

## ADVANCES & INSIGHTS: *The NIH Women in Science Newsletter*

This e-newsletter is brought to you by the NIH Working Group on Women in Biomedical Careers.



July 2015 | Volume 8 | Issue 4

womeninscience.nih.gov

### Recent Research

#### The Role of School Performance in Narrowing Gender Gaps in the Formation of STEM Aspirations: A Cross-National Study

Mann A, Legewie J, Diprete TA. *Front Psychol.* Feb 25, 2015; 6(171).

<http://dx.doi.org/10.3389%2Ffpsyg.2015.00171>

Researchers studied how a student's peers influence his or her aspirations to go into a science, technology, engineering, or math (STEM) career. They analyzed data from 331,834 15-year-olds at 12,846 schools in 55 countries who had taken an international academic skill assessment test. Students who scored high on math- and science-related sections were more likely to say that they hoped to have a STEM-related job at age 30. However, at schools where math and science performance was strong (and therefore competition between students may be high), those high-scoring students were less likely to aspire to STEM careers than their counterparts who went to school with lower-achieving peers. Girls were less likely than boys to want jobs in STEM, but the higher-achieving, competitive environments were more influential for boys' aspirations than girls, which narrowed the gender gap for high-performing students in these environments.



 @NIHDirector

 @JanineClaytonMD

 @NIH\_ORWH

### In This Issue

#### Recent Research

The Role of School Performance in Narrowing Gender Gaps in the Formation of STEM Aspirations: A Cross-National Study

Gender and Clarity of Evaluation Among Academic Scientists in Research Universities

Two Brief Interventions to Mitigate a "Chilly Climate" Transform Women's Experience, Relationships, and Achievement in Engineering

#### Scientist Spotlight

Ida Owens, Ph.D.  
NIH Intramural Investigator

## Gender and Clarity of Evaluation Among Academic Scientists in Research Universities

Fox MF. *Sci Technol Hum Val*. Jul 2015; 40(4): 487–515.

<http://sth.sagepub.com/content/40/4/487>

Tenured and tenure-track professors in science, computer science, and engineering departments at nine universities completed a mailed survey in 2002–2004 that included a question about the criteria for tenure and promotion. A total of 765 responded. While 48.7 percent of men said criteria for tenure and promotion were “very clear,” only 34.1 percent of women agreed. Women were more likely to find the criteria “moderately clear” or “slightly clear.” Some of the strongest predictors of clarity were informal: a collegial climate and speaking daily with colleagues about research. While being in a department with a collegial climate made criteria clearer for everyone, this was especially the case for women faculty. The author suggests that future research on the causality of the relationship between clarity of criteria and departmental collegiality would be useful.

## Two Brief Interventions to Mitigate a “Chilly Climate” Transform Women’s Experience, Relationships, and Achievement in Engineering

Walton GM, Logel C, Peach JM, Spencer SJ, Zanna MP. *J Ed Psychol*. May 2015; 107(2): 468–485.

<http://psycnet.apa.org/doi/10.1037/a0037461>

First-year engineering students — 92 women and 136 men — in their first semester at the University of Waterloo were randomly assigned to one of two hour-long interventions designed to mitigate the effects of a “chilly climate” women may experience in engineering, or conversely, a control group focusing on a neutral topic (study skills). A “social-belonging” intervention contained materials emphasizing that while men and women often feel like they do not belong in engineering at first, the feeling typically goes away. An “affirmation-training” intervention emphasized that upper year students often learn to incorporate broader aspects of their self-identity in their daily lives to manage stress and find “balance” in engineering. Students were given keychains to remind them of the interventions. At the end of their first year, women who had the interventions, unlike women in the control group, had engineering grade point averages as high as men’s and led women to view daily adversities as more manageable and improved women’s academic attitudes. The authors conclude that feeling socially marginalized can affect achievement and that short-term interventions can help women in male-dominated fields.

## Institutional Spotlight

Montana State University

## Current News and Reports

Better With Both: Encouraging Scientists to Study Both Sexes

Give Women an Even Chance

## Editorial Staff

### Editor in Chief

Jennifer Plank, PhD

### Associate Editor

Kjersten Bunker Whittington, PhD

### Associate Editor

Sara Cassidy, PhD

### Associate Editor

Terri Cornelison, MD, PhD

## Spotlights

### Scientist Spotlight: Ida Owens, Ph.D.

Dr. Ida S. Owens is an intramural NIH investigator and head of the Section on Genetic Disorders of Drug Metabolism within the *Eunice Kennedy Shriver* National Institute of Child Health and Human Development (NICHD). Early contributions from Dr. Owens came as a member of the Laboratory of Developmental Pharmacology in NICHD, where she initiated a research program investigating the uridine diphosphate glucuronyltransferase (UGT) drug detoxifying system. UGTs are a family of enzymes that convert small lipophilic molecules into water-soluble, excretable metabolites. Dr. Owens was made chief of this research program in 1981, when it was made into a permanent Section on Drug Biotransformation. Some notable contributions of her research group include the identification of the defects in the *UGT1A1* gene that cause Crigler-Najjar syndrome (a severe condition characterized by high levels of toxic bilirubin in the blood), and uncovering the unique capacity of UGT isozymes to detoxify innumerable chemicals derived from metabolism, diet, environmental contaminants, and medications. More recently, Dr. Owens has extended her research into the role of UGT complexes in prostate health and disease.

Dr. Owens graduated *summa cum laude* from North Carolina College, now North Carolina Central University, with a B.S. in biology and a minor in mathematics. She earned her Ph.D. in physiology with a minor in biochemistry from Duke University. Dr. Owens was also the first African-American woman to receive a Ph.D. from Duke, one of the last major universities to desegregate (the graduate and professional schools were desegregated in 1961, and four African-American students matriculated to Duke graduate schools the following year; the first five African-American undergraduates at Duke matriculated in 1963). At the time, the university had no African-American faculty, administrators, or trustees. Dr. Owens' experiences as Duke's first African-American female Ph.D. recipient are captured in a 34-minute documentary, *The Education of Ida Owens*, produced to commemorate 50 years of integration at the university.

Dr. Owens has received many awards throughout her career, including the NIH Director's Award in 1992 for her work on drug detoxifying enzymes. In 2009, the American Asthma Foundation recognized her as one of the top 5 percent of cited authors in pharmacology-related journals. She has published more than 75 primary research articles in journals such as the *Journal of Biological Chemistry* and *Proceedings of the National Academy of the Sciences of the United States of America*, and she has been invited to present her research at numerous national and international scientific meetings.

In her spare time, Dr. Owens enjoys reading, nurturing beautiful plants, and visiting museums and the theater.

### Institutional Spotlight: Montana State University

The National Science Foundation's ADVANCE program aims to increase the representation and advancement of women in academic science and engineering careers. The institution highlighted in this newsletter, Montana State University (MSU), is a recipient of a 2012 ADVANCE Institutional Transformation Award, a five-year grant focused on transforming the culture of academic science, technology, engineering, and mathematics (STEM) disciplines to promote a more diverse STEM workforce.

MSU's ADVANCE Project TRACS (Transformation through Relatedness, Autonomy, and Competence Support) is a cutting-edge program designed to broaden the participation of women faculty in STEM and social and behavioral sciences (SBS) using the tenants of self-determination theory (SDT). SDT is a theory of intrinsic motivation that hypothesizes people have three basic psychological needs — competence, relatedness, and autonomy — that, when fulfilled, foster the most volitional and high-quality forms of motivation and presumably career satisfaction and success. MSU uses SDT, its institutional context, and the social science literature to achieve three main goals to promote women in STEM and SBS.

One goal is to enhance research capacity and opportunity, as successful grant applications are a cornerstone of the retention and advancement of women scientists. To achieve this goal, MSU has designated a grant submission training coordinator to preferentially assist female STEM and SBS faculty with proposals for external funding. Faculty can request assistance with such tasks as generating high quality grants, developing budgets, submitting paperwork, responding to reviewers, and facilitating interdisciplinary collaborations. The school has also established a Grant Facilitator Network, a list of successful grantees willing to give assistance and advice to female STEM and SBS grant writers. MSU's Mini-Grant Award Program is an innovative approach to promoting research that aims to fund a diverse array of projects, including requests for funds to collect pilot data or to diversify the scope of a researcher's work.

Another major goal of ADVANCE Project TRACS is to enhance work-life integration. MSU has instituted family advocates to normalize discussions of family needs among faculty and to help individuals navigate the Montana State University System and learn about the school's policies and programs available to meet their individual and family concerns. Family advocate and assistant professor of political science Dr. Sara Rushing explains the impetus for developing the family advocate position. "Our institution is very decentralized and lacks robust institutional policies. Women faculty who were trying to figure out maternity leave really had very little to work with [regarding instituted leave policies at MSU]. Many of them were the first in their department to ever request such a thing. What we found was people across the university were getting very different arrangements." Highlighting another novel approach to normalizing work-life integration, MSU's family advocate meets with faculty candidates of both genders to explain MSU's work-life integration programs. STEM and SBS departments were the first to institute this practice; however, the program was so successful that nearly every faculty search at MSU now requests that candidates meet with a family advocate during their interviews. Candidates from both genders reported that they appreciated meeting with the family advocate during interviews. The first year this practice was in place, 50 percent of all STEM and SBS faculty hired were women.

MSU is also confronting the two-body problem in unique ways. The two-body problem is a term used to define couples that both aspire for academic jobs. More than 40 percent of academics are married to other academics and finding both partners a fulfilling job can be tricky, particularly in geographically isolated areas. When courting potential faculty, MSU assumes that every candidate has a partner. Notably, their data show that partner accommodations are a major factor in determining whether an offer is accepted or declined. MSU has embraced this as a two-body opportunity. "We have hired 30-plus tenure-track partners in the last two years. The nice thing about doing so many [partner accommodations] recently is that the stigma has rapidly fallen away. Now departments are competing for partners because they want to build their faculty and, in general, the partners are great candidates," Dr. Rushing explains.

MSU is also working to enhance cultural attunement within the institution to support an increasingly diverse STEM and SBS workforce. The school has developed a "search tool kit" to promote diverse hiring, which Dr. Rushing advocates as an easy tool any institution can use to promote diversity within its own ranks. "[The kit] is a document that outlines how to recruit a more diverse faculty, including the best practices from across the country and from social psych[ology] research, compiled into one to-do guide." The guide, as well as more information about the ADVANCE program, is freely available on the [MSU ADVANCE program website](#).

### **Did you know?**

Early Stage Investigators (ESIs) who have had a lapse in their research career can extend their ESI eligibility. Generally, the length of the extension is equal the length of the hiatus. To learn more, visit <http://grants.nih.gov/grants/guide/notice-files/NOT-OD-09-034.html>.

# Current News and Reports

## Better With Both: Encouraging Scientists to Study Both Sexes

NIH's mission is to seek fundamental knowledge about the nature and behavior of living systems and the application of that knowledge to enhance health, lengthen life, and reduce illness and disability. There is growing recognition that the quality and generalizability of biomedical research depends on the consideration of key biological variables, such as sex. NIH has long appreciated the importance of enrolling men and women in clinical research to both provide a basis for application of results and identify factors that affect disease course and treatment outcome. Women now account for roughly half of all participants in NIH-supported clinical research, which is subject to [NIH's Policy on the Inclusion of Women in Clinical Research](#). However, preclinical research studies continue to rely heavily on male animals and/or omit reporting of the sex of animal subjects; this is particularly problematic in studies that intend to inform our understanding of diseases and conditions affecting both sexes.

In June 2015, [NIH announced](#) that it is changing the instructions for scientists applying for NIH funding, as well as revising the criteria for the reviewers who judge the funding applications. These changes are part of an NIH-wide initiative to improve the reproducibility of publicly funded research through increased scientific rigor and transparency. As part of these efforts, NIH is specifying that researchers must consider sex as a biological variable in studies with vertebrate animals and humans. Strong justification from the scientific literature, preliminary data, or other relevant considerations will be required for those scientists proposing to study only one sex. These updates, pending expected approval by the White House Office of Management and Budget, will take effect for funding applications submitted to NIH in January 2016. This new policy promotes the best science by ensuring a balanced approach to studying both sexes in NIH-funded biomedical research.

## Further Resources

See [the public announcement, NOT-OD-102: Consideration of Sex as a Biological Variable in NIH-funded Research](#), and [Additional Guidance](#) for more details. For additional resources, see the NIH Office of Research on Women's Health website, [Studying Sex to Strengthen Science](#), which includes [research and training materials](#) such as online courses, resources on methods and techniques, and scientific reports. The site also includes [research summaries](#) on specific topical areas with known sex/gender differences.

## [Give Women an Even Chance](#)

Posted by Marcia McNutt in May 2015 for *Science*

Marcia McNutt, Editor-in-Chief of *Science* Journals, describes her recent experience on a selection committee tasked with evaluating 60 proposals from a national pool of graduate students applying for small research grants. McNutt notes during her review process, more than 10 percent of applicants had at least one supporting letter containing "inappropriate material for the topic at hand." The problematic letters were written by both women and men but were all about female candidates. The letters included character observations related to being "nice," "pleasant," and "humble," as well as comments that the applicant manages to successfully balance being a student, scientist, and mother. The author writes that these remarks do not belong in recommendation letters, which are meant to describe qualities such as problem solving, creativity, and teamwork. McNutt urges letter writers to carefully consider the unconscious biases that their letters may be displaying.