

Women in STEM

BC Groundwater Association 2023 Annual Conference

Jolene Hermanson, M.Sc., P.Geo, PNL2-MCC

Coach for Women in Sciences, Tech, Engineering & Math (STEM)

Hydrogeologist (Waterline Resources)





Gender

Stopping the Exodus of Women in Science

by Sylvia Ann Hewlett, Carolyn Buck Luce, and Lisa J. Servon

From the Magazine (June 2008)

Summary.

A new study reveals that U.S. companies face a troubling brain drain: Fifty-two percent of female scientists, engineers, and technologists abandon their chosen professions. If companies understand why women drop out, however, they can create targeted interventions and head off a talent shortage. [close](#)

- 41% of highly qualified scientists, engineers, and technologists at the lower levels of the corporations are women.
- 52% of these women will quit their private sector jobs (around age 30-35).
- Many leave the STEM all together.



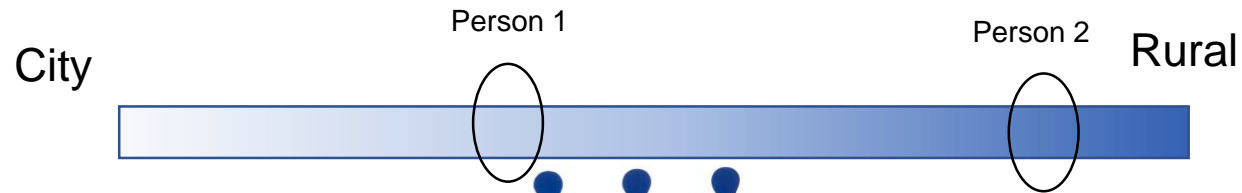
Growing gap in STEM supply and demand



Entering STEM – Diversity & Perspective



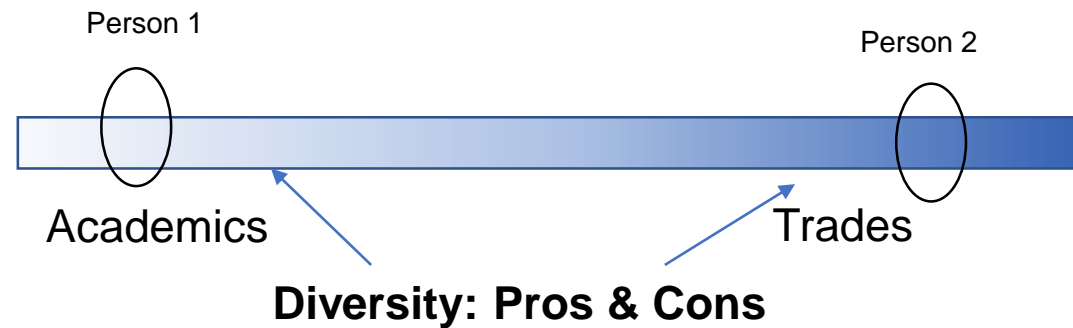
Background



Interests/Values



Pathway

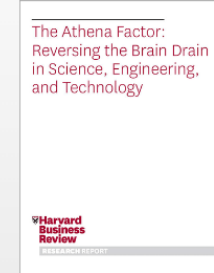


Why Do Women Leave?

Athena Project Findings: 5 Major “Antigens”

1. **Difference in Cultures:** Women may be marginalized by “hostile macho cultures” (extension of the locker room). Often seen as exclusionary. Gender credibility gap.
2. **Isolation:** Being the sole woman on a team or at a site. Makes it difficult to find support or sponsorship. Makes taking risks riskier, less collaboration, lower ability to learn and problem-solve or be involved in business decisions.
3. **Systems of risk and reward:** The “diving catch” and “firefighting” (emergency) culture of companies disadvantage women, who tend to be risk averse. Without buddies to support them, they feel they could go from “hero to zero” in a heartbeat.
4. **Extreme work pressures:** STEM jobs are usually time intensive, extreme working environments.
5. **Mysterious career paths:** As a result of the above, women find it hard to gain an understanding of the way forward. 40% feel stalled or stuck in their careers.

Perfect storm of career hurdles right when family pressures intensify.



The Athena Factor: Reversing the Brain Drain in Science, Engineering, and Technology

by Sylvia Ann Hewlett, Carolyn Buck Luce, Lisa J. Servon, Laura Sherbin, Peggy Shiller, Eytan Sosnovich, Karen Sumberg



Gender Differences in Personality Traits

Controversial: causes and precursors?
Nature vs. nurture

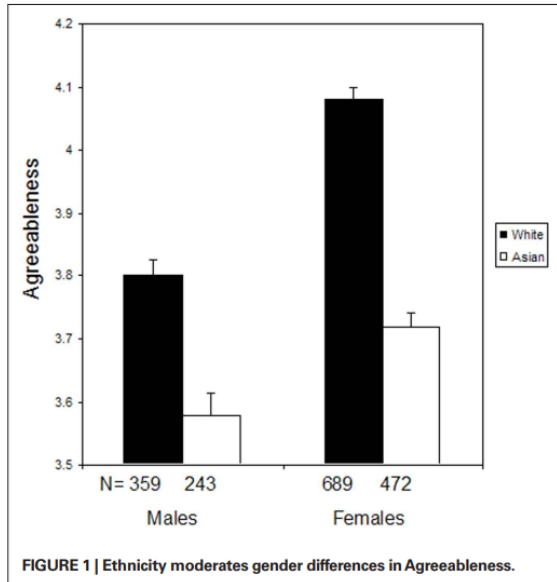


FIGURE 1 | Ethnicity moderates gender differences in Agreeableness.

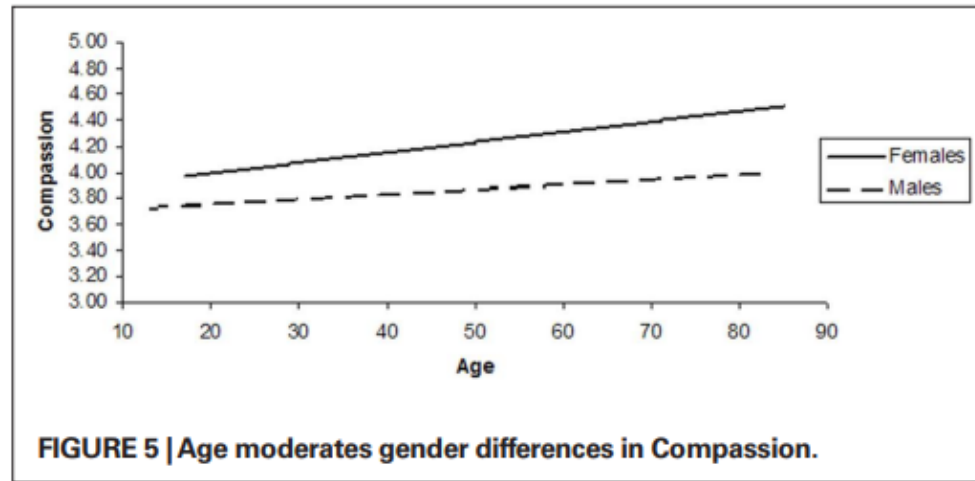


FIGURE 5 | Age moderates gender differences in Compassion.

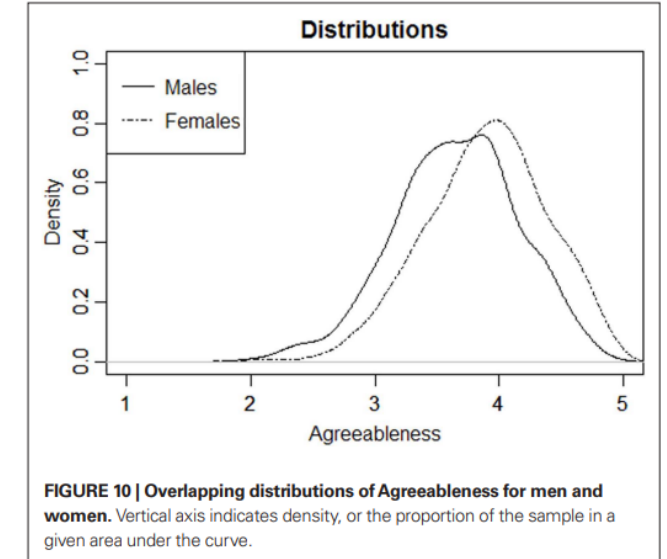
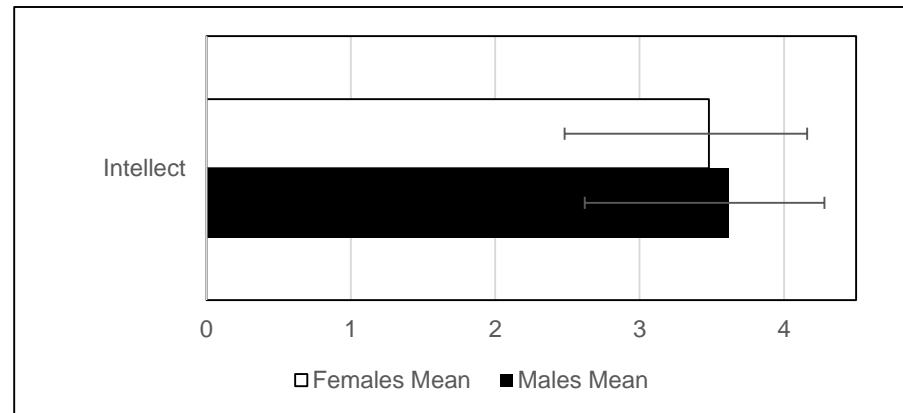


FIGURE 10 | Overlapping distributions of Agreeableness for men and women. Vertical axis indicates density, or the proportion of the sample in a given area under the curve.



The Effect

Real Thoughts

- I'm worried I'll be fired because I'm not performing well enough
- I'm nervous of being rejected or dismissed
- I'm nervous of messing up
- I don't have the confidence to stand up for myself
- I had a past project not go well and I'm worried they're not giving me work because of it
- I'm slow to learn things, I get so frustrated with myself
- I'm worried I'm not smart enough
- I'm worried I'm not doing it right
- They're too busy to give me feedback or mentor
- I don't feel supported. I feel alone.
- I can't say no to projects, even if I don't have time.
- I don't think my colleagues like me
- I get really nervous in front of my colleagues or in meetings
- They put more confidence in his work than mine
- I'm not taken seriously
- They don't support the projects I want to take on
- I can do the technical work, but I don't know how to navigate the inter-personal stuff
- I don't have a plan or goals, I'm astonished that I got here..
- It's hard to figure out my place in the company
- I have no support to do what I know I'm capable of doing
- I have so much potential, but I don't know how to channel that exactly. I have no time to think about it.
- It's so hard to balance life and work
- I have low energy
- I work such long hours



Feelings

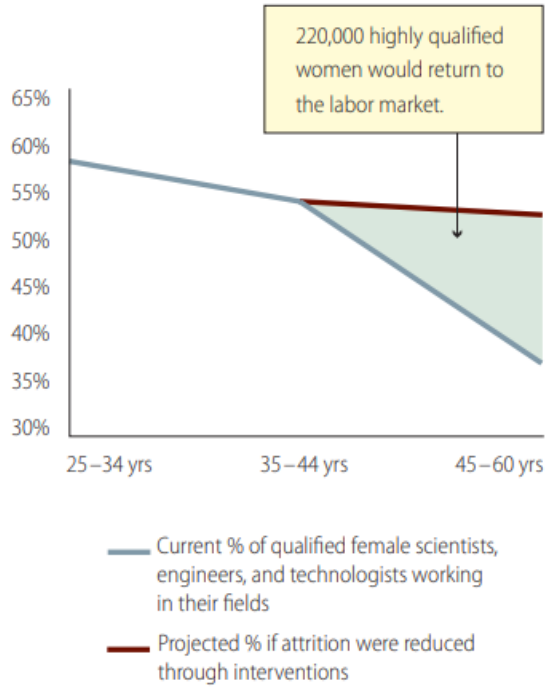
- Worry
- Inadequacy
- Alone
- Helpless
- Overwhelmed
- Rejected
- Frustrated
- Angry
- Confused
- Lethargic



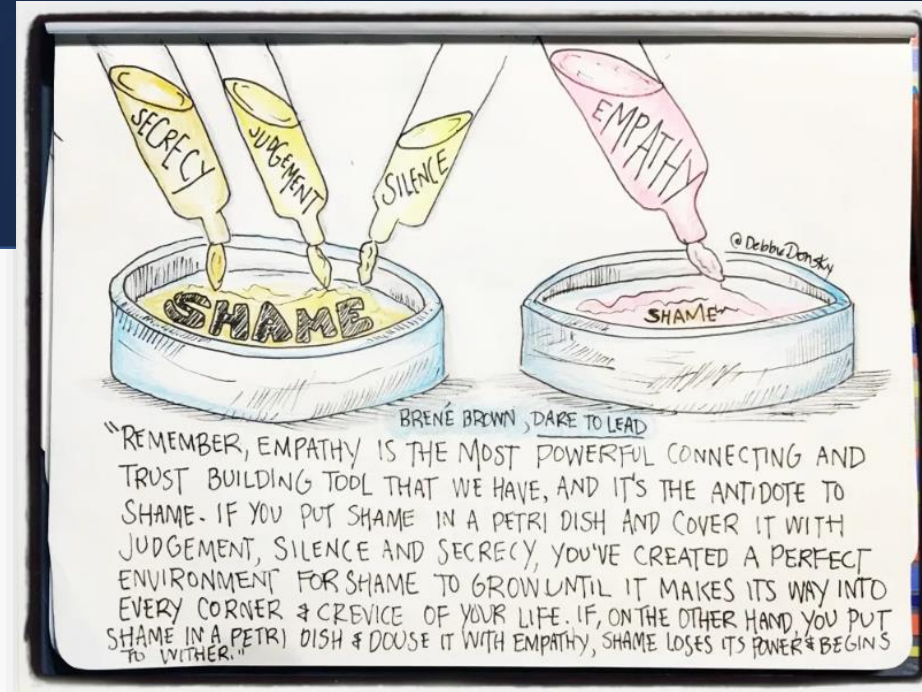
Behaviours

- Overwork
- Say yes to everything
- Avoid decisions
- Avoid risk
- Avoid management jobs
- Avoid field jobs
- Avoid tough discussions
- Avoid standing up for herself
- Avoid presenting
- Avoid setting ambitious goals
- Question her decisions
- Question her judgement
- Not ask for feedback
- Not ask for support
- Judge others
- Blame others
- Resent others
- Quit

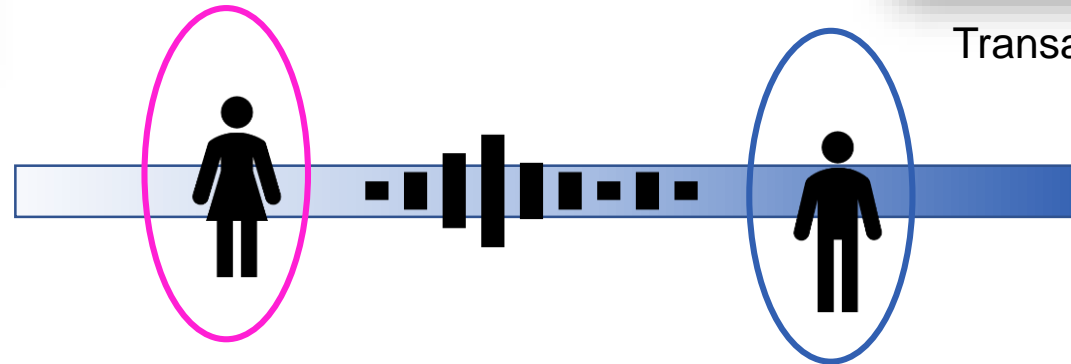
FIGURE 9.3
Intervening at the Fight-or-Flight Moment



Solution?



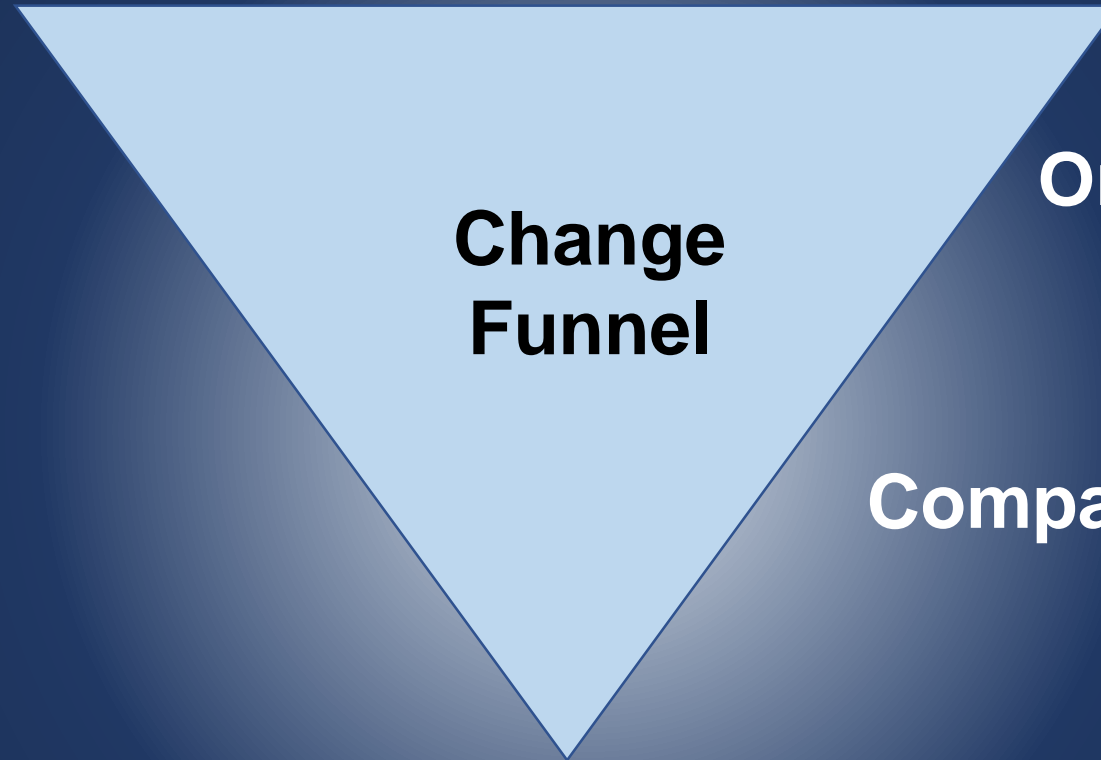
Transactional vs. Transformational Change



Human stories – our brain does not resonate with numbers.

Solution

Systemic Transformation



Organizations

Companies

Individual Transformation

Building Resilience, Skills & Confidence



Coaching for Individual Transformation

“Coaching has a measurable effective impact on... learning outcomes, ...work performance... and psychological well-being.”

The effectiveness of workplace coaching: a meta-analysis of contemporary psychologically informed coaching approaches

Coaching
psychology
meta-analysis

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Qing Wang

School of Psychology and Cognitive Science, East China Normal University, Shanghai, China

Yi-Ling Lai

Organizational Psychology, Birkbeck University of London, London, UK

Xiaobo Xu

School of Psychology and Cognitive Science, East China Normal University, Shanghai, China, and

Almuth McDowall

Organizational Psychology, Birkbeck University of London, London, UK

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Abstract

Purpose – The authors examine psychologically informed coaching approaches for evidence-based work-applied management through a meta-analysis. This analysis synthesized previous empirical coaching research evidence on cognitive behavioral and positive psychology frameworks regarding a range of workplace outcomes, including learning, performance and psychological well-being.

Design/methodology/approach – The authors undertook a systematic literature search to identify primary studies ($k = 20$, $n = 957$), then conducted a meta-analysis with robust variance estimates (RVEs) to test the overall effect size and the effects of each moderator.

Findings – The results confirm that psychologically informed coaching approaches facilitated effective work-related outcomes, particularly on goal attainment ($g = 1.29$) and self-efficacy ($g = 0.59$). Besides, these identified coaching frameworks generated a greater impact on objective work performance rated by others (e.g. 360 feedback) than on coachees' self-reported performance. Moreover, a cognitive behavioral-oriented coaching process stimulated individuals' internal self-regulation and awareness to promote work satisfaction and facilitated sustainable changes. Yet, there was no statistically significant difference between popular and commonly used coaching approaches. Instead, an integrative coaching approach that combines different frameworks facilitated better outcomes ($g = 0.71$), including coachees' psychological well-being.



Thank You

Jolene Hermanson Coaching
jolene@jolenehermanson.com
www.jolenehermanson.com

