# Whiteness and Fear: Backlash to Mathematics Education Reforms

Eric Cordero-Siy,[1] Michael Lolkus, & Frances K. Harper

***Abstract***

*Recent reform efforts to center issues of equity and social justice in mathematics classrooms have been under fire from the loudest sectors of right-wing media. The hysteria around incorporating social justice issues in mathematics classrooms is captured in the artificial binary: STEM or CRT. In our paper, we examine resistance to reform efforts in mathematics education in artifacts geared towards audiences beyond mathematics education researchers through the lens of whiteness. We analyzed artifacts from the Math Wars of the late 1990's and the current backlash towards mathematics education reform (Math Culture Wars) in California and Florida. We identified fear as a significant mechanism to upholding whiteness in the backlash to mathematics education reforms, particularly centering white fear. By describing how fear is constructed in the artifacts, scholars may find more targeted responses to the backlash by addressing the ideas perpetuated in these artifacts. Still, the field of mathematics education has done little to become more inclusive and just because our agenda is too closely aligned to the status quo, with responses to the backlash being largely absent or tepid. We close with recommendations for action and allyship within the broader field of education to thwart the hysteria against CRT.*

***Keywords****: Math Wars, Math Culture Wars, Mathematics Education Reform, Whiteness, Fear*

**A**merican society and its education system is at a crossroad. In the months since proposing this paper, two major waves of news have emerged. Racist, violent acts towards BIPOC communities continually make news headlines (e.g., towards a predominantly Black community in Buffalo, NY, an Asian-run salon in Dallas, TX, a six-year old Palestinian-American near Chicago, IL) at the same time state legislators are banning "forbidden" books and instructional materials that make students feel "discomfort, guilt, anguish, or another form of psychological distress solely because of the individual's race or sex" (e.g., Florida H., 2022). School mathematics is not immune from this. Mathematics has largely been regarded as value and culture-free, so mathematics classrooms should just "be about numbers;" however, researchers noted this ideology aligns with whiteness and white supremacy (e.g., Battey & Leyva, 2016).

School mathematics is a racialized space for students both at the individual and structural levels (Martin, 2019). Mathematics educators and researchers are taking up calls (e.g., TODOS, 2020) to teach mathematics for social and racial justice. These efforts have taken multiple forms,

1. Corresponding author: Eric Cordero-Siy, Boston University: ericcs@bu.edu

including teaching with dual goals of promoting social justice and supporting traditional mathematics (e.g., Gutstein, 2006), ensuring BIPOC students have access to and achieve in mathematics as a tool of liberation (e.g., Moses, 1994), and reform efforts to center justice in mathematics classrooms. Still, organized and persistent efforts outside academia and school resist mathematics education reforms, especially ones centering social and racial justice.

## Whiteness and Whiteness as Property within Mathematics Education

We examine backlash to reform centering racial and social justice in mathematics education through the lens of whiteness. Whiteness is a social construction that maintains white supremacy, the ideology that the white race is superior to others, while simultaneously claiming a sense of delicacy and fragility (Frankenburg, 1993; Leonardo, 2009). Whiteness operates in mathematics education particularly on prevailing ideologies of colorblindness ("Math doesn't see color"), meritocracy ("You just need to work hard"), and individualism ("I'm not a math person") (Battey & Leyva, 2016).

Harris (1993) offered whiteness as property where white people gain, accrue, and maintain benefits within societal institutions. Within her argument, she explains the property functions of whiteness where its holders have intertwined rights which we see manifested in mathematics education. First, whiteness provides the right to use and enjoyment where one can use whiteness as "an active entity that—like other types of property—is used to fulfill the will and exercise power" (Harris, 1993, p. 1734). Battey and Leyva (2016) argued white students' languages and behavior are used in mathematics to exert power over students of color by "managing" their language and behavior to revert to the white norm, even when they substantively contribute to classroom mathematics. Second, whiteness provides the right to reputation and status where white racial identity "by recognizing the reputational interest in being regarded as white as a thing of significant value" (Harris, 1993, p. 1734). We see this in mathematics where "those who benefit from whiteness hoard real property to gain intellectual property" (Bullock, 2017, p. 633). Consider the amount of "property" owned by those deemed "successful" in mathematics. In 2021, 70.6% of public-school students who enrolled in Advanced Placement mathematics are white or Asian[2] (Office for Civil Rights, 2021). In 2018 (most recent publicly available data), 90.8% of doctorate recipients in mathematics are white or Asian (Golbeck et al., 2020). In the same year, 80% of public middle and high school mathematics teachers are white, 93% of which teach in a school where more than 50% are white (Rotermund and Burke, 2021). Finally, whiteness provides the absolute right to exclude where "whiteness became an exclusive club whose membership was closely and grudgingly guarded" (Harris, 1993, p. 1736). Mathematics education has long been the site of meritocracy where pervasive discourses of "high" and "low" students (e.g., "honors" and "support" mathematics classes) serve to separate those in the club, with white and white-adjacent students in the club, and everyone else, not. This leads to, according to Battey and Leyva (2016), the academic delegitimization of non-white and non-white-adjacent students.

Because mathematics education is a white institutional space and its practices have been shaped by whiteness and whiteness as property (Martin, 2019; Bullock, 2019; Hand & Spencer, 2015), genuine reform that upends the roots of mathematics education threatens whiteness.

2. We include Asian(Americans) in the first two data because of their proximity to whiteness in mathematics in that their presence as non-White achievers in mathematics absolves mathematics from racism (see Chen and Buell, 2017). The number of Asian (American) teachers were not included in the third set of data.

## White Emotions

We dig into emotions as a reaction to mathematics education reform, ergo, threats to whiteness. We adopted an interactionist conception of emotion, meaning that emotions are both an individual, physiological experience and an expression that (re)produces sociocultural and sociopolitical discourses (Zembylas, 2007). If whiteness is unsettled, strong emotions are used to repair and revert to the status quo (DiAngelo and Sensoy, 2014). In particular, white emotions, such as disgust (Matias, 2016), have been used to hinder justice movements. Ultimately, the emotions stabilize whiteness and white supremacy and allow whites to keep "material benefits, protection, and advantage at the expense of the humanity, achievements, and reality of people of color" (Matias, Thompson, and Luney, 2022, p.14).

Even in the act of proposing mathematics education reform, particularly the standards-based reform of the 1990-2000's and the current turn towards justice, we see strong emotions enter. Incidentally, we do not argue that mathematics education reform fully dismantles white supremacy and, arguably, is problematic; Gillborn (2005) argued educational policy acts to defend white supremacy. It could, however, challenge whiteness by centering diverse perspectives. But when whiteness is decentered, "the emotionalities of [w]hiteness become too unfettered" (Matias, Montoya, & Nishi, 2016, p. 3).

Because mathematics education is a manifestation of whiteness as property, the strong emotions to reform are analogous to someone losing whiteness. Matias (2016) illustrates the loss of whiteness, "melancholic state of existence that constantly mourns and grieves its own death yet, in actuality, never really dies... Whites never fully let go of their whiteness or the sense of loss of whiteness. It becomes a perpetual state of being, one that becomes the shared burden for humanity" (p. 112). Thus, we ask, what emotions, rooted in whiteness, emerge in mathematics education reform?

## Research Process

### Context and Goals

For the last forty years, mathematics education reform efforts have championed equity, but whiteness inherent in these efforts has upheld inequities in the achievement, access, and opportunities of BIPOC students (Bullock, 2019; Martin, 2003). Thus, this manuscript does not break ground by describing whiteness as a mechanism to maintain the status quo. Instead, we hope to contribute to our field's understanding of the reforms by situating it within the framework of whiteness as property. Specifically, we examine the discourses in the backlash to two reform movements: the math wars and the math culture wars.

#### *Math Wars (MW)*

Controversy around standards-based reform efforts sparked the (MW) in the late 1990's. Initially, this reform movement centered around the publishing of "Curriculum and Evaluation Standards for School Mathematics" (hereafter "Standards") from the National Council of Teachers of Mathematics (NCTM), particularly, California's adoption of the Standards in 1994. Overall, reforms sought to lessen mathematical formalism and direct instruction (Herrera & Owens, 2001).

Tensions arose between prioritizing student-centered pedagogy, which would limit the amount of content presented, and prioritizing content (Klein, 2003), which catalyzed multifaceted backlash (see Berry et al., 2014; Schoenfeld, 2004).
As Wright (2012) recounted:

> The reformers believed in equity, education for the masses and advocated primarily progressive and critical teaching approaches. They saw mathematics as a value-laden subject, which served as a barrier to social and economic advancement for particular groups in society, although it had the potential to be a democratising force. The traditionalists saw mathematics very much as a value-free subject and believed in the maintenance of excellence, advocating a primarily conservative teaching approach. (p. 9)

We included the MW because it championed, "mathematics for all" (Martin, 2003). Under this slogan, reforms themselves ultimately failed to "grapple with the complexities and particularities of race, minority/marginalized status, differential treatment, underachievement in deference to the assumption that teaching, curriculum, learning, and assessment are all that matter" (Martin, 2003, p. 10). Moreover, the discourse is reflective of racial remediation as a strategy to "eliminate irritation, not to execute justice" (Bullock, 2019). The slogan is still persistent in mathematics curriculum and policy such as NCTM's (2014) position statement, "Achieving access and equity requires that all stakeholders ensure that all students have access to a challenging mathematics curriculum" (p. 1).

### *Math Culture Wars (MCW)*

The current reform movement seeks to center social justice, and specifically racial justice. TODOS: Mathematics for All (2020) called for mathematics educators to take an antiracist position by "challenging belief systems that perpetuate microaggressions [and] disrupting the role mathematics classes play in pushing students out of schooling" (p. 2). Efforts to attend explicitly to social and racial justice in curricular content choices, pedagogical approaches, and organizing structure of mathematics have sparked the MCW, particularly in California and Florida. The backlash in California stems from the implementation of a new mathematics curriculum that includes a social justice component. Reformers argued for the inclusion because a "different perspective enables teachers to not only help their students see themselves inside mathematics but develop knowledge and understanding that allows them to use mathematics toward betterment in their worlds" (p. 55). In Florida, the backlash manifested in a state ban on mathematics textbooks that included prohibited topics such as "CRT," defined as "the theory that racism is not merely the product of prejudice, but that racism is embedded in American society and its legal systems in order to uphold the supremacy of white persons" (Florida State Board of Education, 2021, p. 1). The Governor argued textbooks were "impermissible" because it indoctrinates "race essentialism, especially, bizarrely, for elementary school students" (Florida DOE, 2022) and state legislature proposed instruction should not include anything that makes students "feel guilt, anguish, or other forms of psychological distress for actions, in which he or she played no part" (Florida H.B. 7, 2022, p. 4). These reforms are situated within broader national culture wars, and backlash to educational reform is often framed as opposition to "CRT" (i.e., Critical Race Theory; see Figure 1).

**Figure 1**: *STEM not CRT Protest (Bloustein, 2021)*

OPINION | LETTERS

## *Critical Race Theory Has a Racism Problem*

From the idea that white people are congenitally disabled by virtue of being born white to the bigotry of low expectations.


Opponents of critical race theory protest in outside of the Loudoun County School Board headquarters in Ashburn, Va.

PHOTO: EVELYN HOCKSTEIN/REUTERS



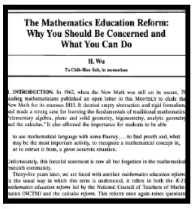
## Methods

We used critical discourse analysis to "explore connections between educational practices and social contexts," particularly issues of "power abuse, injustice, and equality to uncover implicit or concealed power relations" (Mullet, 2018, p. 117) to examine how power structures are maintained (Oughton, 2007). We analyzed a number of artifacts from the MW and MCW. We used the following criteria for inclusion: (1) explicitly discussed mathematics education; (2) related to MW or MCW in California or Florida; and (3) authored by writers from various backgrounds and for diverse, broad audiences. Our rationale for these criteria was based on ensuring that backlash explicitly addressed mathematics education reforms (sometimes discussed alongside broader reforms). To do so, we focused on the states where mathematics reform backlash has been most prominent. We also sought to consider a range of voices (e.g., general public, mathematics education, STEM/mathematics; different media sources), which have made a broader impact on narratives surrounding mathematics education reforms. After applying criteria, we included nine artifacts in the analysis, which are presented in Figure 2 and Figure 3.

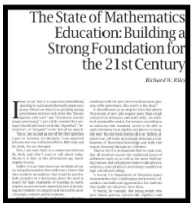
We selected a discourse to examine (i.e., the backlash to mathematics education reforms) then selected and explored the background of each text because examining the social and historical context and producers of the texts is a key aspect of critical discourse analysis (Mullet, 2018). Next, we identified emotional language clarifying the particular emotion that was being expressed, especially when related threats to rights to property (i.e., rights to use and enjoyment, right to power and status, and power to exclude). Using these emotions, we identified characteristics, manifestations, and functions of the emotions. Although literature on whiteness helped sensitize us to code for themes, concepts from the literature on whiteness were used to interpret the themes rather than dictate the themes.

**Figure 2**: *MW Artifact Descriptions*


**Klein (1999):** Klein is a professor of mathematics. He has shared multiple pieces expressing dissatisfaction with the California mathematics reform. This artifact is found in the second edition of "How to teach mathematics" by Steven Krantz. It no longer appears in the most recent edition and can be accessed on Mathematically Correct, a website that shared writings critical of reforms.

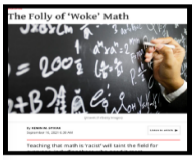



**Wu (1997):** Wu is a professor emeritus of mathematics. Although Wu was critical of the Wars reform, he expressed support for the latter Common Core reform. This artifact is found in the American Mathematical Monthly, a professional magazine of the Mathematical Association of America, most of whom are university mathematicians.




**Riley (1998):** Riley was the secretary of education under the Clinton administration. This artifact is found in Notices, a professional magazine of the American Mathematical Society, most of whom are university mathematicians. This is the text of a speech he gave at the Joint Mathematics Meetings, a large mathematics conference hosted annually by the American Mathematical Society.

**Figure 3:** *MCW Artifact Descriptions*

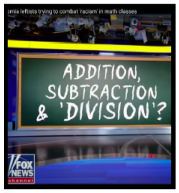



**Spivak (2021):** Spivak is founder and chairman of SMI Group LLC. This artifact is found in the National Review, a popular publication known for defining modern American conservatism (Sivek, 2008). This artifact has been shared on social media 1,678 times according to sharescore.com.


**Evers & Wurman (2022):** Evers is a senior fellow at the Center on Educational Excellence at the Independent Institute and headed the Trump-Pence transition's agency review for the Department of Education. Wurman is an engineer and research fellow at the Independent Institute. The artifact is an open letter shared on Independent Institute, an American libertarian think tank, and has more than 1,000 signatories.


**Barak et al. (2022):** The authors are a group of computer scientists (Barak and Cohen) and engineers (Mims and Nelson) at different institutions. The artifact is found on a Google-hosted site and is an open letter with more than 1,500 signatories that are limited to STEM and quantitative field professionals.

**Chayes & Liu (2022):** Chayes and Liu are both professors in the department of electrical engineering and computer sciences at UC Berkeley and hold administrative positions (associate provost and dean, respectively). The artifact is published as an op-ed in the LA Times, a publication that leans left, according to Ground News (2022).




**Fox News (2021):** Fox News interviews Carol Swain, a political scientist and former tenured professor at Princeton and Vanderbilt and a co-author of Black Eye for America: How Critical Race Theory is Burning Down the House. This artifact is found on YouTube with a little over 400,000 views and published by Fox News, a media company that leans right, according to Ground News (2022).


**Florida Department of Education (2022):** This artifact is a press release from the Florida Department of Education under the DeSantis administration. This artifact spurred news reporting on the amount of mathematics textbooks that were rejected because they contained prohibited topics such as "CRT."

## Findings: Fear to Uphold Whiteness

We found authors of the texts evoked a strong emotion of fear within two broad narratives—a fear of a growing enemy and a fear of loss. The authors wrote about an enemy aiming to replace K-12 mathematics and gaining traction, despite a flimsy research basis funded by powerful, bad actors. They explained the threat to affordances of the current ideology of mathematics and how losing them would erode the American economy, and thus America's international competitiveness.

### Fear of a Growing Enemy

In both reforms, the authors invoked fear of a concrete, growing enemy and sought to discredit research and reform proponents. In our first characterization of fear, the backlash discourse framed reforms themselves as something to be feared because they are based on a dangerous, ill-informed paradigm backed by selfish bad actors with substantial profit to gain.

#### *The Ill-Informed Paradigm*

Authors presented a growing ideology taking over school mathematics, which we refer to as "the paradigm." In the MCW, the paradigm has a specific name, "CRT," but was not presented with the nuance of the original conceptualization of CRT. Instead, CRT refers to the idea that racism is embedded in society/institutions (versus individual prejudice; Florida State Board of Education, 2021). To an extent, Florida (2022) elaborated on and legislated "CRT" in H.B. 7 where they deemed any activity that "espouses, promotes, advances, inculcates, or compels such individuals to believe… an individual, by virtue of his or her race, color, sex, or national origin, is inherently racist, sexist, or oppressive, whether consciously or unconsciously,…an individual's moral character or status as either privileged or oppressed" is unlawful (p. 1). The paradigm described in the MW centered on efforts to focus on mathematics curriculum standards that shifted from prior-

itizing procedures to conceptual understanding (Schoenfeld, 2004). Standards that centered mathematics with real-world applications were seen as an attack on traditional mathematics that was reserved for select individuals (Ravitch, 1996) and primarily a mental exercise (Klein, 2003). The paradigm, thus, frames mathematics as a race-neutral, exclusive activity.

Discounting research supporting reform served as one mechanism to sow fear of the paradigms. During the MW, opponents described research informing reform as "fads" and "experimental" with some echoes of how No Child Left Behind (2001) described "scientifically-based" research (i.e., preference for random-assigned experimental research as objective and the one correct way). For instance, Wu (1997) described the pedagogical practices in the MW as "based on opinions rather than research data of large-scale studies from cognitive psychology" (p. 946). Discourses in the MCW mirrored this skepticism, claiming that the new curriculum "propose[s] drastic changes based on scant and inconclusive evidence. Subjecting the children of [California] to such an experiment is the height of irresponsibility" and that the current reform is "elevating trendy but shallow courses over foundational skills would cause lasting damage to STEM education in the country" (Barak et al., 2022, para. 9). Spivak (2021) offered another interpretation, that current reforms are simply "belied by common sense" (para. 22).

These attempts to discredit the paradigms, and thus stroke fear of reforms, are effective because the paradigms themselves run counter to widely accepted ideological discourses of mathematics. For example, Klein (1999) wrote that the MW leaned on the "thesis that learning styles are correlated with ethnicity and gender is widely accepted in education circles" and that such research "leads to new, watered-down mathematics curricula" (para. 28). He then argued that there is "no doubt that minority students can thrive in traditional programs" and concluded that the "mathematics community would do well to purge itself of any hidden assumptions that non-Asian minority students learn mathematics differently from anybody else" (para. 39). This illustrates the source of fearing the
paradigm—mathematics must remain untouched for the use and enjoyment of those currently in possession of it, white and white-adjacent folk. Moreover, the arguments of the paradigm being supported by flimsy research echoes the right to exclude, that those who are in possession are able to exclude research that justifies reform.

### *Bad Actors*

Another prevailing and related fear mechanism in the backlash is the identification of powerful bad actors. These actors are framed as people and groups, who stand to profit, working behind the scenes to push for reform, and as such, should be feared. In the MW, Klein (1999) named technology corporations as a bad actor. Namely corporations, such as Exxon and Texas Instruments, sought "to create new consumers of technology" (para. 17) through funding large grants and attending academic conferences. He asserted that proponents of reform gained from these relationships because the "de-emphasis of basic skills [leads to] greater reliance on technology" (para. 10). Thus, technology corporations were a bad actor because the de-emphasis of algorithms challenged the ideological discourses of whiteness in which mathematical procedures are done using one right way.

In the MCW, a different bad actor was introduced, namely a group of "progressive" mathematics education researchers (i.e., Deborah Ball; Rochelle Gutiérrez) who espouse and promote the paradigm (Spivak, 2021). Spivak questioned their intellectual contributions using emotional verbiage such as "groans" and "overstates" and framing their work as Gutiérrez's "worries," and

Ball "complains." Thus, the author positioned them and their work as not to be taken seriously because it "sound[s] like parody" (para. 4). These discourses uphold whiteness by framing the bad actors as responding emotionally, which remains unacceptable within the ideological discourses of mathematics as objective (i.e., emotion free).

Spivak (2021) also framed the ideas of bad actors as "gaining traction" (para. 8) by describing how they are being taken up by schools and school districts with the backing of powerful institutions. Specifically, he named the Gates Foundation's funding of Ball's *TeachingWorks* project, and Education Trust-West's (tied closely to the Obama administration) funding of the toolkit, *A Pathway to Equitable Math Instruction.* Consistent discourses here position Obama and Gates as the bogeymen of the left (see McLaughlin, 2021; Smith, 2021) and help explain why the paradigm is "gaining traction" and "strongly endorsed by educators, leading mathematics organizations, and policy-makers" (para. 4). Politicizing reform efforts by associating them with the bogeymen of the left also invokes the possessors' right to exclude in that they exclude those who challenge the status quo by painting them as profit-seeking entities, and thus cannot, in good faith, enter the space of mathematics education.

### *Fear of Loss*

The second fear mechanism promotes fear of hypothetical outcomes of reforms (not the reforms themselves) by characterizing what society will lose. Here, discourses evoke a fear of losing "real" mathematics (i.e., neutrality and objectivity) as well as losing the status and opportunities often associated with mathematics.

**Loss of "real" mathematics and unreliable, hypocritical actors.** Fear mechanisms across all artifacts upheld whiteness through adhering to a neutral view of mathematics, particularly mathematics as solely getting correct answers and distanced from power, history, and human relationships. The impact of this loss of objectivity should be feared. For example, Evers and Wurman (2022) emphasized that there is "actual" math, "as in arithmetic, algebra, geometry, trigonometry and calculus—not an endless river of new pedagogical fads that effectively distort and displace actual math" (para. 2). Wu (1997) described mathematics as a field with "precise technical language" and that "a tendency of the reform is to move mathematics completely back into the arena of everyday life where ambiguity and allusiveness thrive. A loss of precision…is the result" (p. 947). Here, the core components of the perceived reality of mathematics as objective are called into question resulting in existential white fear (van Kessel et al., 2020). This view of mathematics that distances itself from human activity allows the authors to add another layer of fear and argue that proponents of reform are hypocritical.

Because authors described mathematics as separate from humans, they are able to argue that mathematics is race neutral (Battey & Leyva, 2016). For some authors, connections between mathematics and race is not only counter to the idea that mathematics is colorblind but also that reform outcomes would hold back underrepresented students by watering down mathematics. In the MW, Klein (1999) described "the cost of eviscerating the algebra component of calculus [as] harmful to students of all ethnicities and both genders" (para. 36). This argument has been more prevalent in the MCW. In a Fox News interview (2021), Swain argued including CRT in Florida textbooks would "destroy opportunities for minority students…These children will not have an opportunity to be successful in life if they cannot be taught math, traditional math" (1:23). Evers

and Wurman (2022) argued focusing on "politics" in mathematics will make "math dramatically harder for students whose first language is not English" (para. 13). Spivak (2021) made a similar point but also focused on the proponents of reforms:

> There is no white math, or black math. There is only math. Americans, particularly our black and Hispanic students, are falling behind because, instead of finding better ways to teach, progressive educators debase math…The idiocy of having math teachers lead discussions on social justice instead of teaching black children how to do math will ensure that black children never receive the tools they need to succeed. (para. 25, 30)

We also found a feared reform outcome of loss related to STEM professions and university mathematics. Chayes and Liu (2022) argued, "The result would be students missing out on math courses necessary to succeed in STEM programs in college and beyond" (para. 7). Backlash texts from university mathematicians addressed reform outcomes as a disruption of the preparation of future STEM students. Some texts pointed to the importance of K-12 mathematics as foundations for calculus and in service of the goals of university mathematics. Wu (1997) argued mathematicians should have a vested interest in "flawed reform" because "the most obvious reason why school mathematics education should matter to university professors is that a continuing influx of mathematically incompetent students would decimate the university mathematics curriculum" (p. 950). Wu invoked fear that students would not understand mathematics necessary for university courses, as an outcome of adjusting instruction to focus on mathematical reasoning and connections to the real world, echoing the right to exclude. Thus, the backlash to reform during the MW maintained K-12 mathematics must stay the same or students will not be prepared for university mathematics. Critics in the MCW make similar arguments, such as framing proposed reforms as "no replacement for the mathematical foundations required for students to pursue STEM" (Barak et al., 2022, para. 28). In this, the possesors call on their right to use school mathematics, in that, higher level (i.e., university) mathematics reaps the benefits of school mathematics.

Moreover, the burden of reform is placed solely on K-12, as opposed to considering the possible need for reform of university mathematics programs. As illustrated by Klein (1999), "the focus should be on raising the level of mathematics education in K-12, not on how best to lower it in the universities" (para. 40). In the MCW, Barak et al. (2022) similarly stated, "K-12 math curriculum development cannot be disconnected from one of its most important end goals: Preparing students for success in college-level STEM education and a STEM career" (para. 9). Here, the backlash to reform and commitments to status quo K-12 mathematics underscore that there is one right way and reason to learn mathematics (i.e., to prepare for college-level mathematics or STEM professions). This framing positions college mathematics and STEM as property, where the loss of "real" mathematics as (whiteness as) property results in the loss of status that is gained through an association with mathematics (Bullock, 2017). Thus, the fear being evoked by those who have passed the gates maintained by status quo mathematics (cf. Martin et al., 2010) is perceived as nothing more than power hoarding.

**Loss of an internationally-competitive economy**. Another evoked fear of mathematics education reforms is that the loss of "real" mathematics will result in America's loss of international competitiveness. From this perspective, K-12 mathematics serves the needs of a capitalist society by producing an internationally competitive labor force. This discourse in the MW was most clear in Riley's (1998) speech: "the need to reach for high standards of learning in mathematics as an ever

more important part of preparing our students to compete and succeed in an increasingly complex global economy" (p. 487). Wu (1997) echoed this sentiment: "the economic and social well-being of our nation is critically dependent on the existence of a robust corps of technicians in science and technology: the competent mathematicians, scientists, and engineers who evolve from school students gifted in science and mathematics" (p. 951).

We also found this fear in the MCW. Chayes and Liu (2022) expressed the fear bluntly: "California [would not] grow the talent needed to remain a global economic engine" (para. 12). Barak et al. (2022) positioned traditional pathways to AP Calculus by 12th grade as preferred for students who wish to pursue a STEM career and noted a resulting "disadvantage [to] K-12 public school students in the United States compared with their international and private-school peers" (para. 2). Moreover, the authors situated their argument on a global stage. Florida's Commissioner of Education said mathematics curriculum should offer "world-class education without the fear of indoctrination or exposure to dangerous and divisive concepts in our classrooms" (Florida DOE., 2022, para. 5).

As we illustrated, the authors of the backlash artifacts instilled fear of a loss of international competition. Authors implied that moving away from traditional mathematics and embracing change would result in fewer students prepared to enter into STEM careers or compete with international and private peers for jobs. Thus, voices of the backlash continued to perpetuate whiteness through the belief that whiteness is property and that there is only so much (international) power to go around. Here, achievement in mathematics in the traditional sense provides mathematically successful individuals with access to real property through attaining well-paying jobs in STEM fields. According to the authors, mathematics education reforms should be feared because they aim to share access to STEM fields more broadly, effectively challenging the exclusive right to power and property owned by those identified as white or with white ideals.

## Discussion and Conclusion

Our analysis demonstrates how fear is used as a mechanism to uphold whiteness in the backlash to mathematics education reforms, particularly centering white fear. We showed how opponents construct reform efforts as an enemy backed by flimsy research and powerful bad actors by invoking white and white-adjacent folks' right to exclude. That is, these bad actors have no place in mathematics education. Additionally, we illustrated how they depicted the loss and deterioration of university mathematics, STEM, and American economic competitiveness as a result of reform efforts that push traditional mathematics out of K-12 further showing their sole right to its use and the right to the high status of university level mathematics and the American economy. Backlash is rooted in the tremendous influence fear has wielded in shaping human history and its influence over power relations within society (Bourke, 2003). In fact, fear is the primary strategy for sustaining white supremacy by undergirding all other strategies and relying on a "promised safety [that] is false because it is always based on the abuse and misuse of power" (Okun, 2021, p. 7). Matias (2023), in parallel, described anti-CRTers with a fear of loss of their identity, humanity, and path. Notably, we saw fear in service of white supremacy as central to the argument because of absence of any other racialized fear. Fear is generally part of the BIPOC experience (Jones, 2022). Especially in mathematics, even high achieving BIPOC students live with the daily fear of inadvertently confirming the racial stereotypes that position them as less mathematically capable (McGee & Martin, 2011). Although having this fear is acceptable, expressing it is not

(Battey & Leyva, 2016). Thus, the emotions featured in this paper solely centers white emotion and fears (Matias, 2014).

Our analysis was limited because we did not analyze other significant reforms (e.g., New Math, Common Core) nor did we exhaust all possible backlash artifacts. We note that characterizing mathematics and mathematics education as steeped in whiteness is not new (e.g., Bullock, 2017); however, a notable contribution is how whiteness is persistent and conceptions of mathematics outside academia and how fear centers white emotions and ideologies while BIPOC emotions are discredited. Gomez Marchant, Aguilar, and Gargroetzi (2023) described how mathematics justifies claims of "truth" in public community meetings to rezone a school to shift its population from majority non-white to majority white. These projects demonstrate the public discourse of using mathematics to reify truth and objectivity as white property (Pham, 2023).

Understanding the backlash to mathematics education reforms has implications for how communities of mathematics teachers and mathematics education researchers can respond. We foresee fruitful responses in centering BIPOC emotions, rather than alleviating white fear, which has been the prevailing tactic of our field's response to the backlash. As we were writing and in response to the Florida mathematics textbook ban, NCTM, a prominent mathematics education organization, promised to "advocate against anything that disproportionately distracts from [equity for all] or hurts the most vulnerable populations within our schools" (NCTM, 2022, para. 1). Such responses double down on white ideological discourses of mathematics and wave the flag of "for all" as a sufficient response. Moreover, underlying this response is an assumption that "student[s] must embrace Whiteness to experience [mathematics'] full benefit" (Bullock, 2019, p. 91).

As we wrote, 21 students and teachers were taken from their families in Uvalde. Mathematics education is not absolved from the violence endemic to American society. Because mathematics education has always been able to retreat to the adage that mathematics is "just about the numbers," our field has been complicit in the violence and harm directed towards the defenseless and the disenfranchised. Without confronting and radically reimagining mathematics, we are stuck in a loop where whiteness begets whiteness.

## References


Battey, D., & Leyva, L. A. (2016). A framework for understanding whiteness in mathematics education. *Journal of Urban Mathematics Education, 9*(2), 49–80. https://doi.org/10.21423/jume -v9i2a294

Berry III, R. Q., Ellis, M., & Hughes, S. (2014). Examining a history of failed reforms and recent stories of success: Mathematics education and Black learners of mathematics in the United States. *Race Ethnicity and Education, 17*(4), 540–568. https://doi.org/10.1080/13613324.2013.818534

Bloustein, P. (2021, July 13). Critical race theory has a racism problem. *Wall Street Journal*. https://www.wsj.com/articles/critical-race-theory-racism-rufo-11626110701

Bourke, J. (2003). Fear and anxiety: Writing about emotion in modern history. *History Workshop Journal, 55*(1), 111–133. Oxford University.

Bullock, E. (2017). Only STEM can save us? Examining race, place, and STEM education as property. *Educational Studies, 53*(6), 628–641. https://doi.org/10.1080/00131946.2017.1369082

Bullock, E. C. (2019). Mathematics curriculum reform as racial remediation: A historical counterstory. In *Critical race theory in mathematics education* (pp. 75–97). Routledge.

Chen, G. A., & Buell, J. Y. (2018). Of models and myths: Asian(Americans) in STEM and the neoliberal racial project. *Race Ethnicity and Education*, *21*(5), 607–625. https://doi.org/10.1080/13613324.2017.1377170

DiAngelo, R., & Sensoy, Ö. (2014). Getting slammed: White depictions of race discussions as arenas of violence. *Race Ethnicity and Education, 17*(1), 103–128. https://doi.org/10.1080/13613324.2012.674023

Florida H. 2020-2022, H.B. 7. (3/10/2022). https://www.flsenate.gov/Session/Bill/2022/7/BillText /er/PDF

Florida State Board of Education. (2021). *F.A.C. 6A-1.094124.* https://www.flrules.org/gateway/ruleno.asp?id=6A-1.094124

Frankenberg, R. (1993). *White women, race matters: The social construction of whiteness*. University of Minnesota.

Gillborn, D. (2005). Education policy as an act of white supremacy: Whiteness, critical race theory and education reform. *Journal of Education Policy, 20*(4), 485–505. https://doi.org/10.1080/02680930500132346

Golbeck, A. L., Barr, T. H., & Rose, C. A. (2020). Report on the 2017–2018 New Doctorate Recipients. *Notices of the American Mathematical Society, 67*(8).

Gómez Marchant, C. N., Aguilar, A., & Gargroetzi, E. C. (2023). "Simply a matter of numbers": Public commentators' construction of a mathematical model of equality perpetuating the myth of mathematics as objective and neutral. *The Electronic Journal for Research in Science & Mathematics Education, 27*(1), Article 1.

Ground News. (2022). *Methodology*. Rating System. https://ground.news/rating-system

Gutstein, E. (2006). *Reading and writing the world with mathematics: Toward a pedagogy for social justice.* Taylor & Francis.

Hand, V. & Spencer, J. (2015). The racialization of mathematics education. In L. Drakeford (Ed.) *The Race Controversy in American Education* (p. 237–258). Praeger.

Harris C. (1993). Whiteness as property. *Harvard Law Review*, 106(8), 1707–1791.

Herrera, T. A., & Owens, D. T. (2001). The "new new math"? Two reform movements in mathematics education. *Theory into Practice, 40*(2), 84–92. https://doi.org/10.1207/s15430421tip4002 _2

Jones, B. L. (2022). Feeling fear as power and oppression: An examination of Black and white fear in Virginia's US history standards and curriculum framework. *Theory & Research in Social Education,* 1–33. https://doi.org/10.1080/00933104.2022.2069529

Klein, D. (2003). A brief history of American K-12 mathematics education in the 20th century. *Mathematical Cognition*, 175–225.

Kokka, K. (2022). Toward a theory of affective pedagogical goals for social justice mathematics. *Journal for Research in Mathematics Education*, *53*(2), 133–153. https://doi.org/10.5951/jresematheduc-2020-0270

Leonardo, Z. (2009). *Race, whiteness, and education*. Routledge.

Martin, D. B. (2003). Hidden assumptions and unaddressed questions in mathematics for all rhetoric. *The Mathematics Educator, 13*(2), 7–21.

Martin, D. B. (2019). Equity, inclusion, and antiblackness in mathematics education. *Race Ethnicity and Education, 22*(4), 459–478. https://doi.org/10.1080/13613324.2019.1592833

Martin, D. B., Gholson, M. L., & Leonard, J. (2010). Mathematics as gatekeeper: Power and privilege in the production of knowledge. *Journal of Urban Mathematics Education, 3*(2), 12–24.

Matias, C. E. (2014). "And our feelings just don't feel it anymore": Re-feeling whiteness, resistance, and emotionality. *Understanding and Dismantling Privilege, 4*(2), 134–153.
Matias, C. E. (2023). Hysteria, hypermania, & hullabaloo: How white emotionalities manufactures fear of critical race theory & teaching. *Thresholds in Education, 46*(1).
Matias, C. E., Montoya, R., & Nishi, N. W. M. (2016). Blocking CRT: How the emotionality of whiteness blocks CRT in urban teacher education. *Educational Studies, 52*(1), 1–19. https://doi.org/10.1080/00131946.2015.1120205
Matias, C. E., Thompson, F. A., & Luney, L. T. (2022). When white dwarfs burn our color: Whiteness, emotionality, and the will to thrive in higher education. *Research Issues in Contemporary Education, 7*(2), 8–34.
McGee, E. O., & Martin, D. B. (2011). "You would not believe what I have to go through to prove my intellectual value!" Stereotype management among academically successful Black mathematics and engineering students. *American Educational Research Journal, 48*(6), 1347–1389. http://doi.org/10.3102/0002831211423972
McLaughlin, D. (2021, December 21). *The cruel irony of our recent presidential choices.* National Review. https://www.nationalreview.com/corner/the-cruel-irony-of-our-recent-presidential-choices/
Moses, R. P. (1994). Remarks on the struggle for citizenship and math/science literacy. *Journal of Mathematical Behavior, 13*(1), 107–111.
Mullet, D. R. (2018). A general critical discourse analysis framework for educational research. *Journal of Advanced Academics, 29*(2), 116–142. https://doi.org/10.1177/1932202X18758260
Namkung, J. M., Peng, P., & Lin, X. (2019). The relation between mathematics anxiety and mathematics performance among school-aged students: A meta-analysis. *Review of Educational Research, 89*(3), 459–496. https://doi.org/10.3102%2F0034654319843494
No Child Left Behind Act of 2001, 20 U.S.C. 70 § 6301 *et seq*.
National Council of Teachers of Mathematics. (2014, April 18). Access and equity in mathematics education: A position of the National Council of Teachers of Mathematics. https://www.nctm.org/uploadedFiles/Standards_and_Positions/Position_Statements/Access_and_Equity.pdf
National Council of Teachers of Mathematics. (2022, April 19). Statement on using mathematics for divisiveness. https://www.nctm.org/News-and-Calendar/News/NCTM-News-Releases/State ment-on-Using-Mathematics-for-Divisiveness/
Office for Civil Rights. (n.d.). *National Data*. https://ocrdata.ed.gov/profile/us?surveyYear=2020
Okun, T. (2021, May). *White supremacy culture - Still here*. White Supremacy Culture. https://drive.google.com/file/d/1XR_7M_9qa64zZ00_JyFVTAjmjVU-uSz8/view
Oughton, H. (2007). Constructing the 'ideal learner': a critical discourse analysis of the adult numeracy core curriculum. *Research in Post-Compulsory Education, 12*(2), 259–275. https://doi.org/10.1080/13596740701387536
Pham, V. N. (2023). Truth as White property: Solidifying White epistemology and owning racial knowledge. *Communication and Critical/Cultural Studies, 20*(2), 288–305. https://doi.org/10.1080/14791420.2023.2199831
Ravitch, D. (1996). The case for national standards and assessments. *The Clearing House, 69*(3), 134-135. https://doi.org/10.1080/00098655.1996.10114296

Rotermund, S., & Burke, A. (2021). *Science and Engineering Indicators*. https://ncses.nsf.gov/pubs/nsb20211/teachers-of-mathematics-and-science#u-s-mathematics-and-science-teachers

Schoenfeld, A. H. (2004). The math wars. *Educational Policy*, *18*(1), 253–286. https://doi.org/10.1177/0895904803260042

Sivek, S.C. (2008). Editing conservatism: How National Review magazine framed and mobilized a political movement. *Mass Communication and Society*, *(11*)3, 248–274. https://doi.org/10.1080/15205430701791030

Smith, W. J. (2021). *Bill Gates's plan to destroy animal agriculture*. National Review. https://www.nationalreview.com/corner/bill-gatess-plan-to-destroy-animal-agriculture/

TODOS: Mathematics for All. (2020). The mo(ve)ment to prioritize antiracist mathematics: Planning for this and every school year. https://www.todos-math.org/assets/The%20Movement%20to%20Prioritize%20Antiracist%20Mathematics%20Ed%20by%20TODOS%20June%202020.edited.pdf

van Kessel, C., Den Heyer, K., & Schimel, J. (2020). Terror management theory and the educational situation. *Journal of Curriculum Studies*, *52*(3), 428–442. https://doi.org/10.1080/00220272. 2019.1659416

Wright, P. (2012). The math wars: Tensions in the development of school mathematics curricula. *For the Learning of Mathematics*, *32*(2), 7–13.

Zembylas, M. (2007). Theory and methodology in researching emotions in education. *International Journal of Research and Method in Education*, *30*(1), 57–72. https://doi.org /10.1080/ 17437270701207785

## **Appendix A:** *References for MW Artifacts*

Klein, D. (1999). Big business, race, and gender in mathematics reform. In S. Krantz (Ed.) How to teach mathematics, American Mathematical Society. http://www.csun.edu/~vcmth00m/krantz.html

Riley, R. W. (1998). The state of mathematics education: Building a strong foundation for the 21st century. *Notices of the American Mathematical Society, 45*(4), 487–491.

Wu, H. (1997). The mathematics education reform: Why you should be concerned and what you can do. *The American Mathematical Monthly, 104*(10), 946–954, https://doi.org/10.1080/00029890.1997.11990745

## **Appendix B:** *References for MW Artifacts*


Barak, B., Cohen, E., Mims, A., Nelson, J. (2022, May 19). *Open letter on k-12 mathematics*. k12mathmatters. https://sites.google.com/view/k12mathmatters/home

Chayes, J., & Liu, T. K. (2022, May 12). *Op-ed: California's math education needs an update, but not the one proposed*. Los Angeles Times. https://www.latimes.com/opinion/story/2022-05-12/california-math-education-framework-test-scores

Evers, W. M., & Wurman, Z. (2022, March 29). *Replace the proposed new California math curriculum framework*. Independent Institute. https://www.independent.org/news/article.asp?id=13658

Florida Department of Education. (2022, April 15). *Florida rejects publishers' attempts to indoctrinate students* [Press release]. https://www.fldoe.org/newsroom/latest-news/florida-rejects-publishers-attempts-to-indoctrinate-students.stml

Fox News. (2021, May 21). California leftists trying to combat 'racism' in math classes [Video]. Retrieved from https://youtu.be/SF8FKAKZXpY.

Spivak, K.M. (2021, September 16). *The folly of 'woke' math*. National Review. https://www.nationalreview.com/2021/09/the-folly-of-woke-math/