigm shift for me. I came to realize that racism is everywhere present and that I am everywhere involved. There are no sidelines. If I am not part of the solution, I am the problem. The next question for me was to understand what exploitation is and where it comes from.

Exploitation is rooted in patriarchy and a western worldview of dominion

My exploration of the historical why and how of exploitation led me to see connections in the United States among racism, confiscation of indigenous land, and patriarchy. It led me back to colonialism and Europe. Instead of exploitation being an unavoidable part of human character or the result of a few greedy, self-serving individuals, I came to see that it has been the defining policy of European societies and their territories. Three sites for my learning stand out: The Doctrine of Discovery; contrasts between indigenous and “industrial” thinking; and conceptions of patriarchy.

The Doctrine of Discovery. The doctrine is not a document per se but an evolving way of thinking in European history and colonies that promoted and sanctioned the conquest, colonization, dehumanization, and exploitation of non-Christian territories and peoples. Leveraging the social construction of race, the doctrine rationalized global exploitation — the unprovoked plundering of others. It has a long history, from papal decrees to legal arguments to international law. I elaborate on its history here because it has significantly expanded my understanding of the context and problem of racism and because it connects the European and U.S. contexts.

What I have found so astounding is how far back its roots extend, how prominent its role has been throughout our history, how painstakingly it has been crafted over time, and how visible it remains in today’s laws, policies, and attitudes. Robert Miller traces the evolution of the doctrine from early arguments about natural rights and a shift in the Catholic Church from shepherding one’s flock to guardianship over all earthly flock (in Miller et al., 2010). He weaves connections among what, for me, have always been a series of descriptive events that simply unfolded. I came to see that arguments for exploitation and domination for colonial Europe began with papal bulls stretching from the crusades of 1096-1271 to the Church’s sanctioning of conquest first by Portuguese and then Spanish monarchs. Authority then shifts from the Church to states to international law. The arguments involve nuances of *dominium*, governmental sovereignty, and property. They use conceptions of “natural” law (as defined by European standards) to justify plundering, as if it had moral integrity. At times, the rhetoric is subtle. At other times, it is not. Pope Nicholas (1455) authorized Portugal, “to invade, search out, capture, vanquish, and subdue all Saracens and pagans.” Sighting and symbolic possession (flags or markings) was often taken as sufficient warrant for claims to land and people.

For me, the role of the Christian Church, the sophistication of arguments designed to defend exploitation as justified, and my obliviousness to this history have been eye opening. Miller also examines how England mixed papal authority with the imposition of English law, ignoring Irish legal and property rights, in its colonization of Ireland (1155-1603). Miller argues that England’s experience in Ireland and its development of legal arguments to rationalize its actions in Ireland provided a foundation for later arguments justifying global expansion. Two significant pivots occurred when early English legal scholars argued that claims to territory not yet claimed by Portugal or Spain avoided infringement on papal

authorization, and then in 1580 Elizabeth I and her legal advisors argued that “discovery” required occupation to be justified. As Miller points out, Elizabeth I, who had been excommunicated in 1570, was not concerned with papal approval, but with establishing international law that would recognize and respect English claims.

I have little sense of how different ones of you may look upon this history. Many of you may view this history as common knowledge, not as revelation, but it has given me a fuller understanding of connections and developments shaping injustice and its justification in our world. Growing up in the United States, I learned about British settlement of North America as reflecting their democratic industriousness and Protestant work ethic, not as highly crafted social policy developed from centuries of nationally competitive exploitation.

Furthermore, the history of the Doctrine of Discovery is not simply about the past. The U.S. *Johnson v M'Intosh* decision of 1823 is a stunning articulation of it that remains with us today. The decision includes explicit, detailed formulations of its central tenets, that the “first discoverer” has significant property and sovereignty rights, as well as sole authority to buy land, that indigenous people retain limited occupancy and use rights, that non-Christians are inferior to Christian Europeans, who are responsible for civilizing them, and that discoverers have rights to contiguous or vacant lands or land seized in just wars (all defined in European terms). And the Doctrine of Discovery, as articulated here and elsewhere, continues to serve as legal precedent as recent as the 1990s and 2000s in Canada, Australia, New Zealand, and the United States (Miller et al., 2010). Learning that my country of origin was built from such principles and that these principles are codified in our laws and continue to serve as the basis for court rulings today shocks me.

What I have come to understand is that the Doctrine of Discovery is not an anomaly. Indeed, it reflects a defining feature of western civilization, visibly and invisibly present in my thought, life, and society. Its history permeates my and our institutions and cultural views. As a child growing up in the United States, I learned in school about the “Age of Discovery,” not the Doctrine of Discovery. Growing up as a Quaker, I learned about Quakers' pacifism, support for abolition of slavery, and good relations with indigenous people, not about their complicity in society's use of the doctrine to wantonly plunder. At the retreat I mentioned earlier, *Quakers and Race: A Spiritual Journey*, I learned instead about Paula Palmer's re-examination of American Quakers' role in assimilation practices at native American boarding schools.⁵ I began to learn about different ways of seeing the world and the narrowness and distortion in many of the stories of my youth and my education.

Contrasts between indigenous and “industrial” thinking. In 1993 at the Schumacher Lecture at Harvard University, Winona LaDuke, an Anishinaabekwe from the White Earth Reservation in northern Minnesota and a U.S. vice-presidential candidate in 1996 and 2000, was asked to provide the mostly white audience with a sense of an indigenous worldview (LaDuke, 1993). She wonders how to communicate across perspectives and offers contrasts as

⁵ See <https://friendspeacetteams.org/trr/>.

a means. Her insights expand my understanding of the why and how of exploitation. She contrasts indigenous thinking with “industrial thinking” (Figure 1).

Figure 1

Contrasts between indigenous and industrial thinking suggested by Winona LaDuke (1993)

<i>Indigenous Thinking</i>	<i>“Industrial Thinking”</i>
natural law and a state of balance	entitled to full dominion over nature
cyclical structure of nature	linear thinking
cultural and biological diversity; in relationship	superiority of civilized (tame) over primitive (wild)
more verbs; things are animate/alive	inanimate nouns; commodification of the sacred
goal of conspicuous distribution; honour in giving	goal of accumulation and consumption

Earlier in my life, I studied social-cultural anthropology at the University of North Carolina. Many of LaDuke’s contrasts are not new to me, such as differences between cyclical and linear thinking and her descriptions of balance, relationships, and reciprocity. There is a power, though, in how she packages them and considers their implications for the world as it is today. And some contrasts are new for me, or are visible in a new light, for instance accumulation. To what extent are my life goals about accumulation, where accumulation is the end (not the means to a greater good, such as to then give generously), where accumulation is the priority (once I have accumulated enough, then I can attend to other matters), or where accumulation determines value (the worth of people, businesses, and societies)? LaDuke identifies accumulation as central to “industrial” thinking, which for me echoes the prominence of accumulation in Lipsitz’s (2006) possessive investment in whiteness. I have come to understand that accumulation plays a prominent role in nearly all forms of oppression and that it is foundational to European and western thought.

To convey the difference between indigenous and industrial thinking, LaDuke relates a story of the origin of the Lakota word for a white person.

There was a white man out on the prairie in the Black Hills, and he was starving. He came into a Lakota camp in the middle of the night, and the Lakota of course were astonished to see him. They began to watch him to see what he was doing. He went over to the food, took something, and ran away. A little while later, the Lakota looked to see what he had taken: he had stolen a large amount of fat. So the Lakota word for a white person, *wasichu*, means “he who steals the fat.”

The Doctrine of Discovery rationalizes stealing the fat. I have come to see stealing the fat as central to a western, European worldview. Unabashed colonization may be in the past,

but key components of our worldview are still in place. I have come to see that racism is just one of many mechanisms developed for stealing the fat.

Conceptions of patriarchy. I have also come to understand better the dynamics of exploitation from the work of Riane Eisler (1988, 2003, 2019). She distinguishes between domination systems:

Figure 2

Contrasts between partnership and domination systems suggested by Riane Eisler (2018)

<i>Configuration of Partnership Systems</i>	<i>Configuration of Domination Systems</i>
Democratic and egalitarian structure in both the family and the state or tribe, and all institutions in between. Equal partnership between women and men and high valuing of “soft” or feminine traits and activities in both women and men, and in social and economic policy. Low degree of built-in violence (not <i>needed</i> to maintain domination) and hierarchies of actualization, where power is not power over, but rather power to and power with.	Hierarchies of domination, not only in the state, but also in the family, and all institutions in between. Gendered system of values, ranking male over female, with rigid gender stereotypes of femininity and masculinity, and devaluing anything considered “soft” or feminine, such as caring, caregiving, and nonviolence, which are considered inappropriate for “real men” and are not part of the guiding social and economic system of values. Socially condoned and idealized violence, from child and wife beating to pogroms and chronic warfare, maintaining rigid top-down rankings of domination — man over woman, man over man, race over race, religion over religion, and so forth.

For Eisler (2018), a systems scientist, the dynamics of racism, patriarchy, economic oppression, and more are part of a system. As she puts it, “the struggle for our future is not between religion and secularism, right and left, East and West, capitalism and socialism, but in all these sectors between traditions of domination and a partnership way of life.” Eisler’s framing has helped me understand why regressive regimes focus on retaining or restoring domination in gender and parent-child relations and why all modern progressive movements challenge one thing: traditions of domination.

Eisler closes her remarks at the 2018 Safe Ireland Summit by offering four key cornerstones for a more equitable, sustainable, and caring world: childhood relations, gender relations, economic relations, and new narratives and new language. I have come to see the pivotal role children play in reproducing exploitive systems. Just as I have learned when I was young that prisons are our society’s most effective training ground for violence, I have come to see that child abuse is not just an outcome of domination systems — it is adaptive; it assures reproduction of the system. Eisler focuses on gender, but I find her work equally applicable to race relations and our relationship with the environment.

As I read more, I could see more fully how systemic the challenges are, how baked in the problems are, how problematic many of my stories are, and how different the world can look through the eyes of others. For example, in a fascinating analysis of patriarchy, Carol Christ (2016) argues that male dominance is enforced through systemic violence and threats of violence. She defines patriarchy as:

... a system of male dominance, rooted in the ethos of war which legitimates violence, sanctified by religious symbols, in which men dominate women through the control of female sexuality, with the intent of passing property to male heirs, and in which men who are heroes of war are told to kill men, and are permitted to rape women, to seize land and treasures, to exploit resources, and to own or otherwise dominate conquered people. (p. 214)

She analyses warfare, private property, and control of women's sexuality, putting the commonplace in new light. She speaks of being stunned by Merlin Stone's statement that, "in matrilineal societies there are no illegitimate children, because all children have mothers" (p. 216). The point being that the language of "illegitimate child" only makes sense in the context of male ownership of children. Christ conveys how different the world could be by describing how a Mosuo woman of the Himalayas explained:

... that in her culture women and men define themselves through their connections to maternal clans. When a girl reaches the age of sexual maturity, her mother prepares a room where she can invite a man to dine with her. If she chooses, she invites him to spend the night with her. Children produced from such unions become part of their mother's maternal clan. The 'fathering' role is assumed by the uncles and brothers of the mother, while the mothering role is shared among sisters. If either member of a couple tires of their sexual relationship, they end it and seek other partners. (p. 218)

Christ uses the Mosuo practice to reveal the many ways our western practices are designed to establish and maintain male control over women's sexuality. She goes on, using patriarchy to explain why we have warfare and private property. Throughout her analysis, she reveals design and coherence for what have always appeared to me to be a haphazard assortment of practices, merely circumstance.

Over time, I have come to see that the systemic exploitation of people of colour, women, children, and the environment are related. I have also come to see that racism is not simply a U.S. dynamic. While the United States has its distinctive form, racism is a global issue, with deep European roots, perpetrated through colonialism. Consider for a moment a growing mathematics education literature on racism in Brazil, India, Australia, and other countries. Indeed, my impression is that Europe's taboo on speaking about racism since the second world war is losing its grip and that Marxist claims that racism is just a misnomer for classism are fading. I am not trying to convince you that my emerging view is right or that the scholars I have referenced have cornered the market on truth, but I am trying to give you a sense of my expanding awareness of the world and the different ways people, from different communities, see it.

Implications for my mathematics education research

An obvious question here is what this personal journey has to do with mathematics education. For me, mathematics education is entangled and deeply implicated. Mathematics education is a major mechanism in our society for including and excluding, designating status, and controlling economic access. As Danny Martin (2019) and Dan Battey and Luis Leyva (2016) argue, it is a white institutional space that maintains a legacy of privilege, where violence and dehumanization characterize the experience of the less powerful. I am compelled to explore how this might be true, how mathematics education might be complicit in the rationalization and defence of exploitation, how I have likely been blind to its role in the oppression of non-white, non-male members of society, and what I might do to change this.

In recent studies, I have been examining what my new awareness implies for my understanding of the work of teaching and its mathematical demands. In addition to shifting what I study, it has shifted how I study, with whom and how I collaborate, and the orientation and sensibilities I bring to the work. I begin by describing the work of two of my close colleagues: Deborah Ball and Maisie Gholson. Each of us has independent work, but we also shape and are shaped by each other's work, and we invest in ongoing work together. I begin with them because their thinking is central to what I am coming to understand about how mathematics education research might address the challenges we face. I discuss recent relatively independent work we each have been doing, but my goal is to provide examples of what I see as implications for mathematics education research in light of the insights I have described above.

As a white Jewish woman with institutional power, Deborah's awareness of racial and intersectional issues in the United States has grown in different yet parallel ways to my own. This growth has led her to develop her thinking about the "power" of teaching — for harm and for good, in a society with its history of enslavement, oppression, and racism, where systemic oppression finds its way into everyday micro-moments of teaching. This is evident in her recent Klein Lecture at the 14th International Congress on Mathematics Education (Ball, 2021). She points out that systems and people are connected and argues three points:

- Teaching is powerful. When it is done with care and judgment, students can thrive — learn mathematics, develop positive identities, learn to value others and work collectively.
- Teaching also involves enormous discretion.
- How that discretion is exercised can either reinforce racialized and oppressive patterns of social, personal, and epistemic injustice and harm, or it can disrupt these patterns.

She explores the nature of teaching as practice and the need for research on "practicing (in)justice," in other words becoming aware of how and when injustice happens in practice and developing practices that disrupt injustice, and are more just. She identifies five challenges for such research:

1. Combining the embodied and relational dimensions with the cognitive and knowledge entailments.

2. Building theory and insight while contextualizing the work and centering identities.
3. Connecting the dots between macro-structures and micro-interactions.
4. Using care to distinguish prescription from detail.
5. Representing the work in a usable discourse of practice.

She unpacks what is meant by each of these, the logic that connects them to an imperative to disrupt rather than perpetuate patterns of oppression, and the broadened collective needed for their meaningful study.

As a black woman engaged in mathematics education research in an inhospitable institutional context, Maisie Gholson works in a black feminist framework to understand how children's identities and relational ties to mathematics, peers, and teachers create different developmental trajectories and learning opportunities. She foregrounds children's humanity and the visceral contexts that shape their experiences. In her invited lecture at the 14th International Congress on Mathematics Education, she argues that:

There is a moral imperative to study the phenomenology of marginalized learners, like Black American children, to protect and promote their physical, socio-emotional, and intellectual well-being in relation to mathematics education.” (Gholson, 2021)

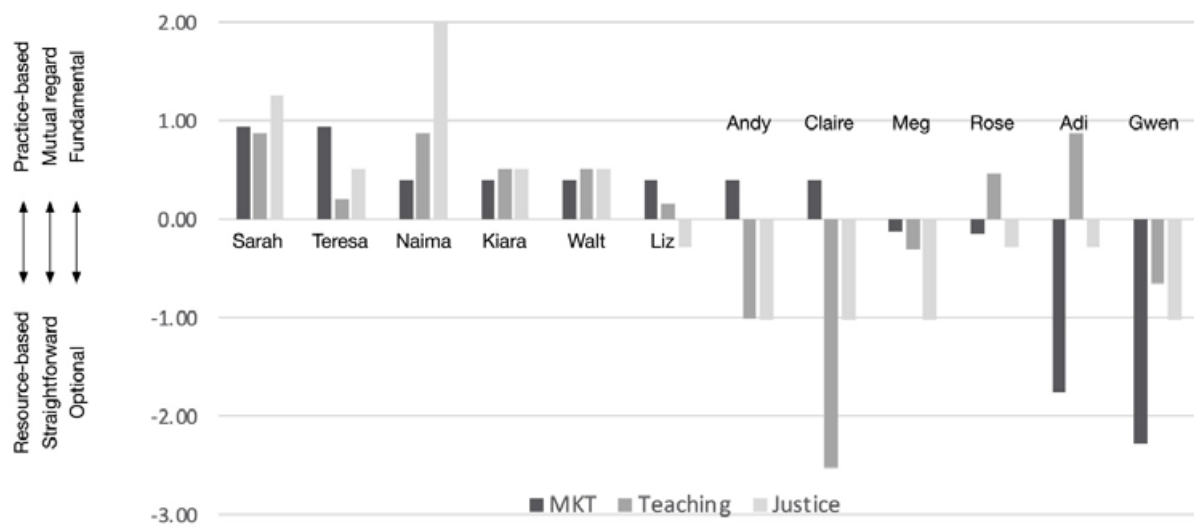
She calls for mathematics education research that promotes black life and well-being. This means dealing with ecological complexity at all levels — the neuro-physical, cognitive, interpersonal, community, societal, and socio-historical levels. She argues that doing so requires development of tools for studying the mundane and everyday, in ways that help us see “the consequential in the inconsequential, the significant in the taken for granted.” She engages lived experience through a hermeneutic circle, a reflexive process of questioning text through different horizons of understanding. She draws on Gadamer's description of horizons as contexts of meaning and refers to Lavery as noting that, “a person with no horizon, in Gadamer's view, does not see far enough and they overvalue what's nearest at hand.” Mathematics education does not see far enough. It needs to see beyond its trained, institutional vision — of mathematics education and of research. In contrast, “marginalized folks [including children] have a unique perspective that allows them to see oppression in ways that others with more privileged identities do not.” Maisie specifically argues that mathematics education researchers need better tools for seeing what happens in mathematics teaching and learning through the experiences and perspectives of children. Maisie is finding new ways to gain insight into the experiences of black girls and shed new and clearer light on what is happening in mathematics teaching and learning.

In my own work, I have been examining what my new awareness implies for my understanding of the work of teaching and its mathematical demands. Imani Goffney and I have been studying nuanced aspects of the work of attending to justice in teaching and associated mathematical demands (Goffney and Hoover, 2021). Elaborating this work has allowed us to see and prioritize mathematical knowledge and skill that, if routinely addressed in the mathematical education of teachers, would increase teachers' capacity to provide positive learning experiences for students currently marginalized. In a different study, Reidar Mosvold, Matthew Dahlgren, and I have been exploring how mathematics teacher educators

think about the mathematical understandings needed to teach mathematics to learners (Hoover et al., 2021). We have found that their thinking about mathematical knowledge for teaching is shaped by how they think about teaching and how they think about justice. In a sample of 12 mathematics teacher educators, we found that their thinking in these three domains tended to align and that misalignment provided important insight into how professional development might serve them better (Figure 3).

Figure 3

Profiles of the extent to which participants think of mathematical knowledge for teaching as practice based, teaching as mutually involved, and justice as fundamental and consequential



Before engaging in this study, we would not have thought that developing one's thinking about justice would be an important tool for developing an understanding of the practice-based nature of mathematical knowledge for teaching. Now we do, and we propose giving the development of thinking about both teaching and justice more prominence in the professional development of mathematics teacher educators and the mathematical education of teachers. Our analysis suggests that individuals who understand the mutual character of teaching or the fundamental character of justice are assets for collective work on mathematical knowledge for teaching and should be recognized.

Maisie, Deborah, and I work in education because we value education and see it as a hope for a better future. Our central professional goals are personal goals. Currently, we are studying what it takes to communicate across difference in mathematics classrooms. In combining Maisie's abiding attention to students and their experiences within and beyond the classroom with Deborah's and my concern for articulating the work of teaching in ways that support learning to teach, we hope to learn from each other about how to attend better to justice in mathematics teaching and learning.

Reflections for me: Questions for us

From my colleagues and my efforts to consider the systemic harm done and ways of doing better in mathematics education and mathematics education research, I offer three broad

reflections. The first is about *the need for “other” perspectives — perspectives different from our own, of those most harmed by current systems and practices that perpetuate these systems*. Maisie calls us to have a deeper, more profound regard for students’ experiences and those of their communities, not simply to consider them while standing on our own ground but pressing ourselves to sense the experience of the other, to the extent we can. Stretching ourselves. In an essay for teachers, *On a Certain Blindness in Human Beings*, William James talks about our inner worlds, where significance and eagerness for life abide (James, 2010/1899). Each of us has this sense of significance and eagerness regarding our life. It is our joy, and to miss it, to go through life without heeding it, is to miss all. From this, though, James describes how immensely difficult it is to know the inner world of another. The essay is about the blindness that afflicts us all, “in regard to the feelings of creatures and people different from ourselves” and the “injustice of our opinions, so far as they presume to deal with the significance of alien lives” (p. 146). James draws attention to the near impossibility of knowing others and yet the vital necessity and the profound reward of glimpsing, through others, “the vast world of inner life beyond us” (p. 152). It is our efforts to see from another’s perspective that affords us an ever-emerging new centre and a more meaningful life. Although James is not writing about “social justice” per se, at least not as a topic as we might identify it today, he refers to those “different from ourselves” and to the “injustice” of our views. My growing sense is that we need to heed the systemic challenges we face, but as these are constituted and reconstituted by our daily interactions, our everyday practices, it matters that we attend to our blindness as people and as researchers. This requires investment in “other” perspectives.

Mathematics education research as a field needs to expand its Gadamerian horizons. Maisie suggests ways of doing this in both our methods and our empathy. For me, the need for exploring perspective and expanding my horizon combines the personal and professional. My research does not have meaning apart from who I am and the contexts in which I work, a point that many other scholars have noted before my noticing it. The insights I have written about above are from my ongoing exploration of perspective, what some might call my political education. In addition, I find myself actively working to find and bridge perspective in my research. As a small example, when I now write something, I invest in rereading with other specific perspectives in mind. Of course, this is what I have always done in many ways, but I do it now with specific, deliberately chosen views, at both the sentence and manuscript level. How might Imani Goffney, a black female colleague, read this sentence? How might Eve Tuck, a Unanga scholar of critical race and indigenous studies, who does not know me and may question the significance of land and place in my work, view this paper? Increasingly, I ask non-white colleagues to review my work, with a focus on noticing my perspective and offering their own. And I look for ways to compensate them for their expertise and vital contributions to my work. Another version of this practice is to ask myself if what I have written is from an institutional perspective, which is inevitably a white perspective. What might I be taking for granted, defaulting to because it is part of the story that I have been steeped in throughout my professional training and career? This exercising of perspective is reshaping me and reshaping my work.

This example leads to a second reflection, *that meaningful regard for justice requires we carry out our work more collectively than has historically been the norm in mathematics education research, and that, in this, each of us be engaged in justice both personally and professionally*. I have been studying collective work as crucial for mathematics teaching and learning for over twenty years. What is it, how is it done, to what ends? In part, from early in my life, I have seen an important collective aspect to doing mathematics. I have also always sensed that collective mathematical work in classrooms was essential for the teaching and learning of mathematics in a democracy. In recent years, though, in relation to seeking to understand (in)justice and act on that understanding, I have come to see that collective work is key for attending to (in)justice. Mathematics education is about the lives of all of us in this world. It is not a disciplinary study of learning or a sociological study of policies and institutions. It is a professional field of study, practical and political in nature, immediately concerned with our collective life and making it better. It is not only about mathematics education researchers' lives, or teachers' lives. It is very much about students' lives and the lives of those who live in our communities and societies. And when power is involved, when power becomes a problem, it is essential that change come from within. It requires that all of us find our voice and speak our truth. This is not a simple matter of having everyone working together as equals. It has no single form. It requires reorganizing the work in ways that groups find their work, that is meaningful to them, and that their work is valued by those who have power, or more importantly, by and within the system.

Bob Moses learned to organize for change from Ella Baker, a civil rights activist with unflinching faith in the power of ordinary people and a collective approach to leadership. Bob always insisted that students have a significant role in any meeting or event of the Algebra Project or any activity in which it was involved. And he would press the young people to figure out what matters to them and what they want to say and do. He encouraged young people to form the Young People's Project, which uses math literacy work to develop the abilities of elementary through high school students to succeed in school and in life.⁶ For Bob, the people most affected needed to be central to solving the problem. This means having authentic places for students, teachers, and communities in the work and holding that space for them. It also means holding space for the people most affected in the academy. For instance, Maisie Gholson uses a black feminist framework, which acknowledges the value of black women and sees their work as an expression of their autonomy rather than an adjunct to the work of others. For me, this is an example of the kind of earned insurgency of which Bob Moses spoke and which our field needs to recognize, not just as legitimate, but as essential to efforts to address equity, access, and justice in mathematics education.

I have no straightforward answers for what this means for my work as a mathematics education researcher or our work together, but I know I need to consider and act on its implications. There may be a place for individual scholarship, mine or others, but collective

⁶ See <https://www.typp.org/>.

engagement is a key resource for attending to justice in all aspects of research. To be a resource, though, engagement needs to stretch me, and such work is not always easy.

The third reflection I offer is *our need to rely on our human faculties of conscience, discernment, and spiritual experience to direct our research*. I can imagine many reservations about doing so. Instead of speaking to those, I focus my comments on the need. First, the problems we face regarding equity, access, and justice require a deeper listening, one fostered by attending to conscience. Perhaps one way to think about this is that when the institutional structure is the problem, including that of the mathematics education research community, then we cannot rely on it alone to guide our work. We must find a means of seeing outside of our institutionally established frames and defaults. Yet it needs to be a reliable means. Our spiritual foundations seem the most likely source. I do not mean the institutions of religion or the particulars of individual faith. I have in mind a rather universalist experience of right and wrong, of what is true for me, true for you, perhaps true for us, and a drive to make decisions based on our best sense of what is right or true. John Woolman writes in his journal about how, inside each of us, there is that which is true and pure, where the heart stands in complete sincerity.

There is a principle which is pure placed in the human mind, which in different places and ages hath had different names; it is, however, pure, and proceeds from God. It is deep and inward, confined to no forms of religion, nor excluded from any, when the heart stands in perfect sincerity. In whomsoever this takes root and grows, they become brethren. (Woolman, 1720-1771/1871/1914, p. 36-37)

I am not trying to make a religious or philosophical point. Mine is a practical point. I find I need to question much of my training, my conceptions of disciplined research, journal standards, everything. I am not inclined to throw them all to the wind. They hold a great deal of wisdom. But I have come to understand that they are also ill and need healing. I have learned in my life that when I still myself, free myself of distress, hold the world in my heart, and listen patiently to that still small voice within, I find good guidance — imperfect, but with practice, helpful guidance. I also find it helpful to know that others know this for themselves, by whatever name, and that, when we call it forth from each other, we see better, see beyond the problematic stories, practices, and trauma of our past. As my sister, Nadine, has written, discernment is the human capacity to grasp the inner nature and relationship of things, especially when obscure, that leads to keen insight and judgement (Hoover, 2018, p. 47). This is the foundation of all science and knowledge.

The flip side of seeing that institutional structures are part of the problem is that the people who are less fully part of the white institutional space of mathematics education research have, of necessity, needed to find other foundations from which to draw than the standard-bearers of mathematics education research. When I consider for a moment who in our field is afforded the most say in what counts as legitimate research, I see how conservative the field is in decisions about important problem spaces and legitimate ways of knowing. I also see hope in complementary resources in those from communities most

harmful in systems of oppression. Most prominent are ways of knowing that draw from religious traditions and spiritual wisdom. For instance, indigenous scholars have drawn on indigenous knowledge, worldviews, and spiritual wisdom in ways that have exposed the narrowness of scientific thought and science education in a democratic society suffering from environmental disasters and profound social trauma. Black scholars often draw from spiritual traditions — even more so when out of view of the establishment and its frequent disdain. Likewise, women and women’s ways of knowing have reshaped both the content and methods of the biological sciences, in recognized ways, over many decades. We live in a world that needs these groundings. We work in a profession that needs them.

Looking back on my journey, one important take-away is that I have learned to question things I have long taken for granted. Even though I was concerned with justice and sought to live accordingly, I have had a certain blindness that comes with growing up in this world, especially growing up privileged. What can we each do to overcome our blindness? Of course, my narrative is my narrative. Perhaps you will find parts of it helpful, but I am not trying to “sell” it to you. Instead, I call on each of you to develop your own narrative regarding oppression in the world, its many forms, connections among them, and implications for mathematics education research. It is not okay to not have a narrative, to not have struggled to make sense of oppression or to listen to others’ perspectives. A second take-away is that I find I must work in community and communities of those who are not like me but with whom I find alignment. In this, I must recognize and acknowledge the value of what those others contribute to the work. In addition, for those of us in positions of power, of all kinds, it may be important to hold space for those who do not have power. They need us to hold space for them to do their work, as they are led, without our inserting ourselves and taking over. Finally, I invite us to each find a reliable means of stepping outside our training and standards, so that we might know when our training and standards are the problem, so that we have a moral compass for reflecting on our profession and the work we do, and so that we have a reservoir that keeps us going and committed.

From where does the onus for change come if not from us?

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