Brain Drain: Why Women Scientists/Engineers Leave Academe and Industry

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Causes of Women’s Departures

- Recent studies in both academe and industry demonstrate that while there still is a “leaky” pipeline, increasing numbers of women are reaching terminal degrees in most S&T fields
- In the workplace (and earlier) women are choosing better opportunities rather than “chilly” workplace climates
- Stereotype threat operates for all humans and is one likely mechanism operating for women in S&T work settings

Recent Studies

- Academe
  - Beyond Bias and Barriers: Fulfilling the Potential of Women in Academic Science and Engineering (NAP, 2007)
  - NSF Science & Engineering Indicators (NSF, 2006)
- Industry
  - The Athena Factor: Reversing the Brain Drain in Science, Engineering, and Technology (HBR, 2008)
  - Climbing the Technical Ladder: Obstacles and Solutions for Mid-Level Women in Technology (Anita Borg Institute & Clayman Institute, Stanford University, 2008)

Academic Pathways

- Women leave S&T degree programs more often than men of similar ability
- Reason: better opportunities elsewhere; why are other opportunities more attractive?
- Yet women are now persisting to S&T degrees at higher rates than ever before
- Similar pattern at every level
Attrition in Academe

- Women less likely than men to apply for faculty positions
- No productivity differences among men and women faculty
- Among reviewed faculty, women as likely as men to be tenured
- Pre-review attrition due to feelings of isolation, lack of respect, difficulty integrating work and family roles

Academic Attrition of Women

- At every educational transition, women less likely to opt for next level, despite prior achievement/talent
- Women more likely to opt out at each work level, despite achievement/talent
- Reasons involve both pushes (isolation/rejection) and pulls (other opportunities) – women’s achievements and talents are not the cause
Sample Recommendations for Academe

- Leadership must communicate a priority on diversity goals, and hold others accountable for results, with training to accomplish these.
- Change processes for recruitment, retention, and assessment of faculty to be more transparent and objective (ie, without bias).
- Provide equal support for men and women faculty at every stage.
- Change culture from male model of faculty (with wife) to human model of faculty.

Situation in Industry

- Claim a high value for diversity of perspective – leads to innovation
- Women highly dedicated; pursue S&T to serve society
- High attrition of women (51%), peaking after ten years
- Huge waste following great investment

S&T Industry Climate for Women

- Few women at high levels
- Fewer women at each level of workforce
- Women perceived as not fitting into technical culture
- Workplace regarded by both men and women as competitive (not cooperative) and requiring access to power/mentoring – which contrasts with espoused value for teamwork

Recommendations from Industry Reports

- Provide professional development
- Foster positive culture
- Walk the talk on family friendliness
- Train for effective management
- Diversify pathways to advancement
Striking Similarities Between Academe and Industry in Situation of Women and Recommendations to Remedy Situation

- Both sectors note the high cost of losing high performing women
- Both focus on providing setting/culture for effective performance
- Both note the importance of leadership on the value of women scientists/engineers
- Both create systems change in policies and practices to implement values

Policies & Practices Matter

- Research on stereotype threat demonstrates that all humans are vulnerable to suppressed performance given hostile context
- Experimental research done in many settings with many groups demonstrates this powerful effect, including behavior observed for women in S&T settings
- Stanford colleague Claude Steele is leading researcher in this area

Research on Stereotype Threat

- Also operates with white men
  - threat in athletic performance where “natural ability” invoked
- Every group has some vulnerability
- Threat operates only if person cares about high performance
- Threat resides in social mistrust not self-doubt
- Remedy is to create social trust
Addressing Stereotype Threat

- Affects all humans in contexts where the stereotype is that they don’t do as well (despite objective skill/capacity)
- This prevails in S&T work settings against women
- Antidote to threat is social trust
  - Requires
    - Objective policies/practices to create effective performance
    - Leadership messages to address perceptions

Both Stereotype Threat and Social Trust are Common Experiences

- At Penn State every faculty search required to interview at least one woman and one minority
  - conveyed that such candidates existed
  - they did!
- Existence or lack of role models can dispel or convey social trust
  - example of elite professor selection
- Requires similar policies and practices at each level
- Changed mindset

Diversity and Ability

- People tend to select similar others
  - this “seems” natural but may have pernicious effects
  - Example of field death
- Research demonstrates that diversity of perspectives plus ability are more effective than ability alone for selection
- Scott Page research: diversity trumps ability for innovation & effectiveness

Bottom Line

- Women have dramatically increased S&T degrees
- Participation in academic and industrial workforces
- Data suggest great interest and dedication as well as higher dropout: great waste
- Why do women drop out?
  - Stereotype threat
  - Lack of social trust

Need Workplaces that Enhance Performance of All

- Possible? Sure!
- Men and women want the same thing
  - Being valued
  - Having opportunity
  - Having a life as well as rewarding work
- Power and privilege corrupt systems, undermine effectiveness
- Need to create workplaces that optimize effectiveness

Thanks!