Symposium on Evidence-based Interventions:

*NSF Taking Action*

Suzi Iacono, Head
Office of Integrative Activities
National Science Foundation

National Academies
March 11, 2019
NSF Commitment to Diversity & Inclusion

• Congressionally-mandated advisory committee--CEOSE
• Office – ODI
• Cross-agency Sexual Harassment Working Groups
  • Director’s Executive Leadership Group on Harassment
  • Director’s Sexual Harassment Task Group
  • Terms and Conditions Working Group
  • Team Responding to the NASEM Report
• Broadening Participation Programs
  • FY19 Budget Request is $887M
• Strategic Plan FY18-FY22 Core Value
  • Inclusion – a staff that is representative...; outstanding and diverse researchers....
• Changes to policies and practices....
Gender and Racial/ethnic Diversity of NSF's Scientists and Engineers: FY 2006-2015

Source: NSF Division of Human Resources Management
Percentage of NSF Proposals from and Awards to Women
FY 2015 Research Proposals - Comparison of Women's and Men's Success Rates

Ratio of Success Rates (F/M)
## Competitively Reviewed Proposals, Awards and Success Rates, by PI Type

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<td><strong>All PIs</strong></td>
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<tr>
<td>Awards</td>
<td>10,425</td>
<td>11,463</td>
<td>11,149</td>
<td>14,595</td>
<td>12,996</td>
<td>11,192</td>
<td>11,524</td>
<td>10,829</td>
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<td>Proposal</td>
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<td>9,431</td>
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<td>11,488</td>
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<td>2,493</td>
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<td>2,775</td>
<td>2,556</td>
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<tr>
<td>Proposal</td>
<td>31,482</td>
<td>32,650</td>
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<td>32,091</td>
<td>38,695</td>
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Research Proposals and Success Rates, FY 2013 – FY 2016, by Years Since Highest Degree and by Gender
BP Focused Programs

*All awards for which information was collected were active as 1/23/2017
NSF INCLUDES: Broadening Participation in STEM

What if we focused more here?

* catalyze

launch

sustain

large-scale social change

incremental change

Impact

Time
ADVANCE
Indicators of Long-Term Goal: A Successful & Diverse STEM Academic Workforce

From 2001 to 2008
Accomplishment

- **Women STEM faculty**: 49% increase in women STEM faculty (from 16% to 24%)
- **Women of color STEM faculty**: Increased from 2.4% to 3.8% of STEM faculty
- **STEM faculty hiring**: 40% increase in new women STEM hires (from 25% to 35%)
- **Women in leadership**: 64% increase in STEM women in leadership (from 10% to 16%)

From 2012 ADVANCE program evaluation (N=13 to 19) not published

ADVANCE IT Institutions Cohorts 1-4 (n=41) from NSF grantee reports
Implicit Bias Research Informing NSF Practice

**Implicit (and explicit) biases research shows impacts on employment opportunities, compensation, promotion, leadership, & health disparities.**

~1970 to now

University of Michigan applied this research to academic settings developing implicit bias training with their ADVANCE Institutional Transformation grant

~2001 to now

NSF chemistry division asked U of Michigan to develop implicit biases training for NSF panels. Additional NSF programs adapted the training for their own panels

~2007 to now

NSF Academy video training “Minimizing Implicit Bias” is available to NSF staff

~2010 to now

NSF creation of video training for panelists on implicit bias in peer review

~2017 to now

Mandatory new NSF Program Officer training includes information on mitigating implicit biases

~2012 to now

*Important Notes:

1. Awareness of ones own implicit biases is NOT enough to eliminate the impact of implicit biases in decision making – structures and policies around decision making need to be created to ensure mitigation of implicit bias influence.

2. “Implicit bias training” does NOT change an individual's implicit biases – rather it provided strategies and tools to mitigate the impact of implicit biases in decision making.
NSF Video contains...

(1) Tips on writing analytical reviews

(2) Broader Impacts

(3) How to mitigate cognitive biases
BEST PRACTICES identified with credible evidence include:

- Analyses of mandated workforce data sets;
- Implicit bias training;
- Conflict resolution; and
- Promoting work flexibility.

PROMISING PRACTICES are defined as those that are consistent with principles established by research but have not been the subject of evaluation. The following are particularly promising:

- Diversity change agents;
- Diversity toolkits;
- Technical qualifications board; and
- Proposal review experiments.

EMERGING PRACTICES include:

- Unconscious bias training for search committees;
- Special training for the entire workforce;
- Hiring and promotions safeguard
Best, Promising, and Emerging Practices to Reduce the Impact of Bias in the Federal STEM Workforce

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- Conflict resolution; and
- Promoting work flexibility.

**PROMISING PRACTICES** are defined as those that are consistent with principles established by research but have not been the subject of evaluation. The following are particularly promising:
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**EMERGING PRACTICES** include:
- Unconscious bias training for search committees;
- Special training for the entire workforce;
- Hiring and promotions safeguard pilots; and
- New inclusive workforce tools.
In the Federal STEM Workforce

**Recommendation 1:** Each Federal agency should exercise leadership at all levels, including senior officials, STEM program and administration managers, human capital officials, and diversity and inclusion officials, to reduce the impact of bias in their internal operations, including:

- Incorporating diversity and inclusion objectives in the strategic plan;
- Implementing recruiting, hiring and promotion practices that encourage diversity and inclusion; and
- Establishing bias-mitigation goals, techniques, and accountability mechanisms.
Conclusions

• Guiding principles
  • Diversity strengthens the STEM enterprise
  • Preparation and advancement of all US talent is essential to US STEM leadership
  • Diversity and inclusion are central all organization’s missions and business cases
  • Groups traditionally underrepresented and underserved are a reservoir of untapped creativity, diversity of thought and engines of innovation

• Mitigating biases/assumptions
  • Raise awareness and motivation to change
  • Provide strategies and tools
  • Empower and set expectations for positive outcomes
  • Increase commitment to reduce bias

• Take action today!
Thanks!

siacono@nsf.gov
Employed scientists and engineers, by sex and race/ethnicity: 1993 and 2013

1993

- White Men: 66%
- Asian Men: 7%
- Hispanic Men: 2%
- Black Men: 2%
- Asian Women: 2%
- Hispanic Women: 1%
- Black Women: 1%
- Other Women: 0%
- Other Men: 0%

2013

- White Men: 51%
- Asian Men: 12%
- Hispanic Men: 4%
- Black Men: 3%
- Asian Women: 5%
- Hispanic Women: 2%
- Black Women: 2%
- Other Men: 1%
- Hispanic white women: 1%
- Other Women: 1%
- Other Men: 1%

SOURCE: National Science Foundation, National Center for Science and Engineering Statistics
Participation of Female Reviewers in Virtual, In Person, and Mixed Panels FY 2014

In Federally Funded Institutions of Higher Education

**Recommendation 2:** Each Federal agency incorporate bias-mitigation strategies into its proposal review process and offer technical assistance to grantee institutions to implement bias-mitigation strategies, including:

- Achieving fairness and quality in the STEM endeavor;
- Collecting and analyzing data on the entire cycle of the grant making process to analyze success rates across groups; and
- Providing information about methods to reduce bias.
Cross-cutting Government-wide Leadership

**Recommendation 3:** The Federal Government, through OSTP, OPM, and the Department of Justice (DOJ), should exercise leadership to reduce the impact of bias in the Federal STEM workforce and federally funded institutions by:

- Serving as focal points and clearinghouses for bias-reduction strategies for both Federal agencies and federally funded institutions;
- Coordinating civil rights compliance efforts;
- Enhancing the capacity for Government-wide performance and accountability for efforts to mitigate explicit and implicit bias through validated measurement tools;
- Spurring greater strategic coordination, collaboration, and impact of successful programs aimed at reducing bias and increasing diversity in federally funded institutions; and
- Strengthening university--community partnerships to mitigate bias and increase access to pathways to Federal STEM employment.
New Merit Review Pilot: 
Reviewer Orientation

- Complaints/Confusion/Data
  - Variable quality of reviews – noted in COVs and in comments from PIs
  - Confusion about Broader Impacts – noted in COVs and in discussion with Advisory Committees
  - Data about differences in success rates – graphs put in every NSF Annual Merit Review Report

- What we will do
  - Move reviewer orientation up a few weeks – before they read proposals and write reviews
  - And use a standardized format for everyone