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Redefining Black Students' Success and High Achievement in Mathematics Education: Toward a Liberatory Paradigm

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> I always take two sets of notes,
> one to ace the test and
> one set I call the truth,
> and when I find historical contradictions
> I used the first set as proof–
> proof that black youths' mind are
> being polluted, convoluted, diluted,
> not culturally rooted. …
> They'll have you believe other wise
> Their history is built on high-rise lies
> the pyramids were completed
> before Greece or Rome were conceptualized,
> then they'll claim the Egyptians race was a mystery
> you tell them to read Herodotus Book II of the histories
> it cannot be any clearer. …
> Black Students,
> Always take two sets of notes.
>
> – Asante (2008, p. 191)

In the opening poem M. K. Asante, Jr. speaks of two sets of notes (partially excerpted above). These words eloquently capture the dichotomy of the racial reality Black students face inside and outside of mathematics spaces. Though mathematics is typically considered completely objective, race-neutral, and culture-free, Martin (2008) asserts that Black students often learn in White institutional space:

> One can also understand mathematics education as White institutional space by considering who is allowed to speak on issues of teaching, learning, curriculum, and assessment and who dominates positions of power in research and policy contexts. In each instance, White scholars disproportionately fill these roles, an important signifier of White institutional space. (p. 390)

White teachers dominate the field of mathematics, another signifier of a White institutional space. In addition to being taught by White teachers, Black students learn that White men created mathematics, and the purpose for learning mathematics is to get a high-paying job in White institutions. These assertions make up the crux of the Euro-

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centric paradigm that pervades school mathematics and only serve White interests. These assertions do not lead to liberatory outcomes for Black people. In a liberatory paradigm, Black students must be taught to think communally and must be part of the process of developing institutions and systems to support the economic, political, social, and cultural advancements of their people. Thus, as Asante explains, Black students must take two sets of notes: one to pass the test and another to learn how to use mathematics to support liberation for themselves and their people.

There has been a movement in mathematics education to achieve liberatory outcomes for Black students. Over the last 10 years, there has been a paradigm shift in mathematics education towards a focus on Black student success and high achievement (Berry, 2005, 2008; Jett, 2010, 2011; Moody, 2003, 2004; Terry & McGee, 2012) and providing them with a liberatory mathematics education (Martin, 2010; Martin & McGee, 2009). The paradigm shift has been led by critical Black scholars who seek to challenge the deficit discourse, inadequate conceptualizations of race and racism, privileged perspectives of mathematics, substandard instruction, and mistreatment of Black students in mathematics education research, policy, classrooms, and society (Anderson, 1990; Martin, 2008, 2009; Martin, Gholson & Leonard, 2010; Tate, 1993).

The current definitions of success and high achievement for Black students are based only on static data (e.g., test performance, grade point averages). The test scores and grades of White students are usually situated as the standard for how Black student success and high achievement are judged. This standard promotes an individualistic focus that mirrors a Eurocentric paradigm, conforms to the standard of Whiteness, and creates inadequate definitions and conceptualizations for a liberatory paradigm (Anderson, 1990; Harris, 1993; Martin, 2009). The standard of Whiteness is a form of property that dictates acceptable norms, behaviors, cultural practices, status, reputation, achievements, and performance in mathematics spaces and society. It also includes the exclusion of Black community. A liberatory paradigm is responsive to the distinct historical and contemporary needs of the collective Black community in mathematics education and society at large.

As the field of mathematics education moves toward a liberatory paradigm, definitions of success and high achievement must be reconceptualized to support liberatory outcomes. Given the United States' racist history and culture, the collective Black community is affected and has specific needs that deserve specific considerations that do not always align with those of the White community. Therefore, a Eurocentric paradigm will not and cannot serve Black people in the same way. For example, there was a period in history where it was illegal for Black people to receive an education. They were banned from learning reading and mathematics skills, but many of them clandestinely learned anyway, even in the face of death, because they knew the knowledge would not only benefit them, but also their family, community, and generations to come. Black people have always had to think and move with the

community in mind. True liberation cannot be achieved through individual pursuits.

In this essay, I describe and critique the Eurocentric paradigm that pervades mathematics education. I explain how the paradigm situates Black student success and high achievement to be aligned with the interests and standard of whiteness. I then describe key elements of the paradigm shift in mathematics education focused on successful and high achieving Black students and liberation. I redefine success and high achievement in mathematics by aligning it with a liberatory paradigm. For liberatory outcomes to be achieved, the expectations, preparation, and definitions of success and high achievement must be connected to the larger goal of Black liberation in mathematics education and society. I ground this liberatory paradigm in a diasporic view of Black history in mathematics, culture, values, and interests.

The Eurocentric Paradigm in Mathematics Education

The definitions used to describe success and high achievement for Black students in mathematics education are based on a Eurocentric paradigm (Anderson, 1990; Bishop, 1990; Martin, 2008) and standard of whiteness (Harris, 1993). The paradigm rests on the foundation that Europeans created mathematics and possess superior intellectual ability. This paradigm is based on European history, culture, interests (e.g., economics, military), and ways of knowing. It is also based on individualism, capitalism, European/White superiority, and the ranking and sorting of racial groups. There are cultural, political, and economic ramifications for the use of a Eurocentric paradigm with Black students (Apple, 1993). This paradigm misinforms Black students about their people's place in the history of mathematics and seeks to destroy their racial and mathematics identities. The Eurocentric paradigm teaches successful and high-achieving Black students to align themselves with European interests (e.g., capitalism, warfare), which are causing Black people harm the world over.

The mathematics curriculum used to determine success and high achievement for Black students is mainly based on the contributions of White men from Europe and North America. Anderson (1990) notes:

> The dominant curriculum in use today throughout the United States is explicit in asserting that mathematics originated among men in Greece and was further developed by European men and their North American descendants. … From generation to generation for centuries this type of Eurocentric "scholarship" has been reproduced in the objective and subjective pursuits of justifying racism. (pp. 349–350)

As Asante's (2008) poem suggests, the curriculum used in most schools does not teach Black students about the mathematics contributions of their ancestors and elders. It represents the implied, understood power of Europeans and Whites: "The decision to define some groups' knowledge as the most legitimate, as official

knowledge, while other groups' knowledge hardly sees the light of day, says something extremely important about who has power in society" (Apple, 1993, p. 222). This (mis)representation has been the status quo for hundreds of years, and at no point has there been a national effort to incorporate the vital contributions of Black people from Africa, North America, and across the world.

The grading and scoring system used in schools is based on a Eurocentric curriculum, individualism, and White superiority. It quantifies Black students' knowledge of Eurocentric ideas and gives no weight to their knowledge of the contributions of their own people. The grading and scoring system creates a ranking and sorting system that promotes individualism and White superiority that runs counter to the goals and objectives of Black liberation. By ranking and sorting the students based on the regurgitation and synthesis of racially biased information, American schools implicitly support the notion of White intellectual superiority.

Martin (2009) describes this ranking system as the racial hierarchy of mathematical ability, which positions Black students at the bottom and White students at the top. The racial hierarchy also applies to Black students' participation and achievement in higher level mathematics courses, in which they are underrepresented. This system supports the notion that few Black students possess mathematical ability worthy of participation in higher level courses. In essence, the system determines Black students' academic worth based on a White standard. This imposed hierarchy of mathematical ability inhibits liberatory outcomes for Black students.

The Paradigm Shift in Mathematics Education

There have been two major paradigm shifts in mathematics education that seek to challenge deficit views of Black students and achieve liberatory outcomes. The focus on successful and high-achieving Black students is one of the longest standing and most developed paradigm shifts. This body of research has given insight into the experiences of successful and high-achieving Black students at the K–12 and collegiate levels (Berry, 2008; Jett, 2011; Terry & McGee, 2012; Thompson & Davis, 2013; Thompson & Lewis, 2005). Success and high achievement most often have been defined based on grade point average, standardized test scores, and advanced placement course participation. This narrow definition is aligned with the Eurocentric paradigm and standard of Whiteness. There must be holistic definitions that support a liberatory paradigm.

Researchers have found that successful and high-achieving Black students have had (a) early exposure to mathematics; (b) family support and advocacy (e.g., parents, aunts, uncles, guardians); (c) participation in college level mathematics courses and program; (d) teacher and peer support; (e) involvement in extracurricular activities (e.g., math programs, sports); and (f) strong spiritual beliefs (Berry, 2008; Ellington & Frederick, 2010; Jett, 2010, 2011; Noble, 2011; Stinson, 2008; Terry & McGee,

2012). An important finding emerging from this research is that Black adults and peers contribute to and support Black students in achieving at high levels in mathematics. This finding illustrates the importance of relationships and community to Black students and how they help them to perform at much higher levels. This support also speaks to the need for successful and high-achieving Black students to give back to their community as a means of ensuring that others are supported as well.

The liberatory paradigm in mathematics education has primarily focused on pedagogy and research related to Black students. Martin and McGee (2009) argue, "Any relevant framing of mathematics education for African Americans must address both the historical oppression that they face and the social realities that they continue to face in contemporary times" (p. 210). In Martin's (2010) edited book *Mathematics Teaching, Learning, and Liberation in the Lives of Black Children*, he assembled Black mathematics education scholars and others committed to providing Black students with a meaningful mathematics education to "change the direction of research on Black children and mathematics" (p.vi).

These researchers have described Black students' experiences, socialization, learning, and identity development through the lens of liberation. However, there has been limited focus on the expectations of Black students in a liberatory paradigm in mathematics education. This focus is important given that Black students have been instrumental in advancing the Black struggle for liberation inside and outside of mathematics spaces. As the field moves toward a liberatory paradigm, the expectations for successful Black students must be defined.

Historically, Black people who have had intellectual, material, economic, and political resources have used them to advance the collective agenda and interests of their people. This collective effort also highlights the distinct cultural importance of the community over the individual. In a liberatory paradigm, successful and high-achieving Black students must make a similar commitment to use their resources for the collective upliftment of Black people in mathematics education and beyond.

A Liberatory Paradigm of Mathematics Education for Black Students

A liberatory paradigm requires Black students to first develop a liberatory mindset anchored in their history, culture, and interests. Central to this paradigm is the understanding that Black students have a responsibility to use their mathematical knowledge to help others and their community become self-sufficient. Ture and Hamilton (2011) assert:

> Black people must redefine themselves, and only they can do that. Throughout this country, vast segments of the black communities are beginning to recognize the need to reclaim their history, their culture; to create their own sense of community and togetherness. (p. 37)

Black people must redefine themselves and their ideas of success and high achievement to align with efforts toward total liberation. A focus on liberation in mathematics education is necessarily in opposition to the Eurocentric paradigm as well as Eurocentric interests and outcomes, such as growing their workforce and supporting international capitalism and warfare.

The success of Black students in a liberatory paradigm includes elements inside and outside of mathematics education. Black students must be taught their role in deconstructing and dismantling the Eurocentric paradigm. Black students must operate from the premise that mathematics is not purely an objective, neutral, culture-free subject matter or space (Ernest, 1991; Ernest, Sriraman, & Ernest, 2016). It is undergirded by the Eurocentric paradigm and, therefore, skewed toward White stand-ards and achievement.

A liberatory paradigm must inform Black students that the way mathematics is currently taught serves White interests and disadvantages Black students. This paradigm must include a re-education of the history of mathematics, specifically highlighting the contributions of Blacks from Africa and throughout the diaspora. Moreover, Black students must know that White adults and children are not the standards of achievement, success, or participation. They must also be taught that earning high course grades and test scores, while admirable, is not true success if it is based solely on Eurocentric mathematical knowledge, individualism, and the standard of whiteness.

True success must benefit the entire Black community and cannot be achieved if Black students have no knowledge of their ancestors' contributions to the field of mathematics. They must know that their people made important contributions and used mathematics to build great civilizations, specifically the first highly technological civilization known to humankind on the continent of Africa. There is evidence that arithmetic, algebra, geometry, trigonometry, and other advanced forms of mathematics originated in Egypt with Black people (Anderson, 1990; Bishop, 1990; Browder, 1992; Jackson, 1970; Van Sertima, 1991). There is also evidence that many prominent White male Greek scholars (e.g., Pythagoras, Euclid) studied mathematics from Black Egyptians (Anderson, 1990; Bishop, 1990; Browder, 1992; Jackson, 1970; Van Sertima, 1991).

This inclusive history is why Black students must take two sets of notes, to identify historical contradictions and provide proof for themselves that they come from great mathematical thinkers. Black students must know they are descendants of mathematically competent people who created great civilizations on the continents of Africa, the Americas, and around the world. Over time, this understanding can transform their thinking regarding their own ability to achieve.

The history of Black people's contributions to mathematics and how they used it provides a clear direction and purpose for what successful Black students must do with their mathematical knowledge. The liberatory paradigm for Black student suc-

cess does not focus solely on individual achievement but instead includes components of giving back, sharing and creating for the whole Black community. Mathematics should be used to help others and build Black communities all over the world. Black student success should be about the collective mathematical achievement of the Black community (Thompson & Davis, 2013). Therefore, successful students must help others acquire mathematical knowledge, especially those experiencing challenges.

No Black student has achieved success alone. There has always been family and community members who have made sacrifices and offered support in becoming mathematically successful (Hrabowski, Maton, Greene, & Greif, 1998). Successful Black students must do their part to ensure that others in their community are mathematically proficient. This requirement reinforces the commitment to the collective achievement of the Black community.

In the Eurocentric paradigm, there is no focus on using mathematics for the benefit of the Black community or liberatory purposes. It has an individualistic aim, to benefit and promote European history, culture, and interests. Although this focus does not align with Black cultural norms, there are still Black students who have to navigate White institutional spaces to become successful in mathematics. However, they are taught to advance White global interests, not Black liberation. These "successful" Black students are taught to use their mathematical knowledge to go to college and get high paying jobs, in companies owned mostly by White men (Kroll & Dolan, 2018). This focus diverts Black intellectual resources away from causes and efforts that support liberation. It also supports the advancement of technology that can be used to further international capitalism and warfare. This career track is perfectly aligned with the goals and objectives of the larger societal Eurocentric paradigm.

Liberated successful Black students know they should not acquire mathematical knowledge solely to get a high paying job. The current and historical position of their people makes that an unwise choice because they see the benefit of a cooperative economics agenda versus an individual and capitalistic agenda. Black students should use their mathematical knowledge to support cooperative economics and collective work and responsibility, which can benefit them, their family, and Black communities around the world. Perhaps the biggest difference between a Eurocentric paradigm and a liberatory paradigm is that the former can produce successful Black students in mathematics who go on to be good employees, but the latter produces Black students who are agents of change and purveyors of community improvement and institution building.

Closing Words

The reality of learning mathematics in White institutional spaces requires that Black students take two sets of notes. The first must be used to pass the test; the sec-

ond must be used to deconstruct and challenge the faulty mathematical knowledge that has been presented as objective, true, and culture-free. The second set of notes self-empowers Black students by informing them of their people's contributions to mathematics and the world. It encourages them to use their knowledge to produce liberatory outcomes for their people. The second set of notes is crucial for the development of a liberatory paradigm to situate Black students' success and high achievement in mathematics education. Until all Black people are liberated, Black students must be provided the knowledge, skills, and dispositions to navigate and achieve in White spaces, all while contributing to the liberation of their people. The Eurocentric paradigm does not focus on the collective achievement of Black students, so it must be abandoned. The focus on liberation for Black people in society has always been about the collective, not the individual. The same must be true for mathematics education.

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