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## BECOME A SCIENTISTA

Guest Post by Olivia A. Scriven,  
Ph.D.; Founder and President/CEO of Partners for Educational Development

This is the second installment of a three-part series, [Why So Few?: African American Women in STEM](#). In this latest contribution, Dr. Scriven examines African American female college enrollment, degree attainment and career experiences in STEM.

### By the Numbers

Part I of this series asked that you consider Facebook COO Sheryl Sandberg's call for women to "lean in" as individual and collective advocates and architects in pursuit of career goals.[1] But what does the call to "lean in" mean when compared against the proposition of being African-American, female and a decision-making leader in the technology sector specifically and STEM fields more broadly? Contrary to often-heard pronouncements about the critical need to vamp up national efforts to produce and support science and engineering talent, investigative research by *CNN.com* exposed the virtual invisibility of African Americans and other people-of-color in decision-making management positions in tech-rich regions such as Silicon Valley. [2]

*"While the 10.7% figure for Bachelor's degree and 13% for Master's is encouraging, the percentages obscure some fields (such as mathematics), where African American female degree attainment is 800% less than degree-attainment levels for white females!"*

*Diversity, access, equity and inclusion* are and remain issues which impede progress. But after more than 40 years of civil rights activism and feminist mobilization, there has to have been some measure of substantive growth when it comes to determining who gets to participate in science and in defining the nature of that participation – right? Well, let's examine some recent available data.

According to the National Science Foundation (NSF), African American women and girls comprise a little more than 6% (N=19,730,247) of the total U.S. population, 14% (N=861,642) of female students enrolled at four-year institutions, and 10.4% (N=19,160) of female graduate enrollment in STEM fields.[3] When we dissect the data to focus on degree attainment and professional career, here is what the numbers illustrate:

**African American Female  
STEM Degree and Career Attainment**  
(Figures are only for U.S. Citizens/Permanent Residents)

- Bachelor's degrees awarded in S&E (2010)
  - Both sexes = 507,143
  - All females = 256,352
  - *Black females = 27,576 (10.7% of female Bachelor's degree recipients)*
- Master's degrees awarded in S&E (2010)
  - Both Sexes = 103,552
  - All females = 51,371
  - *Black females = 6,704 (13% of female Master's degree recipients)*
- Doctoral degrees awarded in S&E (2010)
  - Both sexes = 20,570
  - All females = 9,468
  - *Black females = 546 (<1% of female doctoral degree recipients)*
- Employed scientists and engineers across all occupational levels in business or industry (2008)
  - All races/both sexes = 4,874,000
  - All females = 1,308,000
  - *Black females = 75,000 (<1% of females employed in S&E)*
- Employed scientists and engineers, S&E managerial positions in business or industry (2008)
  - All races/both sexes = 314,000
  - All females = 63,000
  - *African Americans = 14,000 (<1 % of ALL employed in S&E Management; data not disaggregated for sex)*

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**Source:** National Science Foundation. *Women, Minorities, and Persons with Disabilities in Science and Engineering: 2013*. Special Report NSF 13-304. Arlington, VA.

### ***The STEM 'Pipeline'***

Encouragingly, the numbers of women in general and African American women in particular have shown steady increases in college enrollment and undergraduate degree attainment over the past decade. The gap, however, is widened at the doctoral level and in career fields. As the data shows, African American women earn 10.7% of Bachelor's and 13% of Master's degrees conferred on women in STEM but dip to less than 1% of the pool at the doctoral level.

While the 10.7% figure for Bachelor's degree and 13% for Master's is encouraging, the percentages obscure some fields (such as mathematics), where African American female degree attainment is *800% less* than degree-attainment levels for white females! Similarly, graduate school (and the subsequent advanced degree) is critical in preparing scientists to engage in high-level research and development, but also in forming professional networks. These networks may not only help to open doors for careers in industry (such as those in Silicon Valley), but for opening doors to careers across all sectors.

Equally alarming is the unacceptably low percentage of African American women who comprise the ranks of

employed scientists and engineers. While the nation is graduating 35,000 Black female scientists and engineers at the undergraduate and graduate levels per year, these women make up less than 1% of S&E professionals – management and non-management alike!

### **Why So Few?**

Most often, scholars, industry professionals and the public make reference to a “pipeline” when describing the flow of students in and out of programs and careers in science – a metaphor that was developed during the science boosterism of the 1980’s. The metaphor, while visual and popular, is problematic as a framework for analysis. When one thinks of a pipeline, the focus is on what goes in and what comes out. However, simply looking at entry and exit numbers obscures other factors that are fundamental to our understanding of who gets to participate in science.

Colleges and universities are generally viewed as the gateway (or what historian Margaret Rossiter describe as the “entering wedge”<sup>[4]</sup>) to professional careers and social and economic advancement. For African Americans, long denied access, education has been particularly important. An understanding of “why so few” African American women earning (advanced) degrees in STEM and working in S&E cannot be fully appreciated without understanding the history of Black women in higher education and efforts to create access to science programs.

Part III of this article will provide a brief historical overview.

#### References:

[1] Sheryl Sandberg. *Lean In: Women, Work, and the Will to Lead*. New York: Alfred A. Knopf, 2013

[2] Julianne Pepitone. “Black, female, and a Silicon Valley ‘trade secret,’” *CNN.com*. Available at [http://cnnmoney.mobi/primary/article?url=http://money.cnn.com/mobile/json/2013/03/17/technology/diversity-silicon-valley.json&cookieFlag=COOKIE\\_SET](http://cnnmoney.mobi/primary/article?url=http://money.cnn.com/mobile/json/2013/03/17/technology/diversity-silicon-valley.json&cookieFlag=COOKIE_SET) Accessed: 20 March 2013

[3] National Science Foundation, National Center for Science and Engineering Statistics. 2013. *Women, Minorities, and Persons with Disabilities in Science and Engineering: 2013*. Special Report NSF 13-304. Arlington, VA. Available at <http://www.nsf.gov/statistics/wmpd/>. Accessed: 20 March 2013

[4] Margaret W. Rossiter. *Women Scientists in America: Before Affirmative Action, 1940-1972*. Baltimore and London: Johns Hopkins University Press, 1995

### **About the Author**

**Olivia A. Scriven, Ph.D.**, is the founder and President/CEO of Partners for Educational Development, an Atlanta-based consulting firm which specializes in designing programs to increase the recruitment, retention and degree attainment of under-represented minorities and women in STEM at the undergraduate and graduate levels. In addition to working with colleges and universities to create campus climates for diversity and inclusion, Dr. Scriven is on the faculty at Georgia Tech where she teaches seminars in African American history from pre-European colonial contact through the Civil War and from Reconstruction through the presidential elections of Barack Obama.

Dr. Scriven holds the doctoral degree in the History of Technology and Science from Georgia Tech – the first and ONLY African American to be awarded the Ph.D. in the program. Her research explores issues of race, gender, and policy in science and technology studies, with a particular focus on pioneering Black women and the role of historically Black colleges and universities (HBCUs) in producing African Americans in STEM. You can read more about Dr. Scriven at [www.partnersforedu.org](http://www.partnersforedu.org).

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