

Increasing Women's Access to Training in Science and Technology



David Miller

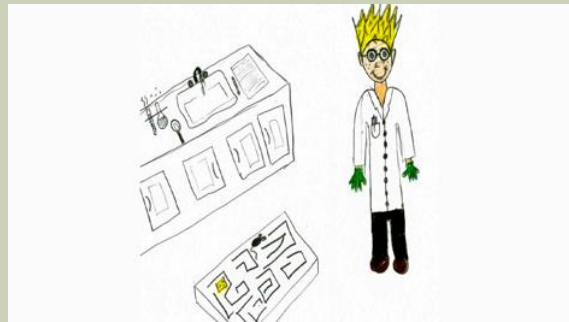
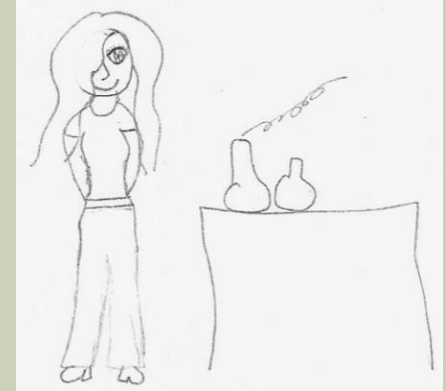
Psychology
Doctoral
Student



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Nov 12th, 2015

START WITH THOUGHT EXERCISE



- In 1960s/70s, nearly ~5,000 Canadian & US children were asked to draw a scientist (Chambers, 1983)
- Less than 1% depicted a woman scientist

OUTLINE OF MY TALK

- The problem
- Interventions at undergraduate level
- Partnerships between industry and higher ed

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GLOBAL STEREOTYPES

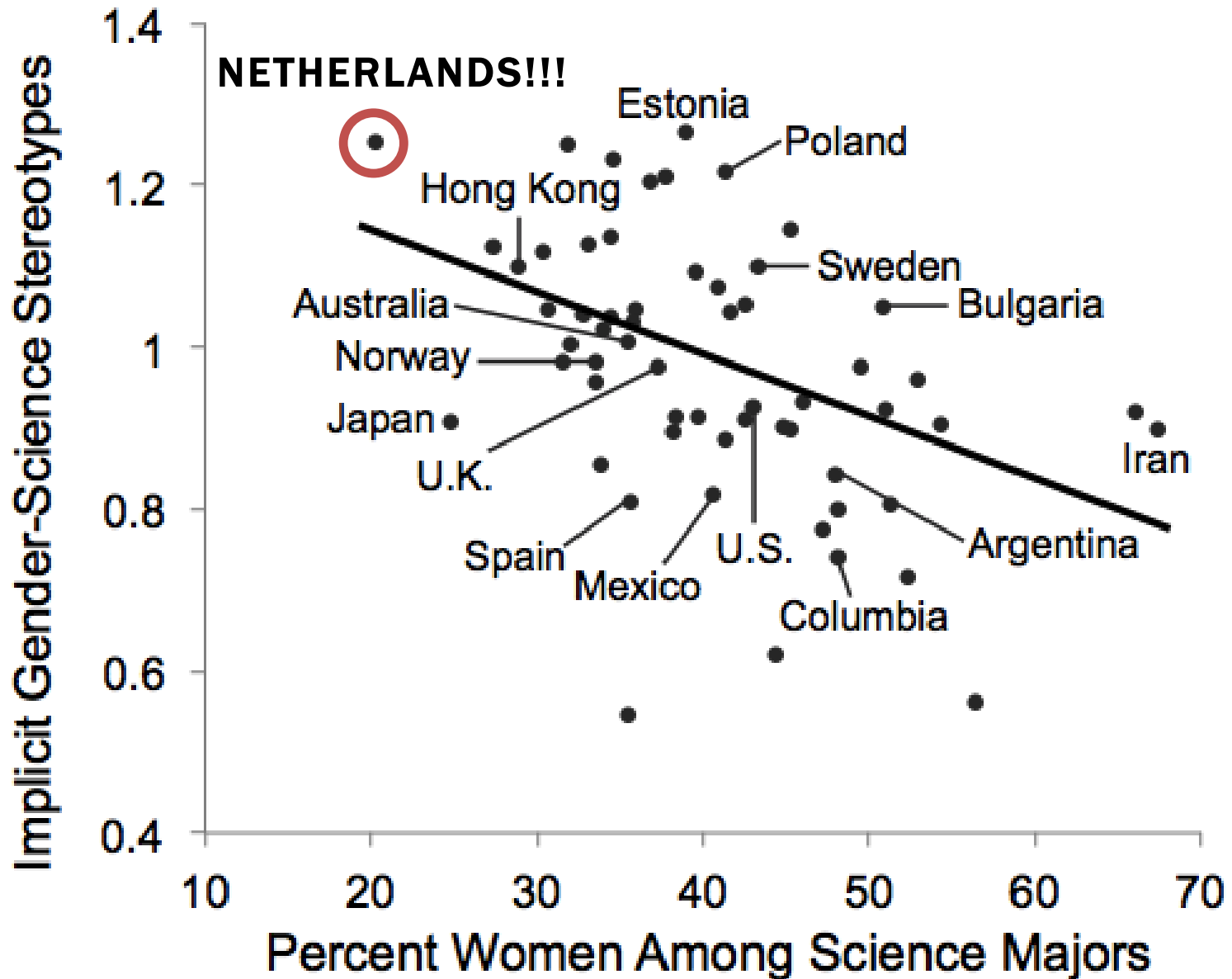
tinyurl.com/MillerStudy

- Internet data from ~350,000 individuals in 66 nations



- Two measures of stereotypes: (1) explicit and (2) implicit
- Global stereotypes, even Norway and Sweden were not immune
- Who had the strongest stereotypes? **THE NETHERLANDS!!!**

STEREOTYPES REFLECT GENDER IMBALANCES



STEREOTYPES THAT KEEP WOMEN OUT

tinyurl.com/StereotypesReview

(Cheryan et al., 2015)

Girls' participation in
computer science and
engineering

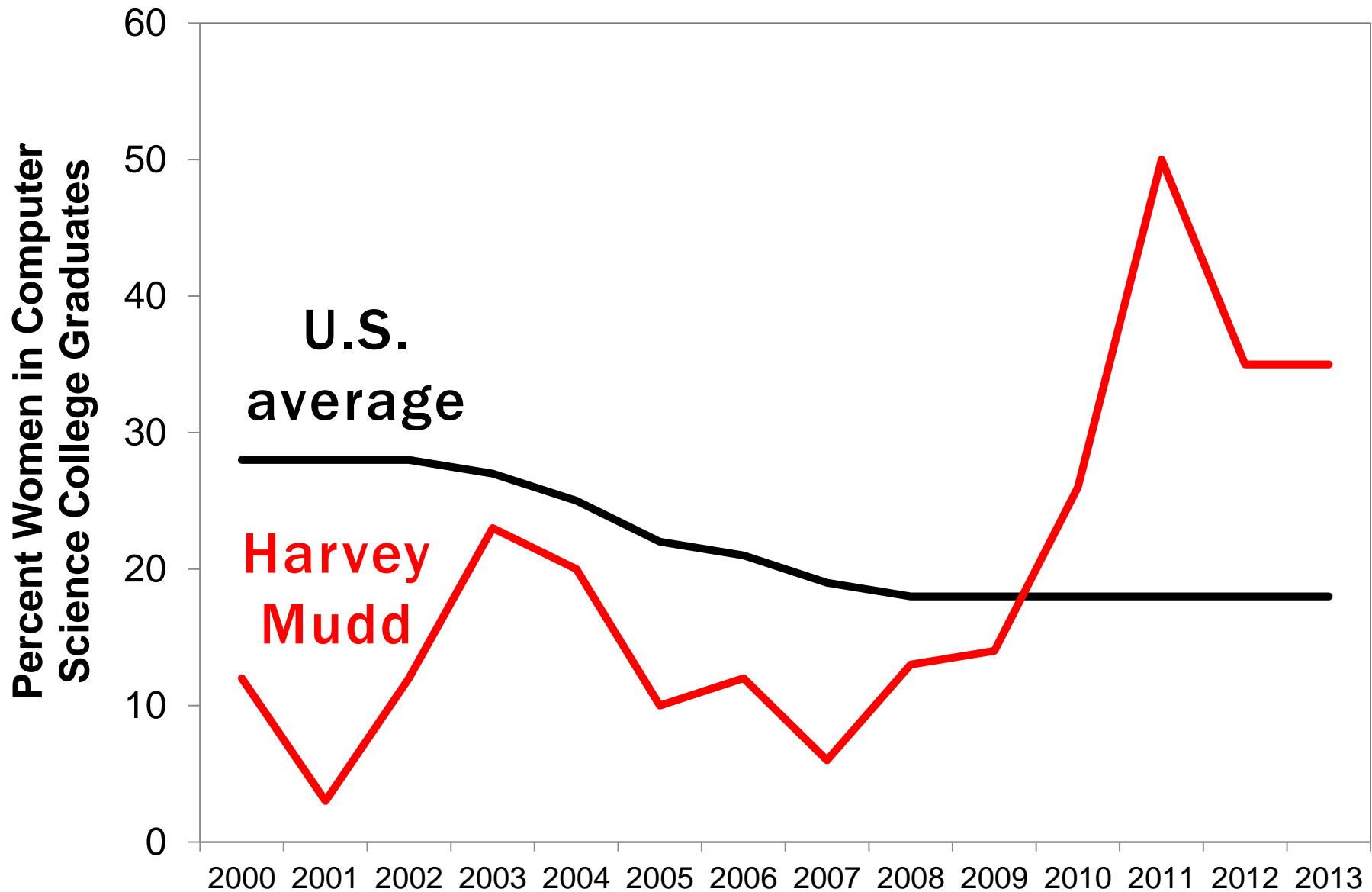
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- **The problem**
 - Strong stereotypes and imbalance in Netherlands
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CASE EXAMPLE FROM THE U.S.



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STEREOTYPES ABOUT THE CULTURE

About the **work**
(e.g., not collaborative,
not a helping field)

Changed stereotypes about the work
by revising introductory curriculum

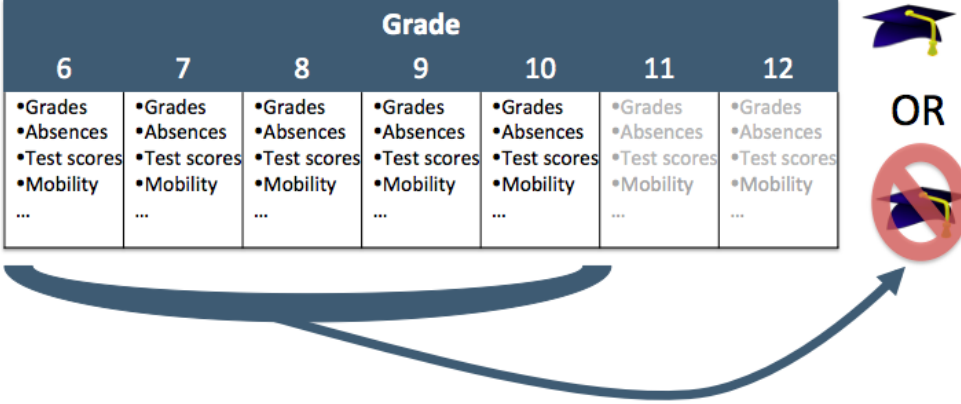
PROVIDE RESEARCH OPPORTUNITIES

bit.ly/AddWomen

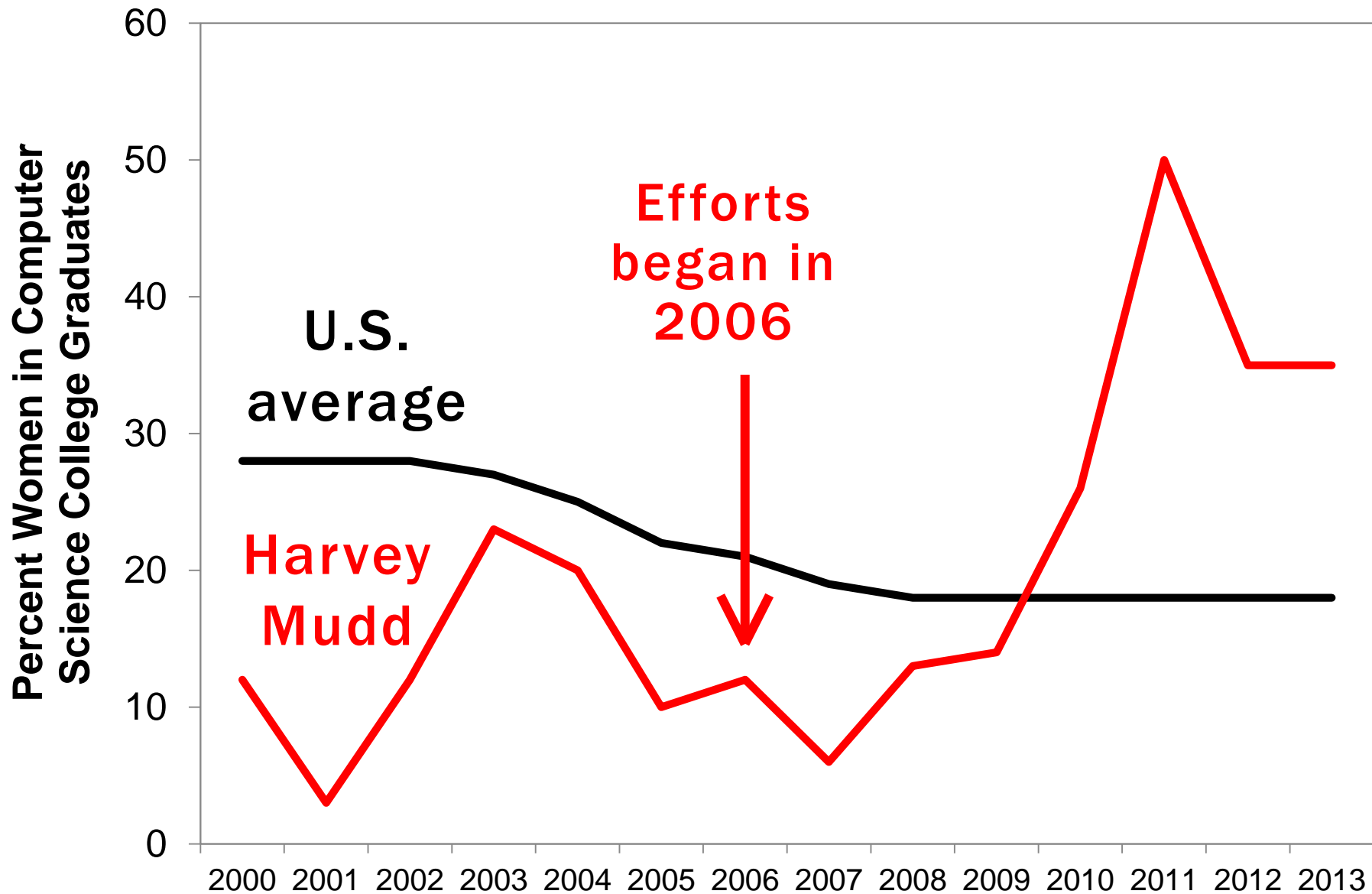
- Summer research after first year
 - 67% of women listed as important for choosing computer science major
 - Versus 25% of men
- Another model: Data Science for Social Good

Grade						
6	7	8	9	10	11	12
•Grades	•Grades	•Grades	•Grades	•Grades	•Grades	•Grades
•Absences	•Absences	•Absences	•Absences	•Absences	•Absences	•Absences
•Test scores	•Test scores	•Test scores	•Test scores	•Test scores	•Test scores	•Test scores
•Mobility	•Mobility	•Mobility	•Mobility	•Mobility	•Mobility	•Mobility
...

OR



LESSON: CHANGE TAKES TIME



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 - Provide research opportunities & internships
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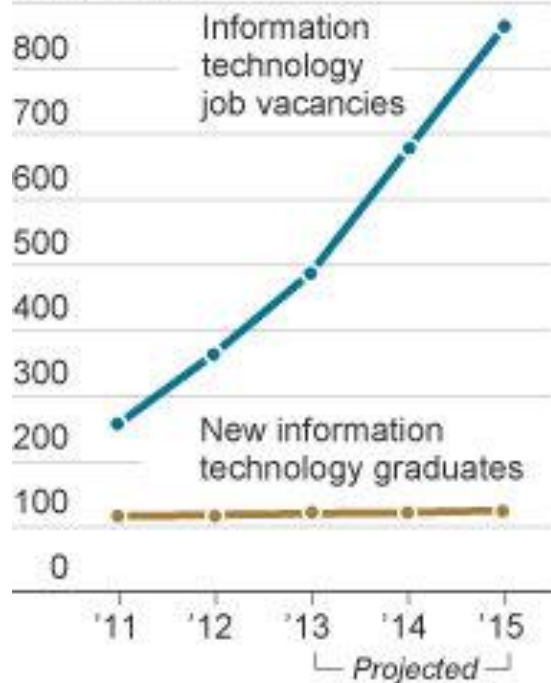
CONTINUING ED. AS LATE ENTRY POINT

Skills Mismatch

The European Union lacks qualified candidates to fill jobs in the growing information and communication technology sector.

E.U. information technology sector

900 thousand



Source: European Commission

THE NEW YORK TIMES

- STEM skills key to every employment field
- But massive skills gap means high demand for continuing education
- An important late entry point for women

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■ Interventions at undergraduate level

- Emphasize applications in intro courses
- Provide research opportunities & internships

■ Partnerships between industry and higher ed

- High demand for STEM skills training after college
- One potential late entry point for women

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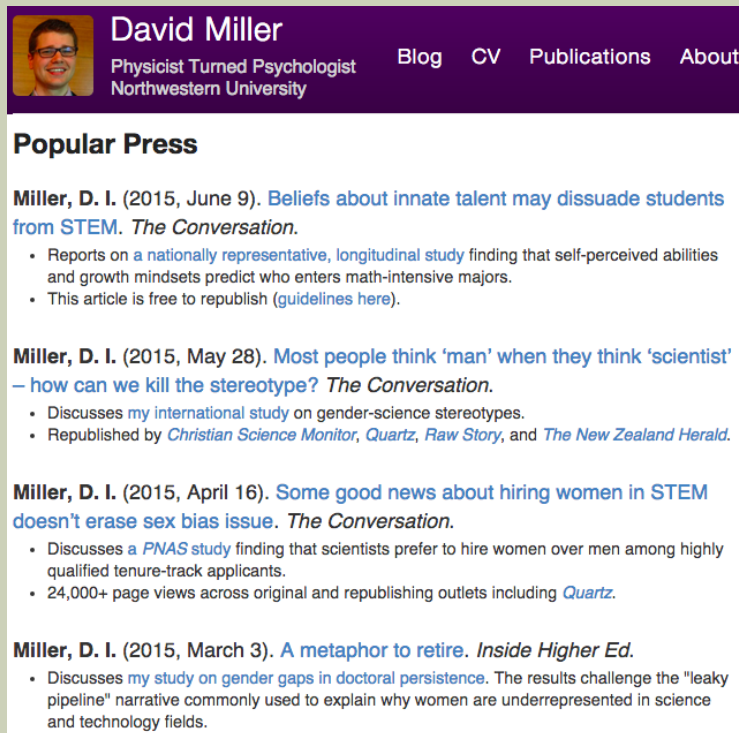
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LINKS TO MORE INFORMATION

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tinyurl.com/MillerPubs

bit.ly/AddWomen



David Miller
Physicist Turned Psychologist
Northwestern University

Blog CV Publications About

Popular Press

Miller, D. I. (2015, June 9). [Beliefs about innate talent may dissuade students from STEM.](#) *The Conversation*.

- Reports on a [nationally representative, longitudinal study](#) finding that self-perceived abilities and growth mindsets predict who enters math-intensive majors.
- This article is free to republish ([guidelines here](#)).

Miller, D. I. (2015, May 28). [Most people think 'man' when they think 'scientist' – how can we kill the stereotype?](#) *The Conversation*.

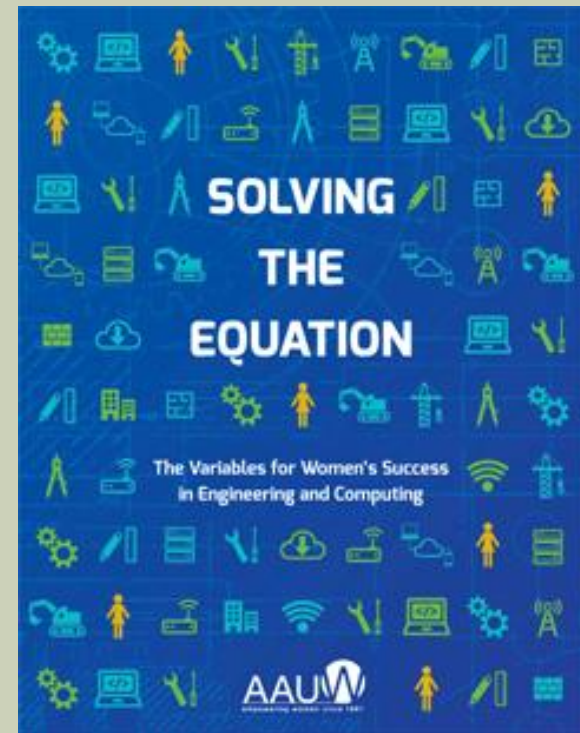
- Discusses [my international study](#) on gender-science stereotypes.
- Republished by *Christian Science Monitor*, *Quartz*, *Raw Story*, and *The New Zealand Herald*.

Miller, D. I. (2015, April 16). [Some good news about hiring women in STEM doesn't erase sex bias issue.](#) *The Conversation*.

- Discusses a [PNAS study](#) finding that scientists prefer to hire women over men among highly qualified tenure-track applicants.
- 24,000+ page views across original and republishing outlets including *Quartz*.

Miller, D. I. (2015, March 3). [A metaphor to retire.](#) *Inside Higher Ed*.

- Discusses [my study on gender gaps in doctoral persistence](#). The results challenge the "leaky pipeline" narrative commonly used to explain why women are underrepresented in science and technology fields.



Review article: tinyurl.com/StereotypesReview