BEYOND “ISM” GROUPS AND FIGURE HIDING:
INTERSECTIONAL ANALYSIS AND CRITICAL MATHEMATICS EDUCATION

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As global mathematics education has taken a critical turn particularly toward acknowledging class, and (less so) gender, and (even less so) race, there has not been an equal effort to interrogate how these concepts interact within the complex constructions of identities, institutions, and ideologies. This creates an analytical vacuum because when humans engage with mathematics, they do so in the totality of their identities. What does it mean for critical mathematics education to exist in such a vacuum? What are the costs? What are the affordances? In this paper, I argue that confronting the messiness of humanity through intersectional analysis facilitates the construction of new types of community within critical mathematics education for which the locus is justice.

It is a rare occasion when Hollywood and the world of mathematics converge. Such a convergence occurred in late 2016 as the Hollywood publicity machine prepared for Hidden Figures (Gigliotti, Chernin, Topping, Williams, Melfi, & Melfi, 2016), a film adaptation of Margot Lee Shetterley’s 2016 book Hidden Figures: The American Dream and the Untold Story of the Black Women Who Helped Win the Space Race. Shetterley is a non-fiction writer, daughter of a National Aeronautics and Space Administration (NASA) father and Hampton University English professor mother, and founder of The Human Computer Project. Her book documents the stories of Christine Darden, Mary Jackson, Katherine Johnson, and Dorothy Vaughan, black women who played key roles in both the National Advisory Committee for Aeronautics [NACA; the agency that preceded NASA] and NASA through the Space Race. The eponymous film recounts Jackson, Johnson, and Vaughan’s work at NASA in support to John Glenn’s 1962 orbit of the Earth.¹ The release of the Hidden Figures film has prompted a surge in public discourse about girls and women in science, technology, engineering, and mathematics (STEM). Pepsico joined 20th Century Fox to launch “The Search for Hidden Figures,”² an initiative that includes a scholarship contest, a website containing STEM-related games and challenges, and two Twitter hashtags #Search4HiddenFigures and #Search4STEM used to bring visibility to “everyday people” who participate in STEM. Additionally, blogs, podcasts, and other media have emerged using the movie as a launching point to discuss broadening participation in STEM.

Shetterley’s (2016) book and the film (Gigliotti et al., 2016) are part of a recent surge of efforts to amend the dominant historical record to include “hidden figures”—the unlikely and unsung contributors to developments in mathematics and science. The Human Computer Project, the organization that Shetterley founded, is dedicated to...
telling stories of women in mathematics and science in hopes that “these role models will inspire a new generation of women and minorities to pursue careers in STEM fields, and that everyone will gain a broader sense of what mathematicians, engineers and scientists look like.”

Scientist Nathalia Holt’s (2016) book *Rise of the Rocket Girls: The Women Who Propelled Us, from Missiles to the Moon to Mars* and journalist Denise Kiernan’s (2013) *The Girls of Atomic City: The Untold Story of the Women Who Helped Win World War II* detail women’s scientific contributions. Mathematics education researcher Erica Walker (2014) wrote *Beyond Banneker: Black Mathematicians and the Paths to Excellence* to document the stories of black mathematicians in the United States. In *The Immortal Life of Henrietta Lacks* (Skloot, 2010) and *Medical Apartheid: The Dark History of Medical Experimentation on Black Americans from Colonial Times to the Present* (Washington, 2008) the authors report on science’s long history of using poor black people’s bodies for experimentation without consent. These biographical works add names and biographies to the roster of scientific contributors, thus troubling the narrative that scientific innovation is a white man’s story. In the case of Henrietta Lacks and those cases in *Medical Apartheid*, these authors use history to call the ethics of scientific discovery to question and to establish science’s debt to those who have been victimized in the name of innovation. In addition to these biographical works, mathematics education researchers have used their work to amplify narratives of unlikely success (see e.g., Baber, 2012; Berry, 2008; Jett, 2013b; Warren & Miller, 2013).

For those of us interested in critical mathematics education and the social and political dimensions of mathematics education, the idea of hidden figures in mathematics is central to much of our work. Often our hidden figures are everyday people who are marginalized or excluded from mathematics education. Some of us are concerned with how identities are hidden in mathematics education; some of us examine cultural forms of mathematics as hidden figures within academic mathematics; some of us consider how the politics of mathematics education privilege certain modes of thought and exclude others. There are some of who examine specific curriculum, policies, and pedagogies while others use different theories to urge the community toward a full rethinking of the enterprise of mathematics education. While we all take on different domains of analysis, much of our work can be connected—more or less explicitly—to the social *isms* that plague our world (e.g., sexism, racism, heterosexism, colonialism, capitalism, ableism, militarism, nationalism, religious sectarianism or extremism).

Although we all are concerned with social *isms*, it is unfortunate that we operate most often in silos; those of us concerned with racism huddle together in one corner while those focused on heterosexism gather elsewhere, and so on. We acknowledge and appreciate work across groups but there is little crosstalk. A survey of prior MES programs shows that this community has addressed nearly all the *isms* listed above. However, there often remains a sense that our own *ism* of interest is more important or more grave than others simply because it is nearest our hearts. This sensibility is
dangerous because it limits our ability to engage in collective action. Furthermore, this sensibility does not align with the way that most people experience these oppressive social and political forces. Therefore, our response to oppression cannot be any less complex than oppression itself.

As depicted in the film, figures in mathematics education are hidden for reasons related to isms. Hence, deep exploration of each of these isms is necessary and collaborative efforts, or *ism groups*, offer great capacity for inquiry and change. However, it is rare that any person experiences only one of these *isms*. In other words, oppression rarely has a single pressure point; it bears down on us in multiple ways at once, producing varied, and often conflicting, effects. We can consider, therefore, the *isms* as existing within a matrix of domination (Collins, 1990/2009) that accounts for both the *isms* and their intersections. However, absent a framework for considering this matrix, critical mathematics education is vulnerable at their intersections which also happen to be the places where the most vulnerable figures are hidden. In this paper, I propose intersectional analysis as such a framework and use it to explore both how critical mathematics education is complicit in figure hiding and how intersectional analysis provides a methodology for moving beyond figure hiding.

**INTERSECTIONALITY AND INTERSECTIONAL ANALYSIS**

Legal scholar Kimberlé Crenshaw (1989, 1991, 2013) brought the term *intersectionality* into academe and black feminist scholars in the United States such as Zandria F. Robinson (2016), Brittney Cooper (2015), and Patricia Hill Collins (1990/2009, 2015; Collins & Bilge, 2016) and abroad such as Nira Yuval-Davis (2006) have advanced this work to the point where it has become a significant concept in broader feminist scholarship (Davis, 2008). Crenshaw (1989) saw that the justice concerns of black women were often subsumed in anti-racist and feminist politics for black people or women, broadly considered. However, a black woman’s experience is neither a *black* experience nor a *woman’s* experience, so “this single-axis framework erases Black women in the conceptualization, identification and remediation of race and sex discrimination by limiting inquiry to the experiences of otherwise-privileged members of the group” (Crenshaw, 1989, p. 140). Crenshaw (1989) proposes intersectionality as a means to acknowledge “those who are multiply-burdened” (p. 140) by different modes of oppression—or different isms. The idea of multiple burden speaks to intersectionality’s key concern that racism, sexism, and other forms of oppression, when considered in parallel, appear additive, but those who experience these oppressions in combination endure multiplicative effects (Choo & Ferree, 2010; Robinson, 2016; Yuval-Davis, 2006).

In recent years, intersectionality has garnered increased attention in academic and public circles as those who have been oppressed seek to articulate the multiple layers of oppression that correspond to different identity politics. Intersectionality embraces a more postmodern approach to identity politics that particularizes the intersections of
identity categories (Crenshaw, 1991). For example, a person who identifies as a queer black woman experiences oppression in the name of racism, sexism, and heterosexism based on her racial, gender, and sexual identity, respectively. Intersectionality acknowledges that there is energy required to address each of these identities and that a person must sometimes make difficult decisions when those identity politics conflict.

Intersectionality’s presence and proliferation in academic spaces represents a form of grassroots theorizing in which a woman of color used her scholarly position as a vehicle to represent the practices and embodied knowledges that, historically, have characterized the lived experiences of her women of color foremothers who have to simultaneously navigate the complexities of gender, race, language, and other identity politics (Collins & Bilge, 2016). Although the terminology is recent, there is a long history of intersectional analysis by both women of color scholars and lay scholars. Crenshaw’s work rests upon the shoulders of women like Sojourner Truth, Anna Julia Cooper, Gloria Anzaldúa, Ida B. Wells-Barnett, Paula Gunn Allen, and countless other known and unknown women who have shaped the consciousness of women of color through the verbal and written articulation of their lived experiences. Like Crenshaw, Cooper (2015) identifies her mother’s and grandmother’s teachings as more than just simple life lessons:

Because of Black feminism, I understand the theorizing that my mother and grandmother taught me to do as being critical and crucial to my survival as a Black woman of Southern [United States], semi-rural, working-class origins now navigating a middle class, urban, academic life. (p. 10, emphasis original)

Naming these articulations as Crenshaw did is a form of scholarly legitimization that makes them “more compatible with academic norms of discovery, authorship, and ownership” (Collins & Bilge, 2016, p. 80).

One significant characteristic of intersectionality is its commitment to praxis (Cho, Crenshaw, & McCall, 2013; Collins & Bilge, 2016). The women of color who have embraced intersectionality as both an intellectual and practical approach to the world throughout history have not had the luxury of separating their intellectual work from their efforts to survive the matrix of domination (Cooper, 2015). Therefore, the women who have advanced intersectionality within academe have retained praxis as a significant part of that conceptualization. Given this legacy, it is not enough to think through the multiple ways in which oppression weighs upon various identities, but it is the scholar’s responsibility to use her or his power to do something in response. This focus on praxis also validates the knowledges that lay scholars—scholars who do not share our academic credentials—bring to this work and promotes collaboration within and outside of academe.

It is also important to note that, although intersectionality is best known and most often articulated as a means of considering domination, oppression is not necessarily
its focus. Rather, intersectionality considers the operations and intersections of social structures (which often are oppressive).

It is worth emphasizing that intersectionality is not the opposite of privilege or advantage: it is possible to be intersectionally advantaged or privileged as well as intersectionally marginalized, dominated or oppressed. The idea of intersectionality also points out that social structures not only disadvantage particular groups (as the language of burdens [or oppression] suggests); they also privilege certain groups, again, in ways unique to particular gender-race-class groupings. Every person is marked by multiple social structures. So the idea of intersectionality criticizes, improves on, and moves beyond the language of double or triple burdens as well as the concept of “dual systems.” (Weldon, 2008, pp. 196, 197, emphasis original)

Thus, intersectionality has great analytical potential beyond those with which we are most familiar.

Collins and Bilge (2016) propose a distinction between intersectionality and intersectional analysis to capitalize on the theory’s great potential beyond considerations of identity. By bringing intersectionality into academe, Crenshaw (1989, 1991) opened up new possibilities for its use beyond her focus on black women’s lived experiences in the United States. Once understood only as a theory of identity, over time intersectionality has taken on broader meaning and intersectional analysis has become a way to engage intersectionality in critical inquiry. Intersectional analysis represents a move in critical ism-focused scholarship “from parallelism to simultaneity and multiplicity” (Robinson, 2016, p. 491). As “oppressions must work together to produce injustice” (Collins, 1990/2009, p. 21), intersectional analyses interrogate both the individual modes of oppression and the entanglements that the matrix of domination (Collins, 1990/2009) produces. Weldon (2008) articulates intersectional analysis’ potential beyond intersectionality’s identity focus: “It refers to a form of relationship between social structures, specifically one in which social structure combine to create social categories to which certain experiences and forms of oppression are unique” (pp. 195–196).

McCall (2005) asserts that there are three forms of complexity that intersectional analysis can address: anticategorical complexity, intercategorical complexity, and intracategorical complexity. These three types of complexity exist on a continuum, with anticategorical and intercategorical complexity on either end and intracategorical complexity in between. Anticategorical complexity represents an approach similar to that of poststructural feminism (see e.g., St. Pierre, 2000) that considers all social categories as fictions that simultaneously produce difference and inequalities by denying the heterogeneity of experience. According to an anticategorical complexity, social life is too complex to create fixed categories. Intercategorical complexity, in contrast, means accepting social categories—at least temporarily—in order to document inequalities across social groups. We can locate the work of many feminists of color here. Finally, intracategorical complexity borrows the anticategorical process of interrogating the boundaries of social categories while
acknowledging that there are stable and semi-stable relationships among categories in line with the intercategorical approach. The focal points of intercategorical complexity are “the neglected points of intersection” (McCall, 2005, p. 1774) among social categories. Although intersectional analysis emerged from this in-between space of intercategorical complexity, its proliferation in social science scholarship reveals its relevance across the continuum. This continuum of complexities mirrors that spectrum of critical postmodern theory that, as I have argued previously (Stinson & Bullock, 2012, 2015), holds great productive possibilities for mathematics education research and critical mathematics education research, particularly.

In his MES3 plenary paper, Thomas Popkewitz (2002) asks: “What are the concrete practices in the [mathematics] curriculum that produce the distinctions and divisions that qualify some and disqualify others?” (p. 2). Popkewitz places his question at the site of curriculum, but I see a form of this question as relevant to the enterprise of critical mathematics education. Therefore, I ask: “What are the practices in critical mathematics education that re-inscribe the distinctions and divisions that qualify some and disqualify others?” Said differently, while the project of critical mathematics education purports, at least in part, to be about inclusion and justice, in what ways do we intentionally or unintentionally undermine those goals? I pose these questions as central to our collective work as a community of critical mathematics educators and I offer intersectional analysis as a framework for our response.

INTERSECTIONAL ANALYSIS AS METHODOLOGY IN MATHEMATICS EDUCATION

Choo and Ferree (2010) propose three different categories of intersectionality that prove useful in responding to the questions I have raised: a group-centered approach focused on inclusion, a process-centered approach focused on analytical interactions, and an institution-centered approach focused on institutional primacy. “The first emphasizes including multiply-marginalized groups in the content of the research; the latter two focus on explaining intersectional dynamics through the way that the analysis of the data is done” (p. 130). Therefore, the first category—the group-centered approach—focuses on intersectionality while the other two—the process- and institution-centered approaches—are forms of intersectional analysis. In this section, I describe these categories, consider how each addresses figure hiding, and discuss the potential for each in our work related to the social and political dimensions of mathematics education.

Group-centered approach (Inclusion).

The group-centered approach to intersectional analysis is likely most familiar in that its focus is on including “multiply-marginalized” groups in research by “giving voice to the oppressed” (Choo & Ferree, 2010, p. 130). The factor that distinguishes intersectionality’s approach to voice from that of other critical social theories is the explicit emphasis on the complexity of identity. This approach to intersectional analysis relies on the idea that figures are hidden when the analytical focus in on only
one dimension of experience. In these situations, multiply-marginalized groups can be excluded. Consider a hypothetical study of first-generation students taking mathematics courses in a U.S. university. The hypothetical researcher is interested in racialized experience so they select black students as participants. This study takes on racism as its ism focus. If immigrant students are not included in the sample of participants, black immigrant students—a multiply-marginalized group—have been excluded and are hidden figures.

Intersectionality’s presence in extant mathematics education research literature most often aligns most with this group-centered approach. Damarin and Erchick (2010) assert: “If mathematics education research is to promote equity for girls and women within multiple racial and ethnic groups, similar attention to the intersection of clearly defined constructs, including gender, is required” (p. 312). Gholson and Martin (2014) and Gholson (2016) use intersectionality as a central component of their analytical framework related to black girls’ and women’s experiences of mathematics. Lambert (2015) argues that intersectionality is useful for considering how disability intersects with race. Scholars such as Berry (2008), Jett (2013a), and McGee (2015) position intersectionality as a way of thinking about how mathematics identity operates with racial identity. These studies are excellent examples of how intersectionality can be used to engage identities in mathematics.

Process-centered approach (Analytical interactions).

The process-centered approach represents as turn toward intersectional analysis by taking up intersectionality as “a nonadditive process, a transformative interactivity of effects” (Choo & Ferree, 2010, p. 131). If the group-oriented approach is an “intersection-only” model, then the process-centered approach is “intersection-plus” (Choo & Ferree, 2010, p. 133; also Weldon, 2008). Hence, while the group-centered approach attends to the space of intersection of identities, in the process-centered approach, the intersectional analyst looks beyond those intersection points to consider the relations among the ism systems. Figure hiding in the process-centered category is the myopic focus on one ism at the exclusion of others in a way that limits the scope of analysis. Here, figure hiding moves from an issue of hidden identities to one of hidden systems.

In her study of successful women in mathematics, Solomon, Radovic, and Black (2015; also see Solomon, 2012) investigated how women negotiate their participation and gender performances in the masculinized world of mathematics. The authors argue that Roz, the subject of this study, experiences a “contradiction between doing mathematics and enacting femininity.”

Here, we can see that Roz views the other women as having resolved the contradiction between being female and being a mathematician by taking on masculine characteristics in order to fit into the world of mathematics, she has chosen to be different—to enact a different kind of mathematical identity, which retains simultaneously a strong and visible
femininity (signalled by the use of the cultural tools of skirt and heels) alongside the mathematics. (p. 63)

Solomon and colleagues consider Roz as a woman succeeding in the masculinized discipline of mathematics. Considering this study through the lens of intersectionality leads me to wonder how Roz’s other identities inform her choices regarding feminine performance. For example, what would it mean for this analysis to consider mathematics as both a masculine space and as white institutional space (Martin, 2011, 2013)? While the authors report that Roz is 52 years old, they do not address her race, so I cannot speculate about how her identity would be positioned within white institutional space. However, it is fair to say that, if Roz is a white woman, her experience of white institutional space would be different from that of a hypothetical non-white woman. Therefore, the conclusions drawn from an analysis of Roz’s mathematical life could be racialized as well as gendered and her efforts to negotiate her identity as woman in mathematics could also be informed by an interaction between gender and race.

Adding an intersectional analysis of mathematics education as white institutional space to Solomon and colleagues’ solid gender-focused approach would speak to how gender operates along with race in mathematics education. However, increasing the scope of analysis has significant methodological implications.

The methodological demands of a process model are greater than those of an inclusion model, since explicit comparison, attention to dynamic processes, and variation by context are all understood as inherent in intersectionality. Insofar as the research embraces some notion of social construction, it also calls for data that are multilevel, capturing both the agency of individuals in making the world they inhabit and the enabling and constraining forces of the world as it has been produced. (Choo & Ferree, 2010, p. 134)

Surely this increase in analytical has implications for research design and data collection, analysis and representation (Stinson & Bullock, 2015), but the research should not be deterred. Process-centered intersectional analysis means, above all, intentionally zooming in and out (Stinson & Bullock, 2012) on the ism at the center of analysis “asking how that dimension of inequality is itself subdivided and crisscrossed with other axes of power and exclusion that are less well articulated” (Choo & Ferree, 2010, p. 135; also Yuval-Davis, 2006)

**Institution-centered approach (Institutional primacy).**

Like the process-centered approach, the institution-centered approach is one of intersectional analysis. In this case the “intersection-plus” idea (Choo & Ferree, 2010) extends to institutions. Often we connect certain isms with certain institutions (Choo & Ferree, 2010; Weldon, 2008). For example, class or capitalism are often central to discussions of economic institutions. Another ready example is the institution of the family; when discussing family, the analysis is most commonly related to gender or sexism (Choo & Ferree, 2010). It is difficult, if not impossible, to imagine these institutions existing in a way that does not prioritize one ism over
another. The idea of the economy relies on economic theory, therefore economic theory—whether capitalism or otherwise—will likely always be central. The example of family presents a more reasonable possibility that the primary focus on gender could eventually shift from its place of primacy as the socio-historical constructs of family and marriage face political challenge. Given these histories, it is not prudent to take an “intersection-only” approach to analyzing institutions because it may not be possible to equalize isms. In other words, it is not possible to consider class equal with gender within the economic institution because of the foundation of the economic institution itself. However, “intersection-plus” does not allow for a class-only analysis of the economy—or a gender-only analysis of family, et cetera. Discussions of family, therefore, would take gender as a core construct of family. The institution-centered approach to intersectional analysis permits isms to have primacy within institutions but not exclusivity, so figure hiding occurs in this case when the central concern eclipses any other systems that may be in operation.

In an early paper, my colleagues and I (Larnell, Bullock, & Jett, 2016) consider the role of race in teaching and learning mathematics for social justice (TLMSJ) as a pedagogical system in mathematics education. We also use principles of critical race theory (CRT) to identify spaces within TLMSJ scholarship where CRT allows for a more nuanced analysis and to illuminate the potential within TLMSJ to address racialized inequities. Although we did not explicitly mention intersectionality in the article, my reflection upon that thinking in concert with Choo and Ferree’s (2010) categories of intersectionality reveals a connection specifically to the institution-centered approach. Given that intersectionality is a valued principle within CRT (Hobbel & Chapman, 2009), this connection aligns with the theoretical underpinnings of the original argument.

I argue that the analysis of TLMSJ presented in this prior article (Larnell et al., 2016) represents an institution-centered intersectional analysis. As a system, TLMSJ necessarily centers on mathematics. More precisely, TLMSJ relies on school mathematics in that its mathematics goals are dictated—perhaps in various degrees based on context—by the standards and norms of school mathematics. In examining TLMSJ, we noticed that tasks addressed justice issues rooted in isms such as racial profiling in traffic stops (racism) and wealth distribution (capitalism), but they did not address those issues as intersectional. We propose such an intersectional analysis of TLMSJ as a type of institution. In our analysis, we maintain mathematics as the core of TLMSJ but our concern is that the desire to fit justice issues into school mathematics may force an oversimplification of these issues that can undermine justice aims. In one of the examples presented, Esmonde (2014) discusses a wealth distribution task conducted with affluent middle and secondary students that were nearly all white (12 of the 13 students). “Whiteness and racism,” we argue “operate in tandem with socioeconomic wealth to generate societal privilege” (Larnell et al., 2016, p. 26). Therefore, the absence of discussion of the relationship between race and wealth distribution in the task and documented classroom interactions represent a
missed intersectional opportunity that results in an incomplete presentation of the issue of wealth disparity.

CONCLUSION

The three categories of intersectional analysis that I have presented represent opportunities to address figure hiding in critical mathematics education by complexifying and enriching research into the social and political aspects of mathematics education. Communities like MES provide opportunities for collaboration in doing the work of intersectional analysis that moves beyond ism groups toward the justice work that, I believe, is the core work of critical mathematics education. According to Rawls (1971), justice is the first virtue of any social institution and “laws and institutions, no matter how efficient and well-arranged, must be reformed or abolished if they are unjust” (p. 3). I envision critical mathematics education’s role within mathematics education writ large as pushing justice to the center of conversations about all parts of the “network of mathematics education practices” (Valero, 2010, p. 374).

Turning an intersectional analytic eye upon (critical) mathematics education cannot be done in isolation. It is not possible for any one of us or any one ism group to fully interrogate the matrix of domination (Collins 1990/2009); there are always things that we cannot see or commitments under which we cannot not operate. Therefore, the pursuit of justice through inquiry is a necessarily collaborative effort. MES offers an excellent platform for this kind of intentional collaboration among critical mathematics educators through what I call justice communities. The justice community is a strategic partnership in which scholars come together across ism groups to investigate one element or dimension of the matrix of oppression with the intention of pooling their intellectual resources in the service of justice. Justice communities can gather around identities (e.g., the mathematics education of trans youth), issues (e.g., islamophobia and mathematics education), places (e.g., mathematics education in rural China), or spaces (e.g., urban mathematics education). A justice community has one aim: to move toward justice by directly confronting the multiplicative effects of injustice and oppression.

In this paper, I have proposed intersectionality as a theory and intersectional analysis as a methodology for the critical mathematics educators to address the complexities of social and political realities and to identify ways that our current approaches to research unintentionally participate in figure hiding. Scholars within justice communities commit to justice above all. If we, as critical mathematics educators, take on Rawls’ (1971) charge to place justice as our first virtue and to dismantle or reform any social institution that is unjust, we also agree to assume all risk associated with this commitment. Given that critical mathematics education has consistently operated on the fringes of the mathematics education landscape, we are accustomed to a measure of risk. However, we are not as comfortable with being vulnerable with each other.
Intersectional justice communities encourage a different form of accountability. As scholars, we are most often accountable to the theories we use, the participants and institutions we study, to our colleagues via blind review, and the discipline to which we belong. When different scholarly interests come together holding a common value, there is a different form of accountability. Each ism group becomes accountable to the others and, more importantly, to justice itself. While this situation makes us each vulnerable, that vulnerability creates the opportunity for less figure hiding, more critical self-reflection, stronger interpersonal relationships, and more effective coalitions. It is in this space that, I believe, we can do the real justice work required of us as critical mathematics educators.

NOTES
1. Although Christine Darden’s story is included in the book, she is not a central subject of the film because she did not join NASA until 1967.
4. Special thanks to Dr. Gregory Larnell for the idea of ism groups generated in our conversations about this paper.

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