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Radical Love as Praxis: Ethnic Studies and Teaching Mathematics for Collective Liberation

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Ethnic studies is a growing movement for curricular and pedagogical practices that reclaim marginalized voices and histories and create spaces of healing for students of color; however, its application to mathematics education has been limited. In this essay, we provide a framework of five ethea of ethnic studies for mathematics education: identity, narratives, and agency; power and oppression; community and solidarity; resistance and liberation; and intersectionality and multiplicity. We describe key concepts and examples of the ethos of ethnic studies.

KEYWORDS: ethnic studies, love, mathematics for liberation, transformative resistance

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I see your lesson plan book
Scrawled in red, black or purple
Whichever color best fits your mental state

Fatigued eyes from too-blue screens
the deluge of emails`
confusion and frustration
schedules and systems built upon the brokenness of the world
the failure to recognize each other's humanity

Somehow, you must navigate all of this
Somehow, you must subvert all of this

Always, there is lack
Always, there is more
Always, there is comparison
Always, the message
give, give, give - until you snap in two
give, give, give - until you collapse under this weight

Pause.
Observe.
Breathe.
Reflect.

And remember that in times of tumult
Full of lashing winds
The trees
that protect each other
That share
The trees
that dance and weave
that bend
in the eye of the storm
are the ones that do not break

Our interconnected roots
Whisper to us softly
I am because we are
We are because I am

A gentle reminder
A firm demand

Do not forget to take care of you
Do not forget to care for each other
This is how we win ~

—Poem by Sara Rezvi, "On the Eve of This School Year | A Love Letter to Radical Math Teachers"

We write this out of love! Our love for students. Our love for teachers. Our love for our communities. We recognize the epistemological force of love and how it is entangled in how we make sense of the multiple and often contradictory spaces we traverse as scholars of color, as children of immigrants, and as mathematics educators (Anzaldúa, 1987; Darder, 2017; hooks, 2001). Once more, we write this out of love. We write this looking into the mirrors of our souls. We look into each other's reflections and see collective grief, collective mourning, collective pain. We see the calls for teachers to sacrifice their bodies, their beings, their lives. We bear witness to the pain of families still reeling from mass death, loss, pain, and poverty (Wrigley-Field, 2020). We recognize the gross inhumanity and violence of these calls and the similarities between and within mathematics education (Capraro & Chang, 2020; Leonard, 2020).

Liberation in mathematics education cannot be conceived without a commitment to our humanity and to love as a grounding force (Darder, 2017; Freire, 1998). The orientation to love proposed here is not a romanticized or liberal notion of love. Our definition of radical love draws on orientations from activist and critical scholarship (Boggs; 2012; Davis, 1990; Freire, 1968/1970; 1998). Paulo Freire, a critical humanist, stipulates both education and love as political projects and called for an "armed love"—the fighting love of those convinced of the right and the duty to fight—with a revolutionary, radical essence, conceiving love as an act of freedom that becomes the pretext for other actions towards emancipation (Freire, 1998). Radical love offers us possibilities to understand our relationships with each other and oppressors in ways that challenge complacency. Angela Davis (1990) reminds us that radical means "grasping things at the root." Therefore, to ground ourselves in the tradition of radical love, we argue that mathematics education must adopt a radical form of resistance that is interdependent, collective, healing, and nurturing for our collective spirits. This is especially important as we, mathematics educators and teachers, navigate complex terrain and search beyond privileged spaces to locate knowledge from communities that disrupt colonial systems of knowledge making.

White settler colonialism has been a major force that not only defines but also sets the conditions for mathematics teaching and learning as it appears today (Bullock, 2017; Larnell et al., 2017; Martin et al., 2010). School mathematics in the United States is tied to histories of racial apartheid, which shape both curriculum and schooling structures and are still perpetuated today through the seemingly benign practices of tracking and ability grouping as well as teacher expectations and curricular differentiation (Louie, 2017; Martin et al., 2010). Perhaps the most oppressive aspect of a colonizing education is the way in which it functions to deculturalize by "destroying a people's cultural identities (cultural genocide)" (Spring, 2016, p. 8). We join a growing group of mathematics educators, researchers, and activists to contend that mathematics is political (e.g., Bullock, 2017; Goffney et al., 2018; Gutiérrez, 2013; Leonard, 2020). Mathematics has been used as a weapon to legitimize capitalist

interests, produce stratified achievement, and position children and families of color at the bottoms of social strata (Martin, 2013; Yeh, 2018). As Dr. Gloria Ladson-Billings (2017) reminds us, "school is often a place of trauma" for many students of color (p. 5). Our affirmation of the problems in mathematics education is not unique or new. These issues have existed since the inception of the United States. Our intervention in this paper uses an ethnic studies framework to deliberately center radical love, hope, and liberation within mathematics education.

We are cautious here not to propagate myopic and pervasive understandings that sever mathematics education from the histories of colonialism. We choose to not subscribe to over deterministic renderings of schools as either mere instruments of social and economic domination OR as sites of liberation and possibilities (Freire, 1998). As educators committed to a more humanizing pedagogy, we see education as a site of social reproduction AND as a potential site for transformation (Freire, 1968/1970, 1998; hooks, 1994). Schools can be a place in which students' ideas and identities are honored and leveraged, and mathematics education can help bring equality and justice to an unjust world (Freire, 1968/1970; Gutstein & Peterson, 2013; Leonard, 2020).

As educators of color whose work in mathematics education centers on anti-racist and decolonizing frameworks, we acknowledge the many privileges that we have and our roles as both the Oppressor and the Oppressed (Freire, 1968/1970). We offer this writing as a collective—of classroom teachers, mathematic educators, and community activists—in which our commitments to ethnic studies transpire in both institutional and community spaces through community-based education, youth participatory action research, and community organizing. While the ethnic studies movement is growing in both college and K–12 schools, its application to mathematics education has been limited (Sleeter & Zavala, 2020). Here, we humbly share how ethnic studies gave us the language and concepts to put our dreams of humanizing and rigorous academic experiences for youths of color into action. What follows are ethea developed through sessions of dialogue and shared reflection on our praxis and then an excerpt of our dialogue. This dialogue models ethnic studies as a process of communal learning towards collective consciousness and action. It is only with others are we able to identify structural and internalized oppression and to dismantle these structures in mathematics education by naming them, questioning their existence, and then envisioning and working towards alternatives (Boggs, 2012; Freire, 1968/1970, 1998). What follows is a conceptualization of ethnic studies mathematics by epistemically situating ethnic studies in the socio-cultural-historical-mathematical world (Frankenstein, 1983; Gutstein, 2008).

There is Emotion in Mathematics: Ethos and Epistemology

> We are the body of light
> That will inspire an entire lifeline
> You are the key to the clouds
> That block the moon
> As long as you believe in you
> (Kumari, 2016, stanza 3).

In this section, we discuss the Ethos of Ethnic Studies Mathematics, along with the epistemological posture of our life-work presented throughout this paper. When we say life-work, we honor the power with(in) (Ayala et al., 2018) each of us, along with our inherent connections to others through acts of spiritual activism (Anzaldúa, 2009). Spiritual activism represents non-binary modes of thinking and being when engaging in acts of social and individual transformation, which arise from Gloria E. Anzaldúa's own lived experiences (Keating, 2008). We center our identities as mathematics educators across multiple privileged and oppressed lived experiences to challenge the current state of mathematics education by providing a humanizing alternative. Only those subject to oppression can fully grasp the injustice in education (Freire, 1968/1970), and it is only an epistemic unraveling of injustice that can lead to the resistance (Medina, 2013) necessary to humanize mathematics. Ethnic studies creates a nexus for such hope and love in the teaching, learning, and living of/with mathematics.

While ethnic studies is a contested and emergent field, we define it broadly as a movement for curricular and pedagogical projects that reclaim marginalized voices and histories and create spaces of healing (Dingle & Yeh, in press; Martinez, 2020; Rangnath et al., in press). Both of these two processes are tied to social actions that challenge and transform oppressive systems and cultures of domination. The goal of the ethnic studies movement is to rehumanize experiences of communities of color, challenge problematic Eurocentric narratives, and build community solidarity across categories of difference, such as race, class, gender, and sexuality (Ferguson, 2012; Omatsu, 2003). Ethnic studies can be framed as anti-racist in the sense that it attempts to unpack, challenge, and eradicate racism as it takes place in our schools and in the broader society, but ethnic studies strives to do more than this. Ethnic studies can also be framed as part of a broader process of decolonization or "delinking that leads to de-colonial epistemic shifts that brings to the foreground other epistemologies, other principles of knowledge, and understanding" (Sleeter & Zavala, 2020, p. 24). Building on our own experiences with ethnic studies projects (Dingle & Yeh, in press; Rangnath et al., in press) as well as the ethnic studies literature (e.g., Banks, 2008; Cammarota, 2016; Cuauhtin, 2019; Sleeter & Zavala, 2020; Tintiangco-Cubales et al., 2015), we developed the framework of five ethea of ethnic studies for mathematics education: identity, narratives, and agency; power and oppression;

community and solidarity; resistance and liberation; and intersectionality and multiplicity.

Ethos of Ethnic Studies: Interconnectedness

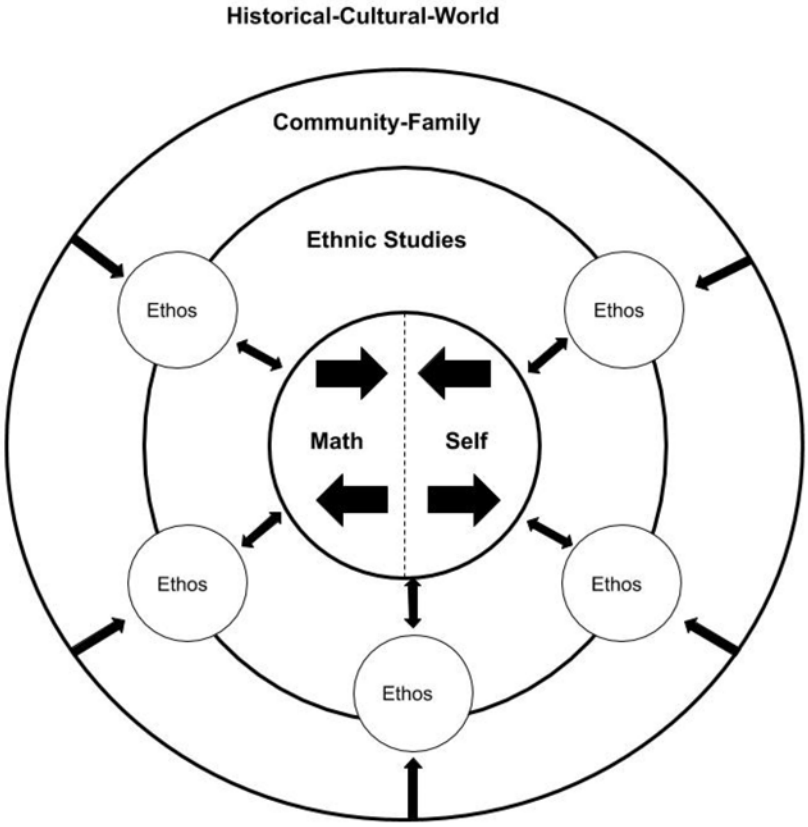

Figure 1. Ethea of Ethnic Studies Mathematics

Ethnic studies mathematics seeks to humanize the classroom for students of color, who have a history of experiencing dehumanization through silencing of their identities, perspectives, and intellectual abilities. Humanization is a collective endeavor linked by the dialectical of human-to-human and human-to-self communication (Ayala, et.al., 2018). Communication is an act both in the political power of education and in its ability to provide self-reflection. Ethnic studies is a bridge that cultivates multiple ethos of love (Rangnath et al., in press). In Figure 1, the different ethea lie centered on the perimeter of the circle that divides ethnic studies mathematics from community-family, meaning the ethea inhabit space in both. The perimeter acts as a link between ethea, signifying that these ethea are interconnected and mutually dependent. Additionally, the ethea are informed by the historical-cultural-world that the community-family is situated in, hence the arrow from the historical-

cultural-world manifests in families and communities to inform and develop the ethea.

The ethea are placed on the same circle to emphasize that they are interconnected, non-linear, and non-hierarchical. For example, the ethos of power and oppression is directly connected to the ethos of identity, agency, and narratives However, the individual ethea do represent specific bodies of history/research, thus they are discussed as independent at times. The arrows between each ethos and the center circle is where/how ethnic studies makes education an intimate experience for learners and where ethnic studies informs the learner while simultaneously allowing the learner to contribute to what is ethnics studies. Ethnic studies mathematics is a process that connects mathematics learning to the community and to the real world while acknowledging the situated, embodied, and emotional aspects of learning (Goffney et al, 2018; Lakoff & Núñez, 2000; Lipka et al., 2005). Hence, a one-size-fits-all approach to ethnic studies can be toxic by ignoring the uniqueness of individual learners, families, and communities.

The center circle of Figure 1 highlights the mathematics that is already inside of every learner (Goffney et al, 2018; Lakoff & Núñez, 2000; Lipka et al., 2005). The false dichotomy between self and mathematics created by Eurocentric narratives ignores and perpetuates racism, heterosexism, ableism, capitalism and subjectivism (Bullock, 2017; Gutiérrez, 2013; Madden et al., 2019; Yeh et al., 2020; Yeh & Rubel, 2020). The fact that people have been socialized into believing that they are either "math people" or not is why the divide exists, but note that the line is dotted because mathematics naturally seeps into and builds from a person's identity, and all people contribute to mathematical knowledge. The dotted line represent the resistance of marginalized people to Eurocentric-only mathematics and the hope they harbor to one day fully erase the lines that divide us. Ethnic studies mathematics is a call to reclaim the inner mathematics already present in all of us. The inward and outward arrows in Figure 1 highlight the constant push and pull that is needed to heal mathematics and the self. The ethea of ethnic studies are rooted in the interconnectedness between individuals and their experiences with mathematics, which centers the focus of ethnic studies on the connection between history, culture, family, and youth development as an external and internal process of mathematical becoming (Freire, 1974). Below is a description of each of the five ethos.

Ethos of Identity, Narratives and Agency

The ethos of identities, narratives, and agency acknowledges identity formulation as not independent but in communion with others, with our ancestral experiences, and with the world around us. While mathematics education often positions identity as an individual trait or as situated within classroom interactions, our ancestors' experiences also shape our identity (Banks, 1999; Leonard, 2020). Leonard (2020) specifically calls attention, in this era of anti-Blackness and strengthened

White nationalism, of the importance of "discover[ing] one's roots" (p. 10). Knowing the counterstories of our ancestors—the contributions and resilience of people of color in the face of hardship and violence—reaffirm both our cultural and American identity.

Counternarratives build from the belief that communities of color hold within them deep resources and ways of knowing and being that are particularly important in disrupting colonial ideologies pervasive in mathematics (Anzaldúa, 1987; Freire & Macedo, 1987; Leonard, 2020). Banks (2004) explains, "The knowledge that emanates from marginalized epistemological communities often contends existing political, economic, and educational practices and calls for fundamental change and reform. It often reveals the inconsistency between the democratic ideals within a society and its social arrangements and educational practices" (p. 237). Yet, much of these rich and collective ways of knowing and being have not yet been made visible in mathematics education. Ethnic studies requires the rewriting of mathematics curriculum from the perspective of people of color, grounding pedagogies and curriculum in counternarratives that offer historical accounts, interpretations, and cultural practices that question dominant narratives. D'Ambrosio's (1985) work in ethnomathematics and the Mathematics in Cultural Context Project, in which mathematics curriculum was developed in collaboration with Yup'ik elders (Kisker et al., 2012; Lipka et al. 2005), highlight the importance of reclaiming identities as central to students' personal and academic development. As Au, Brown, and Calderon (2016) state, "As peoples of color—what we must know to survive, to understand who (and where) we are, to imagine freer and more joyful futurities—we demand curricula that honor the knowledge production of our ancestors; engage the yearnings of our children, families, and communities; and interrogate the enduring tradition of White supremacist subjugation and misrepresentation" (p. 151).

Ethos of Power and Oppression

Equity-based reforms in mathematics education have focused on access and inclusion to acquiring knowledge specific to the discipline with minimal attention to the historical, social, cultural, and political situatedness of mathematics education; thus, these initiatives have perpetuated existing racial, gendered, linguistic, and ableist hierarchies (Bullock, 2017; Louie, 2017; Yeh et al., 2020). Freire and Macedo (1987) remind us that "the intellectual activity of those without power is always characterized as non-mathematical" (p. 122). What we argue here is the importance of examining and abolishing ideological systems of oppression in mathematics education. Mathematical "smartness" is an ideological system that perpetuates Whiteness and serves as a tool for stratification (Bullock, 2017; Leonardo & Broderick 2011; Yeh et al., 2020). Ability is commodified and seen as property; success of mathematics is measured in terms of achievement of numerical target, and such data are used to construct and constitute some students as "mathematically smart" while

simultaneously constructing and constituting other students as "not-so-smart," deficient, or learning dis/abled (Leonardo & Broderick, 2011; Yeh et al., 2020). The construct of mathematical "smartness" intersects both race and ability.

Mathematics education has a legacy and history of systemic epistemicide of peoples of color—the erasure of knowledge systems, including languages, experiences, and interpretations of the world, and ways of coming to know and understand—through exclusion within schooling from its functions, curriculum, and pedagogy (Louie, 2017; Martin, 2013; Martin et al., 2010). Despite 40+ years of research on culturally responsive pedagogies and multicultural education, the mathematics learning experiences of students of color still mirror U.S. politics of xenophobia and assimilation. Students of color educated in Western schooling practices learn to perform mathematics using algorithms that are not their own, in a language different from their native tongue, and solving mathematics problems irrelevant to their interests and experiences. Challenging oppression in mathematics education requires us to shift from the single conceptual standpoint to recentering nondominant perspectives and knowledge traditions. Freire (1968/1970) posits that the Oppressed have insights into the nature of oppressions that are necessarily hidden from the Oppressors. It is the Oppressed who must lead the struggle for liberation on their own behalf AND for the Oppressors, not only because of their insights but because any attempts for the Oppressors to lead the struggle is a reenactment of the power relations that exist under conditions of exploitation. It is in the moment that the Oppressed (student, educators, and communities of color) take charge of the struggle for liberation that they evidence to themselves and to the Oppressors a clear understanding of their own humanity as agents in history.

Ethos of Community and Solidarity

The third ethos is about community and solidarity. The central purpose of ethnic studies is rooted in the Third World Liberation Front movement (Ferguson, 2012; Omatsu, 2003). Ethnic studies emerged out of students' need to belong, to see themselves in the curriculum, and to be respected as human beings. Ethnic Studies mathematics makes explicit the centrality of community as a site for learning, organizing, and activism (Civil, 2007; Cuauhtin, 2019; Sleeter & Zavala, 2020; Tintiangco-Cubales et al., 2015). It is important to stress, however, that community contexts differ across geographic locations, which is to say, there is no single way to approach mathematics teaching and learning from and with youth of color. This is where ethnic studies begins, through community responsive methodologies and pedagogies (Civil, 2007; Sleeter & Zavala, 2020; Tintiangco-Cubales et al., 2015). Mathematics education that centers on equity for students of color must place them out front and create methodologies and pedagogies that are responsive to the specific needs, strengths, and contexts that communities possess. Ethnic studies draws strength from community and from the differential spaces of struggle and solidarity. Learning is a process

that is lived, engraved in students' bodies and memories, not just what is experienced cognitively (Anzaldúa, 1987; Collins, 2000; hooks, 2001; Lakoff & Núñez, 2000). Students come to the mathematics classroom with not just an identity but a community of people who have helped influence, impact, and shape that identity. Connecting to students' communities is a critical aspect of countering the master narrative of who and what mathematics is.

Ethos of Resistance and Liberation

Local and community-based knowledge cannot be used solely as a resource to critically read and write the world through mathematics (Freire, 1968/1970; Gutstein & Peterson, 2013); ethnic studies projects must also lead to resistance and liberation (Sleeter & Zavala, 2020; Tintiangco-Cubales et al., 2015;). The ethnic studies program in Arizona consisted of a youth participatory action research program called the Social Justice Education Project (Sleeter & Zavala, 2020). This provided students the opportunity to engage in transformational resistance (Solorzano & Bernal, 2001), which requires a critique of social oppression and a motivation driven by social justice (Cammarota, 2016; Gutstein & Peterson, 2013; San Pedro, 2018). Ethnic studies mathematics is a revolutionary praxis of mathematical spiritual wisdom, which consists of the cultural, historical, spiritual, and logical forms of mathematics that help us connect to other individuals and additional forms of mathematics that are collectively created (Martinez et al., 2021; Shirude, in press). A true revolutionary praxis (Freire, 1968/1970) where action and reflection harmonize to create the sound needed for social transformation is a necessity to reach resistance and liberation.

Mathematical reflection requires mathematical spiritual wisdom (Martinez et al., 2021; Shirude, in press). Reflection alone cannot lead to liberation, and we cannot forget the need for mathematical action in the classroom. Mathematical action must connect mathematics learned in the classroom to the community and greater society (Martinez et al., 2021; Yeh & Otis, 2019). Ethnic studies mathematics is a revolutionary mathematical praxis that balances mathematical action and mathematical reflection towards transforming mathematics education. Rahman (1991) was speaking of participatory action research (PAR) in saying, "an immediate objective of PAR is to return to the people the legitimacy of the knowledge they are capable of producing through their own verification systems, as fully scientific, and the right to use this knowledge" (p.15), which we can extend here to say ethnic studies mathematics has the same goal. As we return the memory of already being mathematicians to the people, the people can then liberate us all as they liberate themselves.

Ethos of Intersectionality and Multiplicity

Rather than conceptualizing identities as fixed and essentialized, ethnic studies probes intersectionality and multiplicity as a fluid, temporal spectrum. It recognizes

the need to attend to multiple ways of being and knowing, especially from gendered contexts in which mathematics has been socially constructed with(in) (Gholson & Martin, 2019; Walkerdine, 1998; Yeh & Rubel, 2020). Although ethnic studies centers its analysis on race and racism, an intersectional approach also attends to multiple identities, as all of us embody multiple identities. Teachers and researchers working from an ethnic studies framework attend to students' multiple social identities and their positions within intersecting relations of power in mathematics. Crenshaw (2017) defines intersectionality as a vehicle to represent the practices and embodied knowledges that, historically, have characterized the lived experiences of her women-of-color foremothers, who simultaneously navigated the complexities of gender, race, language, and other identity politics (Collins & Bilge, 2016). Structural intersectionality "refers to the connectedness of systems and structures in society and how those systems affect individuals and groups differently" (Few-Demo, 2014, p. 181). Crenshaw (1989) explained, for example, Black women's marginalization is "greater than the sum of racism and sexism" (p. 140). Furthermore, her racialized, classed, and gendered being is constructed "by and through race, and that the production of [Black] women and other stable gender categories require[s] violence" (Haley, 2016, p. 8). In schooling, violence is enacted through institutionalized policies, such as school disciplinary practices that offer brutality, suspension, expulsion, and detention. A Department of Education study from 2011–2012 revealed that Black girls were six times more likely to be suspended than their White female counterparts (Lyfe, 2012). We demand an end to these practices and the carceral mechanisms currently operating in K–12 institutions that disproportionately impact Black girls particularly and students of color more broadly. An ethnic studies framework attending to the ethos of intersectionality and multiplicity recognizes, affirms, interrogates, and then disrupts hegemonic gendered violence and trauma experienced in mathematics classrooms.

The notion of multiplicity not only connects to oppression but also empowerment. Borderlands consciousness (Anzaldúa, 1987) refers to identities of peoples of color as produced in multiple and often contradictory physical, social, and political spaces—spaces that are inhabited by both dominant and nondominant forms of feeling, seeing, and doing. As such, our worldviews as students and educators of color include homegrown ways of knowing as well as western epistemes. These approaches empower educators and students of color in that they recognize the advantage of having insights into the experiences of the Oppressed and the Oppressors and may reveal the cracks that support social change (Anzaldúa, 1987; Collins, 2000; Davis, 1990; hooks, 1989). As educators and researchers, our work should attend to and leverage the multiple ways of knowing through an intersectional lens. The flexibility that an ethnic studies framework offers acts as a site of disruption and counterweight to how oppressive power morphs and diffuses into mathematics classroom spaces.

Based on the ethea provided in this framework, the design of an ethnic studies mathematics curriculum needs to a) center on the perspectives of people of color, b) critically identify and challenge how racism and colonialism functions in mathematics education, c) attend to students' multiple identities and their positions within intersecting relations of power, d) engage in community-based pedagogies and experiences that bridge mathematics classroom to community and social movements, and e) respect all students' curiosity, thinking, and intellectualism.

Table 1
Ethos of Ethnic Studies Mathematics

Ethos	Description
Identities, Narratives & Agency	Identity, Narratives, and Agency in mathematics, as defined by ethnic studies, are the ways in which we view and learn about ourselves as mathematical beings that go beyond the dominant narrative. This requires an intentional grounding of pedagogies and curriculum on counter-narratives that offer historical accounts, interpretations, and cultural practices of communities of color. As mathematical beings, our humanity is tied to our ancestors, to each other, and to our relationship with the natural world defined by mathematics.
Power & Oppression	Power and Oppression in mathematics, as defined by ethnic studies, is the acknowledgement of the coercive powers that have historically been used to silence and disrupt the liberation of peoples of color. Dismantling hegemonic structures requires naming them, questioning their existence, and then envisioning and working toward alternatives. The internalization of our *true* mathematical identities as a tool against coercion and disenfranchisement is our power.
Community & Solidarity	Community and Solidarity in mathematics, as defined by ethnic studies, see mathematics as integral to activist movements for social justice. Ethnic studies is a process that connects learning to the community and to the real world, acknowledging the situated, embodied, and collective nature of learning and change. Mathematics learning is not just experienced cognitively; it is a process that is lived, engraved in students' bodies and memories, and shaped by our histories, ancestors, and communities.
Resistance & Liberation	Resistance and Liberation in mathematics, as defined by ethnic studies, is the determination to resist & disrupt oppression. Ethnic studies mathematics projects engage critical consciousness that moves toward praxis—students take action at the individual and/or community level to create change in the world using mathematics. Peoples of color find empowerment in the internalization of their own mathematical identities.
Intersectionality & Multiplicity	Intersectionality and Multiplicity in mathematics, as defined by ethnic studies, explicitly examines tensions at the intersections of identities and attends to broader sociohistorical discourses that are at work. Rather than conceptualizing identities as fixed and essentialized, identity is seen as a fluid, temporal spectrum shaped by sociohistorical context.

Dialogue: Ethnic Studies, Mathematics, and Healing

The framework of the five ethea of ethnic studies mathematics shared above developed through sessions of dialogue, storytelling, and shared reflection on our praxis as a collective of classroom teachers, mathematic educators, and community activists. We continue the traditions of our ancestral heritage by storytelling here. We invoke the cultural memories of how we process, of how we understand, of how we listen and honor each other's brilliance through the form of dialogue. The excerpt included was selected to highlight our own meaning-making and application of ethnic studies as a humanizing process for us, our students, and the readers. We began meaning-making when Yeh asked the question, "How can the application of ethnic studies in mathematics serve as a process of healing?" Ethnic studies is not curriculum; it is a pedagogy, a process that is lived. What follows is our conversation, a living manuscript (Shor & Freire, 1987) of knowledge construction.

> *Shirude*: My instinct is to go back to what I had said earlier: using ethnic studies within mathematics changes the narrative of what mathematics is, what it has been, and what it can be. Mathematics is used all day long by every human being all the time, and we just don't acknowledge these doers as mathematicians. Mathematics has actually come from the same communities who have historically been told it was an accident. The things we hear, read, watch in books or movies, would have you believing that these mathematical wonders were accidents (Dewey, 1986), that the people who created them didn't really recognize that they were doing mathematics. But, like, how would you know? Why do you get to decide it was an accident? Did you ask them? I can't believe that it was an accident, given how accurate the mathematics are, but that's the narrative that's been told (Zinn, 1980/2015).
>
> An easy example to contextualize this is to look at our students' thinking in the classroom. Something that's commonly used with mostly K–8 educators, but I wish K–12 teachers used, is number talks. A simple explanation of what a number talk is you put up a relatively simple arithmetic problem, for example 7 * 8, then you ask students to figure out multiple different ways that answer could be found. Finally, you ask students to share their way, and we write down all of the different ways. The actual process has more steps; I'm just giving a quick brief on it. By not just valuing but encouraging multiple ways of solving this problem, we begin to start changing the narrative of what is correct in math class (Anderson, 2007). It's small and it's not ethnic studies per se, but it's kind of leaning into what we're talking about here because it

changes the narrative that, well, 7 * 8 is 56, that's it. It starts to break into "How are you thinking? Why do you think that way?," and it starts to lean into ethnic studies. The way that I leaned into ethnic studies here was just talking about numbers.
And that math talk allows us to look at math history: how did different peoples learn and understand the idea of multiplication. It is often taught as though its inception was a linear process from addition straight to multiplication. Perhaps there was more to it than that. Maybe a student can understand multiplication far easier than they can understand addition or repeated addition. Maybe patterns that showed the commutative property were observed and then connected with patterns regarding addition that were later observed. When you consider both of those, you start to break down the reality that the way we have often taught math isn't the only way that things have been learned or discovered or created. This becomes a healing process for children because it's freeing (Fasheh, 1997); it literally frees their hearts and minds and souls from the idea that the way that they think is right or wrong. Rather, it encourages the idea that they are mathematical beings and the way that they think and feel and learn is mathematical.

Rezvi: I have to wholeheartedly agree with what *Shraddha* is saying. Mathematics is a human construct, a human invention, and thus a way of knowing that belongs to all people. We know that mathematics has powerful origins, for example, from the Islamic world. The word "algebra" itself is Arabic and roughly translates to "balance and completion," which resonates for me as words of healing in and of itself. Both this word and the word "algorithm" come from one of the most brilliant mathematicians of the Islamic world, al-Khwarizimi. We also know that the oldest library in the world was founded by Fatima Al-Fihri, a Muslim woman in Morocco, in 859 A.D. (Siddiqi, 2018).
We don't typically learn this kind of history in our schooling—that there was this great love across cultures and generations for learning and a profound respect for knowledge. We are forcefully prescribed a very specific lens to look through and then internalize. We typically learn about Fermat, Euler, Newton, Leibniz, Plato, as if these were the sole owners and creators of mathematics. Their contributions were valuable, but they weren't the only inventors of their findings.

> I am thinking about Rudine Sims Bishop's work in literacy and her call for books to function as windows, sliding glass doors, and even mirrors that reflect the reader's own experience.
> I want mathematics, just like literacy, to reflect and honor its multicultural heritage of pathfinders and voyagers, of weavers and artists, of predictors rather than the truncated version we are required to teach in schools.
> It reminds me of the words of Ezra Hyland, "Humans don't make our stories, but it's our stories that make us human [paraphrasing Amiri Baraka]… It's not until we learn the stories of each other that we are able to embrace our true humanity… When I know the story of my people and my culture, that's when I become human to myself" (Jacobs, 2016, 18:00).
> What are the mathematical stories we need for our own healing, both individually and collectively, to become fully mathematically human? Healing can happen when we can know our authentic selves reflected in multiple modalities, not as a side story, nor as a brief mention or a historical footnote, but rather a multidimensional narrative that travels through space and time to center these understandings. I think about the fact that I come from two people, who came from two people before them, who came from two people before them, and so on and so forth. If I use the powers of exponentiation to analyze this and simply go back sixteen generations, approximately 32,768 of my ancestors needed to breathe, love, and live in order for me to be here, reflecting in this space with you today.

$$M_{ancestors} = \sum_{i=1}^{k} 2^i$$

> When we know our full stories, our intellectual origins, our interdependent connections upon which these mutually shared knowledges were built, we engage in healing the epistemological ruptures caused by the toxic diet of Western mathematical consumption. I am ending my thoughts here on the brilliance of adrienne maree brown's thoughts on healing behavior:

> "We are all the protagonists of what might be called the great turning, the change, the new economy, the new world. And I think it is healing behavior, to look at something so broken and see the possibility and wholeness in it. That's how I work as a healer: when a body is between my hands, I let wholeness pour through. We are all healers too—we are creating possibilities, because we are seeing a future full of wholeness." (brown, 2017, p. 14)

> Incorporating an ethnic studies framework in our teaching praxis offers a potential space for healing the brokenness currently standardized in mathematics education across the United States. This is particularly true, I feel, for children navigating kindergarten through 12th grade. I am stating explicitly that this is harmful to all children because White children grow up thinking that only Western mathematics has value and children of color grow up believing the same. It is the same narrow narrative and must change if we, too, are America.
>
> *Yeh*: This is so powerful! This makes me think of a quote from bell hooks that defines for me ethnic studies. As bell hooks (1989) reminds us, the journey of naming and reclaiming who we are is a space of healing and radical opening: "We are transformed individually, collectively, as we make radical creative space which affirms and sustains our subjectivity, which gives us a new location for which to articulate our sense of the world" (p. 23). What you're describing here goes beyond curriculum, beyond the replacing of Eurocentric curriculum with one that is "non-Eurocentric," beyond ethnomathematics (D'Ambrosio, 1985), or of studying mathematics in student communities. It's about reorganizing knowledge, curriculum, and processes around questions that are central to the well-being of communities of color.
>
> As an immigrant and a person of color in the U.S., I never felt a sense of belonging because I was always invisible—the stories, the contributions, ways of thinking and being of folx of color have been erased. Ethnic studies is healing because for too many of our students of color, it has been cultural erasure. Valenzuela (1999) describes this process as subtractive schooling. In the mathematics classroom, erasure occurs through denial of our history. The vast majority of discussions on the origins of mathematics and science include only the Greeks, Romans, and other Western populations. Yet, Africa is home to the world's earliest form of mathematical thinking and the first known use of measuring and calculation, confirming the continent as the birthplace of both basic and advanced mathematics. Sharing the true roots of mathematics history should be part of the mathematics curriculum.
>
> Culture also goes beyond race/ethnicity but applies to multiple social identities. My oldest child is multiply marginalized (Annamma et al., 2013) as a dis/abled young woman of color. When we think of mathematics as being only one way, following a set of

> rules, only expressed verbally or in written form, and when she never sees herself in the context or the text of the problems posed, it is an act of violence to her. It silences her, and it makes her feel as she shouldn't and doesn't belong in our math classrooms. By honoring her ways of problem solving, her choice of modalities in expression and engagement and of mathematics as embodied (Lakoff & Núñez, 2000), this is also ethnic studies mathematics. Marginality is often described as imposed by oppressive structures; however, marginality is much more than a site of deprivation... it is also the site of radical possibility, a space of resistance (hooks, 1994). Those are the margins; we fight Whiteness and oppression daily, and our ancestors and our youth have fought this for so long. They hold the key to changing our current state of oppression in math education. They've been disrupting, organizing, and creating change. Let's look to them for guidance.

Martinez: One word that comes to mind is multiplicity. Multiplicity as it relates to identity, fragmentation, and healing that requires us to embrace the complexities of identity in being okay that we cannot assume a specific order to identity development. As such, I want to make sure to honor a lot of women of color whose theorizing around multiple identities has led to ways of resistance, transformation, and healing (Torre & Ayala, 2009). For me history is important, and I was listening to the new Nas album, and he states "the stupidest part of Africa produced Blacks that started Algebra—proof, facts—imagine if you knew that as a child" (2020, 0:43). Even though I do not like saying anyone or thing is stupid, I found it powerful, as it relates to reclaiming your history and the role history has in making an individual's multiple futures. If we dive deeper, math is already a part of our ancestors, along with the intergenerational knowledge being described with *Cathery*'s story. I like what was mentioned earlier about ethnic studies, that it's not just ethnomathematics, it is a reflection upon who is centered. Note ethnomathematics emerged in the academy, and, yes, D'Ambrosio considered himself a Freirean and he did amazing work, but it's not truly centered with the people because we cannot ignore the privilege that comes with being in the academy. We begin to differ in the multiplicity that each of us bring. I am glad we have different experiences from teaching teachers in the university, to our community work, and especially in *Shraddha* being a current ethnic studies high school teacher, which ties back to the multiplicity

being multiple modes to connect with others in developing our collective identities.

Cathery, your story reminded me of a counseling session where I was asked what do I think I deserve and responded with tears. It took years to realize that I do deserve to be happy in this world, and I feel ethnic studies can provide an opportunity for such growth in others. People deserve to know that they come from mathematics (Freire et al., 1997). One final thing, ethnic studies is a connection to the indigenous history, to the indigenous people across the world. This allows us to spiritually heal in reconnecting to our ancestors and their spirituality (Anzaldúa, 1987). The cosmology of many indigenous people did not even have a direct word for mathematics because mathematics was part of their everyday being (León-Portilla, 1963/2012). Mathematics is another energy that can connect us to other people and to the natural world. No person can be complete in terms of their identity development without acknowledging that mathematics is already a part of them and thus contributed to their identity development.

Shirude: First, thank you, *Ricardo*, for sharing that really deep personal story about your life. It inspired me to think about the ways mathematics has impacted my life. I remember my K–8 experience: I love mathematics! It is so fun, it is so easy, it just makes sense. I don't need to try hard at any of it. I'm in a multi-age classroom, grades 1–3, and when second grade comes around, the first graders show up, and I'm like, "Let me show you how it's done here." I guess it was another reason I decided I wanted to be a math teacher. So much of it was just, you know, I had only really experienced two years of school, and I still had a big love for math and specifically teaching it.

My grandfather was a math teacher in India, and your last statement reminded me of him because of the idea of mathematical energy. My grandpa didn't say a whole lot, he was a very thoughtful man. I was in second grade, and I taught him how to do a Sudoku puzzle. He had never done one before; it wasn't something he knew about, and I taught him how to do it! And literally, every day since I was in second grade until he died when I was a senior in college, he did a Sudoku puzzle, every single day for 15 years. I remember this and think, "I had that level of impact on his life, every single morning, simply by teaching him when I was 8 years old

how to do a Sudoku puzzle." Like, wow! It's that mathematical energy you're talking about: teaching him, nothing crazy, simply how to do a puzzle. But, it changed his daily life for the rest of his life, and it inspired me as an eight-year-old. If I can teach this math teacher something about math, then I can change the world. I'm going to be a math teacher! I literally changed the daily existence of my grandfather's life as an 8-year-old by teaching him something so simple. It is that mathematical energy you talked about; no one would think that I had necessarily changed anything at the time, but my grandfather's energy changed. I felt it. And what I had felt was that exact phrase that you use: mathematical energy. That just speaks to me so much…

I was so inspired as a kid, filled with mathematical energy. Then I hit high school, and that passion just shattered. I was like, "I'm not a mathematician. I can't do this." I struggled so much! But I also just loved it so much that I kept pushing through. Then I got to college. I was studying to become a teacher. I was told by the middle school math teacher that I was working with when I was 18 years old (they wouldn't put me at the high school because I look too young or something), she straight up told me, "You should really just consider switching to be an elementary school teacher. No one's going to respect you here, you look like one of the kids." I don't know why she didn't respect me as a math teacher, she didn't really get to know me. But, ultimately, I didn't argue or say anything against what she said to me, probably because I was too afraid or I believed I was too young or too quiet to say anything. I don't even remember all the reasons anymore. But, really, it was her mathematical energy that just demoralized, dehumanized, me and made me agree with her. It was an act of violence. It was her saying without saying it: "You are not a mathematician, the way you do things is not real or true or good enough for math education. You think puzzles are fun? Go teach the kindergarteners; they'll love that." As though, if they're learning different ways to live life, they're not learning.

All of that comes from ways of knowing. Ways of knowing are so deeply rooted to energy, somehow, that we see humanity and the ways in which we learn and live through that lens (Cruz, 2001). Mathematical energy and ways of knowing—I love those phrases forever, and I think I said them a hundred times in the sentence.

> *Martinez*: I feel like you just described what ethnic studies is. It cultivates and takes the beauty that is mathematics and refines it into love. Love amongst the people. Your story about math made me feel a deep sense of love, and thank you for sharing that.

Conclusion

Our paper structure and the discussion above pivots from what counts and what is traditionally considered excellence in educational research. This is an intentional act to challenge the essentialization, individualism, and competition pervasive in the field of mathematics education. The dialogue serves as an example of ethnic studies mathematics in practice, emphasizing its collective process. Knowledge is co-constructed in dialogue and through story-sharing; thus, acknowledging the centrality of context, communities, histories, relationships, interactions, and connections in learning. It is only with others are we able to identify structural and internalized oppression and to dismantle these structures in mathematics education by naming them, questioning their existence, and then envisioning and working towards alternatives (Boggs, 2012; Freire, 1968/1970, 1998).

Ethnic Studies mathematics is grounded in radical love—love for self, our ancestors, and the communities we serve. The process of healing begins as we center on the stories (and mathematics) of Black, Indigenous, and people of color forgotten and forcibly erased (Banks, 2008; Dingle & Yeh, in press; Rangnath et al., in press; Rezvi et al., 2020), creating a transformative space in which mathematics education can be humanizing by providing a panorama of what is and has always been mathematics. In this paper, five ethea—identities, narratives, and agency; power and oppression; community and solidarity; resistance and liberation; and intersectionality and multiplicity—are shared. Birthed from our conversations and the sharing of our stories as mathematics teachers, mathematics educators, and community organizers, the process of developing the ethea of ethnic studies mathematics contributed to our own healing. We ask our readers to consider the same. How does the doing, teaching, learning, and studying of mathematics lead to healing for you, for students, and for our communities?

bell hooks says, "I came to theory because I was hurting... to grasp what was happening around and within me. I saw in theory a location for healing" (1994, p. 59). We share our stories as sites of healing, but they are also sites of theory and contribution. Our educational journeys and commitments have important implications for mathematics education, which from its origin has never been neutral but instead has been invested in maintaining particular perspectives and realities while at the same time rendering invisible others (Patel, 2016). There is wisdom in our stories and the stories of our students, teachers, and teacher educators of color whose voices are too often silenced in our field. How we communicate our experiences, listen to

them, make meaning of them, study them, and share them allows for mathematics education as a field to advance, interrupt, and create alternatives outside of this deliberate design of domination.

Ethnic studies mathematics is an epistemology and a pedagogy grounded in radical love. In other words, it is a commitment to the life work for individual and social transformation. We ask the reader to take time to focus on radical love (Davis, 1990) in the mathematical spaces you occupy and consider how to challenge and transform what is considered "correct" math or "valid" research and envision healing. We close this piece in meditation and blessing.

> We are speaking to the silenced you
> we who keep **us** safe
> May the past inform the present
> May the present transform the future
> May your ancestors guide you
> You who come from big shoulders
> You with the wind whistling in the ribcage of your heart
> May there be patience, may there be guidance
> From above and below—
>
> I wish we were not being sacrificed this way
> I wish our society loved us
> What would the world be like?
>
> I wish people would love math
> like they love their mother
> like they love their children
> As a source of strength, wisdom, and courage.
> Do we have to love math?
> Is it not enough to love humanity?
> A first attempt at an answer
> Our humanity is inextricably tied
> To our mathematics
> Like Moon and Sun
> Our orbits always connected with one another
> May this dance grow ever brighter.
>
> — Sara Rezvi & Shraddha Shirude, "A Prayer for Healing and Rupture"

References

Anderson, R. (2007). Being a mathematics learner: Four faces of identity. *The Mathematics Educator*, *17*(1), 7–14.

Annamma, S. A., Connor, D., & Ferri, B. (2013). Dis/ability critical race studies (DisCrit): Theorizing at the intersections of race and dis/ability. *Race Ethnicity and Education*, *16*(1), 1–31. https://doi.org/10.1080/13613324.2012.730511

Anzaldúa, G. (1987). *Borderlands/la frontera: The new mestiza*. Aunt Lute Books.

Anzaldúa, G. (2009). *The Gloria Anzaldúa Reader* (A. Keating, Ed.). Duke University Press.

Au, W., Brown, A. L., & Calderón, D. (2016). *Reclaiming the multicultural roots of U.S. curriculum*. Teachers College Press.

Ayala, J., Cammarota, J., Berta-Ávila M. I., Rivera, M., Rodríguez, L. F., & Torre, M. (Eds.). (2018). *PAR EntreMundos. A pedagogy of the Americas*. Peter Lang.

Banks, J. A. (1999). *An introduction to multicultural education* (2nd ed.). Allyn & Bacon.

Banks, J. A. (2004). Race, knowledge construction, and education in the United States: Lessons from history. In J. A. Banks & C. A. M. Banks (Eds.), *Handbook of research on multicultural education* (2nd ed., pp. 228–239). Jossey-Bass.

Banks, J. A. (2008). *Teaching strategies for ethnic studies* (8th ed.). Pearson.

Boggs, G. L. (with Kurashige, S.). (2012). *The next American revolution: Sustainable activism for the twenty-first century*. University of California Press.

brown, a. m. (2017). *Emergent strategy: Shaping change, changing worlds*. AK Press.

Bullock, E. C. (2017). Beyond "ism" groups and figure hiding: Intersectional analysis and critical mathematics education. In A. Chronaki (Ed.), *Proceedings of the Ninth International Mathematics Education and Society Conference* (Vol. 1, pp. 29–44). MES9.

Cammarota, J. (2016). The praxis of ethnic studies: Transforming second sight into critical consciousness. *Race Ethnicity and Education*, *19*(2), 233–251. https://doi.org/10.1080/13613324.2015.1041486

Capraro, R. M., & Chang, J. L. (2020). When one lacks will, they denounce… *Journal of Urban Mathematics Education*, *13*(1B), 1–4. https://doi.org/10.21423/jume-v13i1Ba407

Civil, M. (2007). Building on community knowledge: An avenue to equity in mathematics education. In N. S. Nasir & P. Cobb (Eds.), *Improving access to mathematics: Diversity and equity in the classroom* (pp. 105–117). Teachers College Press.

Collins, P. H. (2000). *Black feminist thought: Knowledge, consciousness, and politics of empowerment.* Routledge.

Collins, P. H., & Bilge, S. (2016). *Intersectionality*. Polity.

Crenshaw, K. (1989). Demarginalizing the intersection of race and sex: A Black feminist critique of antidiscrimination doctrine, feminist theory and antiracist politics. *University of Chicago Legal Forum*, *1989*(1), 139–167.

Crenshaw, K. (2017). *On intersectionality: Essential writings*. The New Press.

Cruz, C. (2001). Toward an epistemology of a brown body. *International Journal of Qualitative Studies in Education*, *14*(5), 657–669. https://doi.org/10.1080/09518390110059874

Cuauhtin, R. T. (2019). The ethnic studies framework: A holistic overview. In R. T. Cuauhtin, M. Zavala, C. Sleeter, & W. Au (Eds.), *Rethinking ethnic studies* (pp. 65–75). Rethinking Schools.

D'Ambrosio, U. (1985). Ethnomathematics and its place in the history and pedagogy of mathematics. *For the Learning of Mathematics*, *5*(1), 44–48.

Darder, A. (2017) *Reinventing Paulo Freire: A pedagogy of love*. Routledge.

Davis, A. Y. (1990). *Women, culture, and politics*. Vintage Books.

Dewey, J. (1986). Experience and education. *The Educational Forum*, *50*(3), 241–252. https://doi.org/10.1080/00131728609335764

Dingle, M. & Yeh, C. (in press). Mathematics in context: The pedagogy of liberation. *Teaching Tolerance*.
Fasheh, M. (1997). Is math in the classroom neutral—or dead? A view from Palestine. *For the Learning of Mathematics*, *17*(2), 24–27.
Ferguson, R. A. (2012). *The reorder of things: The university and its pedagogies of minority difference*. University of Minnesota Press.
Few-Demo, A. L. (2014). Intersectionality as the "new" critical approach in feminist family studies: Evolving racial/ethnic feminisms and critical race theories. *Journal of Family Theory & Review*, *6*(2), 169–183. https://doi.org/10.1111/jftr.12039
Frankenstein, M. (1983). Critical mathematics education: An application of Paulo Freire's epistemology. *Journal of Education*, *165*(4), 315–339. https://doi.org/10.1177%2F002205748316500403
Freire, P. (1970) *Pedagogy of the oppressed* (M. B. Ramos, Trans.). Herder & Herder. (Original work published 1968)
Freire, P. (1974). *Education for critical consciousness*. Seabury Press.
Freire, P. (1998). *Pedagogy of freedom: Ethics, democracy, and civic courage*. Rowman & Littlefield Publishers.
Freire, P., D'Ambrosio, U., & Mendonça, M. D. C. (1997). A conversation with Paulo Freire. *For the Learning of Mathematics*, *17*(3), 7–10.
Freire, P., & Macedo, D. (1987). *Literacy: Reading the word and the world.* Bergin & Garvey.
Gholson, M. L., & Martin, D. B. (2019). Blackgirl face: Racialized and gendered performativity in mathematical contexts. *ZDM*, *51*(3), 391–404. https://doi.org/10.1007/s11858-019-01051-x
Goffney, I., Gutiérrez, R., & Boston, M. (Eds.). (2018). *Rehumanizing mathematics for Black, Indigenous, and Latinx students.* National Council of Teachers of Mathematics.
Gutiérrez, R. (2013). The sociopolitical turn in mathematics education. *Journal for Research in Mathematics Education*, *44*(1), 37–68.
Gutstein, E. (2008). The political context of the National Mathematics Advisory Panel. *The Mathematics Enthusiast*, *5*(2–3), 415–422.
Gutstein, E., & Peterson, B. (Eds.). (2013). *Rethinking mathematics: Teaching social justice by the numbers* (2nd ed.). Rethinking Schools.
Haley, S. (2016). *No mercy here: Gender, punishment, and the making of Jim Crow modernity.* The University of North Carolina Press.
hooks, b. (1989). Choosing the margin as a space of radical openness. *Framework: The Journal of Cinema and Media*, *36*, 15–23.
hooks, b. (1994). *Teaching to transgress: Education as the practice of freedom*. Routledge.
hooks, b. (2001). *All about love: New visions.* New York, NY: Harper Perennial.
Jacobs, L. (2016, January 27). The African American read in from NCTE [Audio podcast episode]. In *Pre K–12 education talk radio*. Education Talk Radio. https://www.blogtalkradio.com/edutalk/2016/01/27/the-african-american-read-in-from-ncte
Keating, A. (2008). "I'm a citizen of the universe": Gloria Anzaldúa's spiritual activism as catalyst for social change. *Feminist Studies*, *34*(1/2), 53–69.
Kisker, E. E., Lipka, J., Adams, B. L., Rickard, A., Andrew-Ihrke, D., Yanez, E. E., & Millard, A. (2012). The potential of a culturally based supplemental mathematics curriculum to improve the mathematics performance of Alaska Native and other students. *Journal for Research in Mathematics Education*, *43*(1), 75–113. https://doi.org/10.5951/jresematheduc.43.1.0075
Kumari, R. (2016). Believe in you [Song]. On *The come up.* Epic.
Ladson-Billings, G. (2017). "Makes me wanna holler": Refuting the "culture of poverty" discourse in urban schooling. *The ANNALS of the American Academy of Political and Social Science*, *673*(1), 80–90. https://doi.org/10.1177%2F0002716217718793

Lakoff, G., & Núñez, R. E. (2000). *Where mathematics comes from: How the embodied mind brings mathematics into being*. Basic Books.

Larnell, G. V., Bullock, E. C., & Jett, C. C. (2017). Rethinking teaching and learning mathematics for social justice from a critical race perspective. *Journal of Education, 196*(1), 19–29. https://doi.org/10.1177%2F002205741619600104

León-Portilla, M. (2012). *Aztec thought and culture: A study of the ancient Nahuatl mind* (J. E. Davis, Trans.). University of Oklahoma Press. (Original work published 1963)

Leonard, J. (2020). Black lives matter in teaching mathematics for social justice. *Journal of Urban Mathematics Education, 13*(1B), 5–11. https://doi.org/10.21423/jume-v13i1Ba404

Leonardo, Z., & Broderick, A. A. (2011). Smartness as property: A critical exploration of intersections between Whiteness and disability studies. *Teachers College Record, 113*(10), 2206–2232.

Lipka, J., Hogan, M. P., Webster, J. P., Yanez, E., Adams, B., Clark, S., & Lacy, D. (2005). Math in a cultural context: Two case studies of a successful culturally based math project. *Anthropology & Education Quarterly*, *36*(4), 367–385.

Louie, N. L. (2017). The culture of exclusion in mathematics education and its persistence in equity-oriented teaching. *Journal for Research in Mathematics Education, 48*(5), 488–519. https://doi.org/10.5951/jresematheduc.48.5.0488

Lyfe, I. (2012, September 19). Kicking Black boys out of class, teaching Black girls a lesson. *The Huffington Post*. https://www.huffpost.com/entry/kicking-black-boys-out-of_b_1894719

Madden, K., Pereira, P., Rezvi, S., Trinder, V. F., Martin, D. B. (2019). Cartographies of race, gender, and class in the White (male settler) spaces of science and mathematics: Navigations by Black, Afro-Brazilian, and Pakistani/American women. In E. O. McGee, & W. H. Robinson (Eds.), *Diversifying STEM: Multidisciplinary perspectives on race and gender* (pp. 69–106). Rutgers University Press.

Martin, D. B. (2013). Race, racial projects, and mathematics education. *Journal for Research in Mathematics Education, 44*(1), 316–333.

Martin, D. B., Gholson, M. L., & Leonard, J. (2010). Mathematics as gatekeeper: Power and privilege in the production of knowledge. J*ournal of Urban Mathematics Education. 3*(2), 12–24. https://doi.org/10.21423/jume-v3i2a95

Martinez, R. (2020). Mathematics reborn: Empowerment with youth participatory action research EntreMundos in reconstructing our relationship with mathematics [Doctoral dissertation, Iowa State University]. Iowa State University Digital Repository. https://lib.dr.iastate.edu/etd/18181

Martinez, R., Lindfros-Navarro, H., & Corral, M. A. (2021). Mathematics with open arms. In J. Cammarota (Ed.), *Liberatory practices for learning: Dismantling social inequality and individualism with ancient wisdom* (pp. 69–92). Palgrave Macmillan.

Medina, J. (2013). *The epistemology of resistance: Gender and racial oppression, epistemic injustice, and the social imagination.* Oxford University Press.

Nas. (2020). King's disease [Song]. On *King's disease*. Mass Appeal.

Omatsu, G. (2003). Freedom schooling: Reconceptualizing Asian American Studies for our community. *Amerasia Journal*, *29*(2), 9–34..

Patel, L. (2016). *Decolonizing educational research: From ownership to answerability*. Routledge.

Rahman, M. A. (1991). The theoretical standpoint of PAR. In O. Fals-Borda & M. A. Rahman (Eds.), *Action and knowledge: Breaking the monopoly with participatory action-research*, (pp. 13–23). Intermediate Technology.

Rangnath, R., Yeh, C., Hsieh, B. (in press). We need to see each other as human: Transformative ethnic studies in schools. In T. K. Chapman, & N. Hobbel (Eds.), *Social justice pedagogy across the curriculum: The practice of freedom.* Routledge.

Rezvi, S., Han, A., & Larnell, G. V. (2020). Mathematical mirrors, windows, and sliding glass doors: Young adult texts as sites for identifying with mathematics. *Journal of Adolescent & Adult Literacy*, 63(5), 589–592. https://doi.org/10.1002/jaal.1038

San Pedro, T. (2018). Abby as ally: An argument for culturally disruptive pedagogy. *American Educational Research Journal, 55*(6), 1193–1232. https://doi.org/10.3102%2F0002831218773488

Shirude, S. (in press). Authentic choice in mathematical assessments. *Mathematics Teacher: Learning and Teaching PK–12*.

Shor, I., & Freire, P. (1987). *A pedagogy for liberation: Dialogues on transforming education.* Bergin & Garvey.

Siddiqi, R. (2018). Oldest library of University of Al-Qarawiyyin in Fez, Morocco. *Pakistan Library & Information Science Journal*, *49*(3), 67–73.

Sleeter, C. E., & Zavala, M. (2020). *Transformative ethnic studies in schools: Curriculum, pedagogy, and research.* Teachers College Press.

Solorzano, D. G., & Bernal, D. D. (2001). Examining transformational resistance through a critical race and LatCrit theory framework: Chicana and Chicano students in an urban context. *Urban education*, *36*(3), 308–342. https://doi.org/10.1177%2F0042085901363002

Spring, J. (2016). *Deculturalization and the struggle for equality: A brief history of the education of dominated cultures in the United States* (8th ed.). Routledge.

Tintiangco-Cubales, A., Kohli, R., Sacramento, J., Henning, N., Agarwal-Rangnath, R., & Sleeter, C. (2015). Toward an ethnic studies pedagogy: Implications for K–12 schools from the research. *The Urban Review*, *47*(1), 104–125. https://doi.org/10.1007/s11256-014-0280-y

Torre, M. E., & Ayala, J. (2009). Envisioning participatory action research *entremundos*. *Feminism & Psychology*, *19*(3), 387–393. https://doi.org/10.1177%2F0959353509105630

Valenzuela, A. (1999). *Subtractive schooling: U.S.-Mexican youth and the politics of caring.* State University of New York Press.

Walkerdine, V. (1998). *Counting girls out: Girls and mathematics*. Routledge.

Wrigley-Field, E. (2020). US racial inequality may be as deadly as COVID-19. *Proceedings of the National Academy of Sciences*, *117*(36), 21854–21856. https://doi.org/10.1073/pnas.2014750117

Yeh, C. (2018). Democratic accountability in the neoliberal era: The politics of teaching and teacher education in mathematics classrooms. *Policy Futures in Education, 16*(6) 764–780. https://doi.org/10.1177%2F1478210318776470

Yeh, C., Ellis, M., Mahmood, D. (2020). From the margin to the center: A framework for rehumanizing mathematics education for students with dis/abilities. *Journal of Mathematical Behavior, 58*, Article 100758. https://doi.org/10.1016/j.jmathb.2020.100758

Yeh, C., & Otis, B. M. (2019). Mathematics for whom: Reframing and humanizing mathematics. *Bank Street: Occasional Paper Series*, *2019*(41), 85–98.

Yeh, C., & Rubel, L. (2020). Queering mathematics: Disrupting binary oppositions in mathematics pre-service teacher education. In N. Radakovic, & L. Jao (Eds.), *Borders in mathematics pre-service teacher education* (pp. 227–244). Springer.

Zinn, H. (2015). *A people's history of the United States: 1492–present*. Harper Perennial Modern Classics. (Original work published 1980)
