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Addressing Dehumanizing Mathematical Practices: Using Supervisory Leaders' Experiential Knowledge to Transform the Mathematics Classroom

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Abstract

Deficit language concerning historically marginalized students pervades much of education today. Black, Brown, and Indigenous children experience marginalization and dehumanizing practices in classrooms instead of participating in a safe space to learn and grow. For this paper we employ a crucial component from Critical Race Theory to address systemic racism in schools: we listen to the lived experiences of professionals of color. These personal narratives open avenues for social justice through critiquing current and historical political, economic, and sociocultural practices and policies. This study examined how four Black collaborators – one high school principal, one middle school principal, one elementary principal, and one special education teacher – each with decades of instructional experience, address four key dehumanizing practices students of color experience in classrooms across the country in their own supervision practices.

Keywords

mathematics supervision; administration; social justice

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Introduction

Black, Brown, and Indigenous students living in the United States have not experienced the same levels of success in mathematics classrooms when compared to White children and those from more affluent communities. Students of color are participants in a hidden curriculum often unknown to them. This hidden curriculum enforces marginalization and dehumanizing practices in classrooms instead of creating a safe space to learn and grow (Battey & Leyva, 2016). If we analyze the histories of our standards, organizations, structures, and priorities, we can step back and see that they were set with a primarily White perspective using White expectations and beliefs. Students of Color learn *their place* within a biased system and culture (Martin, 2015).

In mathematics research, studies show that Black⁶ students are consistently outperformed by all other racial groups on assessments (NCES, 2021). This research, even in trying to establish a frame for social reform, perpetuates a deficit mentality that Black students cannot perform as well as others in their cohorts, and as such need to be fixed or remediated to catch up. Gutiérrez (2008) criticizes this ability-based research as a *gap-gazing* fetish in mathematics. She cautions that this research fails to account for student identity and agency by fixating on the notion that intelligence is a quantifiable measurement. It creates an *us versus them* dichotomy, where the success of some depends on the failure of others (Gutiérrez, 2008).

This societal meta-narrative concerning mathematical capability is far reaching. For example, the National Assessment of Educational Progress⁷ (NAEP), the country's largest standardized assessment, details on their own website that their test is "the largest nationally representative and continuing assessment of what America's students *know and can do* [emphasis added] in various subject areas" (NCES, 2021). This problematic language emphasizes that in education some children can, and some children cannot. Specifically, for Black, Brown, and Indigenous children, the discourse focuses on their internal deficits as students, placing blame solely on them for any academic failure (Latta, 2019; Valencia, 2010). What does not happen enough is research critically examining the pervasive White political, historical, and sociocultural hegemonies that structure and continue to structure the academic opportunities for students of Color (Ladson-Billings, 2006; Ladson-Billings & Tate, 1995).

Dehumanizing practices pervade many facets of education. These practices exist in the content and pedagogical choices teachers make in the classroom (Skrla & Scheurich, 2001). "What happens when we assume that certain children are less than brilliant? Our tendency is to teach less, to teach down and to teach for remediation" (Delpit, 2012, p. 6). As detailed above, Black students find themselves the focus of mathematical scrutiny that positions them into deficit narratives. We define dehumanizing as school practices and structures that prevent Black students from being recognized as equitable and worthy humans in the teaching and learning of mathematics. We instead often see Black students viewed as a test score, behavior problem, and incapable and/or not worthy of high-quality mathematics. This is what perpetuates the status quo

⁶ This article uses the term Black to represent students that originate outside African origins (United States Census Bureau, 2019), and to speak against the Anti-Blackness that perpetuates American society (Dumas, 2016).

⁷ Known as the Nation's Report Card. National based standardized test that yearly assesses a randomly chosen set of fourth graders, eighth graders, and 12th graders on a variety of subject areas (NCES, 2020)

(Stinson, 2004) and continually limits their rights and opportunities within and outside of the mathematics classroom (Oakes, 1986; Oakes et al., 2004).

Within the mathematics classrooms, educators and administrators should aim to deconstruct these dehumanizing practices that racialize mathematical capability (Martin, 2009). Focus needs to be placed on how mathematics education allows students to change the status quo, to address meritocratic rhetoric that stratifies children into *haves* and *have nots* (Martin, 2006). Humanizing mathematical practices can transform the classroom into a space for restorative social justice and learning (Friere, 2000). This critical examination must incorporate the fact that racism is an ongoing force within the country, and that the educational community must dismantle these dehumanizing practices to create a just society for, not only Black, but all marginalized students.

Theoretical Framework

To address dehumanizing pedagogical and content practices, we borrow the crucial component from *Critical Race Theory* (Dixson & Rousseau Anderson, 2006; Ladson-Billings & Tate, 1995; Solórzano & Yosso, 2002) concerning experiential knowledge. Critical Race Theory contends that to address the continued cycle of racism in schools for students of Color, we must listen to the lived experiences of those that have engaged/engage in these hegemonic structures. To accomplish this, Solórzano and Yosso (2002) emphasize the need for social justice researchers to focus their studies on the experiential knowledge of people of Color. Critical Race Theory draws from their lived experiences by using non-traditional forms of methodology and methods.

One method for Critical Race Theory research is using the narratives to center those that have been placed on the fringes of society. Researchers privilege their stories as crucial to analyzing and understanding the social phenomenon occurring (Solórzano & Yosso, 2002). These shared stories aim to empower people of Color. Personal narratives give rise to the richness and value that comes from lived realities (Terry, 2011), to allow society to see the ways in which their experiences provide avenues for social justice through critiquing political, historical, economic, and/or sociocultural practices and policies that position them as “Other” (Solórzano & Yosso, 2002). These realities encourage researchers and participants to collaborate towards dismantling established educational (and societal) hegemonies. The goal is to create a new educational community, one that embraces all students of color to develop fully enriched lives. (Terry, 2011).

Methodology

This research borrows from Solórzano and Yosso’s (2002) method for collecting stories as an analytical framework: these narratives were developed from our own professional experiences, existing literature, and our co-authors/educational supervisors’ experiential knowledge (Solórzano & Yosso, 2002).

Professional Experiences

Author One. Author One is a middle-class, White, English-speaking female. She spent four years working as a secondary mathematics teacher at her local city's alternative⁸ school. Through her first-hand experience in this environment, she became aware that her school system's academic expectations and opportunities for her Black students did not equal those of White students. It was from this professional experience that she chose to return to university to pursue a PhD in Curriculum and Instruction, Secondary Mathematics, focusing on mathematical curriculum that humanizes mathematical spaces for Black students. She is currently in her sixth year of her graduate program.

Author Two. Author Two is a middle-class, White, English-speaking female. She was an elementary school teacher for nine years and an instructional coach for three years. Her teaching experience includes a year of teaching in a private school for students with dyslexia, three years in a Title 1 school, and five years in a suburban community school. Her coaching experience was in a rural district with a large population of English Learners. Her teaching preparation program and PhD program both had an urban school focus. She is a National Board Certified Teacher (NBCT) and is a mathematics teacher educator. Author Two has worked with four of the co-authors in different capacities: a fellow teacher colleague, professional development provider, instructional coach, and instructor.

Existing Literature

We pulled from predominant transformative mathematics researchers (for example see Berry et al., 2011; Martin, 2009; Stinson, 2006; Terry, 2011) to develop a more in-depth understanding of dehumanizing mathematical practices faced by Black students. These researchers studied the influential power of racist meta-narratives in education. Like Solórzano and Yosso (2002), we used this literature to compare and reflect on our own professional experiences to closely examine predominant content and pedagogical practices that Black students encounter daily in the mathematics classroom.

While there are many practices that dehumanize Black students in mathematics, this paper highlights four key themes that mathematics researchers' detail as repeated practices in schools across the country. These are: (a) colorblindness (Bonilla-Silva, 2003; Fergus, 2017), in which educators ignore the race of their students to the detriment of their student's academic and emotional growth; (b) deficit and stereotypical views (Berry et al., 2011; Stinson, 2006); (c) limited or lack of meaningful mathematics opportunities (in and out of class time) (Delpit, 2006; Oakes, 1986; Oakes et al., 2004; Strayhorn, 2015; Strayhorn et al., 2013); and (d) an intense focus on discipline (Boucher, 2016; Skiba et al., 2002; Wald & Losen, 2003), where Black students face stricter punitive repercussions than their peers. We acknowledge that there exist many other dehumanizing practices that need addressing by researchers and the community at large.

⁸ By alternative education program, the author means a non-traditional school site to support the educational needs for students at risk of school failure or school expulsion.

Co-Authors/Educational Supervisors' Experiential Knowledge

Experiential knowledge refers to the sense making and knowledge someone achieves through personal experience. Critical Race Theory recognizes the legitimacy and need for experiential knowledge to be used to critically analyze racial injustices (Delgado Bernal, 2002). However, Black leaders' voices are often silenced or marginalized in the discussion for educational reform. This misses a crucial perspective on how to address dehumanizing practices, as those that experience racism are best positioned to question and provide options for change to majoritarian systems (Sleeter, 2016). For this work, we sought to center the perspectives from Black leaders who lead and support predominately White faculty.

This specific study arose from a mutual collaboration between the first and second author. The first author spent a semester as a student in the second author's graduate education class. We realized quickly that we shared a passion for transforming mathematics for Black students. From that realization, we wanted to collaborate on an exploratory study that used the voices of Black educational supervisors to start a dialogue on how to address on-going dehumanizing practices that both authors recognized through personal experience and professional research.

Additionally, we recognized our limited understanding concerning these racialized experiences due to our whiteness. Through a continuing conversation, we chose to bring in four prominent educational Black leaders that we had worked with to help open our own understanding of how these leaders understood and addressed our four chosen dehumanizing themes. We recognize that this study is limited in its scope, but we believe it provides a productive dialogue in how to dismantle destructive mathematical teaching practices.

Co-Author Supervisory Leader 1: Euphemia⁹. Mrs. Euphemia has spent the last twenty-five years in education. She has served students and families in several roles including as a classroom teacher, an instructional coach, an assistant principal, and currently an elementary principal in a southeastern state. Her influence is apparent throughout her district as she works alongside her peers in strategically planning and implementing a vision for teaching and learning that prepares all students for college and career readiness. She serves as a member of the pilot team for Competency-Based Education and Assessment for a southeastern state. Mrs. Euphemia believes that a solid culture and climate is the foundation for a strong learning community. She strives to make school a place where all students are excited to learn and grow as leaders in their school community and beyond.

Co-Author Supervisory Leaders 2: Marjorie. Dr. Marjorie is a compassionate educational leader, who understands the value of leading for transformational change and the value of developing instructional leaders. Dr. Marjorie has nineteen years of experience working as an educator in a southern state. For nine years, she has applied research-based practices as an elementary and middle school instructional leader. Dr. Marjorie has also served as a regional instructional coach. She is credited with transforming the culture in two secondary schools. With her team, she has won several awards, including, CLAS Banner School, School of Distinction for two years, School Showcase Award, School Safety of Excellence, Blue Ribbon Lighthouse

⁹ Pseudonyms used. Names chosen using famous Black mathematicians.

Award, and many more. Dr. Marjorie has led school improvement reform, facilitated professional learning communities, and mentored many aspiring leaders.

Co-Author Supervisory Leader 3: Hewitt. Dr. Hewitt has served students in many capacities including: classroom teacher, curriculum specialist, and secondary school principal. She is credited with transforming an alternative education program and a largest high school into a safe and nurturing learning and working environment. She and her team have garnered several state and national recognitions for their efforts in improving student outcomes. This includes recognition for increased graduation rates and post-secondary school placement. Dr. Hewitt understands that successful schools have healthy school cultures. She believes that all students will rise to their highest potential when supported by highly effective teachers and administrators.

Co-Author Supervisory Leader 4: Samuel¹⁰. Mr. Samuel has taught for twenty years in several school districts within a southeastern state as an elementary and special education teacher. Mr. Samuel served as an assistant high school football coach for seventeen years and has four publications. Mr. Samuel is currently a Special Educator with the PASS (positive approach to student success) program in a rural district outside a large urban area in a southeastern state. Mr. Samuel believes that our role as educators is to pitch information where students can get a hit and not a strike.

Research Question

This study addresses the following research question: How do Black educational supervisors address four identified dehumanizing practices in the teaching and learning of mathematics?

Data Collection

Data collection occurred over the Spring 2016 semester. Each co-author was asked to collaborate with the first two authors on this study. The four dehumanizing themes were decided prior to dialoguing with Euphemia, Marjorie, Hewitt, and Samuel. However, we allowed the four of them to guide the direction of our conversation as they provided insight into how these themes occur and are addressed in their schools. Collected data came from dialoguing with each co-author in person, on Skype, through email, and/or through phone calls. We provided each co-author the opportunity to go back through their conversations to correct, remove, and/or provide more clarity. We present their narratives below, interweaving what prominent mathematics research has found to help situate each dehumanizing theme.

Findings

Each of our co-authors provided valuable knowledge in addressing the four dehumanizing themes of this study. For colorblindness, all four supervisors demanded teachers embrace the

¹⁰ Author One and Author Two recognize that Samuel is not serving on an administrative supervisory level, but we believe his experience and knowledge overseeing and working with a multitude of teachers positions him as a supervisor. His experience and insight were a valuable voice to add.

beauty that is color, to question implicit and explicit biases that White teachers' hold, and to develop relatable lessons for their students. In response to deficit mentalities, the supervisors urged the need for high mathematical expectations at all times for students. By doing so, teachers implement exploratory lessons that allow students of color to unpack mathematical standards conceptually. These lessons, coupled with STEM opportunities (e.g., robotics) allow for meaningful mathematical opportunities that develop the STEM identity of Black, Brown, and Indigenous students. Lastly, regarding the overabundance of disciplinary actions against Black students, the implementation of restorative justice pedagogy and opportunities for alternative forms of discipline (community-based service options) were offered as ways to combat inequitable behavioral expectations.

Colorblindness

While the percentage of students of color grow in today's classroom, most teachers remain White – 79% being White, non-Hispanic (NCES, 2020). Although we often hear teachers say, “I don't see color, I love all children,” White teachers are still members of the majoritarian group within society. The narratives perpetuated against people of Color are soaked up by White educators from birth. As a result, White teachers inadvertently engage in a pedagogical practice known as colorblindness. According to Bonilla-Silva (2003), colorblindness is a result of White people engaging in four different mentalities: abstract liberalism (each individual person has equal opportunities for success, ignoring institutional practices such as de jure and de facto segregation); naturalization (racial phenomena is naturally occurring and racism is unavoidable); cultural racism (racial groups are responsible for their own misfortunes in society); and minimization of racism (racism/discrimination no longer plays a role in minorities' opportunities). These four frames are not isolated in nature; White people engage in combinations of all four.

Delpit (1995) ascertains the dangers of making children invisible by saying that, “...if one does not see color, then one does not really see children (p.177).” By engaging in this pedagogical practice, teachers replicate social, cultural, and educational structures that uphold White privilege. The lack of acknowledging the differences in the lived experiences of students of Color compared to their White peers results in maintaining a false status quo for all (Fergus, 2017). Unknowingly teachers create a caste system in their classroom – White and Other.

This frustration was demonstrated in our conversation with our elementary principal. When describing her experience with her White teachers engaging in colorblindness, Euphemia explicitly had to warn them about the repercussions of this pedagogical choice, “You may think you are [colorblind], because you believe that you are not racially biased, but come on. When you say that, it makes me think that you are not acknowledging children of color and their culture and background.” Euphemia understood the inherent dangers that result in ignoring the identity of children. Without educators understanding that race plays an inherent role in a child's life, vital learning opportunities are missed. Euphemia continued, “we have an identity that needs to be recognized... We are not all the same and should not be taught the same. Differentiate instruction for children of color.”

Hewitt also described similar frustrations when dealing with colorblindness with teachers. She detailed this practice as racist, and that if a new teacher continued to engage in such a manner, he or she would not be considered for another year of teaching. Like Euphemia, Hewitt wanted educators to see the beauty that color brings to the classroom:

See color in the policies you have put in place. Question color! In our field, it is critical. It is what makes us rich. It makes us reflect on whether equitable opportunities are truly available to all students. People are different and color (heritage, cultural) in many cases makes us even more uniquely beautiful.

Marjorie, a middle school principal, advised us on how she helped structure her schoolteachers to move from this mentality to embracing a more culturally responsive frame, “As a leader, I set clear expectations with a vision for teaching and learning. This includes a vision to develop culture around learning and not socioeconomic status and race.” Marjorie engaged her teachers to reflect on gut reactions. What caused these misconceptions about Black students to occur? She required her teachers to participate in professional development that unpacked preconceived biasness. This was achieved through reading numerous articles and attending district workshops. Additionally, Marjorie had teachers take part in poverty simulations to *see life* through the footsteps of her students’.

Samuel shared that he engaged in comparisons to help change the perspective related to colorblindness. Sometimes he gave the example of a guy in a wheelchair, and asked “do we see a home and provide a ramp or not?” He said he often saw teachers who are less tolerable for those students from a different background. He reminded them that he was that kid and came from where those students came from. Teachers need to always hold high expectations for their students.

Deficit and Stereotypical Views

Besides colorblindness, there are other problematic perceptions White teachers hold about their Black students. These preconceived notions center around deficit and stereotypical views that ultimately hinder mathematics teaching and learning. For example, the deficiency language concerning Black students holds real consequences for both students and teachers. Stinson (2006) discussed how this negatively influences Black students: “African American children, specifically African American male students, are often characterized as incapable of measuring up to the schools’ predetermined goals and objectives and lacking the behavioral and social skills and life experiences to be academically successful” (p. 485).

Deficit and stereotypical views result in Black students’ academic experiences suffering. Students see their teachers’ lower academic expectations (Berry et al., 2011). Zero tolerance rules and more punitive punishments come from administrators (Payne & Brown, 2017). These practices can be seen in the tracking of students to remedial mathematics classrooms, class groupings, and the type of work assigned.

Samuel set the stage with this statement:

Most educators -- it's all about them and their content. They don't connect student success to their success. I have a coaching perspective. When we think about the draft, we all want LeBron James. But what it is what we do with the third, fourth, and fifth players in the draft that makes a team successful. This is just like the classroom. We have to build kids up and use their strengths, not break them down focused on weaknesses.

To address deficit thinking, Marjorie set the expectation of focusing on things that her faculty can control. She did not want to hear the blame game statements. She shared her advice with us:

We can't control families and home, only the happenings at school. We have eliminated excuses in our data meetings and observations. We have a focus on instruction -- I want to see small groups and manipulatives with high quality mathematics experiences. We are preparing them for a global society. Real world is small groups, thinking and problem solving together. I want to see that in the mathematics classrooms.

Samuel added that teachers need to provide contexts that are relevant to the students' community and funds of knowledge. "I have also seen boring lessons or lessons that required a certain strategy and that prohibited students from displaying their sense making." He helped teachers that he collaborated with to use games that kids know to help make connections and applications.

Hewitt's response to deficit thinking came from her own personal experience reading Rosenthal and Jacobsen's (1968) *Pygmalion in the Classroom* as a new teacher. She told us that this specific literature shaped her own beliefs. She believes that teachers must do what is best and not what is easiest in the classroom. To challenge personal deficit mentalities, teachers must always hold high expectations and not accept excuses. She explained,

We must understand that [students'] proper or improper education at our hands will ultimately impact us directly or indirectly... Do not make excuses for poor behavior and always discipline in love and fairness. Do not take bus rides through their communities or peer at them as if they are foreign specimens. They are people deserving of respect and our very best. This deficit way of thinking serves no purpose and reveals nothing about the child, since it only nurtures stereotypes.

Two of our leaders provided a word of caution. Euphemia and Hewitt shared often when it comes to Black students educators tend to *love* them to death—often times resulting in a crutch. Or teachers see them as the angry, aggressive students because they do not understand them and where they come from. Understanding where students come from requires building relationships. The school community must plan actions that increase community engagement and relationships so that educators do not engage in practices that perpetuate the deficit view of *culture of poverty* (Delpit, 2012). For example, Euphemia and her faculty plan school picnics, community events, and home visits.

Lack of Meaningful Mathematics

Historically, the notion that Black children do not academically perform as well as their White peers in mathematics has been represented in many research studies (Davis

& Martin, 2019; Gutiérrez, 2008). There have been many studies that highlight the superiority of White knowledge in comparison to Black children by identifying the achievement gap. These studies produce a racial hierarchy of intellectual capability (Davis & Martin, 2019). These false narratives are detrimental and not true. "There is no achievement gap at birth," meaning White children are not born superior to Black children (Delpit, 2012, p. 5). Instead, the practices and structures in place in schools create an environment that sets up the barrier for our Black students. For Black students in mathematics, this effects their mathematical opportunities and school experiences (Delpit, 2012).

One practice that develops from this racial hierarchy of academic ability is called pedagogy of poverty (Haberman, 2010). The academic expectations for Black students are lowered (Ullucci & Howard, 2015). Instead of teachers implementing challenging student-centered collaborative lessons, learning becomes an algorithmic based task heavily teacher led. Kill and drill problems are the norm. Academic rigor greatly suffers (Haberman, 2010).

With our supervisory leaders, there is a mixed response to meaningful mathematical experiences. Marjorie shared she has not found this issue in her school. She found teachers were developing lessons that the students were interested in and found relevant. She gave her teachers the permission (power) to change the context of the mathematics tasks to make the learning meaningful and relevant. She said that they have shifted from teaching the curriculum (textbook) to standards-based instruction to increase the rigor.

Samuel highlighted his collaboration with teachers. He focused on providing relevant contexts or connections to students' lives and community. He used games to increase the engagement and learning as well.

Both Euphemia and Hewitt admitted to this being a struggle. They see that the mathematics is more procedural and missing engagement and relevance. Euphemia told us:

We have a lack of sound, meaningful mathematics for all students, not just Black students. The first thing I attempt to bring to light is that we have to make the instruction relative to students. If I had to pinpoint making it more relative to Black students I think we need that!

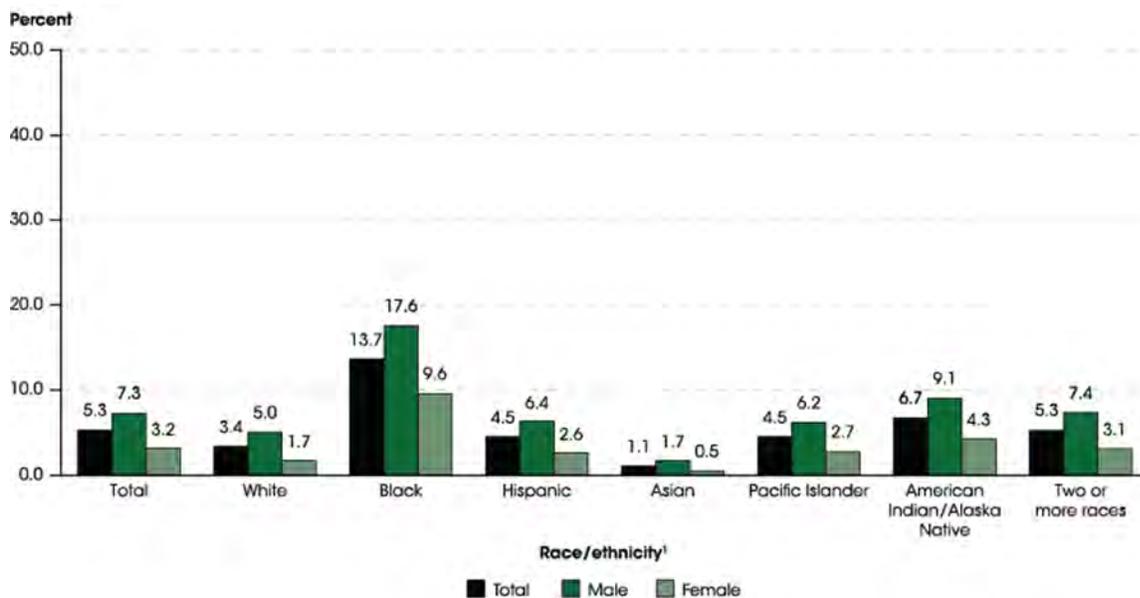
Hewitt shared the same struggle,

Mathematics continues to be taught in skill and drill practice. Students are continuing to work problems and not truly think much about what they are doing. I am currently providing professional development to math teachers that will assist them with teaching from a conceptual level. Math for math's sake will not assist any student or ensure his or her success. We must not deny children of Color high level concepts. They are able to grasp difficult concepts. I encourage teachers to stay away from the compensatory approach, skills only and use a combination of rigorous concepts with foundational skills. This approach will assist them with getting caught up with their peers.

Inequitable Behavioral Expectations

The ability to have input on one's academic trajectory is significant to success. However, with school's militarizing student bodies through zero-tolerance policies, the ability to make academic decisions are often stripped from Black children through disciplinary punishments (Morris & Perry, 2016). Often there is a focus on compliance and not engagement within mathematics classrooms. Disciplinary action against Black students is disproportionately high compared to their White peers. This is represented in Figure 1 (NCES, 2019).

Figure 1. Percentage of Public-School Students who Received Out-of-school Suspension, by Race/ethnicity and Sex: 2013-2014



When discussing the inequities in discipline and behavioral expectations, Hewitt framed it as such,

No one wants to believe they treat children unfairly, but with the disproportionate number of students of color placed in special education or suspended or even expelled from school, somebody has to admit that we (educators) are holding unfair views of children. We must accept either poor behavior or low academic performance as an innate characteristic among students of Color or educators are choosing to poorly educate and unfairly discipline them.

Both Euphemia and Marjorie felt that this was not problematic in their current schools. Both shared successful practices that they have implemented. Euphemia related to us,

We thoroughly investigate any issues and if they are a reason for removal we even try to drill down to the when and where incidents happen. My assistant principal tallies the part

of the building and the time of day, as well who has submitted referrals to try to alleviate any of this type of behavior. We look at behavior reflections for students, and in-house community service opportunities before we ever look at suspensions.

At Marjorie's school, she came into her position introducing her faculty to restorative discipline. The faculty also did a book study for a year on the topic. She feels that the school might have had more issues before she took her leadership position and brought in the restorative discipline mindset.

Discussion

Supporting mathematics opportunities for all students is a task that needs to be addressed from the very beginning of a pre-service teacher's (PST) preparation throughout a teacher's professional career. Throughout the entire journey, PSTs, novice, and veteran teachers need to engage daily with their own whiteness. Opportunities to examine how dehumanizing practices continue from a person's lack of awareness and/or perpetuated ignorance to the struggles of their students of Color must occur. Through our dialogue with our co-authors and our own professional experiences, we provide suggestions on how to begin this transformation.

Grounding Practices in Black Scholarship

As Critical Race Theory says, it is vital for people to engage in the words and stories of those that are affected by daily, systemic racism. One way to accomplish this is for teachers of all levels to read literature from prominent Black (and people of Color) scholars. This can range from W E. B. DuBois to James Baldwin, Audre Lorde and bell hooks. This needs to happen in PST programs, in diversity classes but also in pedagogical education classes. Practicing teachers can accomplish this through professional development opportunities, for example, teacher book clubs. Both PSTs and practicing teachers need to have critical conversations with these works, to discover how race is interwoven through centuries of White majoritarian practices in the country. In what ways does this influence today's classroom for both teachers and students of Color? How could a teacher perpetuate these norms through her pedagogical and content practice?

This level of development is exemplified by the first author's own journey. In her first year of teaching, she told Hewitt, her principal at the time, that she "did not see color in her room". During her pre-service program, Author One spent little time reading any Black literature. This spilled into her professional practice when she became a first-year teacher. Author One thought as a white teacher that seeing race, seeing a child as *Black*, was a disfavor to that child's learning. Quickly and thoroughly, Hewitt criticized that pedagogical practice, and required the first author to read, read, and read more. Her first book was C. G. Woodson's *The Mis-Education of the Negro* (1933). From reading and subsequent honest, open conversations with Hewitt and other Black co-workers, Author One learned why removing race from the classroom was a dangerous precedent to engage in. Even after almost a decade later, that specific experience and the growth from it continues to shape Author One's psyche.

Cultural Pedagogy

PSTs and practicing teachers need opportunities to see how mathematics can be reflected within the culture of their students. While there are different approaches to implementing this – for example, Ladson-Billings’s culturally relevant pedagogy, Gay’s culturally responsive teaching, or Paris’s culturally sustaining pedagogy – it is vital for PSTs and teachers to learn pedagogical and content practices that extend from embracing a cultural pedagogy. We do not argue for one specific pedagogy over another; however, we do provide consistent themes from a recent metasynthesis on cultural pedagogy practices in mathematics that can be used in guiding the professional development of cultural pedagogy.

In their research, Thomas and Berry (2019) wanted to study how “researchers interpret mathematics teaching practices that support Culturally Relevant Pedagogy (CRP) and Culturally Responsive Teaching (CRT) in pre-kindergarten through 12th grade” (p. 23). Five themes emerged from their study. First is caring, where teachers need to embrace positive mindsets and actively collaborate with their students in knowledge making. The second theme was context, where teachers learn who their students are and the spaces and places the students reside in in order to create real connections in their lessons. The third theme is cultural competency, which requires teachers to develop understanding and knowledge of their students’ social and cultural capital. The fourth theme is high expectations; teachers should have both high expectations for their students and themselves. The last theme is mathematics instruction, with teachers engaging in high- quality teaching practices and high-quality tasks. The authors believe that PSTs and practicing teachers must be educated on what these overarching themes are, why they are valuable to the learning of their students of Color, and how the themes are implemented in a mathematics classroom.

Cultural teaching was found to be an important tool for student success in our co- authors’ experience, and the four leaders provided different ways in which this was implemented. Hewitt said that it began with telling and teaching Black students that math is something that all can do and do well. She added,

Using practical and relevant examples embedded into the math curriculum have been helpful. The old age question of “what do I need this for” must be answered. I have also found that mental math strategies have been effective in building confidence. This challenging strategy if done properly only serves to empower students that may not have had the level of success that they deserved.

Both Euphemia and Marjorie provided professional development to their faculty in cultural pedagogy. Euphemia shared,

I try to provide my staff with the best professional development possible. We have a district math coach who is from India and is very passionate about relevant mathematics instruction that is culturally sensitive. We have really worked hard on learning how to keep students in the appropriate stage of development in the math learning and practice (Concrete, Abstract, and Representational). We have learned that in the past we have tried to move too quickly to the representational phase with many students.

Marjorie told us her focus was on cultural pedagogy with district professional development. From this, teachers developed relevant mathematics lessons and worked to develop positive relationships with students.

Mathematics and STEM Opportunities

Black students need enriching, positive mathematics and STEM experiences. These opportunities can be extracurricular clubs, competitions, or learning experiences. For in-class instruction, the mathematics learning experience should be relevant to students' lives and provide entry points for all learners to see a real-world connection between self and their mathematics.

These enriching opportunities are vital, as there is a significant connection with Black students pursuing a STEM degree and the STEM opportunities provided in their elementary and secondary education. Interests are cultivated through engaging with toys and robots, experimenting with different types of technology connected directly to the STEM field. Having discussions about STEM career opportunities and providing informal or formal visits to different STEM locations (e.g., a virtual trip to a museum) are critical. Even more so, the opportunity to engage in quality STEM instruction and to be challenged in and out of the classroom is vital to developing positive STEM student identities (Strayhorn, 2015).

Three of our four supervisory leaders felt successful in providing enriching opportunities in their after-school programs. For example, Marjorie told us that at her school that students have equal access to their after-school programs. She said, "All of our after-school programs are for ALL students. This includes robotics and the ozobots (used for coding). There are also reading and other math opportunities offered after school open to all students."

Hewitt had a similar perspective in what opportunities she wanted students of Color to engage in:

I encourage my students of color to participate in classes provided by the technology center offered by the school district. We work with scheduling with our students so they are afforded those opportunities at the technology center. Additionally, I strongly encourage activities that involve students participating in construction, opportunities like robotics and coding.

The authors recognize that some mathematical opportunities, like robotics and coding, are limited based on district funding. However, teachers can still provide dialogue about the existence of these STEM careers, use free online videos and software that engages students in new ways to view mathematics. Teachers can collaborate together across contents to have their students see the intersectionality of education.

Implications for (Re)Humanizing Mathematics Education

To set the stage for rehumanizing mathematics and dismantling dehumanizing practices, we draw again from the experiential knowledge of our four impactful Black co-authors/supervisory leaders. Using their collective wisdom, our leaders identified behaviors that new and veteran

teachers, supervisors, and instructional leaders need in order to cultivate a positive environment for the teaching and learning of mathematics. By having other supervisors, educators, and community leaders embracing these purposeful content and pedagogical choices, we hope that current and future students of Color will cultivate positive STEM identities in school. Their recommendations for rehumanizing mathematics include the following:

- Develop healthy relationships with all students
- Take time to learn their interests, family, communities
- Identify biases, acknowledge them and work to move past them
- Collaborate with professionals of Color
- Invest in cultural pedagogy
- Increase the relevancy of instruction
- Slow down... do not be so fast to jump to procedures
- Be prepared to learn from the students

Our supervisory leaders have powerful experiences and insights regarding the dehumanizing practices that plague mathematics education. They provided their strategies and discourse around how they have addressed dehumanizing practices in addition to what they recommend for humanizing mathematics. These leaders are fostering positive teacher and student identities by focusing on building student relationships and by providing their faculty with support for cultural pedagogies, high quality mathematics, and positive discipline strategies. These endeavors are yielding results that uplift teachers and students in and out of the mathematics classroom.

These recommendations match recommendations from our leading mathematics organizations (e.g., National Council of Teachers of Mathematics, TODOS: Mathematics for All) about teaching and learning mathematics with a lens for access and equity for all students. It is imperative that our predominately White teaching force and leadership heed the voices of our co-authors and calls to action from our organizations. If not, complacency and a lack of listening supports educational malpractice. It is time that we identify these dehumanizing practices as that – malpractice. Preparation programs, beginning teacher mentor programs, and teacher evaluations need to address these practices in order to rehumanize the teaching and learning of mathematics.

Limitations

It is necessary to recognize the limitations associated with this study. First, this study is exploratory in nature, with our desire to have those silenced begin a dialogue about their experiences dealing with dehumanizing practices in their schools. We did not purposefully engage in this collaborative research in a way to dismantle systemic racism, as is the overall goal of Critical Race Theory. Instead, this study produced the knowledge and experience of professional Black leaders that we also personally and professionally know as exceptional educators. We hope the dialogue that we provided gives rise to new studies that provide more quantitative and qualitative research to dismantling the educational structures that other children.

Second, we – as the two White co-authors – recognize that there is a tension in this collaborative venture with our four Black co-authors when discussing dehumanizing themes that affect not only Black children but all children of Color. While we are privileged to know our co-authors personally and professionally, we recognize that our Black leaders may have to act more covert than overt within their schools. These are school systems that are predominately White led. We were cautious in pushing them beyond their comfort zone in sharing. We wanted them to lead by example and decide when to push on these tensions.

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Author Biographies

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Artavia Acklin has spent the last twenty-five years in education. She has served students and families in several roles from a classroom teacher, an instructional coach, an assistant principal, to currently a principal at Painted Stone Elementary in Shelbyville, Kentucky. Her influence is apparent throughout her district as she works alongside her peers in strategically planning and implementing a vision for teaching and learning that prepares all students for college and career readiness. She serves as a member of the pilot team for Competency-Based Education and Assessment for the state of Kentucky. Mrs. Acklin believes that a solid culture and climate is the foundation for a strong learning community. She strives to make school a place where all students are excited to learn and grow as leaders in their school community and beyond.

Tommy Acklin has taught for twenty years in several school districts within Kentucky as an Elementary and Special Education Teacher. Mr. Acklin served as an assistant high school

football coach for seventeen years, and has four publications. Mr. Acklin is currently teaching with Shelby County Schools (KY) as a special educator with the Positive Approach to Student Success (PASS) program. Mr. Acklin believes that our role as educators is to pitch information where students can get a hit and not a strike.

Linda Harper has served students in many capacities from classroom teacher, curriculum specialist, and was a secondary school principal at the time of this study. She is credited with transforming an alternative education program and a large high school into a safe and nurturing learning and working environment. She and her team have garnered several state and national recognitions for their efforts in improving student outcomes. This includes recognition for increased graduation rates and post-secondary school placement. Dr. Harper understands that successful schools have healthy school cultures. She believes that all students will rise to their highest potential when supported by highly effective teachers and administrators.

Tiffany Davis is a compassionate educational leader, she understands the value of leading transformational change and the value of developing instructional leaders. Dr. Davis has nineteen years of experience working as an educator in the state of Alabama. For nine years, she has applied researched based practices leading school transformational change as a K-12, elementary, and middle school instructional leader. Dr. Davis has also served as a regional instructional coach. She is credited with transforming the culture in two secondary schools. With her leadership, her team has won several awards including: CLAS Banner School, School of Distinction, School Showcase Award, School Safety of Excellence, and the Blue-Ribbon Lighthouse Award. Dr. Davis has led school improvement reform, facilitated professional learning communities, and mentored many aspiring leaders.