Chapter XX:

The Racialization of Mathematics Education

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This chapter examines the racialization of mathematics education within the context of US K-12 education. While it is widely acknowledged that mathematics education houses chronic disparities between groups of students from more- versus less-dominant racial, ethnic and linguistic groups, fewer stories are told about the role of mathematics education in creating and fueling these disparities. The grand narrative of Black failure and White success is told without regard to the realities of racism, which shape the experiences of both Black and White (and all students) in US society. We argue that the same way in which Whiteness affords those identified as White with "material and non-material" benefits[i], the experiences of those identified as Black are shaped by entrenched notions of racial hierarchy and inferiority.[ii] As a result, mathematics education is a profoundly racialized experience in students' lives.[iii] Increasingly, the processes and structures that play a role in students' racialized experiences have been under investigation in the field of mathematics.[iv] The argument we develop in this chapter is developed from this work and our experiences as mathematics education researchers. Here, we set out to illustrate how the process of racialization gets constructed from the ground up--in moments of classroom life, within the schools in which those classrooms are situated, and within the structures and systems which constitute those schools.

As other chapters in this volume have detailed, racism is a reality of American education. In the case of the American public school, it is both its inheritance and its living wage. The historical realities of racism, which allowed Whites but denied Blacks the right to acquire property, receive inheritances, work for a wage, and to have legal protection of these (property, inheritance, and wages) helps to explain the expansive differences in wealth that we see in the US today. Those benefits did not simply accrue to Whites in a tiny snapshot of time. Rather the arrangement ensued for centuries both during and after African American enslavement. As professors of mathematics education, we argue that mathematics education has played a crucial role in the perpetuation of economic benefits to Whites and of deficit perspectives of African American and other racial/ethnic communities.

Racisms' wages are not only material. They are reconstituted in the stories that are told. These narratives work to reinforce and even justify those material advantages, rendering them normal and natural. Mathematics unlike any of the other school subjects is uniquely poised to reinforce the story that racism tells. Racism tells a story that human beings are divided into groups based on phenotypic features and that these groupings are

hierarchically arranged. Racism both posits that there are biological differences and then assigns differing value to those differences. Both lies are reified through an intricate, and largely sanctioned, system of stories and practices.

One such story relates to intelligence. Mathematical-thought has come to be seen as the apex of that intelligence. Western man has been constituted through powerful stories about the nature of knowledge. Western knowing is logical versus intuitive, methodological (scientific) versus episodic, and universal versus local. The very idea of intelligence is tied to these notions of Western knowing. Standardized examinations of intelligence (modern IQ tests) serve to reinforce them. Mathematics and the practices of mathematics fit nicely to support these notions of Western man. Mathematics is a systematic science designed for generalizability. As we will describe, the idea of Western man, intellectual superiority, and mathematics converge. Children who perform well in mathematics, then, are defined as intellectually superior and mathematical, and are often White and male. As educational resources are doled out unevenly, those with greater access to (quality) mathematics instruction, and opportunities and (beliefs about their inherent intellectual gifts) produce higher mathematical test scores- reinforcing the story of racism.

The role of the system of mathematics education in heightening experiences of racialization among groups of children is becoming widely accepted in the field of mathematics education.[v] A primary reason for this is the recognition that mathematics carried out in school is a particular type of cultural activity that was produced within cultural communities, and that mathematics classrooms themselves function as cultural communities. In other words, the field is beginning to recognize mathematics teaching and learning *necessarily* involve issues of race, culture and power, and that the stories perpetuated by mathematics education about the intelligence of Whites on one end versus African Americans on the opposite end were (and continue to be) cultural constructions.

We examine the relation of mathematics education to issues of race, culture and power, and describe how features of what we call *school mathematical practices* are related to the perpetuation of racism in society. This work is the result of conversations, research and imaginings with colleagues as members of the Diversity in Mathematics Education (DiME) Center for Learning and Teaching. We note that while we use the term "we" throughout the chapter, as individuals we have different experience with and perspectives on mathematics education. Hand, is a White female from an upper-middle class family. She has studied children's mathematics learning in both formal and informal environments, including in middle and high school classrooms. Spencer comes from an urban, low income, working class African American family. As a public school student, she saw first-hand the highly racialized system of mathematics-course tracking. These experiences shaped her work as a middle school mathematics teacher and her current work as a mathematics teacher educator. The litmus test for the validity of this chapter is the felt experiences of African American students and communities, as well as our

experiences as mathematics education researchers and teacher educators.[vi]

Equity, accumulated advantages and invisible racism

Before we move forward, it is important to define some terminology. Equity is an important concept for educators. It is most often juxtaposed with the term, equality. While equality is concerned with sameness, equity is concerned with fairness. If a tornados strike two towns, leveling one and causing minor damage in the other, equality would give both towns the same amount of help. However, equity would provide more resources to the town that was leveled, recognizing that it needed more help to be restored. Extending the analogy, if in one town residential areas were hit hardest, while in the other town infrastructure such as highways were hardest hit, equality would provide both towns with the exact same kind of aid. It would ignore the different needs. On the other hand, aid workers operating from an equity frame would provide the towns with the specific kinds of support they needed to regain their normalcy.

While the town analogies above are a good way to begin our understanding of equity, we must caution that they are merely analogies. They do not relay the complexities involved with achieving equity in social systems. In the case of schools, for example, differences/disadvantages/damages are not always material. In the case of two students where one comes from a household where multiple generations have advanced graduate degrees, and the other will be the first in her family to complete high school, we cannot simply hand the latter student a bag of "generations of college attendance." Such a bag would need to contain the decades of formal, and informal networks, the social positions, the power, as well as the wealth resulting from the degrees obtained over multiple generations of the former student's family.

Racism, then, can most easily be understood as those *accumulated advantages*.[vii] Being able to own property, operate a business, accumulate wealth from one's labor, and have one's rights and wealth legally protected, are all historic advantages that Whites had in the US. We can add to this list the psychological advantages that racism bestowed upon Whites such as an assurance of safety and personhood, individual fulfillment via being able to pursue one's curiosities and passions, and living in a society where one's cultural practices, physical features, and ways of being were seen as normal (and even superior) to others. Those historic benefits of being White have not disappeared. While it is no longer legal to deny Blacks the right to own property, the accumulated wealth that Whites have garnered by their historic acquisitions remain. In the context of education, this wealth matters greatly and manifests itself in the kinds of schools White children have access to, the salaries teachers in those communities can expect to receive, and the learning opportunities afforded to those students.

Perhaps equal to if not greater than these material advantages are the non-material ones. For example, a high school district serving a majority of White students

automatically offers very few low-level mathematics courses. White students learn mathematics from teachers (the majority of whom are White) who see their cultural practices, language, and communities as normal. The mathematics examples used in classrooms draw on the lives and experiences of Whites. White students get to experience built-in mathematics role models in the form of their mathematics teachers. White students get to learn mathematics from teachers who assume that they are intelligent, and come from an educated and concerned family. One can imagine a vastly different scenario. A high school district serving mostly African American students offers mostly low-level mathematics courses and only a few high level ones. Black students learn mathematics from teachers who see their cultural practices, language, and communities as deficient. The mathematics examples used in classrooms do not draw on the lives or experiences of African Americans. With very few Black mathematics teachers, African American students do not experience built-in mathematics role modeling. Black students may or may not learn from teachers who assume that they are intelligent and that they come from an educated and concerned family. These advantages and disadvantages- this racism- operates in virtual invisibility in mathematics classrooms, in schools, and in US society. In his now classic 1947 work Ralph Ellison wrote, "I am an invisible man. No I am not a spook like those who haunted Edgar Allan Poe; nor am one of your Hollywood ectoplasms. I am a man of substance, of flesh and bone, fiber and liquids-and I might even be said to possess a mind. I am invisible, understand, simply because people refuse to see me" (prologue, p.3). [viii]

The invisible racism of which Ellison and others have spoken helps to explain why despite the dismantling of legalized discrimination, deep patterns of racial inequity persist. Invisible racism is a super and sub conscious reality in US society and persists despite the average citizen's belief that they are not racist. Examining this notion, the vast majority of US teachers, principals and school personnel would never use the N-word towards a student, sit all of their Black students at the back of their classroom, or implement a policy where Black students received only the most outdated text books. Each one of these acts would be considered racist. However, thousands of teachers and principals operate in schools where Black students receive inadequate academic preparation, receive mathematics lessons with low cognitive demand, are overlooked for gifted testing, and are rarely enrolled in honors or Advanced Placement mathematics courses. These practices continue virtually uncontested. This is because racism is etched into our norms, ideations, and projections. It helps to explain both what we do and as Ellison declares what we *refuse* to see.

Below we examine how invisible racism functions through a particular aspect of the system of mathematics education to afford disproportionate access to material and psychological resources for educational success.

Invisible racism operating through school mathematical practices

Invisible racism is perpetuated through the system of mathematics education in large part due to a lack of recognition of the relation between current practices and broader cultural and historical processes. In this section we illustrate how the characteristics of what we call *school mathematical practices* are shaped by (and shape) socio-historical processes and have implications for the experiences of racialization of students, their families and society writ large.

School mathematical practices are particular types of cultural practices that involve learning mathematics in school. Cultural practices such as this are orchestrated by individuals in their moment-to-moment social activity as individuals embody particular roles, expectations and values in pursuing personal and collective goals [ix]. In the mathematics classroom, this involves the teacher and students engaging in activities that they take to be learning mathematics. This moment-to-moment activity is necessarily shaped by cultural expectations, norms, structures, and systems of meanings functioning at broader scales, which are ultimately linked to those of particular ethnic and racial communities.[x] For example, there is often an assumption that students' achievement in school is a direct result of their level of effort. This story of motivation and achievement functions in classrooms to provide categories for students ("motivated", "lazy"), and is also an aspect of White privilege, in which the accumulated (dis)advantages of non-White communities are not made explicit. Individuals respond to expectations and meanings at these broader scales as they engage in local cultural practices that have become routine and transparent over time.[xi] This means that as individuals go about their daily lives, they are involved in producing and re-producing culture, privilege, marginalization, and racism. We are not generally aware, however, of the minute and mundane ways that we perpetuate racism, since cultural practices are highly interconnected and interwoven into the fabric of our everyday lives.

This perspective on racism—as re-made in daily life through cultural practices, instead of contained in specific acts and structures—is central to the racialization of mathematics education. Forms of mathematical knowing and reasoning that are common in school are embedded in cultural practices, and these practices can be traced to particular racial and ethnic communities. In the sections that follow, we outline four features of school mathematical practices that distinguish them from other forms of mathematical activity, and that perpetuate systemic inequality for White and Black students.

Feature 1: School mathematics practices were produced largely within White communities

Historically, school mathematical practices have been tied to social and cultural communities comprised of mathematicians, scientists, and mathematics teachers.

Statistically speaking, these communities comprise individuals from White, middle to upper-class backgrounds. Mathematics that has been developed for centuries by communities around the world is largely missing from school mathematics curricula. Instead, the cultural practices of school mathematics (that includes use of tools such as textbooks) have been modeled after ways of communicating and reasoning mathematically, and of organizing social relations in ways that reflect the practices of Whites in Western nations who have had the opportunity to attend college and were largely successful in mathematics. These practices reflect a set of value hierarchies organized in these communities about what is powerful, perceptive, legitimate, and virtuous activity in the world.

Since school mathematical practices are tied to middle and upper class White communities, children from these communities have greater access to preschool and informal familial and communal practices that prepare them for elementary school mathematics. This is not to say that these children possess a greater *understanding* of mathematical concepts; rather, that they have learned mathematical procedures and ways of reasoning that are privileged in school. These accumulated advantages with respect to school mathematical practices makes the playing field unequal at a very young age. While this is true for most school subjects, the features described in the subsequent sections serve to exacerbate these early disparities in mathematics education.

Feature 2: School mathematical practices draw from stereotypical views of mathematical activity and are treated as isolated from other cultural and social activity

When asked to draw a picture of someone who does science or mathematics, children often sketch a White man working alone with lab equipment or on complex mathematical formulas and laws.[xii] This image of mathematicians as White, male and isolated forms as early as elementary school among children of all different racial backgrounds, and undergirds the assumption that mathematics is a part of White communities. This image also reinforces the idea that in comparison to most school subjects, which involve perspective, judgment, and interpretation--mathematics is cut and dry. The mathematics that students learn in school is “beyond debate”, since it was discovered or invented by mathematicians long ago, and can be repeatedly proved through logical thinking processes. As a result, mathematical concepts, principles, procedures and solutions are taken to be self-evident, meaning that they can be arrived at through processes that do not depend on cultural perspectives or values. Children who demonstrate prowess in mathematics are viewed as having a genetic predisposition for logical-mathematical reasoning. The relation of children’s natural giftedness in logical reasoning to their membership in White communities is unmarked.

While mathematical reasoning draws heavily on logical deduction and the manipulation of symbolic notation, mathematics is also an applied, creative and intuitive

activity that involves actively mathematizing the world.[xiii] Numerous professional communities develop and produce mathematics in the process of carrying out tasks and solving problems (e.g., engineers, artists, economists). More importantly, human beings engage in creative mathematical activity in their routines of everyday life.[xiv] This mathematical activity is shaped by the context that we find ourselves in (e.g., a grocery store versus basketball practice), the tools available to us for carrying out mathematical process, and our goals. We don't even recognize that we are doing mathematics because it simply becomes a tool in service of a broader goal. Thus, mathematical activity is first and foremost social and cultural activity, and many of the mathematical concepts addressed from Kindergarten through high school become familiar to us first outside of school.

To treat mathematicians as independent from a professional community is also unwarranted, and assigns them a position of privilege in society. Even when working alone, mathematicians are continually building off of each other's ideas and communicating their findings to a broader community. The community of mathematicians functions like any other community, in that it develops, engages in, and is constantly changing a set of practices and norms for carrying out its activities. These norms and practices reflect certain values and perspectives about the world, which are derived in cultural and racial communities. While all professional communities have ties to racial and cultural communities, as mentioned earlier, the community of mathematicians has largely remained been White and male. Thus, these links remain strong. To situate judgments about the validity of mathematical practices solely with this elite community, then, without interrogating the relation of the practices valued by this community to those of particular cultural and ethnic communities is problematic.

These narrow images of mathematics, who can do it, and what does and does not count as legitimate mathematical activity supports a perspective of *mathematics learning* as a straightforward and individual process, in which a select group of students can reason deductively until arriving at a correct solution. Stories of mathematical ability as based in the genetics (of White communities) and of mathematical activity as an individual process based solely on logical thinking processes, have made mathematics education an ideal candidate for the functioning of invisible racism.

Feature 3: Learning mathematics in school is equated with the memorization of abstract mathematical procedures

Following from the perspectives of mathematics described above, school mathematical practices tend to be organized around individual seatwork, in which students commit to memory a set of procedures and apply them to large problem sets. This is in contrast to the preponderance of research that indicates that productive mathematics learning involves actively making sense of mathematical concepts and procedures and the connections between them.[xv] Engaging students in rich conversations around multi-faceted mathematics problems in which they are asked to explain, justify and critique mathematical ideas with each other not only promotes deeper learning, but also enables a greater range of students to perceive themselves as capable of doing

mathematics.[xvi] The recently adopted Common Core Standards for K12 Mathematics builds on this research through standards for mathematical content and classroom practices.[xvii] Yet, school mathematical practices have remained largely stagnant over the past twenty years, despite the efforts of mathematics teachers, mathematics teacher educators and administrators to initiate this and other reforms. This situation holds true particularly for African American students in low-income schools that do not have the accumulated advantages required to support reform efforts like the Common Core.

Feature 4: School mathematical practices afford the use of measurable and quantifiable test questions

The fact that mathematics is viewed as primarily dependent on logical processes and that mathematics classrooms tend to be organized around the memorization and recall of mathematics facts and procedures has made mathematics a prime subject for the application of standardized assessments. Generally speaking, students are taught to solve mathematics problems using the specific procedures authorized (by the teacher or textbook) for the problems. Thus, if a child reaches a correct answer on a test, it can be assumed that the child has applied a proper procedure to solve the problem. This means that is it unnecessary to evaluate the student's reasoning process: the solution stands on its own. Situations like this, in which a child's response to a multiple-choice question is assumed to directly and accurately measure the skill or understanding being assessed lends itself to the use of standardized assessments. Unlike in other subjects, in which there is accommodation for misinterpretations of a question or problem, or for different forms of reasoning, school mathematical practices support a perspective of mathematical solutions as unequivocal. Since the solutions are decisive, and the scores are treated as an accurate representation of mathematical ability, they can be used to compare children's capacity for logical thinking processes.

We have shown, however, that to a certain degree what is being measured by standardized tests is a child's ability to participate in the practices of school mathematics. As described above, the practices of school mathematics are linked to a particular vision of mathematics, to the community of mathematicians, and ultimately, to White communities. Given this scenario, it makes sense for there to be a significant gap in the scores on standardized tests of achievement between White and Black students. Black, Latino and students from other less-dominant racial and ethnic backgrounds are being compared to their White peers based on a system that privileges Whites. By definition, then, mathematics education is a system of White privilege.

It is important to emphasize the word "system" in our argument. The features of school mathematical practices are interrelated and mutually dependent. Because of this, we do not lay blame for the racialization of mathematics education with a particular community, practice, or idea. For many years, mathematicians have attempted to

diversify their community to invite more women and groups from less-dominant ethnic and racial backgrounds. These efforts have largely failed, we argue, in part due the invisible racism that pervades K12 mathematics education. As mathematics education researchers, we also understand the importance of disciplinary research informing practice and policy. However, taking a sociocultural perspective on education means that we cannot separate disciplinary ideas from how they play out in classrooms and educational contexts. We view the recent turn in educational research towards a model of practice-research partnerships, in which researchers work alongside practitioners, policymakers and communities leaders to address our children's educational experiences to be a step in the right direction.[xviii] Research-practice partnerships in mathematics education, in particular, must attend to the role of broader contexts, historical structures and current practices in shaping opportunities to learn mathematics for different groups of students.

Implications of the Invisible Racism of School Mathematics

The implications of school mathematical practices for the perpetuation of privilege and oppression in society are numerous. Here, we focus primarily on ramifications for the views of intelligence, the practice of tracking, and identities of White and Black children as capable human beings.

First, the stories of mathematical ability as based in genetics and of mathematical activity as the definitive act of rational thinking have made mathematics a proxy for the measurement of general intelligence. The shape of the curve generated by scores of standardized exams of mathematics can be mapped onto a bell curve of intelligence, whereby the individuals in the lower quartiles (Black and Brown) are perceived to be less naturally gifted than individuals in the upper quartiles (White and Asian).[xix] The dual mappings play into societal stereotypes about which racial and ethnic groups are more intelligent than others. This mapping is also reinforced by a view of intelligence as a singular, fixed trait (versus malleable and multi-faceted components of a complex system), which again can be easily correlated with another heritable trait: skin color. When viewed as proxies for intelligence, scores on high stakes mathematics assessments can also serve as objective and indirect assessments of students' potential in and beyond college. This is a primary means through which learning mathematics in school becomes a racialized experience for students. As White and Asian children continually receive higher scores on the tests than their African American, Latino, and Native American peers, and these scores are treated as indicators of ability and college readiness, mathematics education fuels societal privilege and oppression along racial lines.

Students' scores on math tests are also a key means of sorting and differentiating students into different academic groupings in school. We are referring here to the practice of tracking, in which students are distributed across different levels of a subject area based on educational achievement and "promise". There has been a tendency for schools

to use mathematics scores (and fluency in the English language) as the primary mechanism for tracking their students. Formal tracking begins around middle school, when students are placed into pre-Algebra or Algebra around 8th grade. (Note that as Western nations push through standards for all students to take algebra while in middle school, formal tracking occurs before 8th grade.) The informal practice of tracking starts much earlier, when students are placed into ability groups in their elementary school classrooms. On the face of it, teachers employ tracking to differentiate the curriculum for their learners. Research indicates, however, that students are often "stuck" in tracks that preclude college preparatory courses, and that tracking tends to fall along ethnic and racial lines [xx]. The result of early tracking is that Black students have less access than Whites to mathematical understandings that are critical to Algebra learning in middle school, and as a result, are not able to take the math courses required for college entrance.[xxi] In other words, tracking inhibits the opportunities to learn of Black and Brown students.

In addition, because mathematical intelligence is viewed as a reasonable measure of intelligence, success and opportunities in school mathematics are guarded vigorously. Researchers have documented situations in which upper middle class parents fight for their children to be placed in the highest mathematics tracks as early as elementary school, and will attempt to dismantle efforts to de-track mathematics courses. Jeannie Oakes and colleagues have documented the struggles of schools and districts to de-track their courses and provide the same high level curriculum across all student groups.[xxii] Time and again these efforts are thwarted when more privileged parents insist that their students (based upon test scores or other measures) should receive additional services and opportunities. Studies also show that holding grades and test scores constant, White students were still more likely to be placed in higher tracked mathematics courses. Many of these placements were based on informal means-such as a parent's request or teachers' judgments about students' behavior.

Tracking and surveillance of school mathematical practices, together with the perception of mathematical capacity as a measure of general intelligence, has had profound implications for the perspectives of Black students and communities about their capacity as humans. Not only do students' identities as mathematics learners shape their achievement and persistence in school mathematics, and vice versa, but mathematics achievement shapes students' perspectives of themselves as mathematics learners (and tacitly, we argue, intelligent human beings).[xxiii] Reconciling one's racial identity with an identity as a mathematical learner can have deeply negative connotations for Black students. [xxiv] The negative perceptions and hidden stereotypes that follow from participating in school mathematical practices and the achievement gap based on race and ethnicity wreak havoc with the identities that Black and Brown students are developing on a daily basis in mathematics classrooms. Again, the relation of school mathematical practices to particular social and cultural communities remains hidden, leading groups of students to attribute their success or failure to (in)ability, (lack of) effort, and membership in a particular racial group.

Not only do these narratives and discourses shape how Black and Brown students see themselves, they shape how they are seen by those in charge of educating them: their

mathematics teachers. Na'ilah Nasir and Niral Shah's 2011 research with African American male mathematics students demonstrated that 1. These students were aware of the narrative that cast Black students as bad in math and Asian students as good in math; 2. Acknowledging this stereotype, Black students routinely pushed against it- providing counter stances and narratives; and 3. These students had to contend against the narratives that teachers held about them as young Black males (i.e. juvenile delinquent and class clown).[xxv] Nasir and Shah conclude that their data,

"suggest that African American students do not typically have a choice to simply ignore these issues, as their awareness of the narratives means that the narratives are salient artifacts within the classroom space that may be deployed against them in some way, usually to position them in ways detrimental to learning. … The young men and boys that we interviewed were, thus, not simply aware of racialized narratives about school and math performance; they found themselves regularly needing to respond to these narratives. … As educators, and as a society, we cannot underestimate the burden such negotiation places on student." (pp.41-42)

In the sections that follow, we explore how school mathematical practices play out in the activities of teachers and students in the mathematics classroom. Likewise, we examine how classroom mathematical activity serves to reinforce broader structures and policies through which school mathematical practices flourish.

School mathematical practices within the mathematics classroom

Mathematics classrooms tend to be places where students become easily sorted and categorized into competent and incompetent members, and in which students have little opportunity to contest this system of meaning. Categorization occurs along the lines of students who are "smart" and "motivated", versus "lazy" and "slow".[xxvi] Why is categorization a prominent feature of math classrooms versus other classrooms? It stems from the perspective of mathematics as a straightforward process of achieving the correct answer in as little time as possible. In this way, you either "get" the answer (and over time, mathematics), or you don't, and the time it takes you to do so correlates directly with your natural talent. The "mathematically intelligent" students quickly stand out, since they respond to the teacher's questions quickly and accurately, and receive high marks on their tests. As a result, mathematics classrooms tend to have fixed and highly visible hierarchies of intelligence, or what have been called *classroom status hierarchies*.[xxvii] Status hierarchies in mathematics classrooms generally follow racial and ethnic lines, reifying the perspective of intelligence as differentially distributed along the racial lines of students. Why are the classroom and societal hierarchies aligned? The reasons partially reside in the confluence of characteristics of mathematics described in

the previous section. The early socialization in ways of reasoning about and communicating about the world (and mathematics) that takes place before and during preschool mean that White children enter elementary school with forms of participation that are aligned with those valued in school. These school discourse practices favored White and Asian students in all school subjects. However, a very strict version of these discourse practices (focused on logical and abstract reasoning versus telling interesting stories or making sense of phenomenon in the world) are the only ones valued and counted in mathematics classrooms and rehearsed by White students at a very early age. Thus, groups of children quickly become stratified into these hierarchies and generally remain there.

Another factor is the heavy emphasis on classroom management, which follows from a perception of doing mathematics as largely dependent on logical thinking skills. This means that all other forms of activity are treated as detrimental to students' learning, and it is easy to distinguish the off-task activities from pure logical thought. This misreading of mathematics learning means that African American children who are expected to become socialized into the practices of White communities and who are pushing against this socialization and negative stereotypes about their communities can appear distracted, off-task, and/or oppositional.[xxviii] This early labeling feeds into tracking systems, through which children who have behavior issues are sorted into lower track math classes, and are eventually taken off of the college track. Being placed in a low track early in a student's educational career also has a negative impact on the student's self-efficacy and confidence in schooling broadly.

We have described how features of school mathematical practices perpetuate invisible racism and how they are cultivated in and through classroom mathematical activity. As mathematics educators, we are not arguing that the development of school mathematical practices in this way was intentional. Rather, we are arguing that mathematics as a domain and as embedded in the cultural practices of schools easily lends itself to the racialization of mathematics education. This focus on school mathematics learning as a cultural practice demonstrates that our system is not "neutral" or "natural". It is incumbent upon us, then, to expose this hidden system of racism, and to challenge the stories and perspectives that fuel it.

"First 15" mathematics in under-resourced, hyper-segregated schools.

We have spent considerable time in mathematics classrooms that serve African American and Latino students from poor, low income, and working class families. Many of the students are the children of immigrants. Others live in foster care, have parents who are incarcerated, and experience at least some degree of uncertainty related to meals and shelter. It is not our intention to present a deficit view of these communities. Like all other places in America, these communities want the best for their kids.

We have noticed that there are certain beliefs (and stances), however, that teachers and school administrations often take towards children and families in these communities. This stance is clear when one visits the front office and it is often clear when one visits mathematics classrooms. The mathematics presented in these classrooms is often of an inferior caliber- both in content (what gets taught) and in pedagogy (how students are engaged in what gets taught). Joi Spencer has characterized the mathematics problems that students in these classrooms work on as "first 15" problems.[xxix] Those who have worked from a typical mathematics textbook will recall that the first 15 or so problems at the end of a chapter or unit are designed to give students practice on the most basic ideas in that unit or chapter. These basic problems can be completed without much struggle. When you venture beyond these initial tasks, however, you are challenged to demonstrate a much greater depth of mathematical knowledge and skill. Tasks beyond the "first 15" are more likely to be aligned with the Common Core and other reforms, in that they push students to work with multiple concepts simultaneously, to demonstrate knowledge of mathematical rules as well as cases when those rules operate differently, to justify their solutions, and to consider the mathematical dilemmas of scientists, engineers, economists, and mathematicians. In hyper-segregated, under-resourced classrooms, students very rarely have an opportunity to work on these latter problems. Undoubtedly one of the reasons that African American and Latino students fare worse on standardized mathematics exams than White and Asian students is the kind of mathematics problems they are (and are not) presented with in their classrooms. As such, First 15 problems serve to under-prepare and under-develop these students in mathematics.

First 15 problems diminish student interest in mathematics. Because mathematics is presented in such anemic ways- as mere steps to follow, these students do not see the richness or purposefulness of the subject. Teachers might believe that giving students complex mathematics tasks (such as those found after number 15) will scare them away. On the converse, not allowing them to see the richness of mathematics, students become disengaged, lowering their participation in the subject. As students participate less and less, they actually learn less mathematics. As they learn less and achieve less, their opportunities to engage in rich mathematics get cut off through an insidious system of tracking. In predominantly Black and Latino schools, tracking manifests itself in a preponderance of low-level mathematics course offerings. In predominantly White and Asian schools (where Black, Latino, and Native American students are in the minority), mathematical course enrollments fall along racial lines. In both scenarios, low-tracked, low-level mathematics courses are almost impossible to emerge from- setting up students for few to no future mathematics and STEM opportunities.

First 15 problems also impact the relationship that students develop towards mathematics. Researchers Margolis Estrella, Goode, Jellison Holme, and Nao, compared technology courses in schools serving a majority of low income, students of color to those in middle class White schools. Their findings revealed much of what we see in the

mathematics education world.[xxx] Students in the former schools were offered courses in typing and word processing, while students in the latter were offered computer science courses. The authors demonstrated how schools' course offerings positioned students differently to technology. The students of color were positioned as consumers and users of technology, while the White and Asian students were positioned as its creators. Mathematics classrooms often recreate this same dynamic. They do not question mathematics, engage with it, banter with their teachers about, or even consider its purpose in the world. They simply follow its steps and obey its rules. The kind of instruction that these students receive, then, assures them that: 1. Mathematics cannot be questioned, and 2. Were it ever to be questioned, it would be done so by someone other than himself or herself. This positioning matters, because doing well in school is as much about how one performs as how one sees themselves in relation to the subject being learned. The powerful messaging embedded in our current system of mathematics education conveys to many White and Asian students that they are the thinkers, explorers, and conquerors- that mathematics belongs to them.

Low quality instruction, with few opportunities to develop mathematical skill, think deeply about mathematics, engage with others in sense making, and to acquire a sense of ownership, does not engender successful, resilient, and competitive students. This kind of instruction is normative and invisible in schools serving students of color. Few question it, and many do not even recognize that it is present. This instruction is maintained through discourses (these kinds of students are not capable of doing such rigorous mathematical work) and practices (we do not offer AP Calculus here because there has never been much interest in it).

In an effort to close the gap between the mathematics achievement of their Black and Latino students on the one hand and White and Asian students on the other, The Rockville Centre School District in Long Island, New York took definitive steps against watered-down "first 15"-type mathematics education.[xxxi] Beginning with their middle schools, all mathematics courses were detracked and infused with an accelerated curriculum. Unlike in previous years where only the highest achieving students were allowed to take accelerated mathematics courses, all middle-schoolers in the district took the same mathematics courses and all courses included the accelerated curriculum. The results of this new arrangement astounded the district. In previous years, merely 23% of regular education African American and Latino students passed the algebra-based regents exam in mathematics. After the new program, 75% of these students passed the exam. This program benefited White and Asian regular education students as well, helping to raise their passing rate from 54% to 95%. By the time that the first cohort of detracked and accelerated students graduated from senior high school, 82% of all African American or Hispanic and 97% of all White or Asian students earned the regents diploma.

Providing a high quality, engaging, and rigorous mathematics education to all children is possible. Such a provision can open up new identities as well as opportunities

for students of color. Reform mathematics alone, though, will not do away with the inequities that we see in mathematics education. Just as the high hopes accompanying the Brown v. Board of Education decision were diminished through institutionalized, invisible racism, inequity must be addressed on numerous fronts. While studies like the one above have shown that changes to mathematics instruction and tracking practices can narrow the gap, the long history of disenfranchisement among African American, Latino and other less-dominant racial and ethnic groups in mathematics education cannot be erased. Further research is needed to understand how this invisible system operates and can be dismantled at all levels of the mathematics education system.

Conclusion

The importance of mathematics education is rarely up for debate. The nation continually emphasizes this importance, the need for more mathematics teachers, and a greater focus on math and science education. Initiatives like Race to the Top, for example, center around STEM education[xxxii] and politicians from both the left and right promote its centrality to the nation's overall success. It is difficult to untangle mathematics education out of current STEM fervor. However, as mathematics educators we feel it is critical to challenge its preeminence in society, and to lay bare its function in diminishing and de-humanizing Black and brown communities. Because mathematics is currently the measure of intelligence, communities of people that hold mathematics knowledge have an unwarranted position of authority over those communities that do not.

Moving the entire nation towards greater mathematics achievement will be a function of truth telling in relation to why so few students of color currently achieve in mathematics. To begin with, the racism that exists in society, schools and classrooms must be brought out of its shadows. Mathematics achievement is rarely won on a level playing field. Notions of a racial hierarchy in relation to intelligence in general and mathematics intelligence specifically shape which groups of students receive the opportunity to learn mathematics, get positioned as smart, and which ones succeed. It does not take a mathematician to realize such inequities and to find them unacceptable.

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[vi] Our focus on African American students is intentional. Historically Blacks and Whites have been cast as racial binaries with Whites possessing positive and Blacks negative attributes. Blacks in US society experience persistently high rates of incarceration, unemployment, and overall low school success, which we identify as evidence of their racial positioning in US society. The positioning of peoples based upon skin color is not unique to the US as peoples with deep skin tones almost worldwide experience societal marginalization. Our decision to focus on African Americans, then, is intended to help the reader consider the case of students of color in general. It is in no way meant to discount the experiences of Native, Mexican American, Puerto Rican, Chinese, Japanese, and countless other groups who have and/or currently do suffer from the impact of racism in schools.
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