

A brief perspective on
U.S. graduate education
in biology

Points to be addressed

- ▶ Too many or too few PhD students?
- ▶ Quality of the career track
- ▶ Current NSF role
- ▶ A Training Grant program that could address the doctoral experience and prospects

The Path Forward

The Future of Graduate Education in the United States



GRADUATE STUDENTS

Aspirations and anxieties

Center for American Progress



BerkeleyLaw

UNIVERSITY OF CALIFORNIA

Berkeley Center on Health,
Economic & Family Security

Staying Competitive

Patching America's Leaky Pipeline in the Sciences

Marc Goulden, Ph.D., Karie Frasch, Ph.D., and Mary Ann Mason, J.D., Ph.D.

The University of California, Berkeley Berkeley Center on Health, Economic, & Family Security

and The Center for American Progress

November 2009

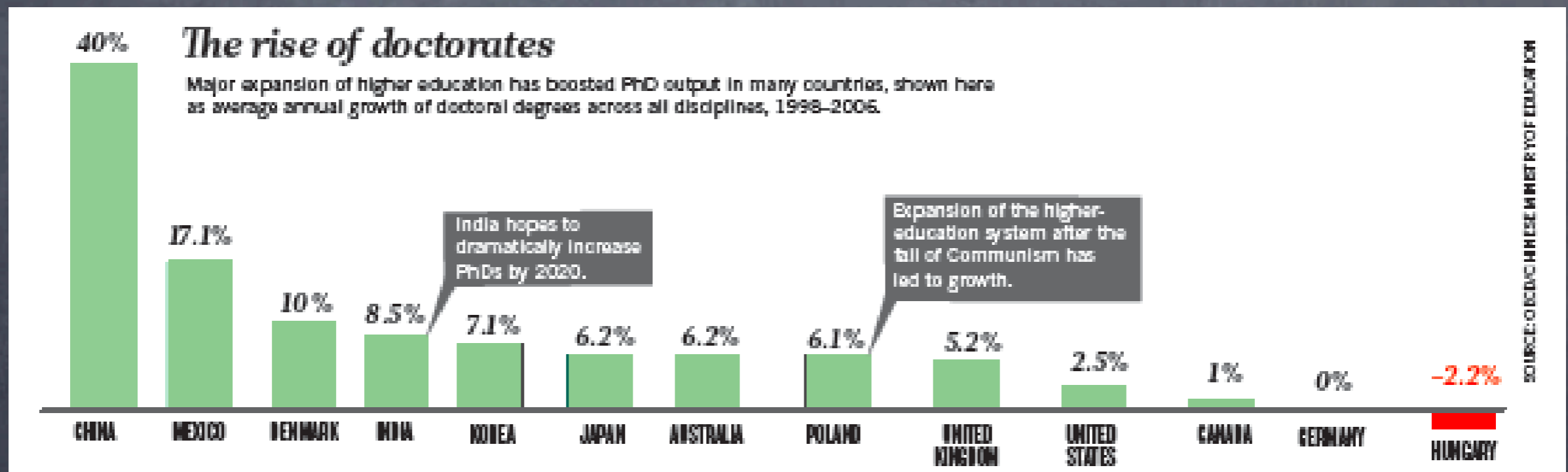


2010 U.S. Trends in doctoral training

- ▶ Doctoral awards were down from 2009 in five of the eight major science fields of study
- ▶ Agricultural sciences showed the largest decrease (15.7%)
- ▶ Much smaller decreases in physical sciences; psychology; social sciences; and earth, atmospheric, and ocean sciences ($\leq 2\%$)
- ▶ Computer sciences posted the largest gain (3.5%)

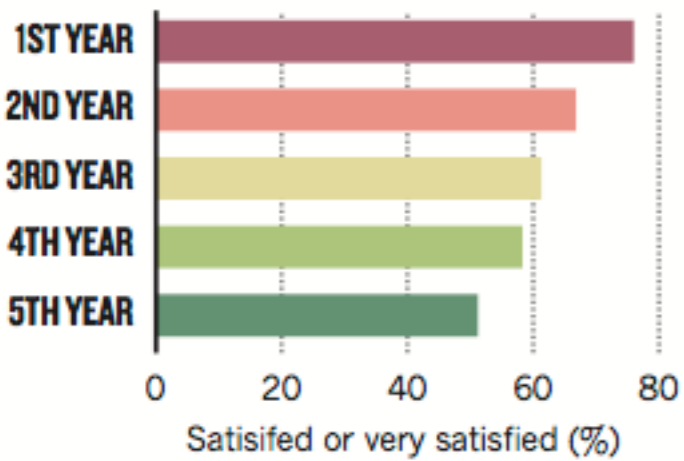
NSF Statistics (Nov. 2011)

International trends in doctoral training

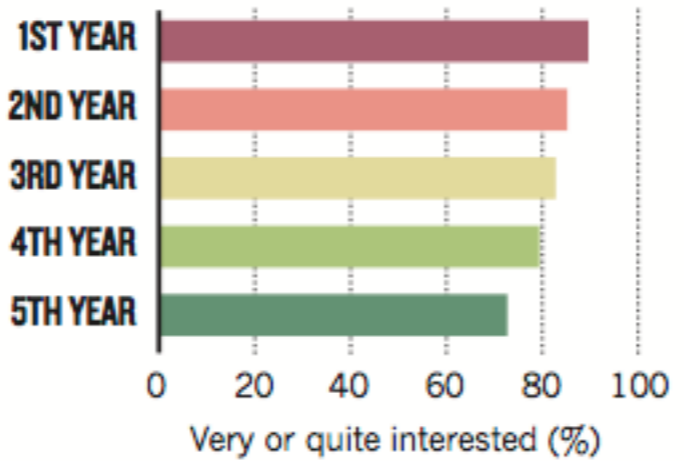


Apprentices, students or slaves?

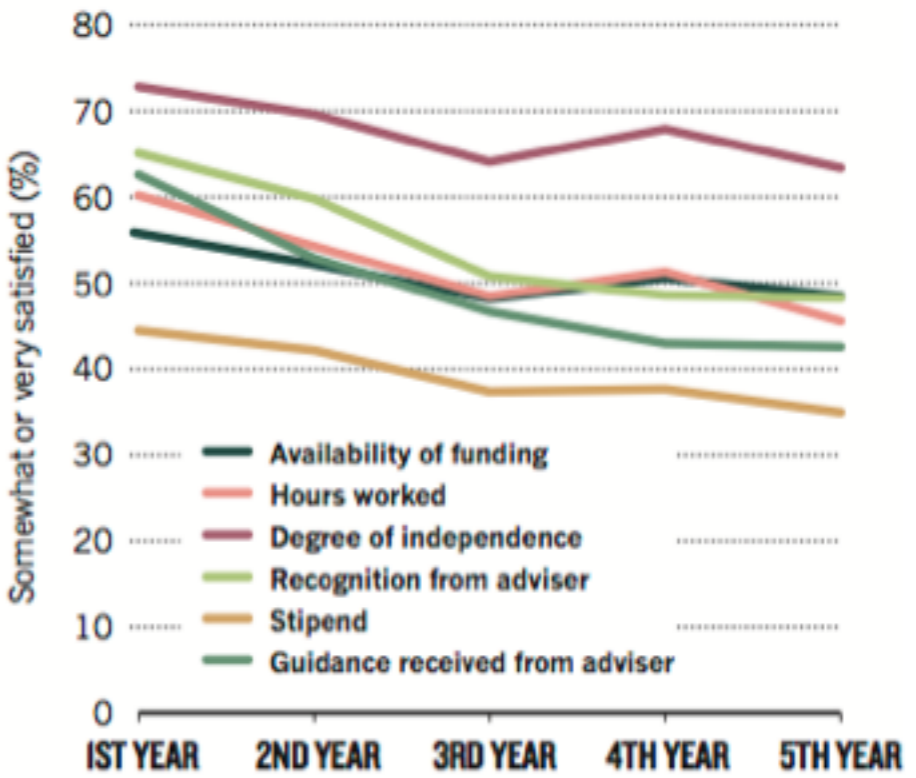
Q Overall, how satisfied are you with your graduate-school experience?



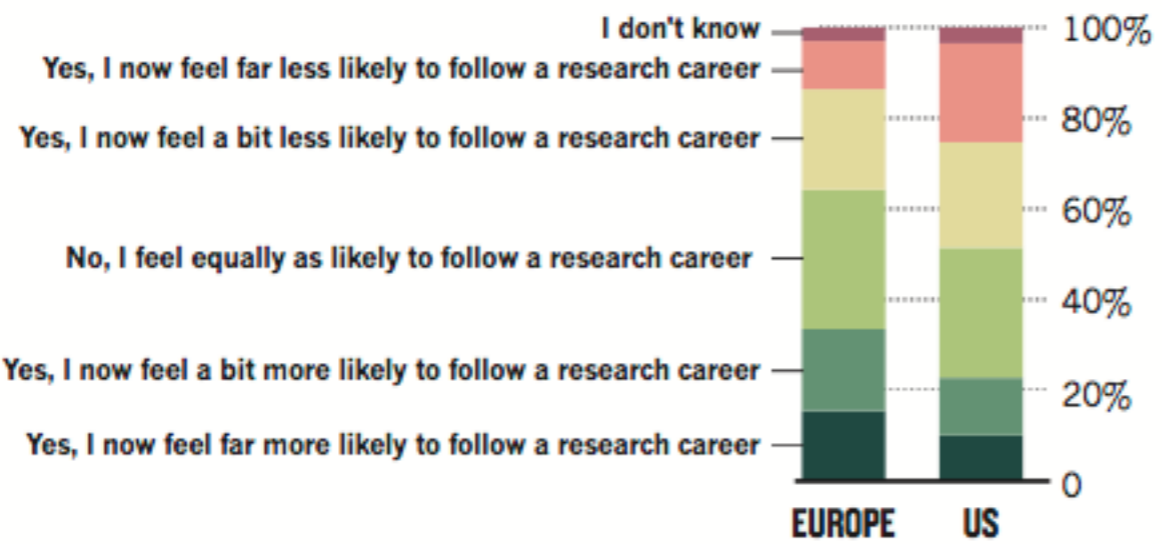
Q How would you rate your current interest in your work?



Q To what extent are you satisfied with each of the following attributes or aspects of your graduate-school experience?



Q Do you think that your likelihood of commencing a research career has changed since starting your PhD?

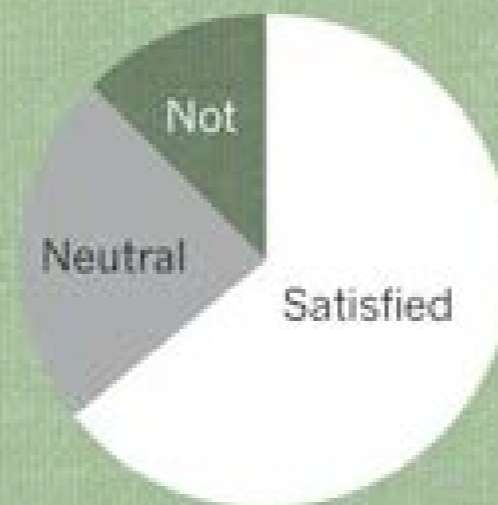


What's a PhD worth?

What's a PhD worth?

*People with a PhD
aren't much happier...*

Number satisfied with their
job 6–10 years after
achieving their highest
qualification.

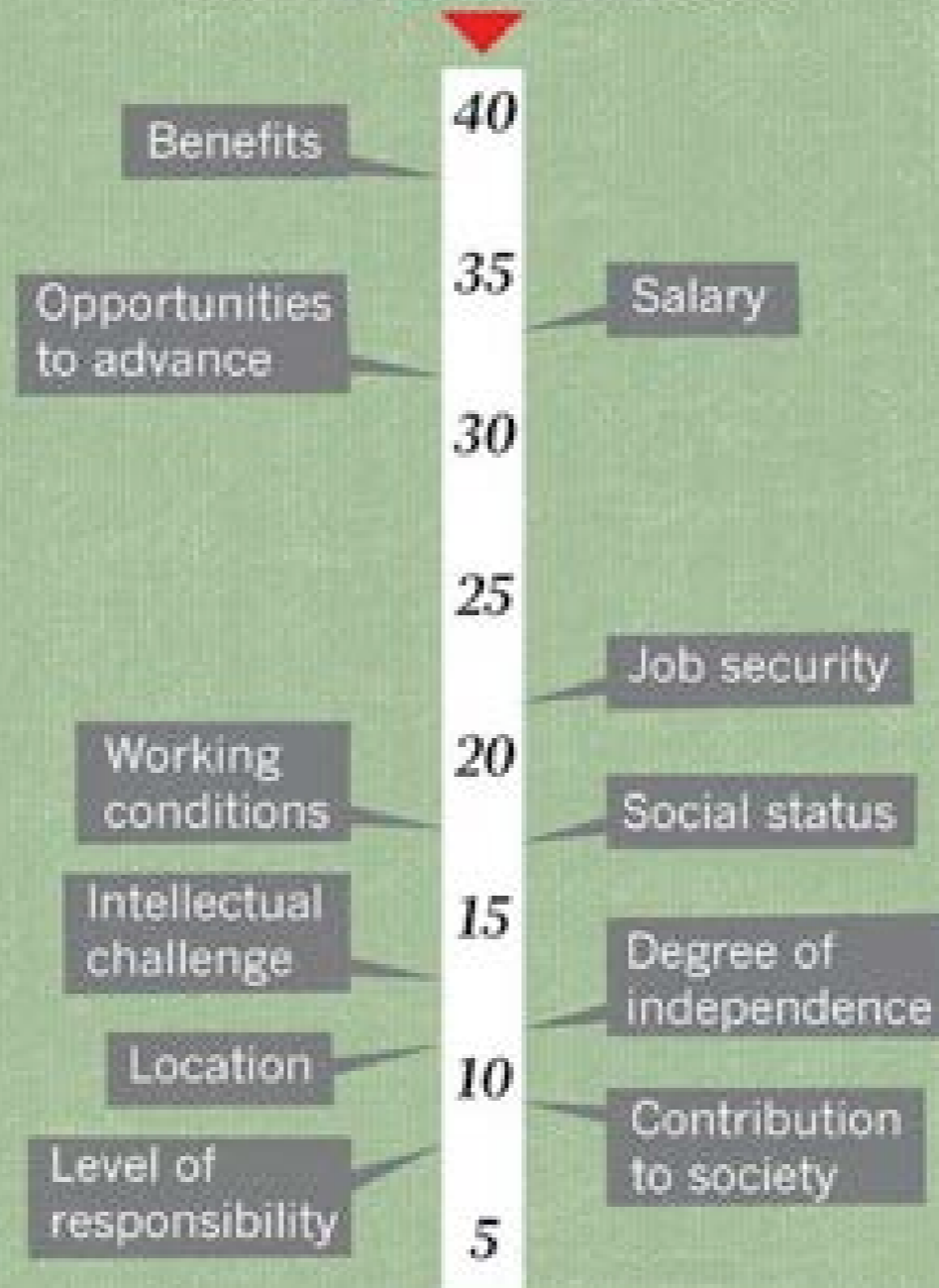


WITH A PHD



WITHOUT A PHD

SCALE OF DISSATISFACTION



Percentage of doctorate holders dissatisfied with employment situation, by reason

What's a PhD worth?

People with a PhD aren't much happier...

Number satisfied with their job 6–10 years after achieving their highest qualification.



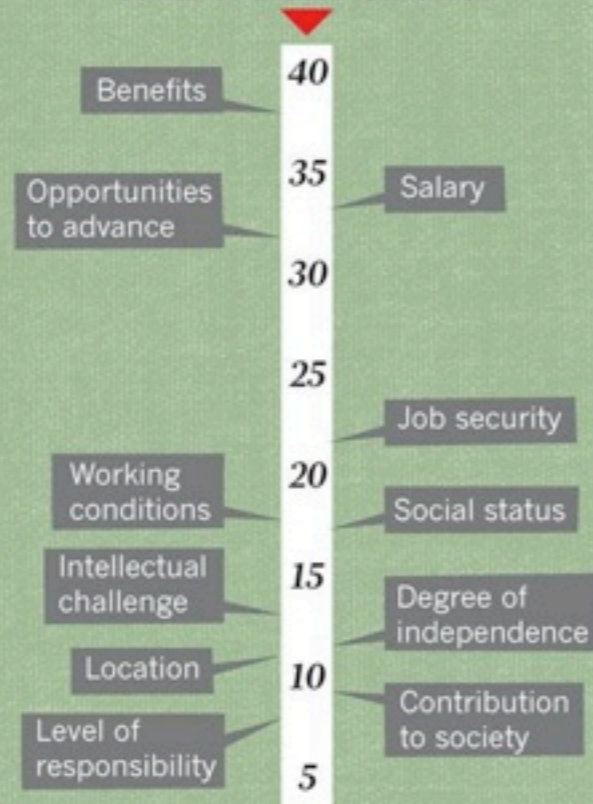
WITH A PHD



WITHOUT A PHD

...they gripe about benefits, but like the intellectual challenge...

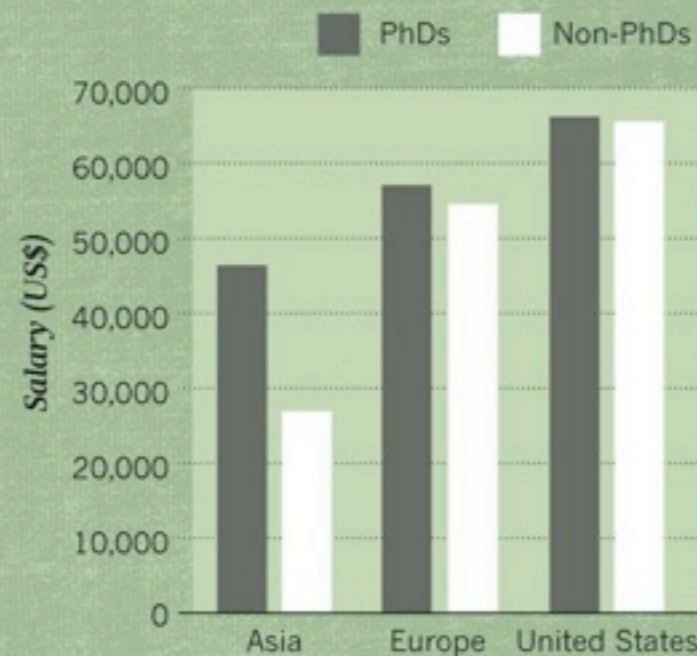
SCALE OF DISSATISFACTION



Percentage of doctorate holders dissatisfied with employment situation, by reason

...and most aren't much richer.

Average salary 6–10 years after achieving highest qualification.



NSF and Graduate Education

- Graduate fellowships for individuals (GRFP)
 - ▶ 2008: 913 awards/133 underrepresented
 - ▶ 1952-2008 success rate of ~8-9%
 - ▶ 2009 and beyond - doubling of fellowship awards
- IGERT training grants (~400 students supported per year)
- Unknown number of individuals supported as part of research grants
- Dissertation improvement grants

What should the Training Grant accomplish?

- ▶ Create or plug into a “critical mass” cohort of students and mentors
- Act as a quality control mechanism for trainee background and diversity
- Challenge the existing paradigm which assumes that most trainees will continue in an academic environment that uses the journal-conference-grant model (use NSF innovation culture)
- Use a minimally burdensome application procedure that will suffice for appropriate evaluation but not dissuade applicants
- Attempt to build on existing institutional frameworks, to enhance and evolve, rather than disrupt existing programs
- Require institutional financial and administrative commitment to ensure that institutions do not substitute NSF support for their own commitment

Other issues to consider

- ▶ Faculty are generally not rewarded for taking lead in TG programs
- ▶ Universities withdraw support as graduate training does not rise high in priorities
 - Biology laboratories become predominantly populated with postdoctoral fellows
 - These are often foreign, and increasingly return to their home countries where science investment is booming

A way forward

- ▶ Goal is to implement new or modified program(s) in FY2014 or 2015
- ▶ This should be preceded by a stakeholders meeting to gel the ideas presented here, and others
 - Stakeholders may include university officials, PI' s of IGERTs, NIH TGs, GAANNs, graduate students
 - Working assumption that sufficient recent surveys and studies are available already