Vive la différence!

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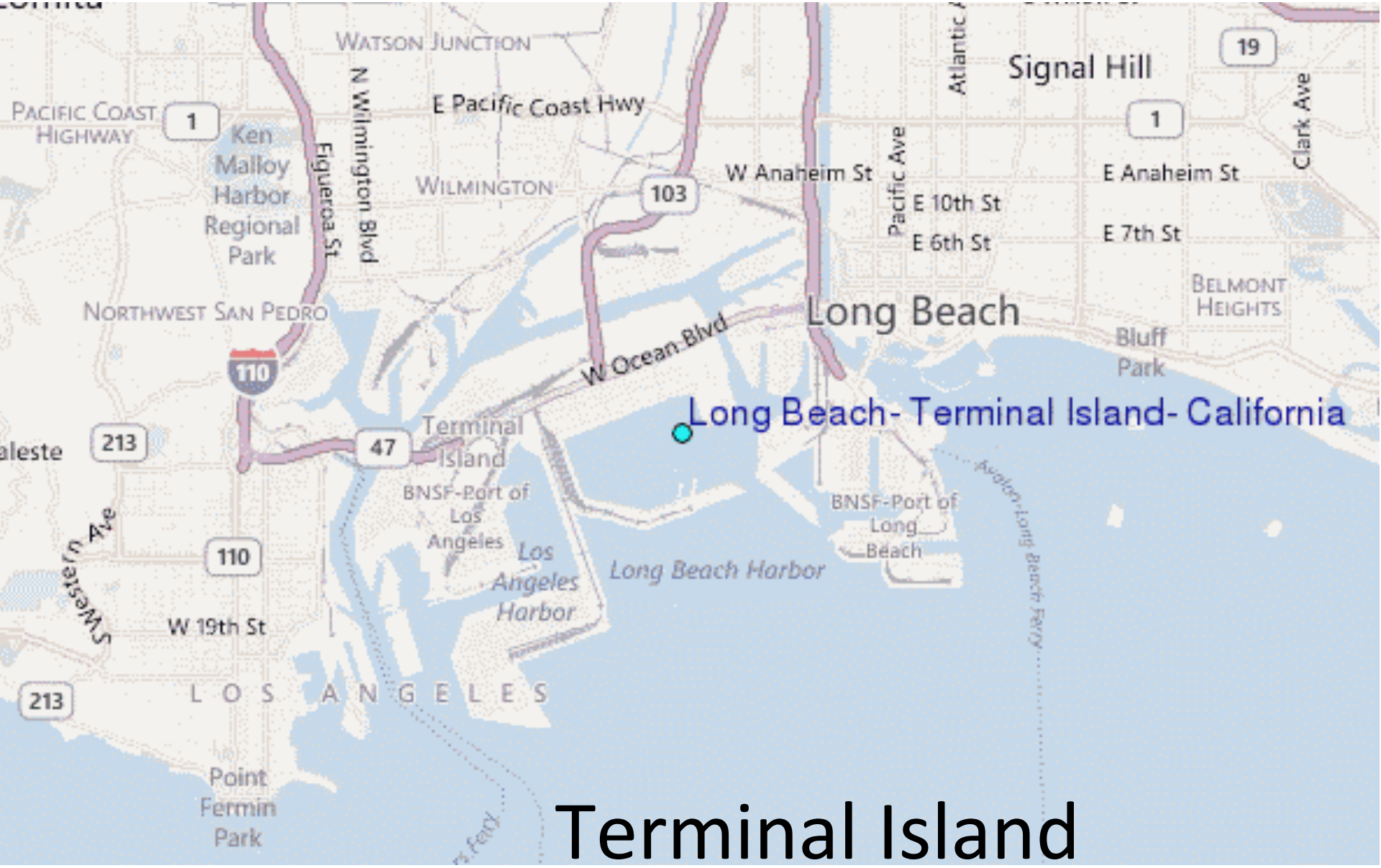
3 P's

1) Perspective
2) Persistence
3) Privilege

1) Perspective

Gordon Sato
Manzanar Project

http://www.ephrem.org/dehai_news_archive/2008/nov-dec08/att-0194/01-Nov21-ManzanarProject-500.jpg



Terminal Island

Manzanar concentration camp

http://www.forensicgenealogy.info/images/manzanar_historical_site.jpg

“Spam and canned spinach”

Ansel Adams http://memory.loc.gov/pnp/ppprs/00300/00370v.jpg

Dorothea Lange http://commons.wikimedia.org/wiki/File:Manzanar_Relocation_Center,_Manzanar,_California._Looking_south_from_this_War_Relocation_Authority_._._._-_NARA_-_538041.jpg

Manzanar Project

http://www.asmera.nl/eritrea2003/massawa102506.jpg

http://www.naturefoundationsxm.org/education/mangroves/red_mangrove_illustration.gif

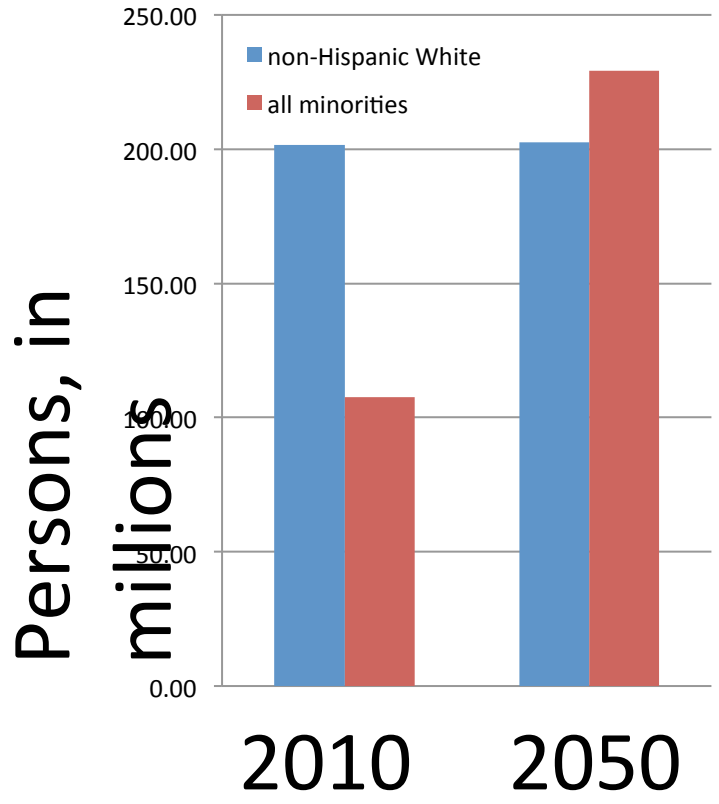
Diversity benefits science.

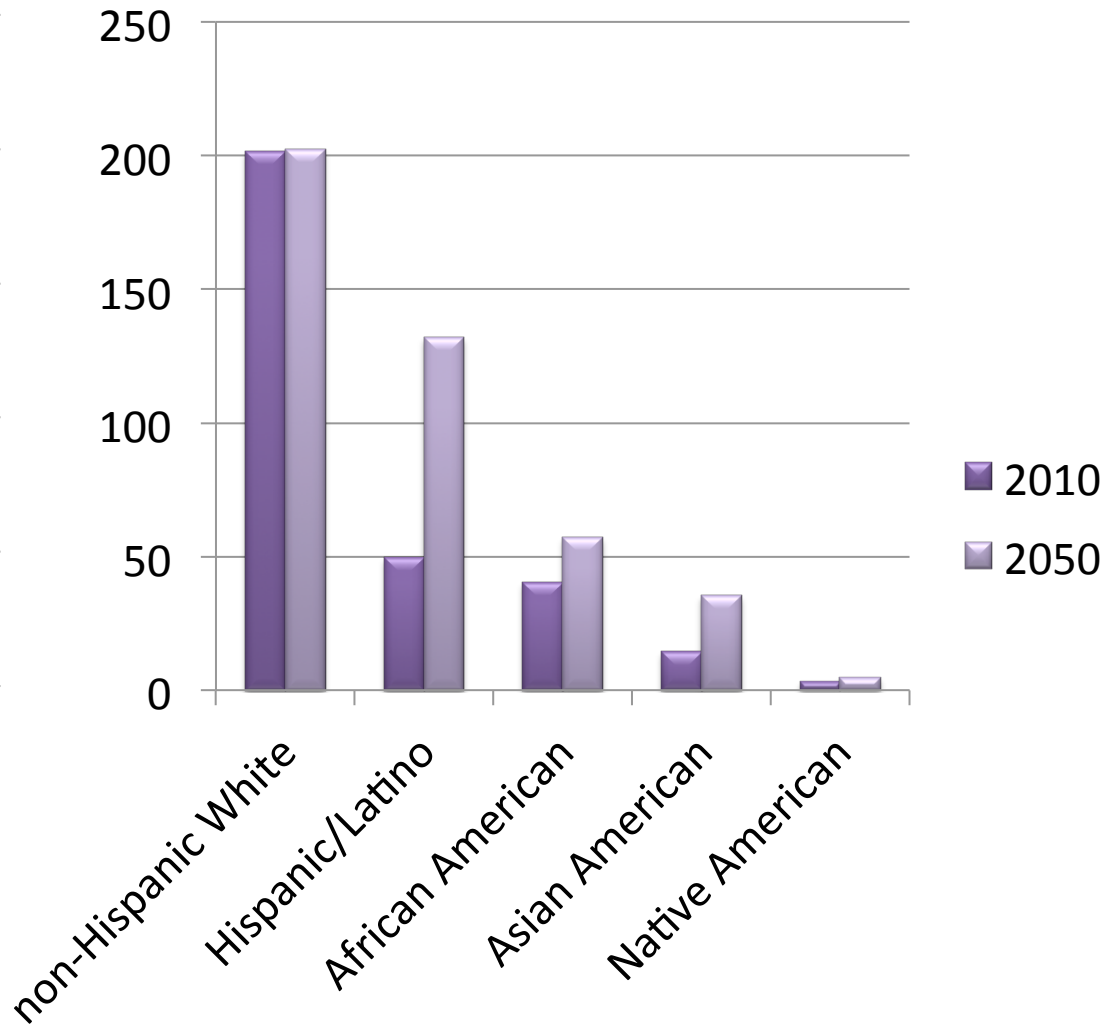
Diversity....

1. .....is a property of a group.
   Science depends on groups.
2. .....adds: (i) perspective, (ii) interpretation, (iii) tools.
   Scientific breakthrough often results from a different approach, a different interpretation, and/or a different set of tools.
3. ....trumps homogeneity and ability when:
   (i) hard problem, (ii) multiple ways to look at the problem; (iii) large set of problem-solvers

- Scott Page, *The Difference*, 2007, Princeton University Press

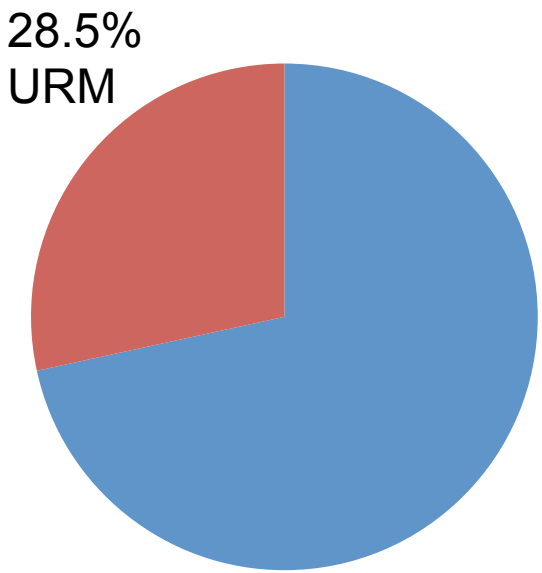
Opportunity: increasingly diverse talent pool



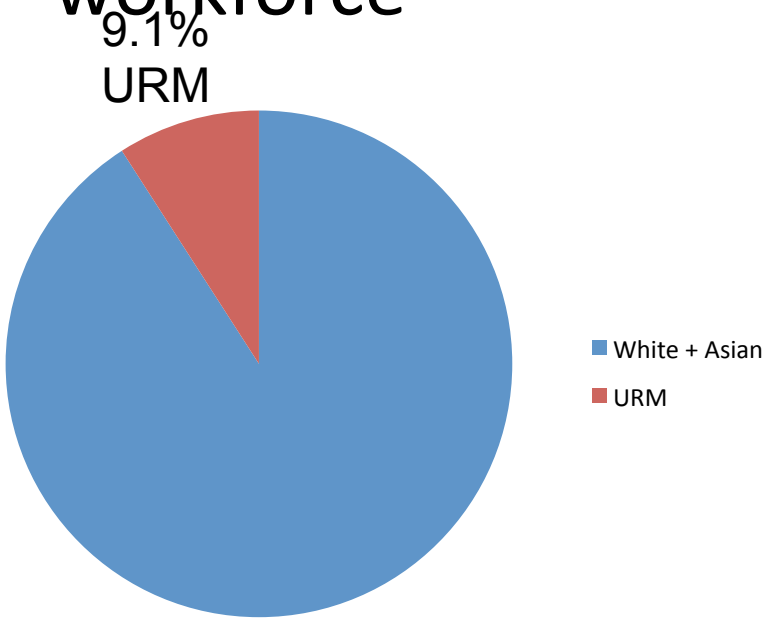


Challenge: we fail to take advantage of the diverse talent pool

U.S. talent pool

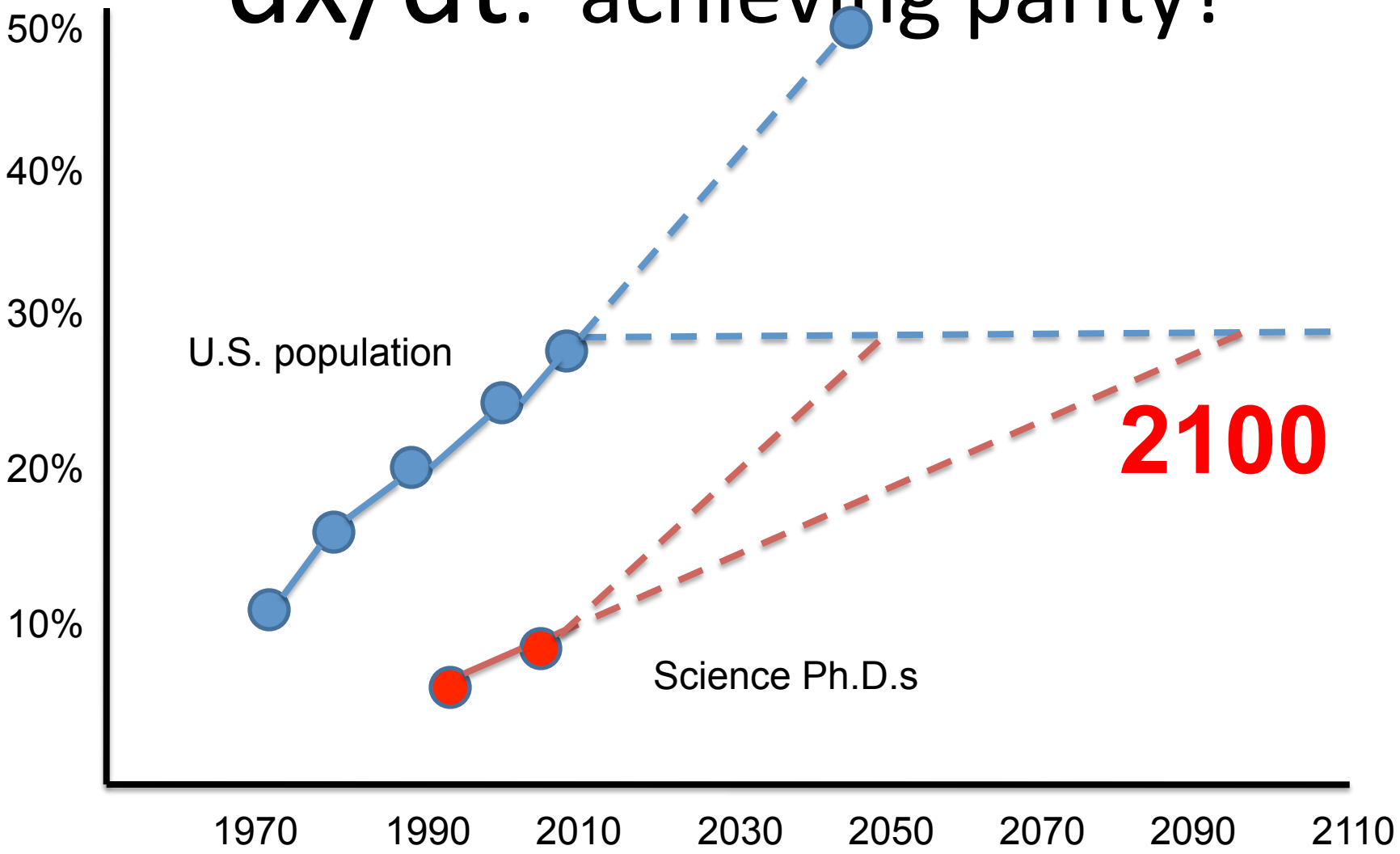


Scientific workforce



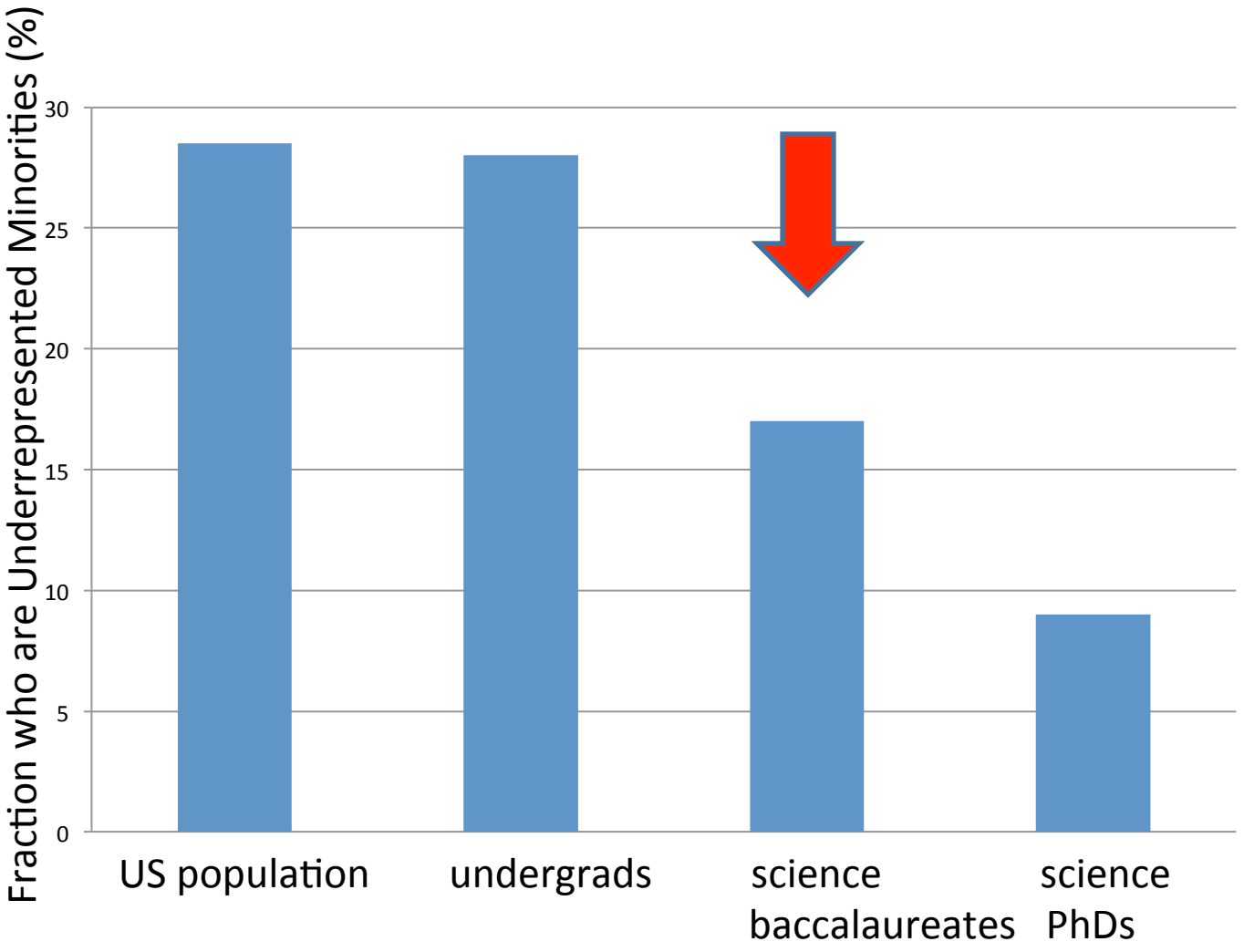
NSF data for 2006, from *Expanding Underrepresented Minority Participation*, National Academies, 2011.

dx/dt: achieving parity?



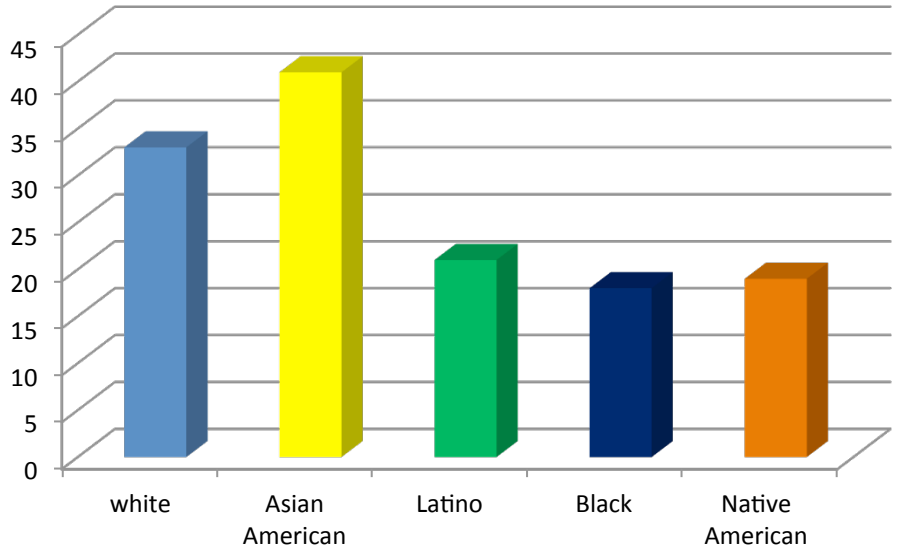
2) Persistence

Undergraduate years are critical

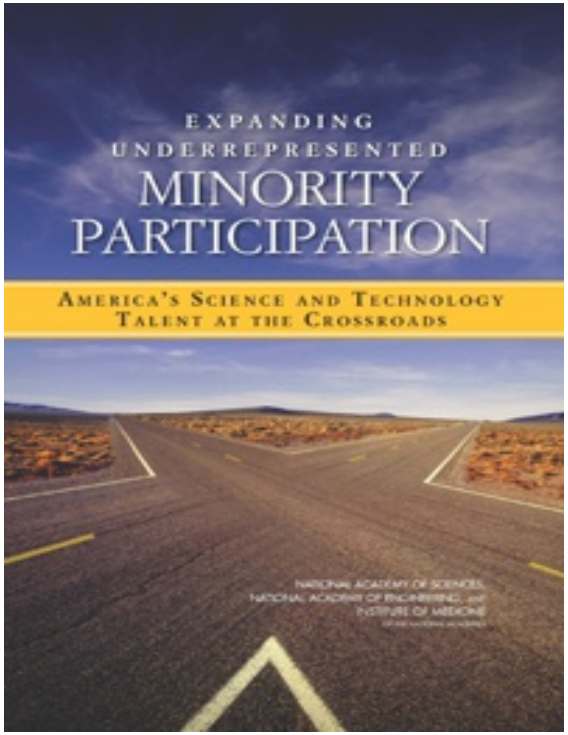


NSF WEBCASPAR (2000-05)

Percentage of 2004 STEM aspirants who completed STEM degrees



5-year completion

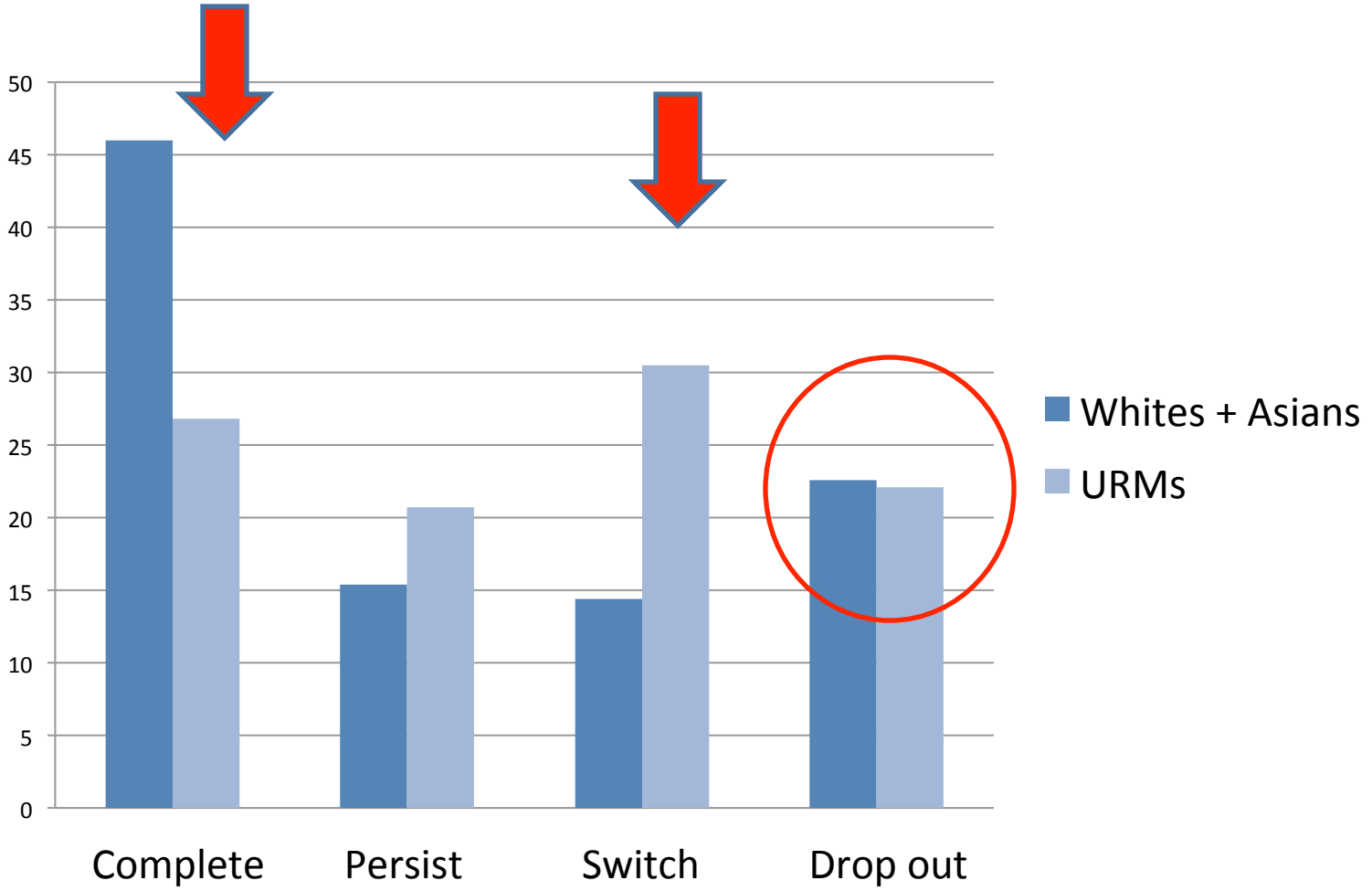


Data from Higher Education Research Institute, UCLA

G. Huang et al., 2000. Entry and persistence of women and minorities in college science and engineering education. U.S. Dept. Education, National Center for Education Statistics

1. Predictors of success in college
2. 5-year outcomes of students entering STEM programs:
   - Complete STEM baccalaureate in 5 years
   - Persist in STEM discipline
   - Switch to a non-STEM discipline
   - Drop out of school

Persistence of undergrad STEM aspirants



G. Huang et al., 2000, Entry and persistence of women and minorities in college science and engineering education, US. Dept. Education, National Center for Education Statistics

3) Privilege

http://www.warhw.com/wp-content/uploads/2010/11/PrivilegeMeans2.bmp

On-line privilege

‘I wish I were black’ and other tales of privilege

Angela Onuwuachi-Willig, The Chronicle of Higher Education, Oct 28, 2013

“To be white is to not think about it,” a white legal scholar named Barbara Flagg wrote two decades ago…..”

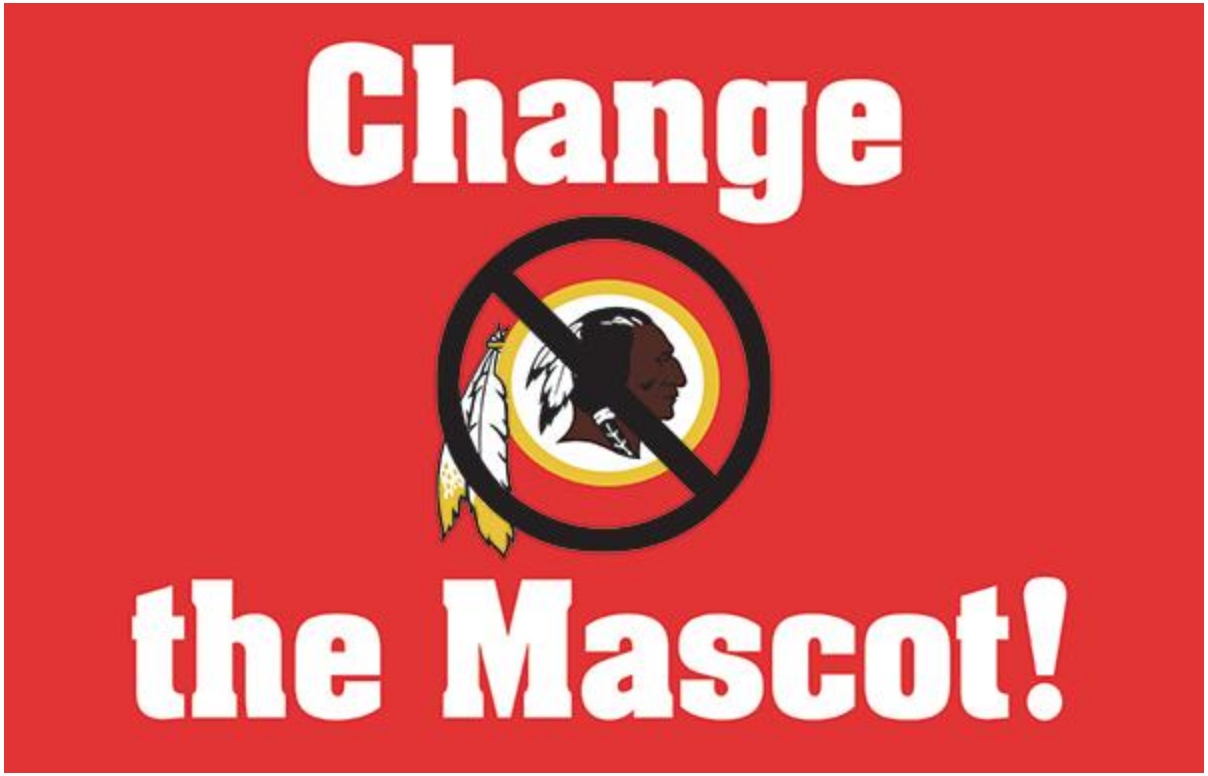
Lairdwilcox: It’s quite a job to claim the effects of discrimination or even slavery 150 years ago give you special privileges for access to college admission that you do not qualify for……

….makes you more deserving than Asian students whose ancestors were, in fact, slaves under the Marxist-Leninist government of the People’s Republic of China only 50 years ago, and yet they have extraordinary grades ace all of the tests they take.

….It’s time for the race racket to come to an end and we all accept responsibility for our abilities or lack of them.

Faculty privilege

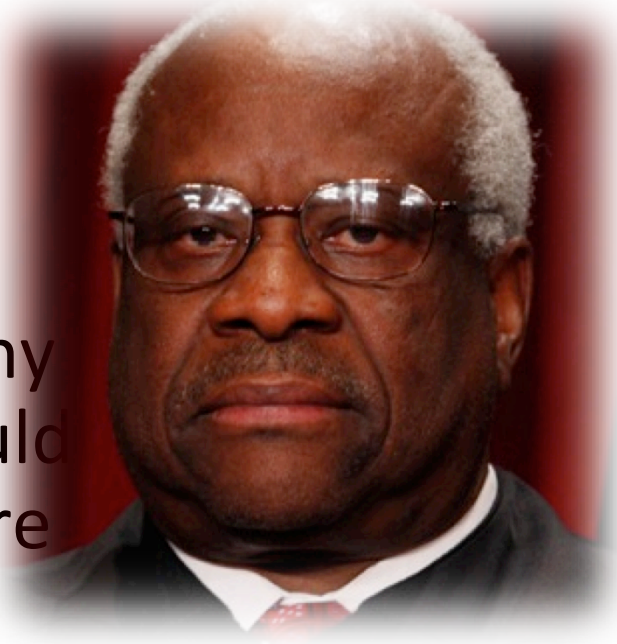
“Majority rules”



http://d1jrw5jterzxwu.cloudfront.net/sites/default/files/styles/article_header_image/public/article_media/changethemascotsign.jpg

…is deciding what's best for others.

"mismatch hypothesis"



"…as a result of the mismatching, many blacks and Hispanics who likely would have excelled at less elite schools are placed in a position where underperformance is all but inevitable because they are less academically prepared than the white and Asian students with whom they must compete."

Justice Clarence Thomas, 2013
concurring opinion, Fisher v. U Texas

Testing the "mismatch hypothesis"

M. Kurlaender and E. Grodsky. 2013. "Mismatch and the paternalistic justification for selective college admissions." Sociology and Education.

- University of California
  - Elite: Berkeley, San Diego, UCLA (30% acceptance)
  - Not-quite-elite: Davis, Irvine, Riverside, Santa Barbara, Santa Cruz (59% acceptance)
- 2004, "Guaranteed Transfer Option" (GTO) (2,300 students)
- Several hundred chose to attend elite campus

Findings….

- GPAs of GTO students statistically same as elite students.
- GTO students no more or less likely to drop out of elite schools.
- GTO students less likely to drop out than peers who chose non-elite schools.
- Mismatch effects no greater for minorities than for whites and Asians.

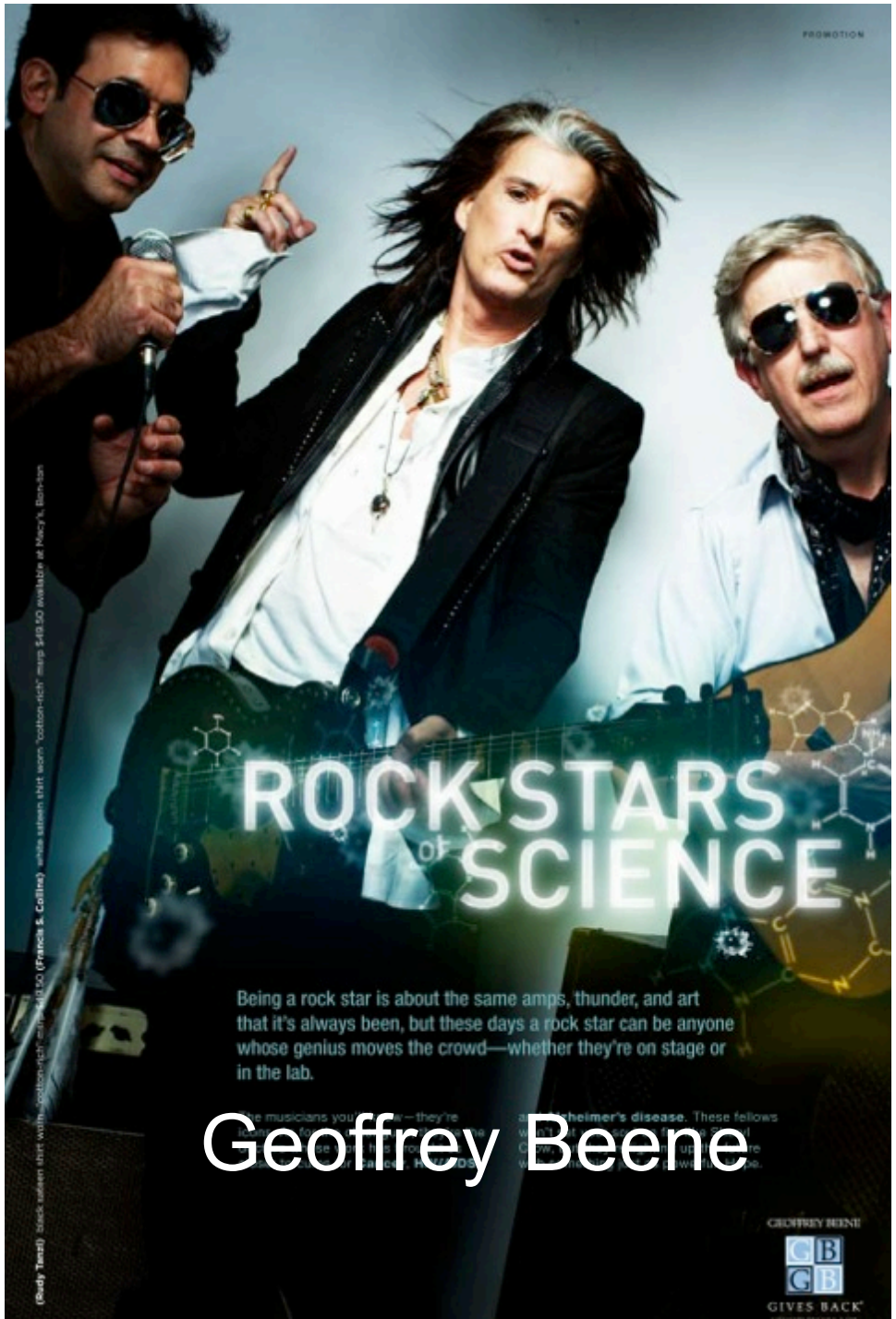
…is deciding who belongs.

"A great scientist looks like me"

(Mirror, mirror, on the wall…)

http://theuglytruth.files.wordpress.com/2009/09/snow-white-mirror.jpg

http://disney-clipart.com/snow-white/jpg/Snow-White/Snow-White.jpg



Geoffrey Beene


“It’s like being in the middle of a genius sandwich”
— Josh Grobin: Energy at the shoot


“That moment changes the way you see the world for the rest of your life”

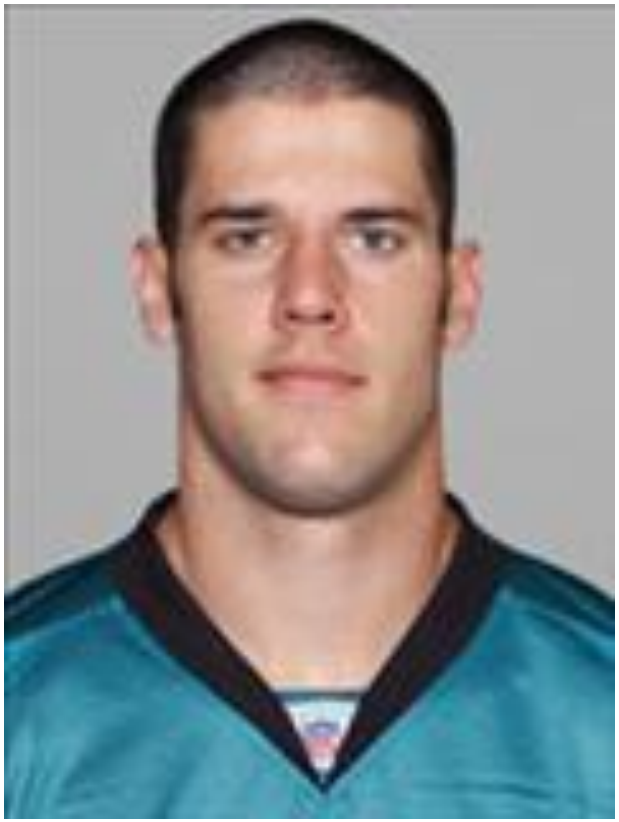
….is denying our bias.

Orchestrating Impartiality

C. Goldin and C. Rouse, 2000.
The American Economic Review, 90 (4): 715-741.

http://performingarts.georgetown.edu/images/Orchestra1_2.jpg

Greg vs. Jamal



M Bertrand and S. Mullainathan, 2004. Poverty Action Lab 3: 1-27.

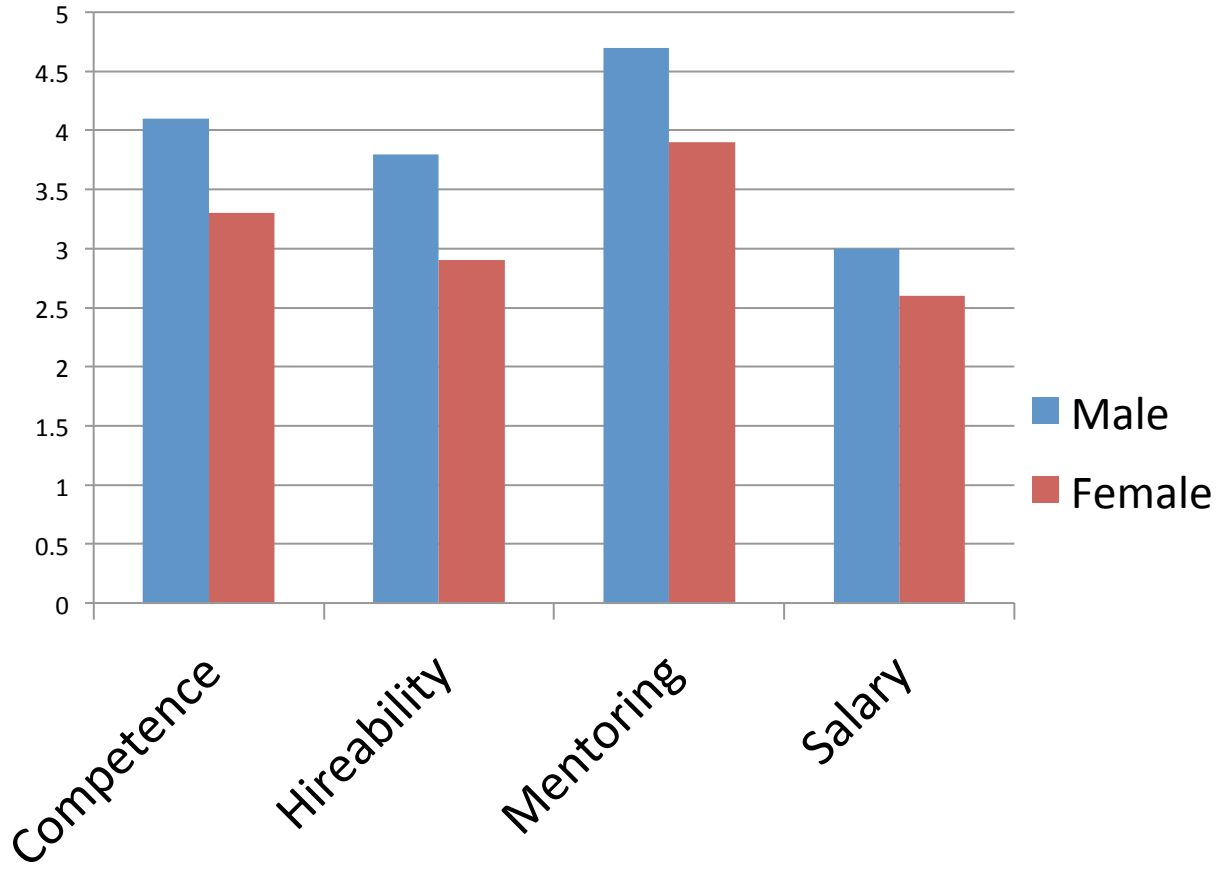
http://media.scout.com/Media/Image/45/450414m.jpg http://www.theonion.com/content/node/46404

What about scientists?

- Application for lab manager position
- Fictitious male or female applicant
- Evaluations by lab PIs:
  - Competence
  - Hireability
  - Worthy of mentoring
  - Starting salary

Moss-Racusin et al., 2012. Proc. Natl. Acad. Sci. USA 109: 16474-16479.

Scientists are biased too…



What can we do?

High school – 4 yrs

Undergrad for B.S. – 4 yrs

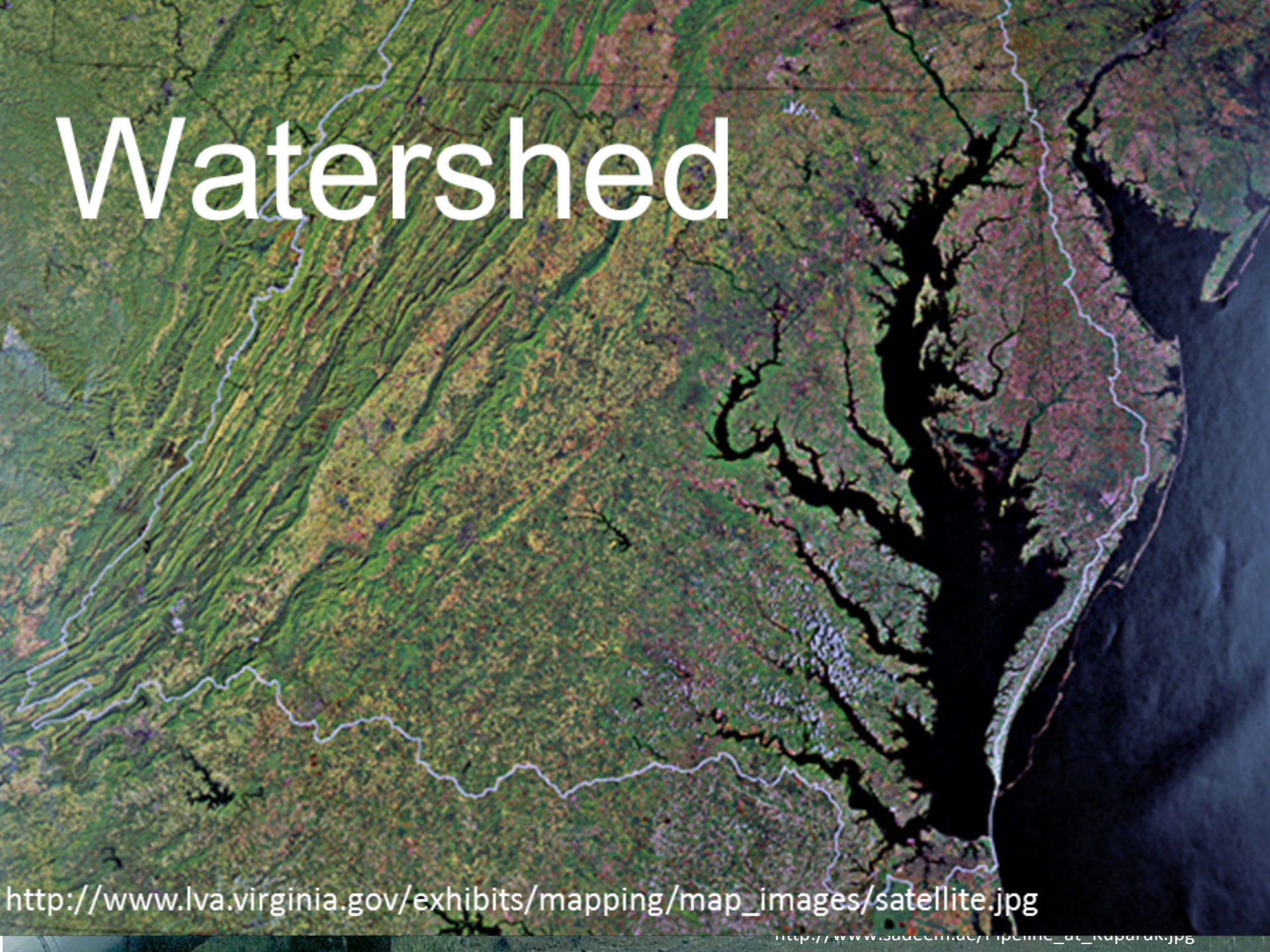
Graduate school for Ph.D. – 4 yrs

Post-doc 1 – 1 yr

Post-doc 2 – 2 yrs

Tenure-track faculty position

Watershed



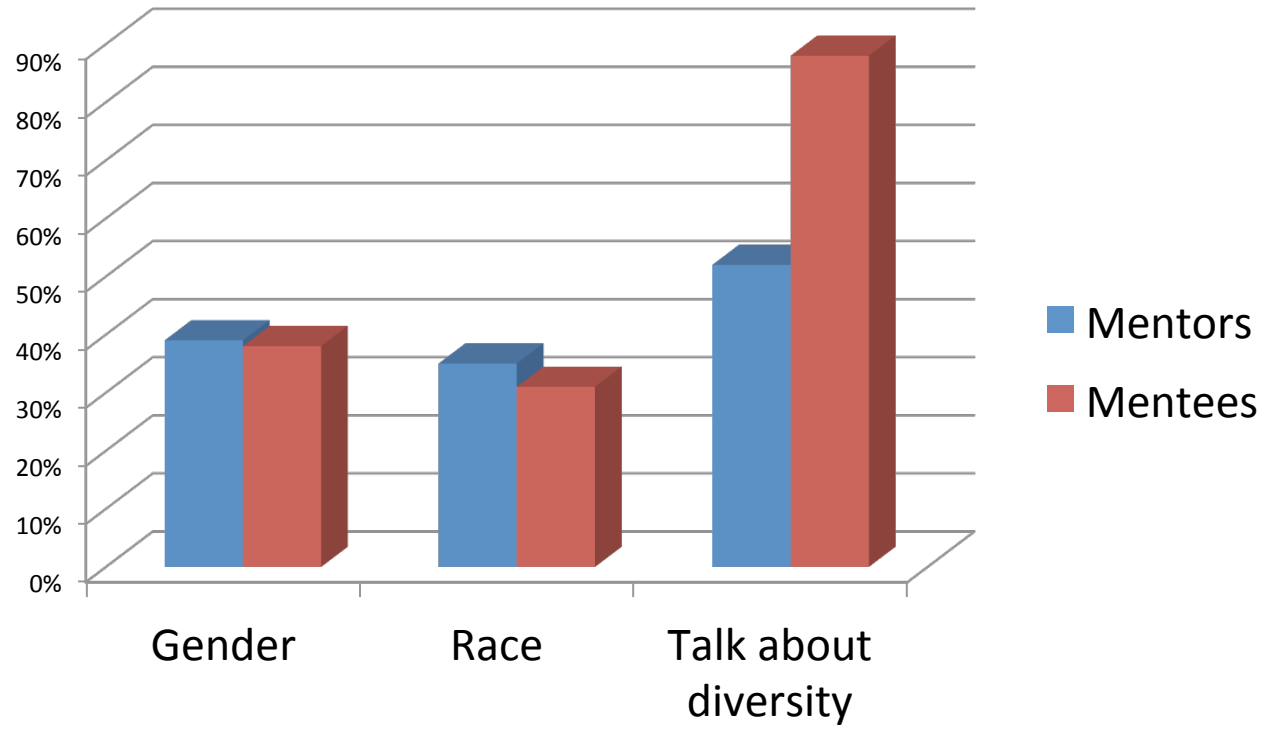
http://www.lva.virginia.gov/exhibits/mapping/map_images/satellite.jpg

Watershed

- Inputs from many different sources, different environments, different pathways.
- Boundaries between stages are not clear.
- Outcome is huge (the ocean) and there are many different places for the water to eventually go.

2. Learn to talk about difference.

What's important in mentoring?



Byars-Winston, Benbow, leverett, Pfund, Branchaw, Owen, 2013.

3. Set high expectations.

http://markblackspeaks.com/wp-content/uploads/Goldfish-Jump-Out-Of-Bowl-2-expectations.jpeg

1) Perspective
2) Persistence
3) Privilege

Persistence Framework

1. Active learning in introductory courses
2. Early research experiences
3. Membership in learning communities

EDUCATIONFORUM

SCIENCE EDUCATION

Increasing Persistence of College Students in STEM

Mark J. Graham,[1,2] Jennifer Frederick,[1] Angela Byars-Winston,[3] Anne-Barrie Hunter,[4] Jo Handelsman[1]*

An evidence-based framework offers a guide for efforts to increase student persistence in STEM majors.