2016

Absence of Diversity in Collegiate Upper-Level Mathematics Classrooms: Perpetuating the "White Male Math Myth"

David W. Stinson
Georgia State University

Journal of Urban Mathematics Education
December 2016, Vol. 9, No. 2, pp. 1–4

EDITORIAL

Absence of Diversity in Collegiate Upper-Level Mathematics Classrooms: Perpetuating the "White Male Math Myth"

David W. Stinson
Georgia State University

Katherine Johnson, Dorothy Vaughan, and Mary Jackson are the names of three Black women who are unfortunately relatively unknown—even though Katherine was awarded the Presidential Medal of Freedom by President Barak Obama in 2015, the highest civilian award in the United States. But familiarity with these three women's names and, more importantly, with these three (and others) women's stories will soon change when the movie *Hidden Figures* (Gigliotti, Chernin, Topping, Williams, & Melfi & Melfi, 2016) has its wide release on January 6, 2017. The movie, distributed by 20th Century Fox, features award-winning cast and crew members and producers, and shows promise in being a box office success and Oscar contender (see Buckley, 2016). The biographical drama is based on the non-fiction book, of the same name, written by first-time book author Margot Lee Shetterly (2016). The dustcover of the William Morrow HarperCollins imprint reads:

> During World War II, America's fledgling aeronautics industry hired black female mathematicians to fill a labor shortage. These "human computers" stayed on to work for NASA and made sure America won the Space Race. They fought for their country's future, and for their share of the American Dream. This is their untold story.

As a mathematics educator and researcher who works at deconstructing the "White male math myth" discourse (see, e.g., Stinson, 2013), I am exhilarated when hidden—or more aptly, too often erased—histories such as these are brought to light. But sadly, such histories are a double-edged sword. Cutting one way, these stories do assist in deconstructing the White male math myth discourse—mathematics is *not* just for White (and Asian) boys and men. Cutting the other way, however, these histories too often become the "exception story," so to speak. That is to say, after learning of such histories as documented in *Hidden Figures* it is too easy for people to walk away and say: "Yes, but they're the exception, not just *any* girl (or not just *any* Black or Brown kid) can be a mathematical wiz. After all,

DAVID W. STINSON is an associate professor of mathematics education in the Department of Middle and Secondary Education in the College of Education and Human Development, at Georgia State University, P.O. Box 3978, Atlanta, GA, 30303; e-mail: dstinson@gsu.edu. His research interests include exploring socio-cultural, -historical, and -political aspects of mathematics and mathematics teaching and learning from a critical postmodern theoretical (and methodological) perspective. He is a co-founder and current editor in chief of the *Journal of Urban Mathematics Education.*

mathematics really is a discipline for, you know, White guys." Thinking such as this is too often undergirded by misogynist (see, e.g., Mendick, 2006) and White supremacist (see, e.g., Martin, 2013) ideologies.

Nonetheless, in the United States, and throughout most of the Western world, people continue to imagine the mathematician as a White, middle-aged, balding or wild-haired man (see Picker & Berry, 2000). The Einstein-ish silhouette readily comes to mind, which continues to position mathematics as the discipline primarily engaged by elite White men (Leonard, Davila, & Stinson, 2012). The dominance of this discourse is so strong that when Professor Erica Walker was casually speaking to another colleague in educational research about her then-forthcoming book *Beyond Banneker: Black Mathematicians and the Paths to Excellence* (Walker, 2014), he puzzlingly asked: "Are there any [Black mathematicians]?" (p. x) Unfortunately, the near absence of female and Black and Brown students in upper-level undergraduate and graduate mathematics courses continues to perpetuate the White male math myth discourse; keeping it alive, even for educators (and others) who should know better.

The near absence of student diversity in terms of gender and race in upper-level undergraduate and graduate mathematics courses is well documented in the field. Even so, the number of female mathematics/statistics majors grew steadily, for the most part, throughout the 1980s and 90s reaching a high of 48.0% of bachelor's degrees awarded in mathematics to women in 2001 (National Science Board [NSB], 2016). Since then, however, there has been a steady, although not steep, decline. Women earned only 43.1% of the mathematics bachelor's degrees in 2013, which is the last year data are available (NSB, 2016). In comparison, women earned 57.3% of bachelor's degrees in all fields, and 50.3% of science and engineering degrees in 2013 (NSB, 2016). Women's strongest showing in science and engineering degrees was in the biological sciences at 59.2% (NSB, 2016).

At the graduate level, women were awarded 39.8% of the master's degrees in mathematics/statistics and 29.1% of the doctoral degrees (NSB, 2016). Women, in comparison, were awarded nearly half of the doctoral degrees in all fields in 2013 (NSB, 2016). Taking these percentages to the classroom level means that a typical 4000/6000 level mathematics course of about 20 students will have 7 or 8 female students, with only 2 or 3 female students in a typical 8000/9000 level mathematics course of about 10 students.

The near absence of student diversity becomes even more stark when accounting for Black and Brown students in upper-level undergraduate and graduate mathematics courses. In 2013, only 4.7% and 7.0% of the bachelor's degrees in mathematics/statistics were awarded to Black and Brown students, respectively (NSB, 2016). But Black and Brown students represented 9.6% and 10.5%, respectively, of bachelor's degrees awarded in all fields in 2013 (NSB, 2016). There were 2.8% Black and 4.0% Brown students who earned master's degrees in mathematics

in 2013, and at the doctoral level the percentages were 1.5% and 1.9%, respectively (NSB, 2016). Again, taking these percentages to the classroom level means that the typical 4000/6000 level (about 20 students) or 8000/9000 level (about 10 students) mathematics course is more times than not completely absent of Black or Brown students.

Given the ever-changing gender and racial demographics of U.S. colleges and universities (Williams, 2014), administrators and faculty members in mathematics departments must begin to take the absence of student diversity in upper-level courses seriously and to develop plans of action. If these mathematicians are genuinely interested in "unleashing the possibilities," so to speak, of the socially constructed discipline so named mathematics (Ernest, 1998), they must create mathematics departments and classrooms that welcome the mathematical ideas, interests, and brilliance of every student—no matter their gender or race. Shetterly's (2016) historical account gives us all pause to think: If not for the women "human computers"[1] at NASA, would it be stars and stripes flying on the moon or a hammer and sickle? In terms of racial diversity, administrators and faculty members in mathematics departments can no longer afford to practice a form of dysconscious racism: "an uncritical habit of mind (including perceptions, attitudes, assumptions, and beliefs) that justifies inequity and exploitation by accepting the existing order of things as given" (King, 1991, p. 135).

Refusing to accept the existing order of things as given will become increasingly important as more colleges and universities move introductory mathematics courses (e.g., college algebra) out of mathematics departments, allowing other departments to design and teach introductory "quantitative literacy" courses (Joselow, 2016). To remain financially viable (in the lack of action of other more humane and just appeals to diversify), mathematics departments must begin to get their "fair share," so to speak, of the students on U.S. colleges and universities campuses in their upper-level courses. Given the decrease in the percentage of White men on campuses, perpetuating the White male math myth discourse will no longer "keep the lights on." Besides, just think of all the new mathematical possibilities when more (and different) human talent is given access to and invited to the discussions.

—Yes, just *any* kid can learn (and be taught) to be a mathematical whiz!

[1] Shetterly (2016) notes:

> And while the black women are the most hidden of the mathematicians who worked at the NACA, the National Advisory Committee for Aeronautics, and later at NASA, they were not sitting alone in the shadows: the white women who made up the majority of Langley's computing workforce over the years have hardly been recognized for their contributions to the agency's long-term success. (xvi)

From the 1930s to the 1980s, Shetterly estimates that Langley employed nearly 1,000 women human computers.

References

Buckley, C. (2016, May 20). Uncovering a tale of rocket science, race and the '60s. *The New York Times*. Retrieved from http://www.nytimes.com/2016/05/22/movies/taraji-p-henson-octavia-spencer-hidden-figures-rocket-science-and-race.html?_r=1

Ernest, P. (1998). *Social constructivism as a philosophy of mathematics*. Albany, NY: State University of New York Press.

Gigliotti, D., Chernin, P., Topping, J., Williams, P., & Melfi, T. (Producers), & Melfi, T. (Director). (2016). *Hidden figures* [Motion picture]. United States of America: 20th Century Fox.

Joselow, M. (2016, July 6). Algebra no more. *Inside Higher Ed*. Retrieved from https://www.insidehighered.com/news/2016/07/06/michigan-state-drops-college-algebra-requirement

King, J. E. (1991). Dysconscious racism: Ideology, identity, and the miseducation of teachers. *The Journal of Negro Education, 60*(2), 133–146.

Leonard, J., Davila, E., & Stinson, D. W. (2012). Beyond the numbers: A Benjamin Banneker Association conference series. *Journal of Urban Mathematics Education, 5*(1), 8–20. Retrieved from http://ed-osprey.gsu.edu/ojs/index.php/JUME/article/view/168/105

Martin, D. B. (2013). Race, racial projects, and mathematics education. *Journal for Research in Mathematics Education, 44*(1), 316–333.

Mendick, H. (2006). *Masculinities in mathematics*. London, United Kingdom: McGraw-Hill Education.

National Science Board. (2016). *Science and engineering indicators 2016*. Arlington, VA: National Science Foundation. Retrieved from https://www.nsf.gov/statistics/2016/nsb20161/#/report

Picker, S. H., & Berry, J. S. (2000). Investigating pupils' images of mathematicians. *Educational Studies in Mathematics, 43*(1), 65–94

Shetterly, M. L. (2016). *Hidden figures: The American dream and the untold story of the black women mathematicians who helped win the space race*. New York, NY: Marrow.

Stinson, D. W. (2013). Negotiating the "White male math myth": African American male students and success in school mathematics. *Journal for Research in Mathematics Education, 44*(1), 69–99.

Walker, E. N. (2014). *Beyond Banneker: Black mathematicians and the paths to excellence*. Albany, NY: State University of New York Press.

Williams, J. P. (2014, September 22). College of tomorrow: The changing demographics of the student body. *US News & World Report*. Retrieved from http://www.usnews.com/news/college-of-tomorrow/articles/2014/09/22/college-of-tomorrow-the-changing-demographics-of-the-student-body