NIH Addresses the Science of Diversity: Focusing on Institutional Change

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NIH Chief Officer for Scientific Workforce Diversity

UCSF Psychiatry Distinguished Visiting Lecturer Series | March 13, 2018

NIH National Institutes of Health
Office of the Director
Scientific Workforce Diversity

NIH Addresses the Science of Diversity

Presentation Outline

- Why diversity matters

- Keys to scientific workforce diversity

- Moving beyond individual-level diversity strategies

- Sustainability requires institutional-focused efforts

Capturing the Benefits of Diversity
Identity is a Proxy for Cognitive Diversity

Thinking Style

Language

Ethnicity*

Religion

*Underrepresented Populations in U.S. Biomedical, Clinical, Behavioral and Social Science Research

Perspectives

Experiences

Nationality*

Geography

Race*

Culture

Skills

Gender*

Physical Abilities

Sexual Orientation

Disability*

Age

Socioeconomic Status*

URM Diversity Declines Along Career Path

Representation in the Biomedical Sciences, 2011-12

Categories: Associates, Bachelors, Masters, Doctoral (Training); Lecturer/Instructor*, Assistant Professor* (Early Career); Associate Professor*, Full Professor* (Tenured Faculty)

Legend:
- Women - Underrepresented
- Women - Well-represented
- Men - Underrepresented
- Men - Well-represented

Gender Diversity Declines Along Career Path

At the current rate, attaining gender parity will take a _very_ long time
(48 years nationwide)

We need <u>accountability</u> – Disaggregate the data!
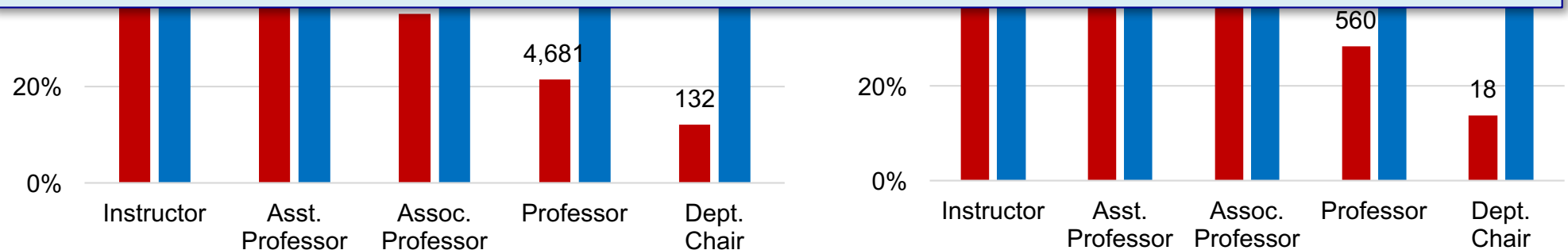
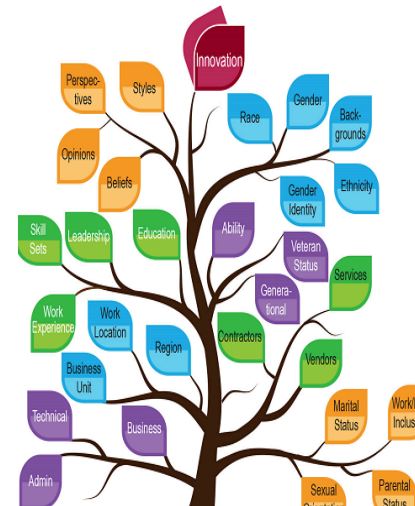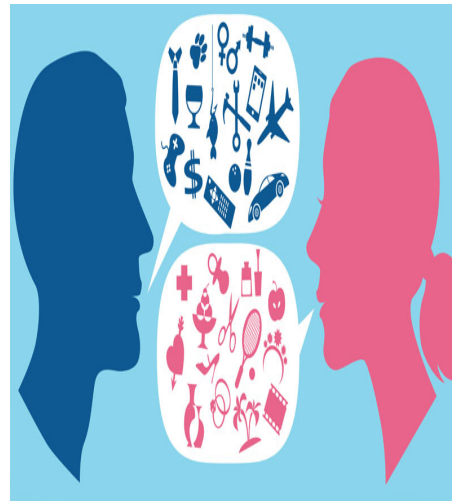**Internal Medicine, Pathology, Neurology, Pediatrics, Psychiatry, Surgery, Radiology
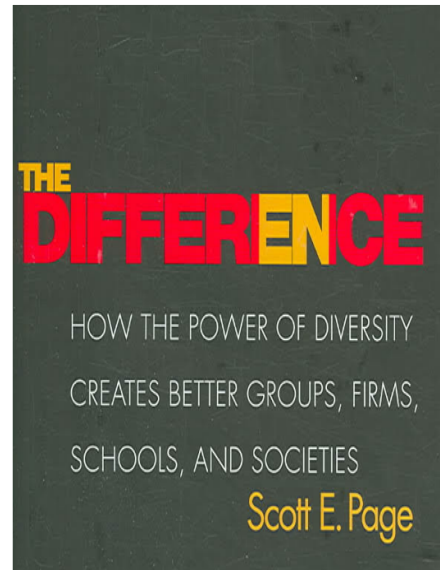
Keys to Scientific Workforce Diversity

Diversity Science

Recruitment Retention

Sociocultural Factors

Sustainability

Diversity Improves Quality of Science

- 2.57 million scientific papers between 1985-2008 (authors with U.S. addresses); 11 scientific fields

- Surnames of co-authors – ethnic diversity

- Controlled for # authors; population density etc.

> Papers written by a diverse groups:
> - Receive more citations
> - Published in journals with higher impact factors

- Similar finding for gender diversity*

Freeman, R. B., & Huang, W. (2014).*National Bureau of Economic Research*, No. w19905.

* Campbell LG, et al. (2013) Gender-heterogeneous working groups produce higher quality science. *PLoS One*.

Keys to Scientific Workforce Diversity

Diversity Science

Recruitment
Retention

Sociocultural Factors

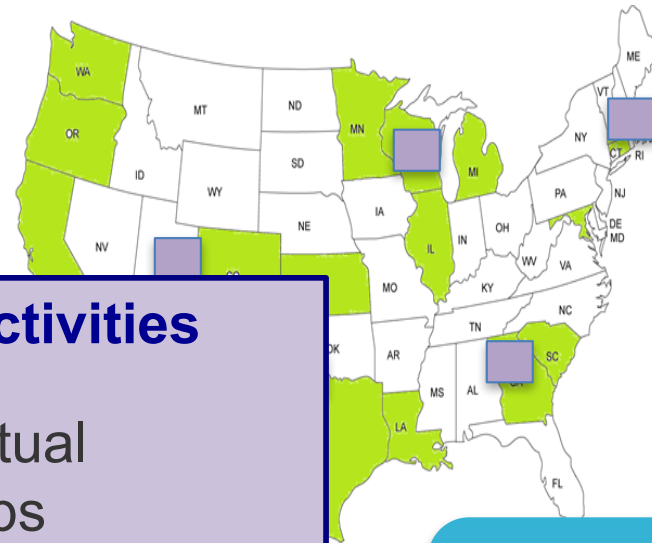Sustainability

NIH Diversity Program Consortium

Building Evidence- Awards made October 2014
Total: $250 million (5 years)

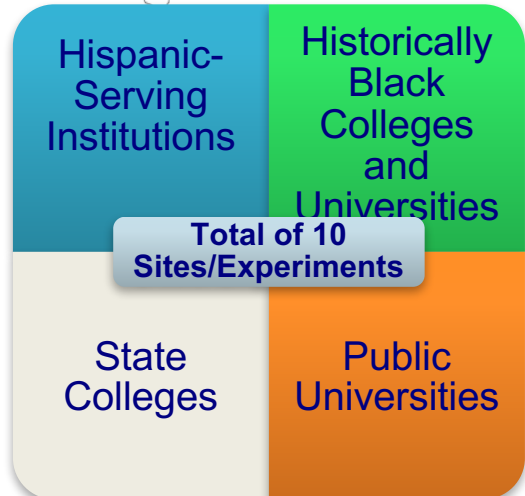**BUILD: 10 sites/experiments**

NRMN

CEC

BUILD Tested Interventions

- Stereotype threat

- Critical race theory

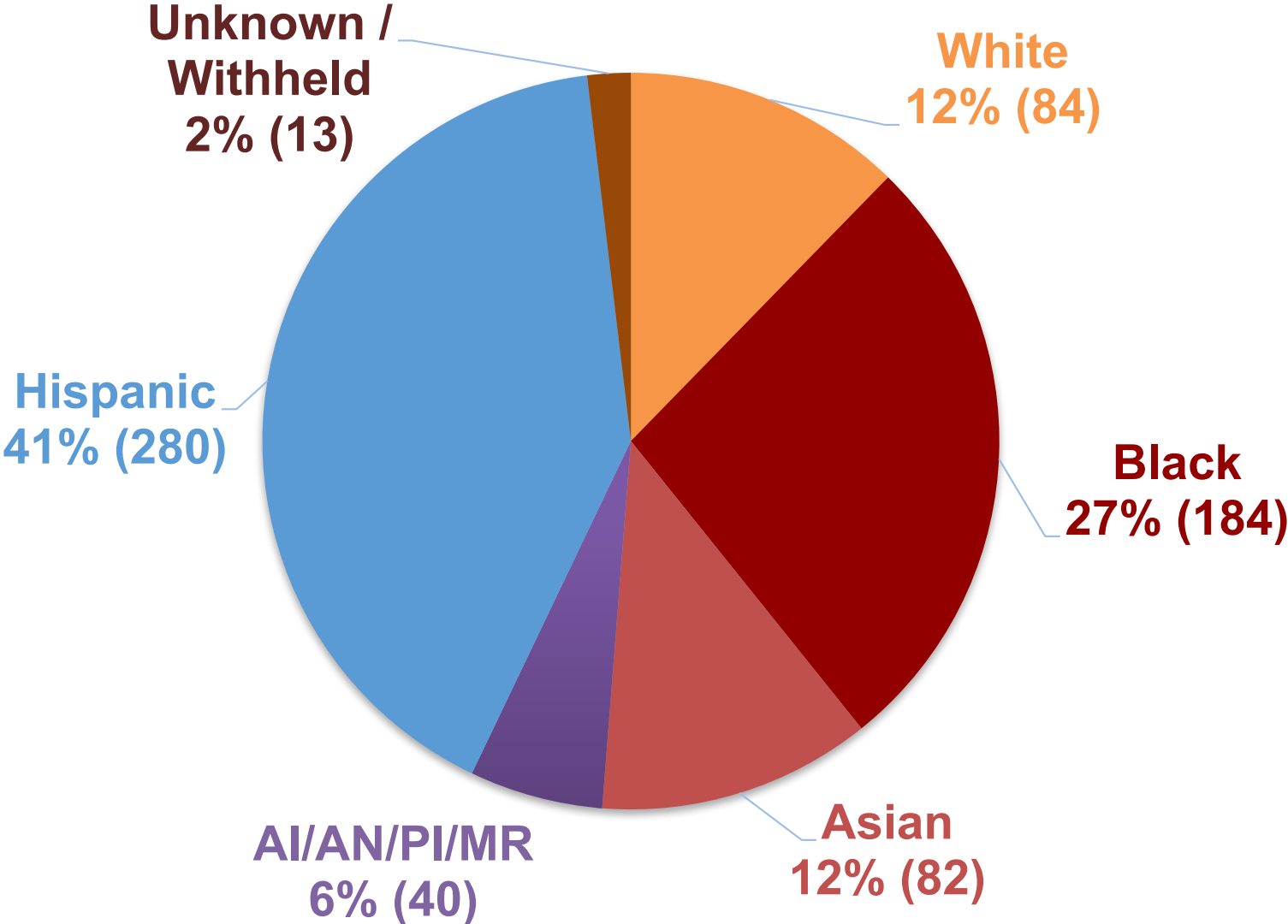- Student entrepreneurship

- Living and learning communities

NRMN Activities

- Guided virtual mentorships

- MyNRMN tool

- Mentors: 2,066*

- Mentees: 3,844 *

- Grantwriting/coaching - mentees: 456 (July '17)

Hispanic-Serving Institutions

Historically Black Colleges and Universities

Total of 10 Sites/Experiments

State Colleges

Public Universities

*Data as of September 2017

BUILD TL4 Participant Demographics (Total:683)

- Unknown / Withheld 2% (13)
- White 12% (84)
- Black 27% (184)
- Asian 12% (82)
- AI/AN/PI/MR 6% (40)
- Hispanic 41% (280)

BUILD Dashboard (Years 1-3)

| | 0 | 200 | 400 | 600 | 800 | 1000 | 1200 | 1400 |

BUILD NRSA training slots (TL4)* — 1329
BUILD research training slots (RL5) — 786
Student Seminars/ Workshops — 364

Student

Faculty Release Time (# participants) — 248
Faculty Mentor Training (# activities) — 91
Pilot Projects — 98
Faculty Professional Development (# activities) — 88

Faculty

Novel Curricula — 104
Institutional Partner Agreements — 88
Publications — 85

Institution

* Students supported for multiple years

Updated December 2017

BUILD: Testable Interventions
Impact on pre-defined outcomes of:

DIVERSITY PROGRAM CONSORTIUM

Supported by the National Institutes of Health

Site-Specific

- Reducing stereotype threat
- Diminishing imposter syndrome
- Overcoming microaggressions
- Mitigating unconscious bias
- Increasing cultural awareness and sensitivity
- Emphasizing cultural assets
- Engaging family and support systems

Consortium-Wide

- Science identity
- Providing financial assistance
- Providing authentic research experiences
- Implementing active learning courses
- Forming supportive cohorts and learning communities
- Mentor training
- Creating professional networks

SF State University Stereotype Threat Intervention

STEP Intervention: Addressing stereotype threat, affirming underrepresented students' values, improving sense of belonging, and building science identity

Course Grades
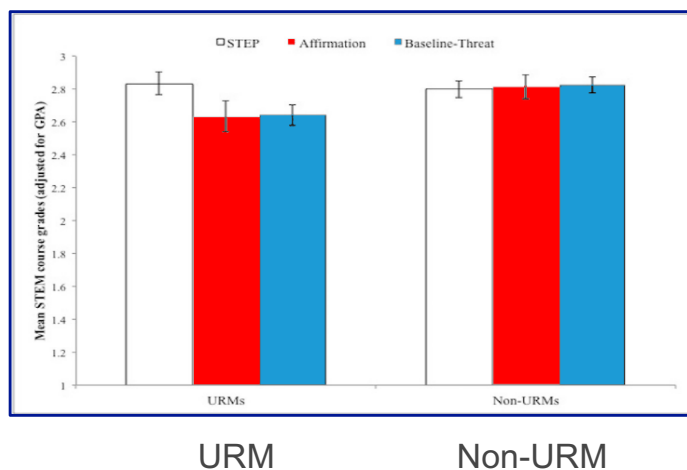
Abstract Reasoning
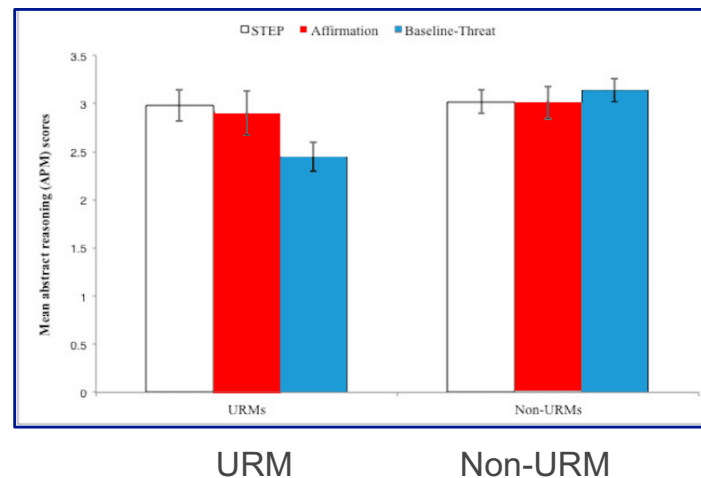
Resilience

Baseline Threat

Values Affirmation

STEP
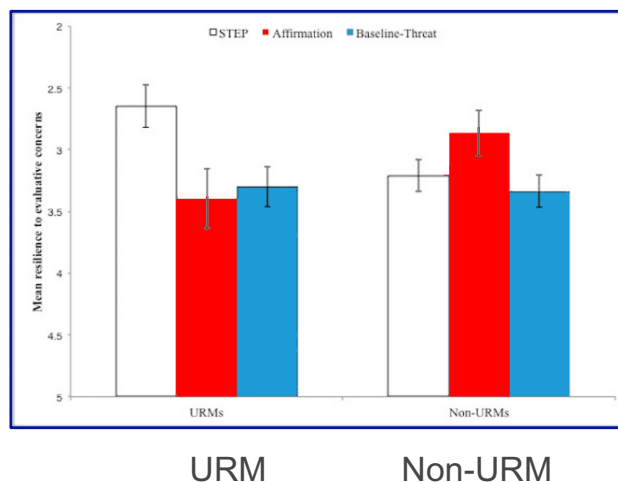
Faculty-Focused Interventions

Certain interventions increase self-efficacy and research success:

- Rigorous pilot-project funding process

- Protected time for research

- Grant-writing workshops

- Grant-writing coaches

BUILD

NRMN

Surveys of self-efficacy

Hallmarks of success: presentations at meetings, publications, external funding

NRMN Grant-Writing Participants
N=432

- Multiracial 4%
- Other 2%
- American Indian/Alaska Native 5%
- Asian 13%
- Black 34%
- Hawaiian/Pacific Islander 1%
- Hispanic 19%
- White 22%
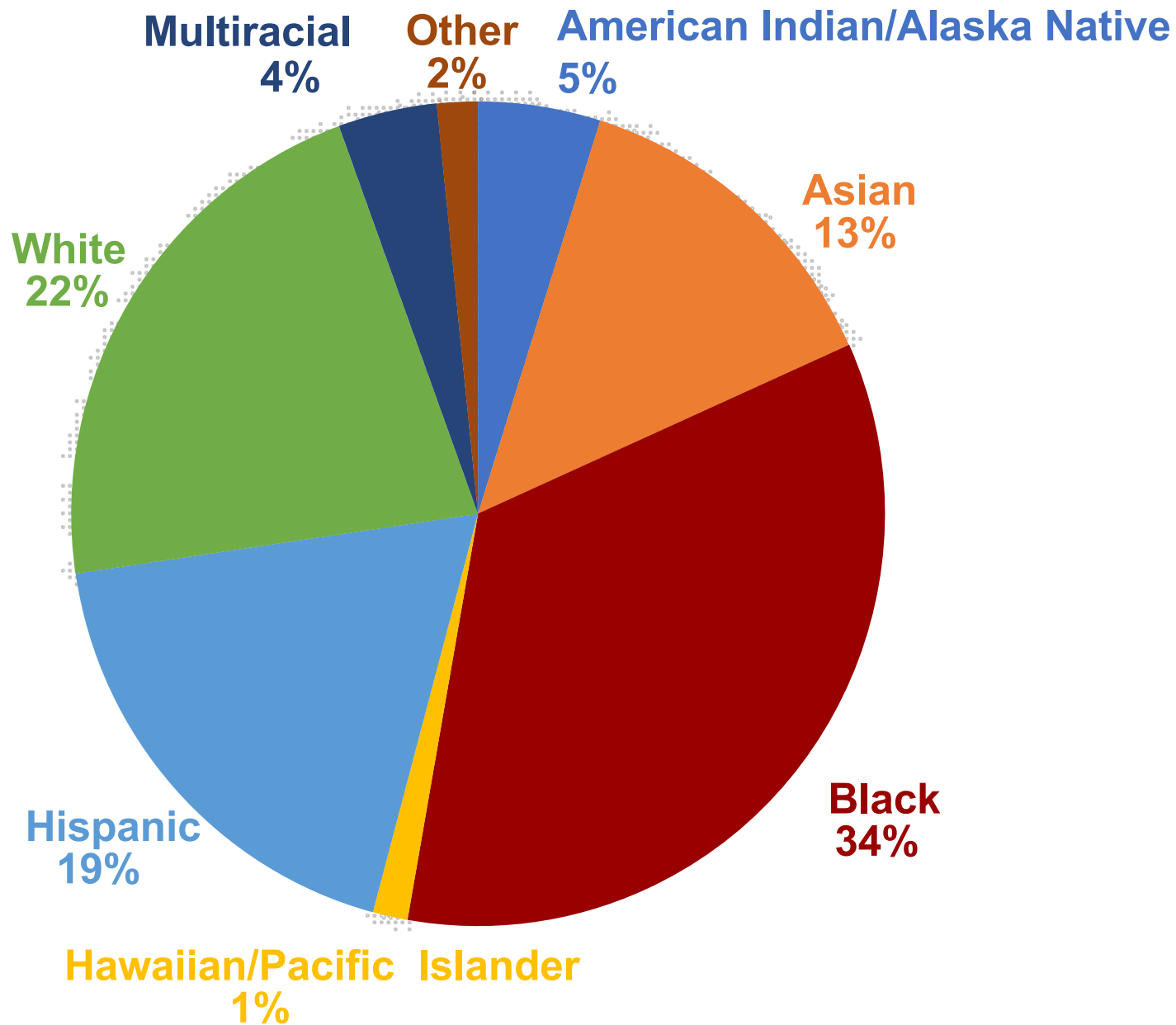
Coordination and Evaluation Center (CEC)
Student Activity Tracking Tool

- Individuals tracked by their activities and linked to outcomes
- Data is tracked in the same way
- Stores all data in one location
- Ensures data will be accessible in future years

Example of Tracking Data
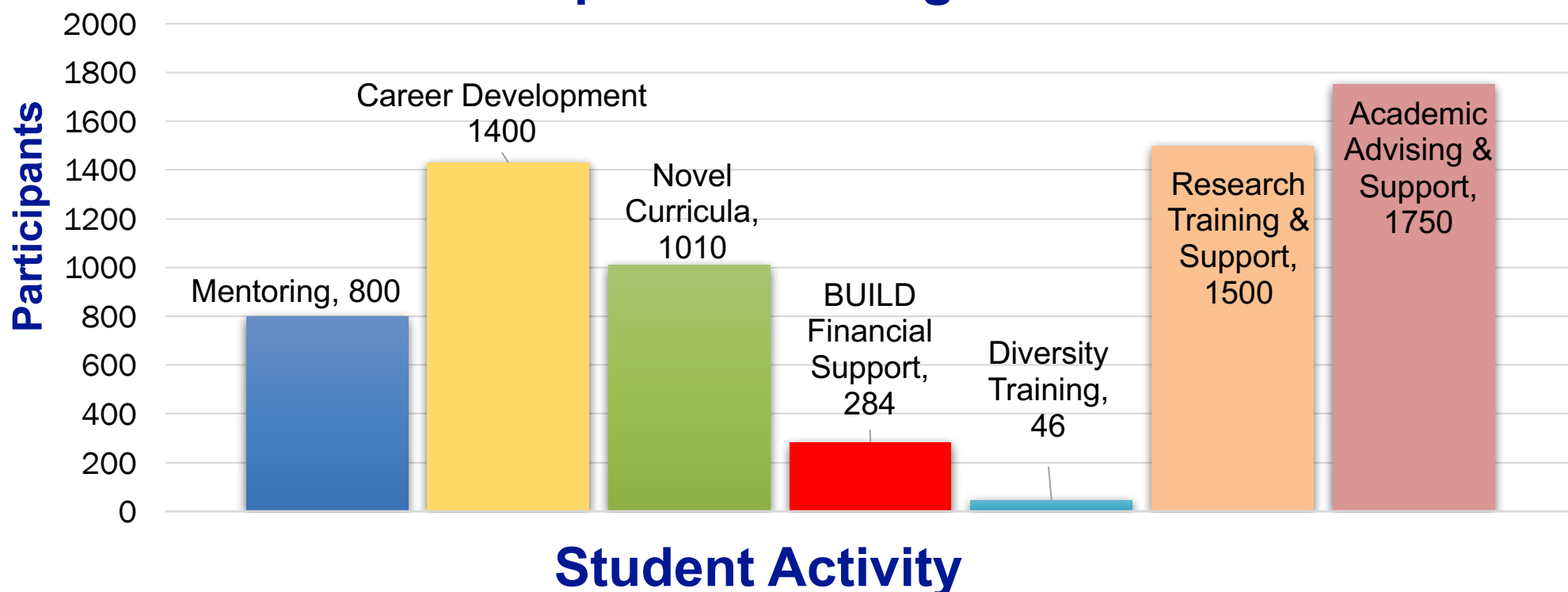
Bar chart with y-axis labeled "Participants" (0 to 2000) and x-axis labeled "Student Activity":
- Mentoring, 800
- Career Development 1400
- Novel Curricula, 1010
- BUILD Financial Support, 284
- Diversity Training, 46
- Research Training & Support, 1500
- Academic Advising & Support, 1750

Keys to Scientific Workforce Diversity

Diversity Science

THE DIFFERENCE

HOW THE POWER OF DIVERSITY CREATES BETTER GROUPS, FIRMS, SCHOOLS, AND SOCIETIES

Scott E. Page

Recruitment Retention

DIVERSITY PROGRAM CONSORTIUM

Supported by the National Institutes of Health

Sociocultural Factors
Stereotypes
Bias
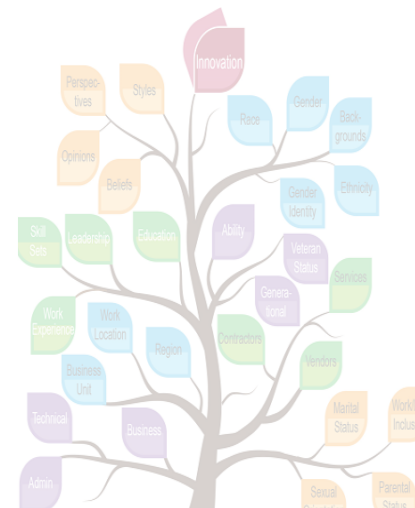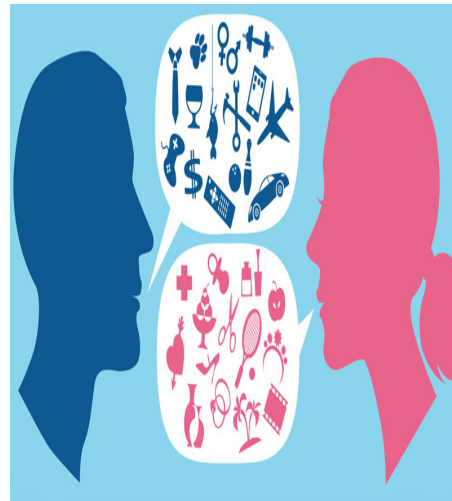
Sustainability

Study: "Who is a Scientist?"
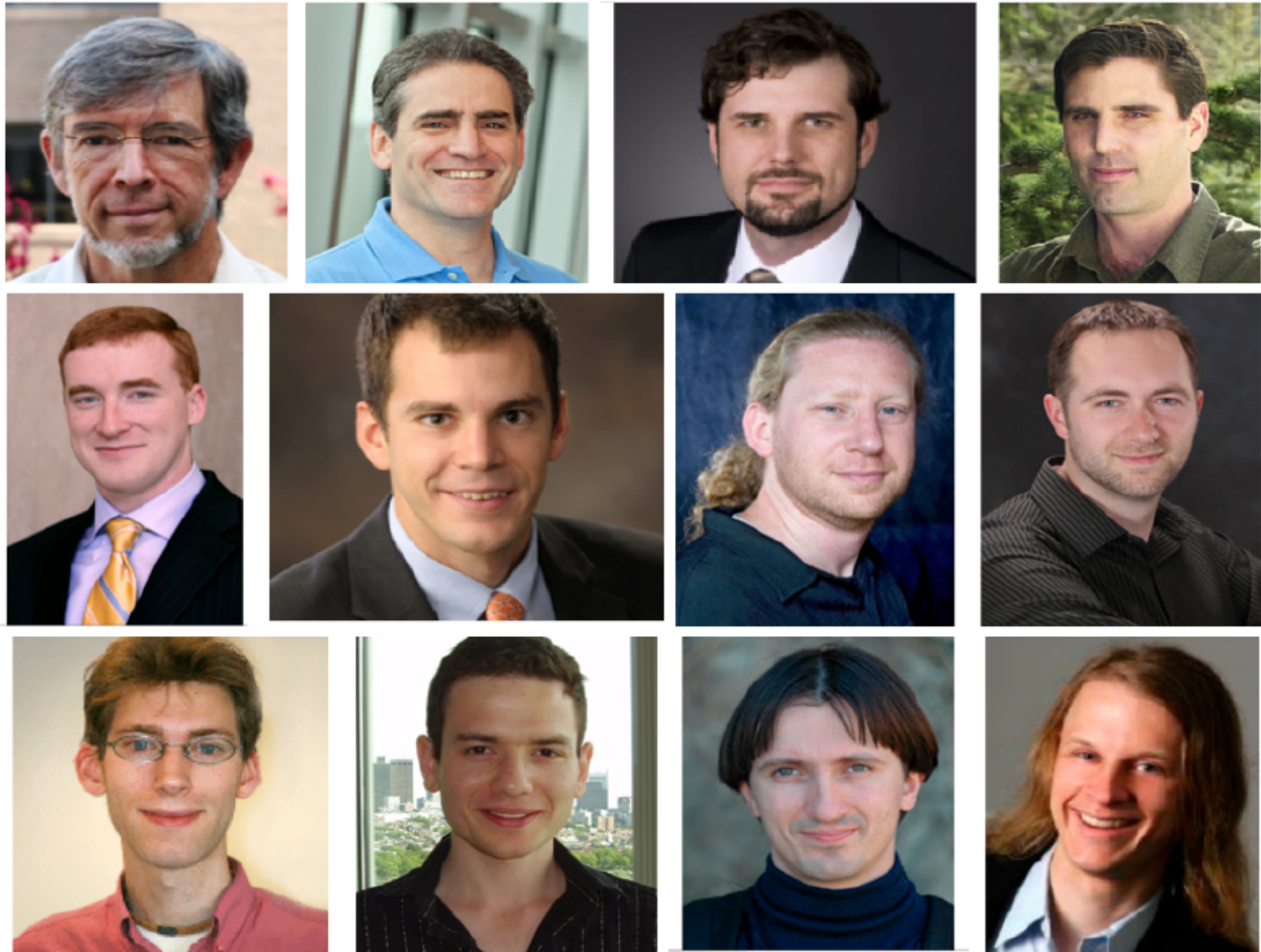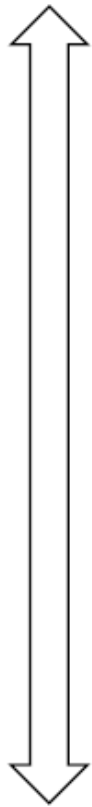
Banchefsky, S., Westfall, J., Park, B., & Judd, C. M. (2016). But You Don't Look Like A Scientist!: Women Scientists with Feminine Appearance are Deemed Less Likely to be Scientists. *Sex Roles*, 1-15.

Study: "Who is a Scientist?"

Women

Men

Judged Career Likelihood

Scientist
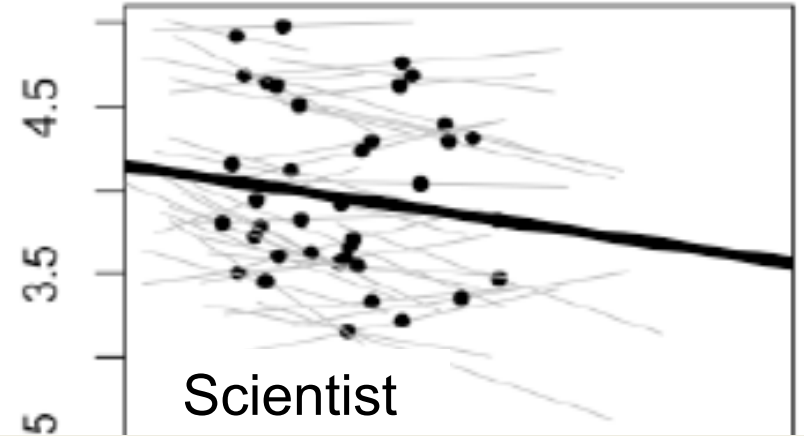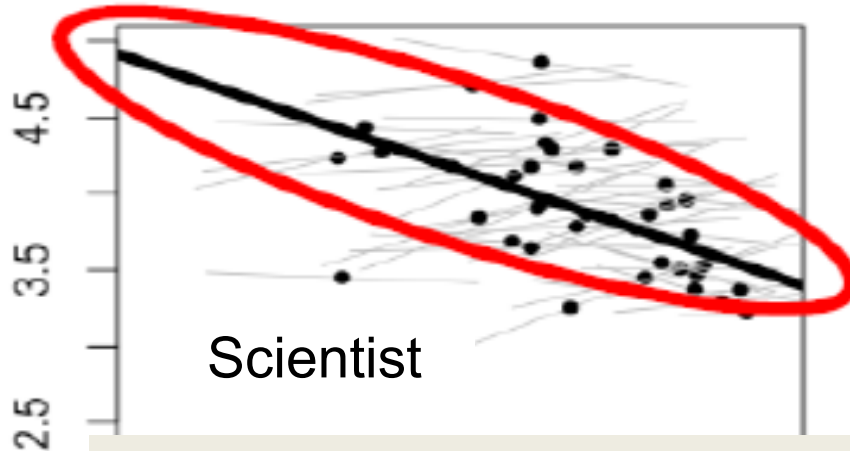
Scientist

Feminine women: Judged Less Likely to "be a Scientist"

Teacher

Teacher
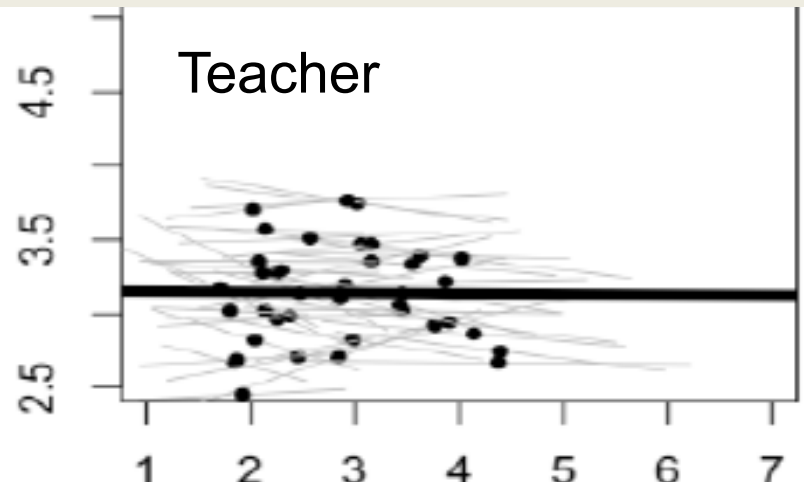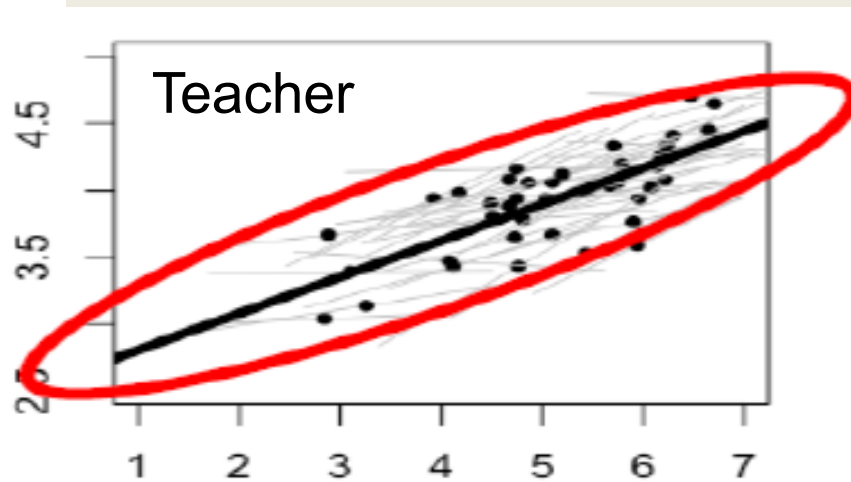
Masculine   Feminine

Masculine   Feminine

Implicit Bias Intervention: Women in Scientific Leadership

- Hypoth[...]tional interve[...] biases and hel[...]

- Measu[...]d demog[...]

Chart: Negative: Bias Toward Women in Leadership / Positive: Bias Toward Men in Leadership. Significant effect of gender: **p=0.001; significant effect of the intervention: p=0.02. Female (n=97), Male (n=126). Pre (green), Post (gray).
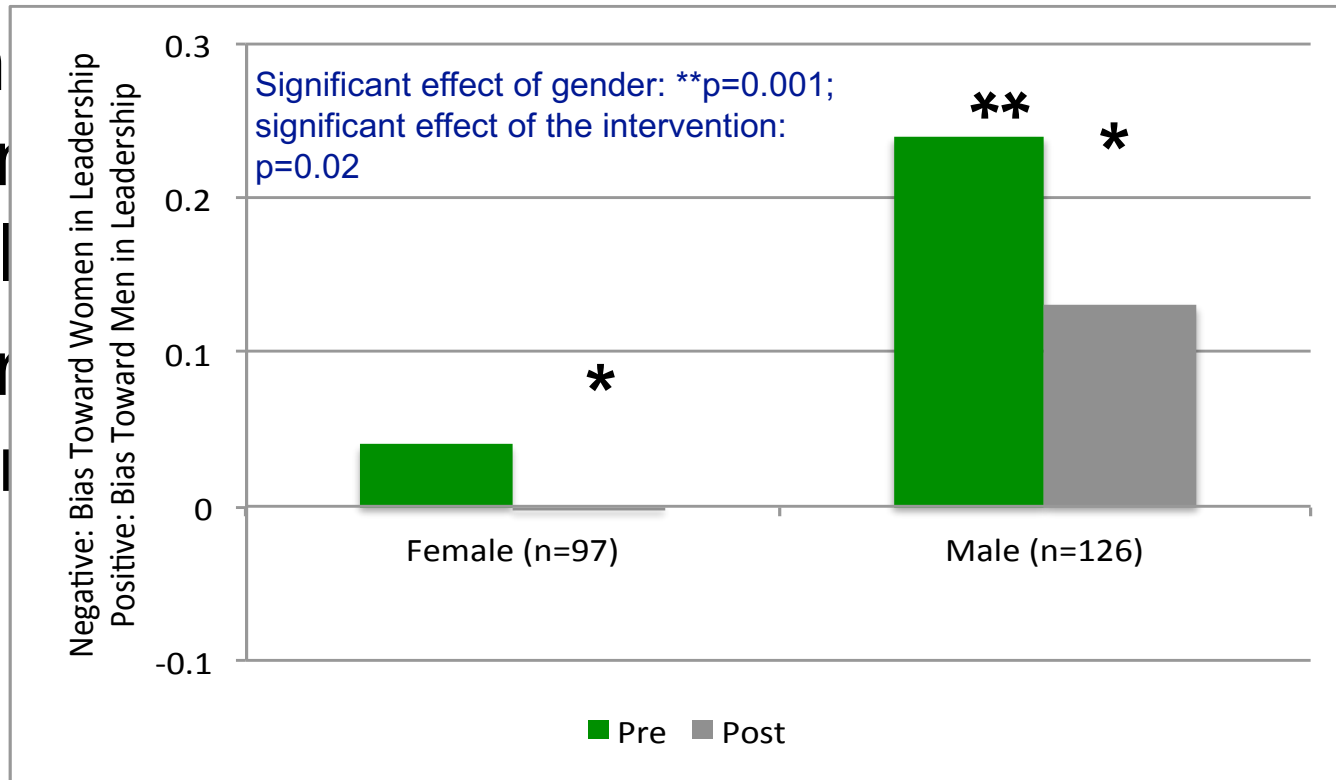
Results of Intervention:
- Changed perception of implicit bias in males and females
- Reduced implicit bias about leadership and men

Girod S., Valantine H, et. al. Acad Med. 2016 Aug;91(8):1143-50

NIH Scientific Workforce Diversity

What are we doing to help?

Interventions at *Individual* Level

Intramural

- Recruitment Strategies and Tools: NIH SWD Interactive Toolkit
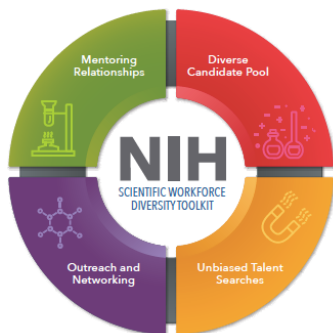
- Retention strategies: NIH Central Equity Committee

- Graduate Student Diversity

Extramural

- BUILD, NRMN, CEC

- Diversity Supplements

- Eliminate R01 funding disparities
  - Next Generation Scientist
  - Peer Review Bias Study
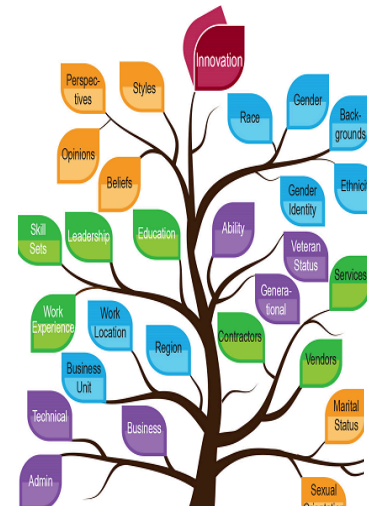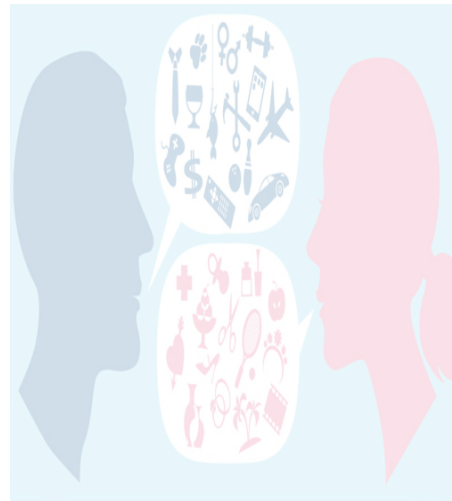
- Sustain and Scale
  - Hubs of Innovation

Keys to Scientific Workforce Diversity

- Diversity Science
- Recruitment Retention
- Sociocultural Factors
- Sustainability
- **Institutional Accountability**

NIH Scientific Workforce Diversity

What are we doing to help?

Interventions at *Individual* Level
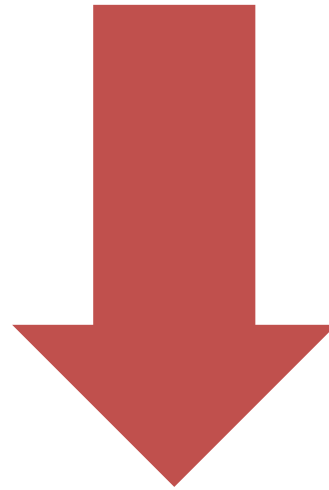
Intervention at *Institutional* Level

Institutional Leadership:
Promotes Diversity and Inclusion

**Three Pillars of Culture**

Institutional Transformation and Culture Change

Programs are necessary but not sufficient:

Promote Transparency and Accountability

Link to Institutional Values and Reward Systems

- Systematic review and transparency of hiring and promotion procedures, policies
- Transparency: collect and publicize aggregate diversity metrics
- Provide tools to Divisions, Departments for enhancing recruitment and retention
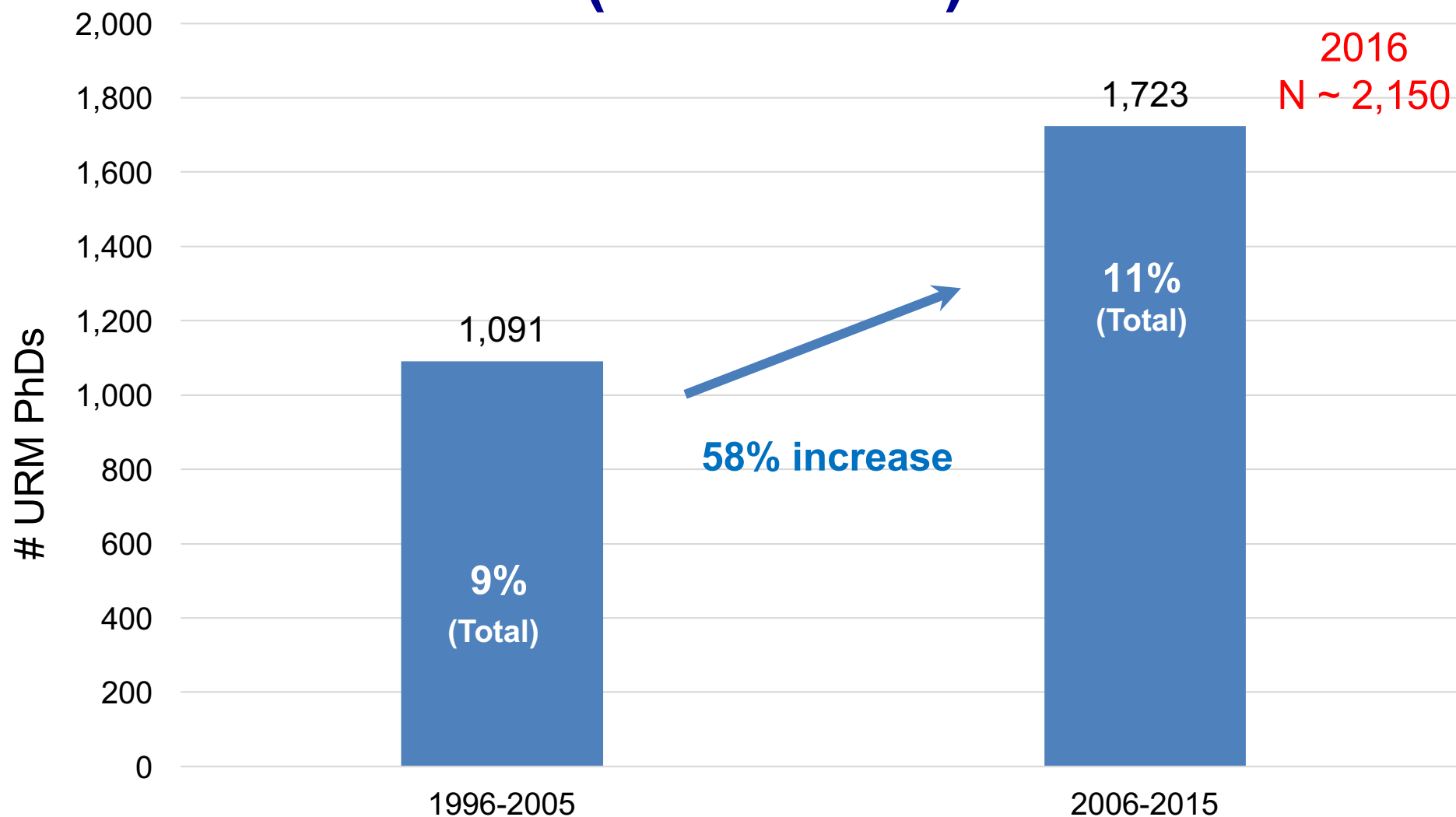- Evaluation of impact

Institutional Leadership Drives Culture Change
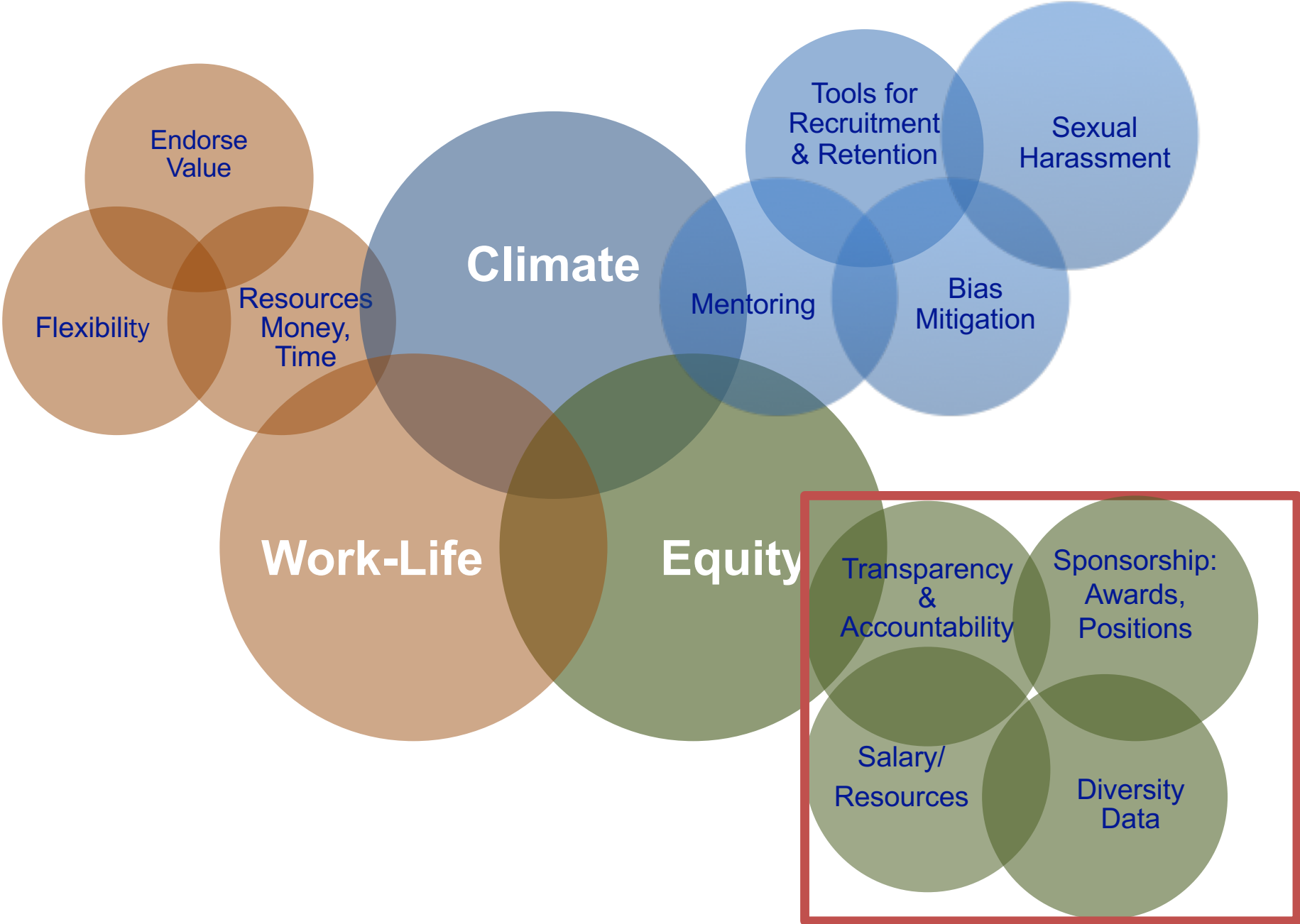
URM Assistant Professors:
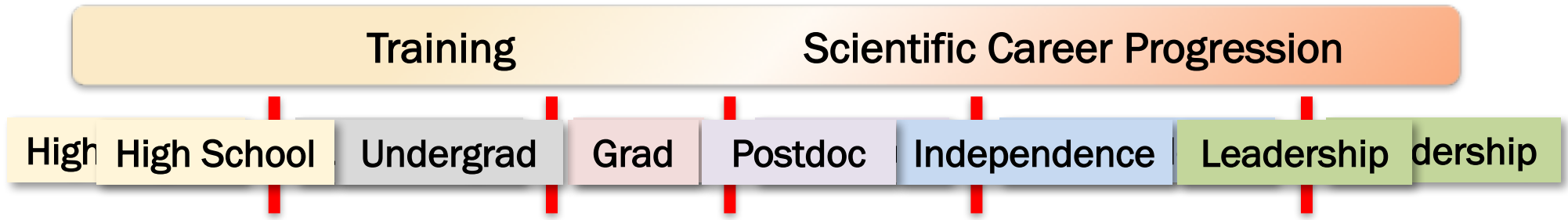## Lags Behind Growth in Ph.D. Recipients
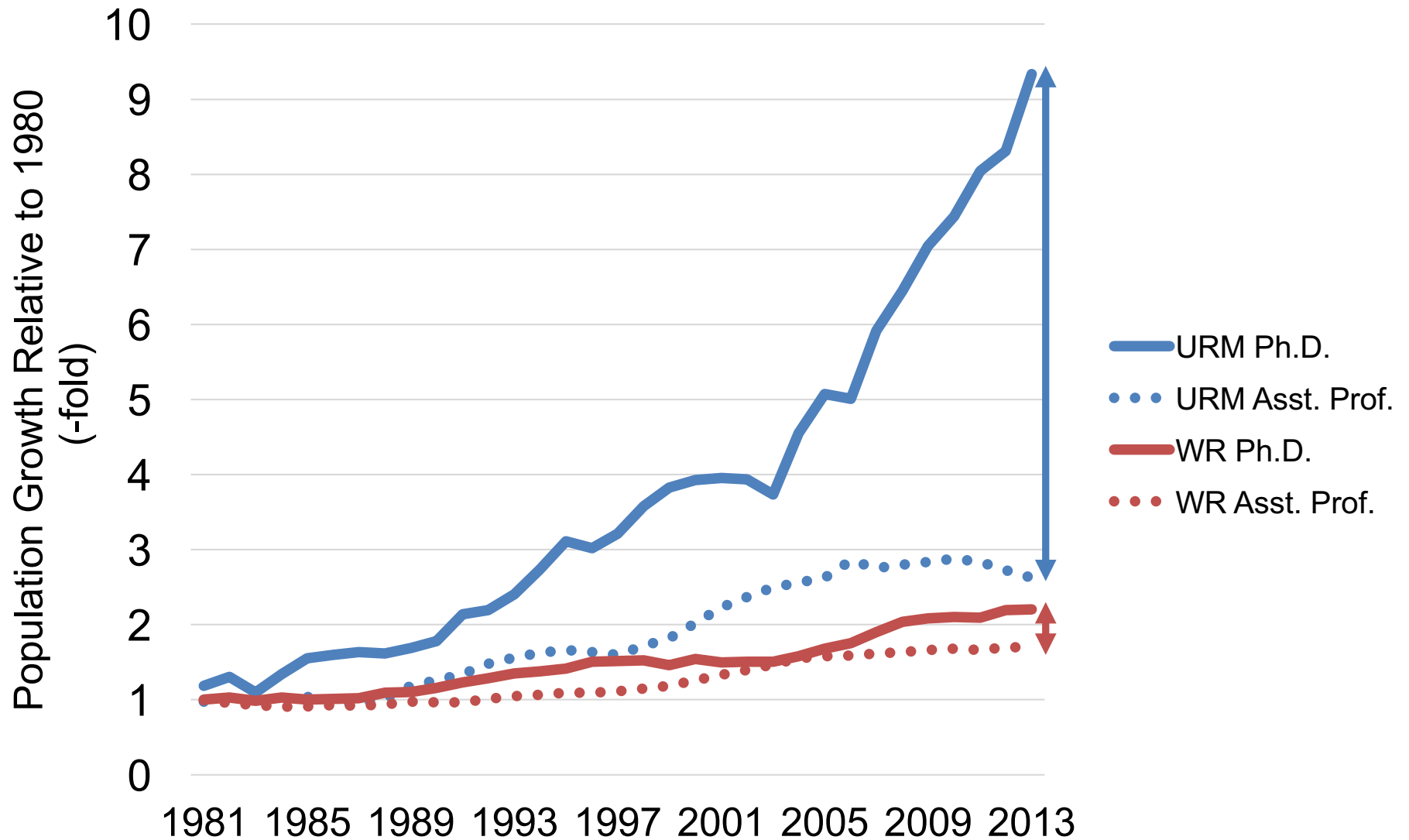
Gibbs, K. D., et al. (2016). *Decoupling the minority PhD talent pool and assistant professor hiring in the medical school basic science departments in the US*.

Increase in URM PhD Recipients (1996-2015)

NSF Survey of Earned Doctorates 1996-2015. Fields included: Biological Sciences (**53%**), Medical Chemistry (**19.2%**), Sciences (**7.5%**), Other Life Sciences (**5.2%**), Psychology (**14.7%**)

# Eliminate Transition Gaps: Enhance Faculty Diversity

Training		Scientific Career Progression		

High	High School	Undergrad	Grad	Postdoc	Independence	Leadership	dership

- Postdoc -> faculty/other research careers
  - Needed: Program linkages across career stages

- Draw evidence from existing programs
  - Integrated approaches
  - Sociocultural factors

Goal: Eliminate transition barriers > achieve sustainable transformation in scientific workforce diversity

Addressing Racial R01 Funding Gap Intervention Targets
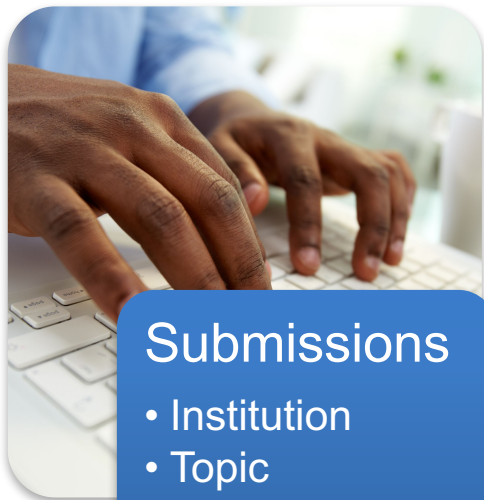
Submissions
- Institution
- Topic

Review
- Less discussed
- Score
- Fewer re-submissions
- Topic

Funding
- IC Council review
- Paylines, select pay
- Topic

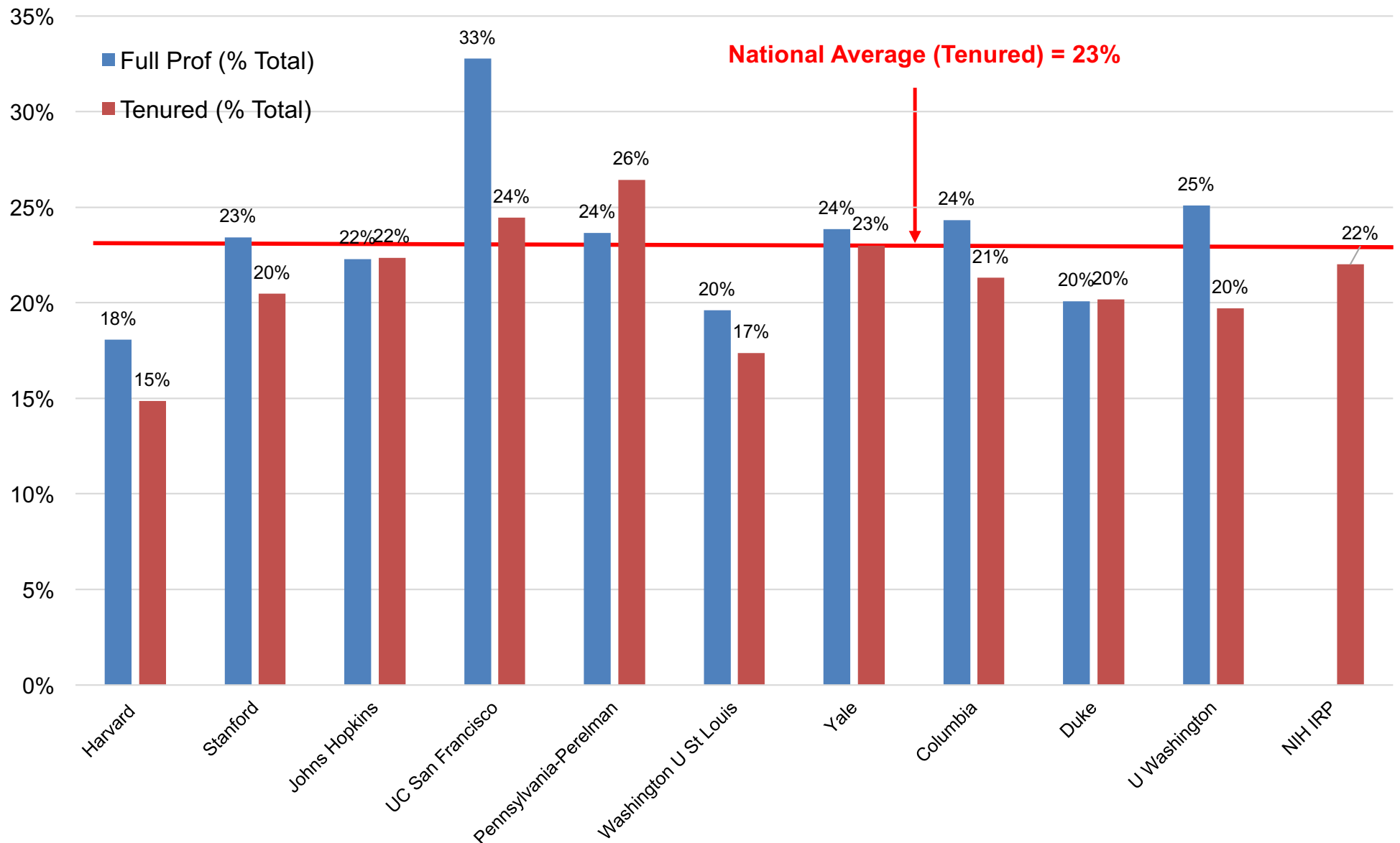Mentoring/coaching pilot to enhance submission and re-submission

- Information on re-submission outreach
- Anonymized application review study

- IC select pay analysis
- Topic further analyses
  - Health disparities
  - Minority health

Spring 2018

Underway

Top Research Institutions:
Women in Senior Academic Rank 2015

- Full Prof (% Total)
- Tenured (% Total)

National Average (Tenured) = 23%

Institution	Full Prof (% Total)	Tenured (% Total)
Harvard	18%	15%
Stanford	23%	20%
Johns Hopkins	22%	22%
UC San Francisco	33%	24%
Pennsylvania-Perelman	24%	26%
Washington U St Louis	20%	17%
Yale	24%	23%
Columbia	24%	21%
Duke	20%	20%
U Washington	25%	20%
NIH IRP		22%

Addressing Gender Inequality in the NIH IRP Action Task Force: Recommendations

Institutional Culture Change

Institution-focused

1. Leadership commitment for hiring and promotion

2. Transparency in resources and salary: tracking, reporting, accountability

Individual-focused

1. Provide support, mentoring, coaching, sponsorship

2. Address inclusion and belonging

Apply to all underrepresented groups

Equity Metrics for Annual Evaluation

- Tenured and tenure-track investigators analyzed separately
  - Demographic data,
  - Salaries, resources for hiring

- Equity of review practices
  - BSC and ad hoc reviewers, promotion, and tenure committees

- Efforts to correct identified inequities

- Efforts to promote diversity, equity, inclusion
  - Diversity of speakers at seminars hosted by the IC
  - Promote awareness of implicit bias
  - Best practices for search committees and outreach
  - Award nominations

- Goals for the coming year

- Input on how OIR and OWSD can support the ICs

Best Practices to Enhance Faculty Diversity
Taking Bias out of the Hiring Process

- Use tools to identify candidates from diverse backgrounds

- Recruitment begins before position available

- Job descriptions might influence who apply

- Ask colleagues for female and minority candidates

- Diverse perspectives & background: Committee

- Criteria before applicant evaluation

- Adequate time for evaluation: Stereotyping

- Articulate the reasons for decisions

- Structured interviews

Institutional Leadership Drives Culture Change
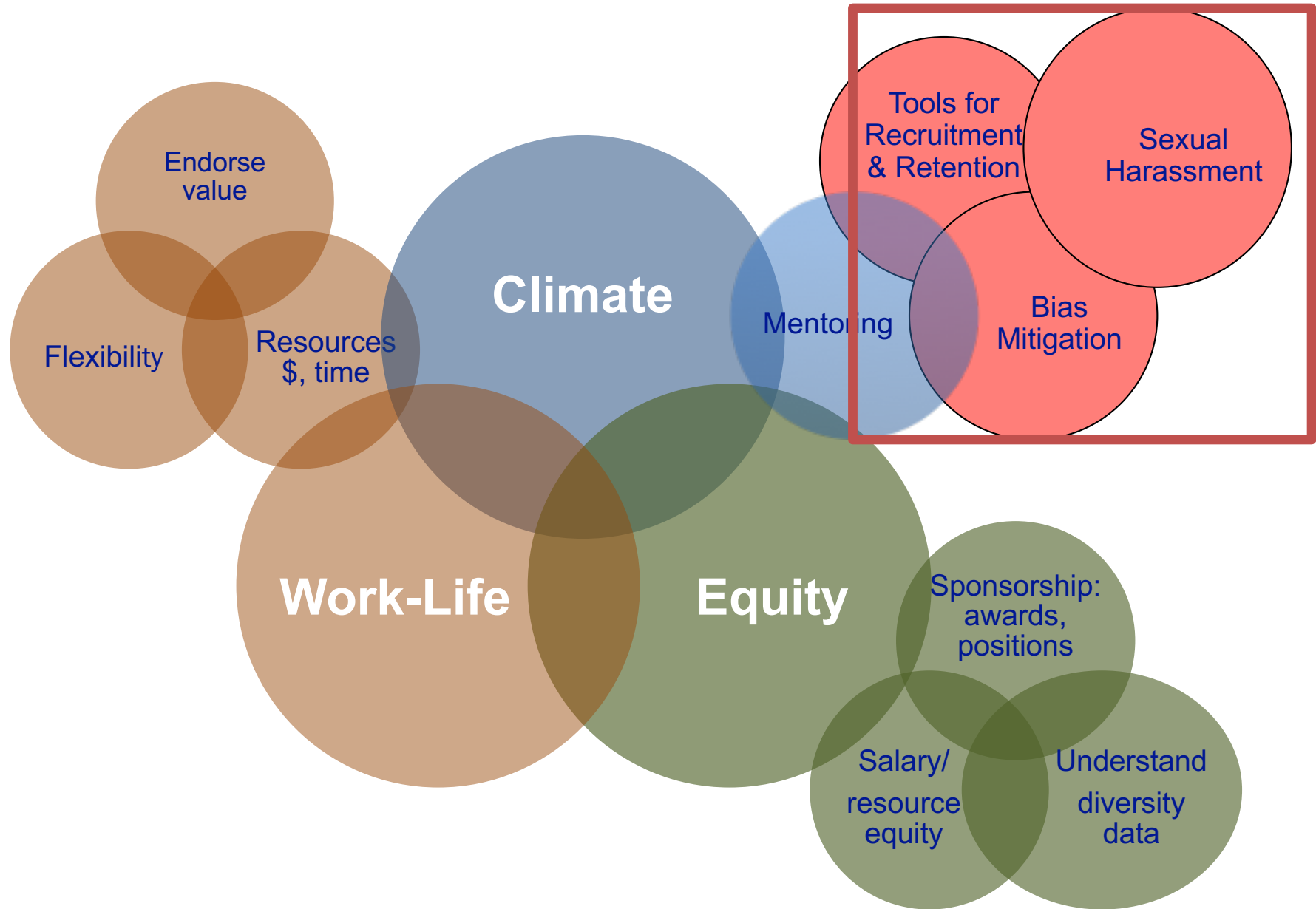
NIH Scientific Workforce Diversity Toolkit

The U.S. scientific research enterprise – from basic laboratory research to clinical and translational research to policy – requires intellect, creativity, and diverse skill sets and viewpoints.

Diversity

... enhances excellence, creativity, and innovation
... broadens the scope of biomedical inquiry
... addresses health disparities
... ensures fairness in our highly diverse nation
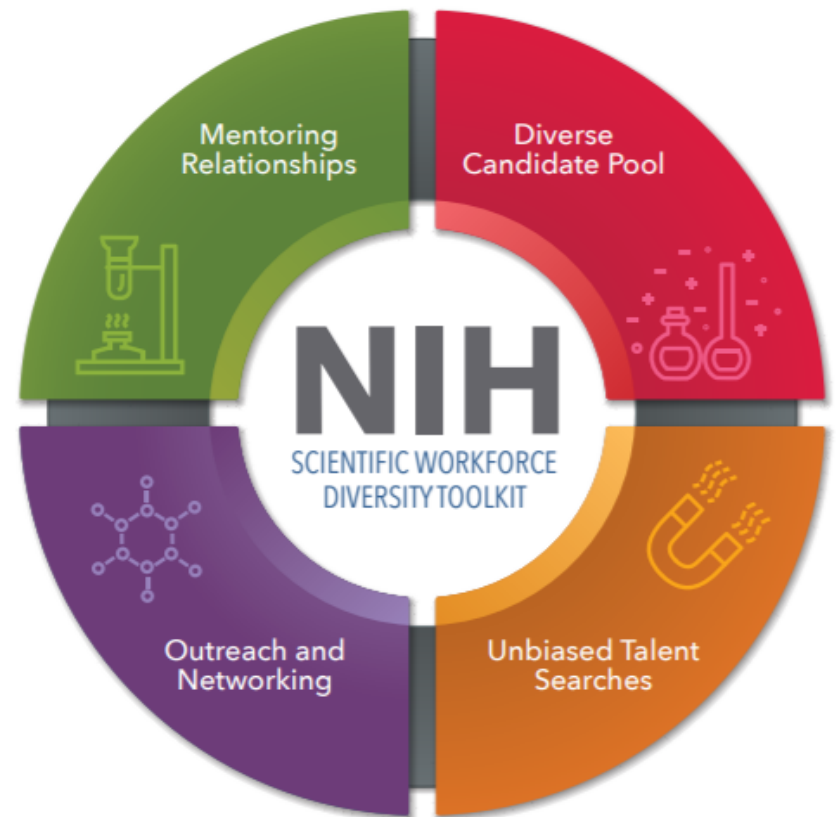
- Recruitment search protocol
- Tips for reducing implicit bias
- Future Research Leaders Conference

Enhancing Diversity in Candidate Pool
<u>Early</u> Stage Investigators
Post-Doctoral and Assistant Professors

Race/Ethnicity

24%
6%
14%
1%
25%
30%

- White/Caucasian
- African-American/Black
- Hispanic/Latino
- Native American
- Asian
- Other

Gender

44%
56%

- Female
- Male
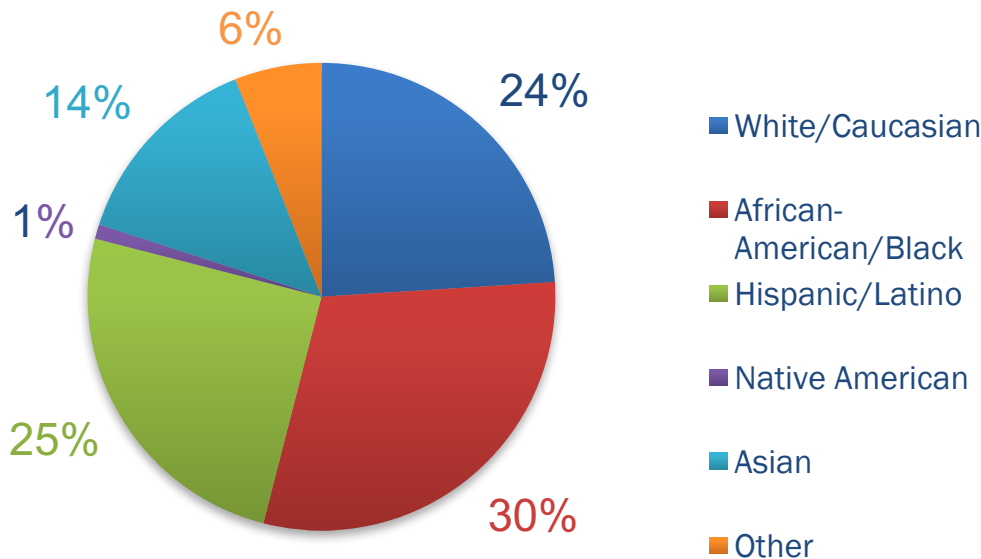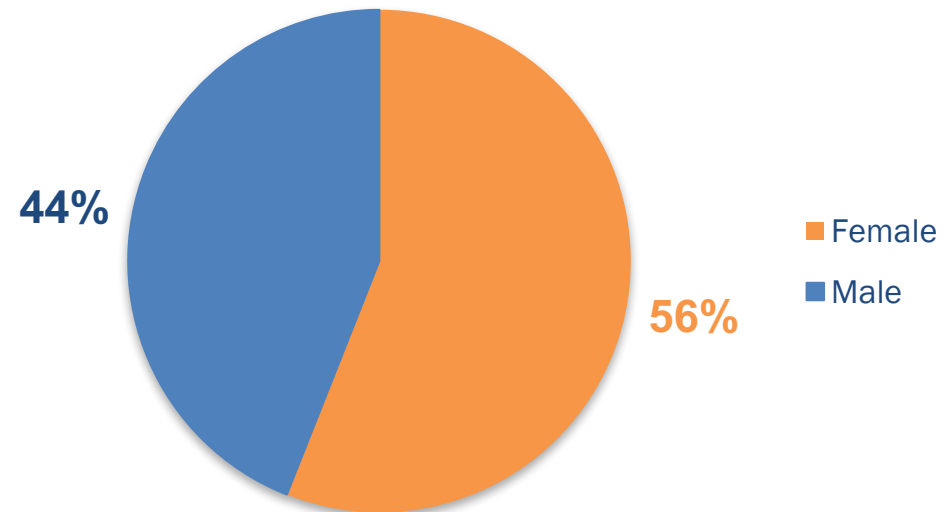
~ 693 total, top 1/3rd culled

4-10 years post-doctorate (most 4-7)

Authorship in top journals

10+ publications: 369

100+ citations: 490

200+ citations: 367

PLOS ONE

JAMA
The Journal of the American Medical Association

The NEW ENGLAND JOURNAL of MEDICINE

Endocrinology

BMC Pediatrics

Neuron

JNeurosci
THE JOURNAL OF NEUROSCIENCE

nature immunology

Enhancing Diversity in Candidate Pool
Mid - Late Career Stage
Associate Professors and Full Professors

Race/Ethnicity

- 2%
- 1%
- 7%
- 22%
- 55%
- 13%
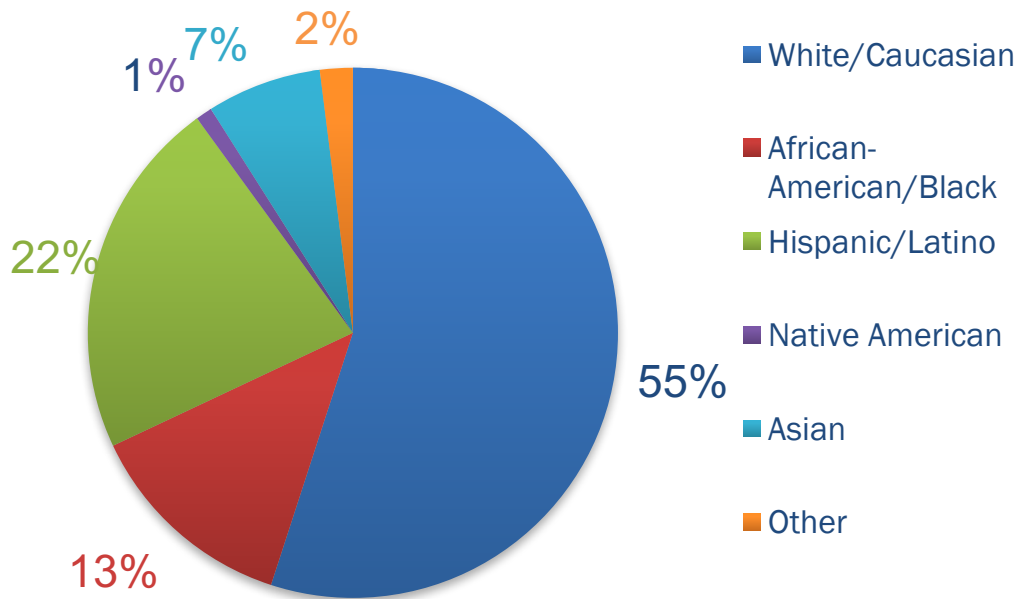
- ■ White/Caucasian
- ■ African-American/Black
- ■ Hispanic/Latino
- ■ Native American
- ■ Asian
- ■ Other
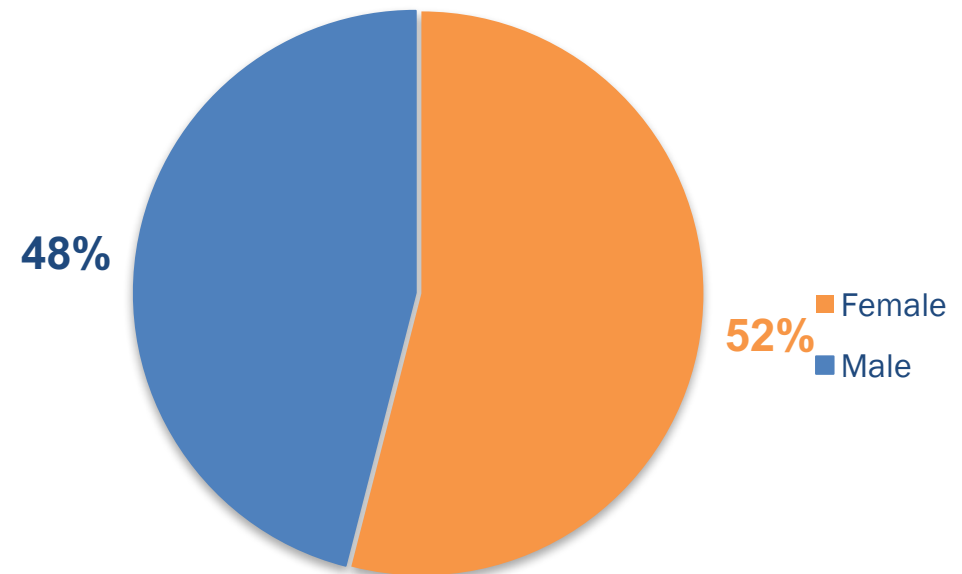
> 706 total, top 1/2 culled
Authorship in top journals
100+ publications: 291
500+ citations: 586
2000+ citations: 414

Gender
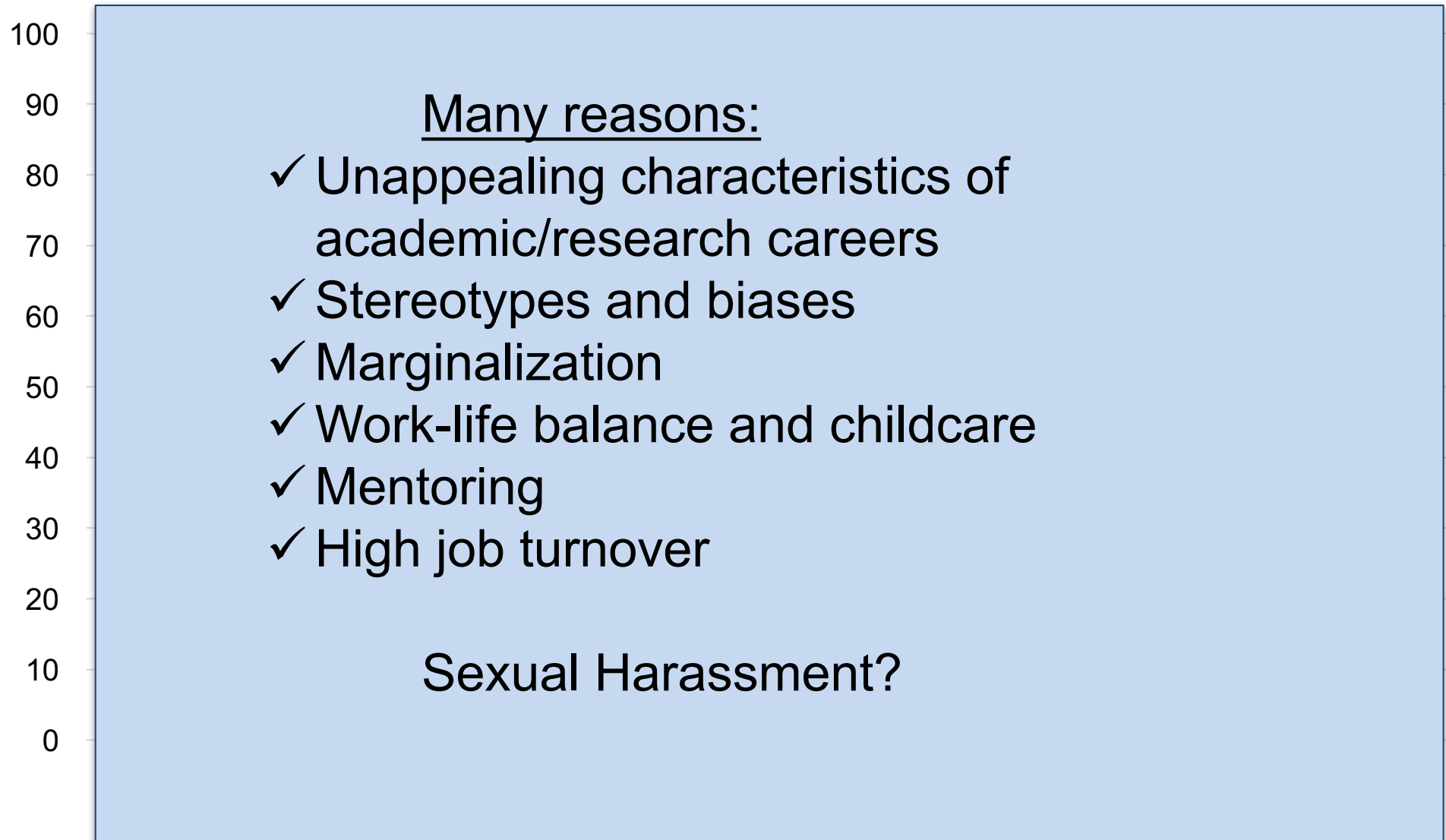
- 48%
- 52%

- ■ Female
- ■ Male

PLOS | ONE EMERGING INFECTIOUS DISEASES CDC

American Journal of PUBLIC HEALTH   PNAS   Science

aps American Physiological Society   AMERICAN JOURNAL of PHYSIOLOGY Cell Physiology

JAMA Neurology

Gender Diversity Declines Along Career Path

100
90
80
70
60
50
40
30
20
10
0

Many reasons:
✓ Unappealing characteristics of academic/research careers
✓ Stereotypes and biases
✓ Marginalization
✓ Work-life balance and childcare
✓ Mentoring
✓ High job turnover

Sexual Harassment?

Sexual Harassment in Science

SundayReview | OPINION

She Wanted to Do Her Research. He Wanted to Talk 'Feelings.'

By A. HOPE JAHREN   MARCH 4, 2016

"… when a female scientist becomes a faculty member, she finds herself invested in every system that is doing the weeding, and soon recognizes that sexual harassment is one of the sharpest tools in the shed."

Severity Among Women With K08 and K23 Awards Who Reported Having Experienced Harassment (n=150)

Table 2. Severity Among Women With K08 and K23 Awards Who Reported Having Experienced Harassment (n = 150)

Experience	Respondents, No. (%) [95% CI][a]
Sexist remarks or behavior	138 (92.0) [86.4-95.8]
Unwanted sexual advances	62 (41.3) [33.4-49.7]
Subtle bribery to engage in sexual behavior	9 (6.0) [2.8-11.1]
Threats to engage in sexual behavior	2 (1.3) [0.2-4.7]
Coercive advances	14 (9.3) [5.2-15.2]

[a] Totals sum to more than 100% because respondents were asked to indicate all that applied.

NIH Initial Response

POLICY

US science agencies grapple with sexual harassment

"An important first step will be to gather as much data as possible to more fully understand the nature and extent of sexual harassment among scientists."

nature
bit.ly/NIHharassment

NIH ha
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Sexual Harassment Prevention Plan Components

- Agency policy for Manual Chapters

- Awareness of policy and harassment prevention plan

  - Education and communication plan

- Sexual harassment hotline (reporting)

- Trans-NIH committee to recommend disciplinary action

- Mandatory sexual harassment training

- NIH sexual harassment survey

Constructed with a trans-NIH group

Institutional Leadership Drives Culture Change
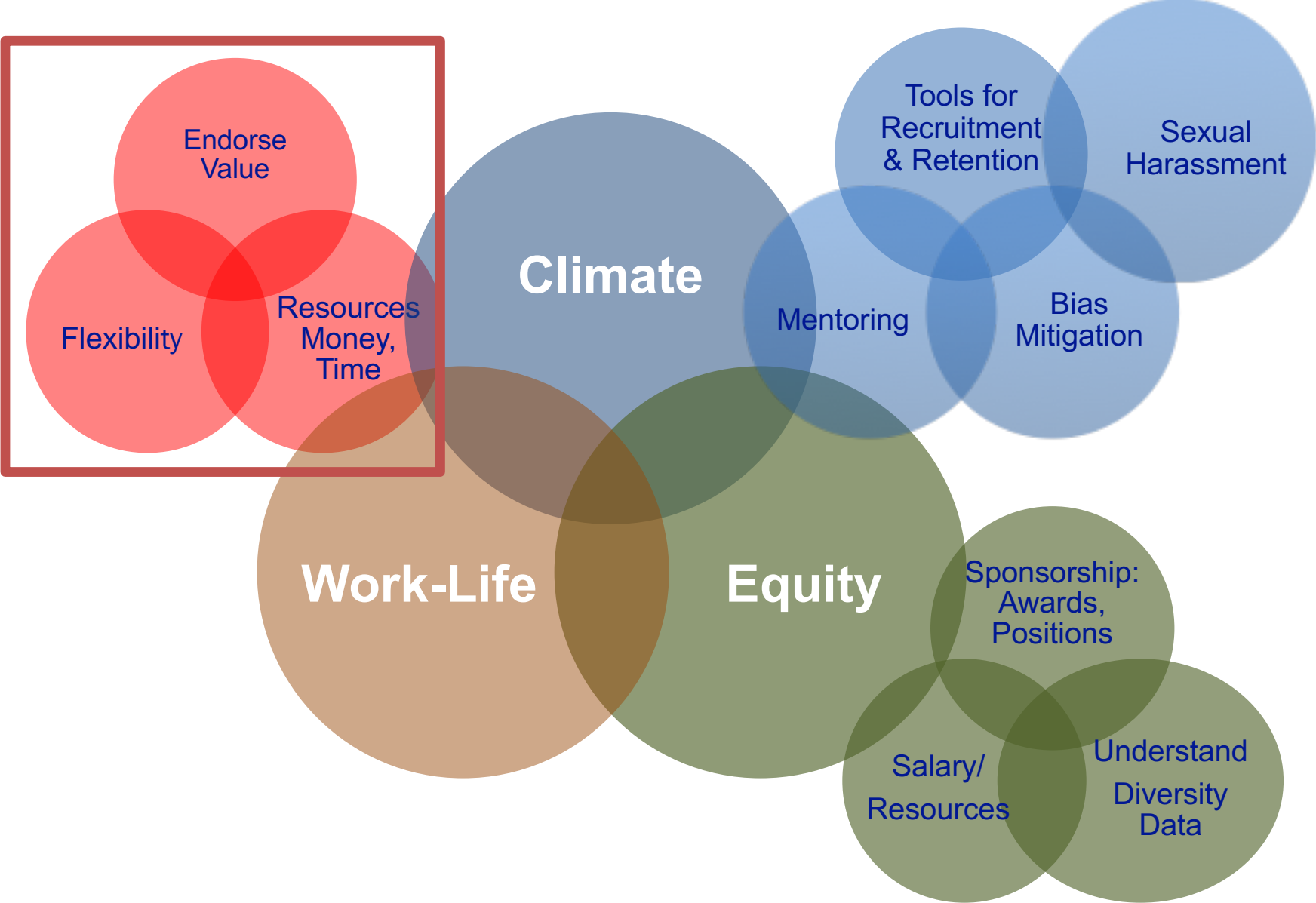
Average Age of First-Time Investigators on R01 Grants is Increasing

Average Age (Years)

MD-PhD
MD Only
PhD Only

NIH Next Generation Scientist Program
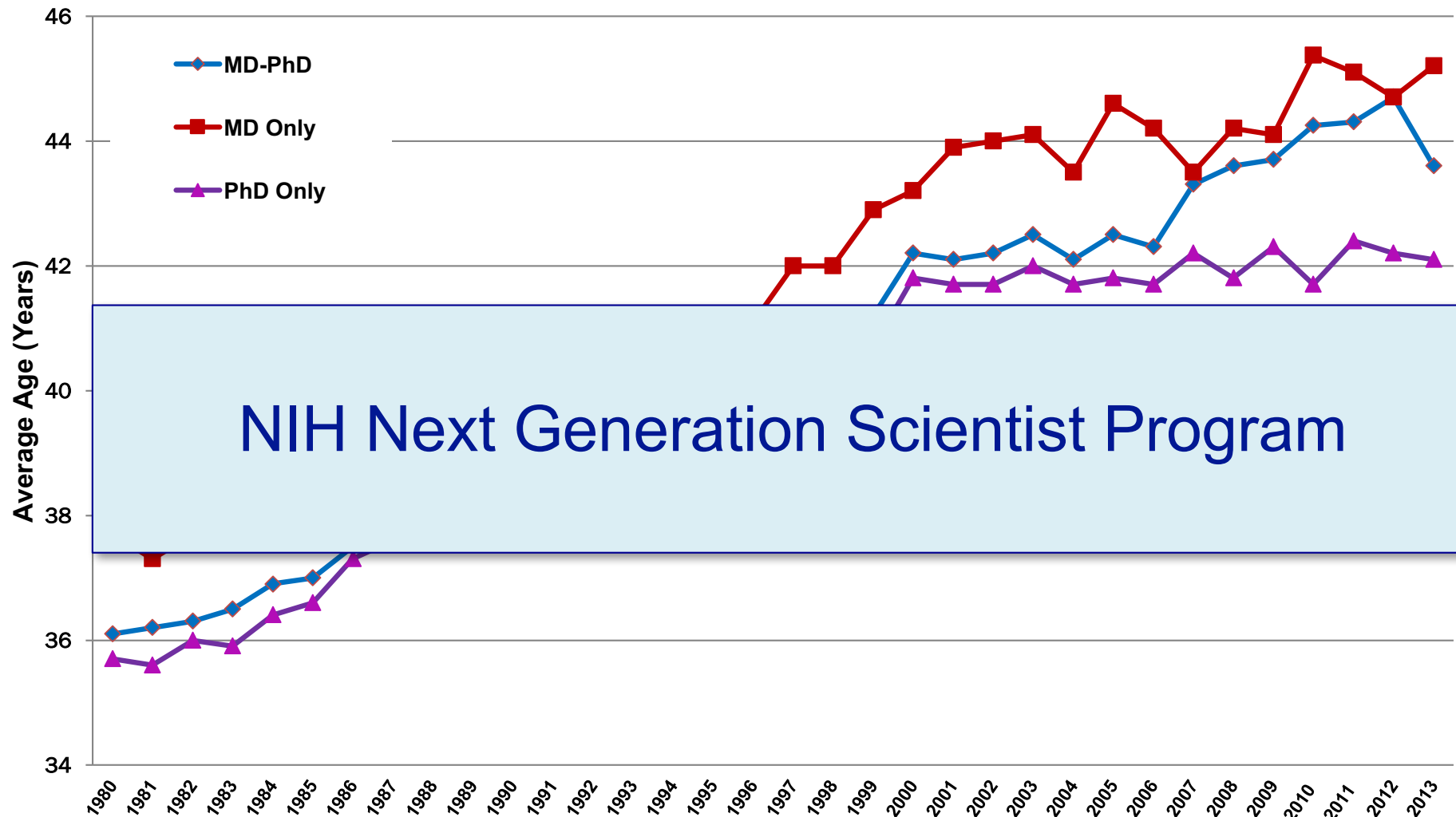
"...runs in our family. My father and grandfather are also working as postdocs."

The Washington Post

By Brigid Schulte August 20, 2015

"Time in the bank: A Stanford plan to save doctors from burnout"

Faculty career flexibility is more about culture than about policies

Culture >> Policies!

Fassiotto M, Simard C, Sandborg C, **Valantine H**, Raymond J.
Acad Med. 2018 Jan 2

diversity.nih.gov