Using a Career Development Intervention to Support Women in STEM Majors

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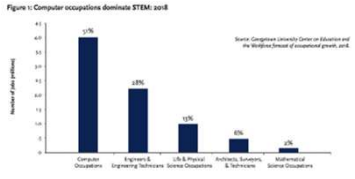
Overview

- Background & Rationale
- Career challenges
- Framework - Social Cognitive Career Theory (SCCT)
- Strategies in literature
- My career intervention

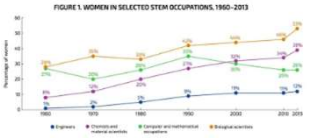
Background

- STEM: Science, Technology, Engineering and Mathematics



Background

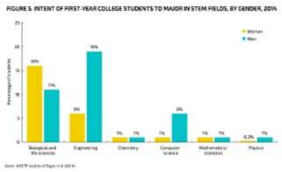
- Females continue to be underrepresented in STEM fields.
  - As of 2013 women accounted for only 12% of all engineers in the U.S. (Corbett and Hill, 2015).
  - In some rapid growth occupations, such as computer science, women's representation has actually declined in recent years (Corbett and Hill, 2015; Michelmore and Sassler, 2016).



Sources: AAUW analysis of data from U.S. Census Bureau (1960, 1970, 1980, 1990, 2000); L. M. Frehill analysis of data from U.S. Department of Labor, Bureau of Labor Statistics (2011, 2014b).

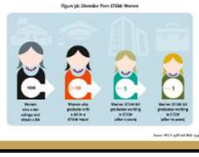
Background

- Among first-year college students, women are much less likely than men to say that they intend to major in STEM fields (AAUW, 2010; AAUW 2015).



Background

- Women are more likely than men to divert from STEM careers at various points (Carnevale, A., Smith, P., & Melton, M., 2011)
  - Women who hold degrees in science and engineering are less likely than men with similar degrees to actually be employed in these fields, constituting 23% of the science and engineering labor force and only 10% of employed physicists (NSF, 2015).



Why Women's Representation Matters?

- Women are a significant portion of the population.
- Maximizes innovation, creativity, and competitiveness
- Ensures women's needs not to be overlooked
- Improves pay equity
  - People in STEM occupations earn an average of $14,000 extra per year *at every education level* over other occupations, except at the Master's and better level (Carnevale, A., Smith, P., & Melton, M., 2011; NSF, 2015).
  - In the overall population of full-time workers, a typical woman is paid 78 cents for every dollar paid to a typical man (U.S. Census Bureau, 2014b).
  - In fields such as mechanical engineering and computer programming, women are paid more than 90 cents for every dollar paid to men for full-time work (AAUW, 2015).

What are some career challenges that women in STEM majors face?

Career Challenges

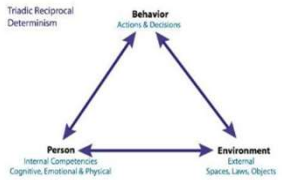
- Lack of self-confidence in STEM subjects
- Low-STEM career self-efficacy
- Stereotype threat
- Lack of social support and encouragement to pursue STEM-related educational and occupational aspirations
- Lack of role models

(Franklin, 2013; Grossman & Porche, 2013; Shoffner, Newsome, Barrio Minton, & Wachter Morris, 2015; Hill, C., Corbett, C., & St. Rose, A., 2010)

Framework: Career Social Cognitive Theory

The social cognitive career theory (SCCT) provides a conceptual framework for understanding how people develop career-related interests, make (and remake) occupational choices, and achieve career success and stability.

Bandura's Triadic Reciprocal Model of Causality



Social Cognitive Career Theory:

- Self-efficacy beliefs
- Outcome expectations
- Personal goals

Framework: Career Social Cognitive Theory

- Self-efficacy beliefs
  - Defined as "people's judgements of their capabilities to organize and execute courses of action required to attain designated types of performances" (Bandura, 1986)
- Outcome expectations
- Personal goals

4 Sources of Self-Efficacy Beliefs

- Mastery Experiences → one's performances on particular tasks
- Vicarious Experiences → our observation of people around us; role models
- Social Persuasions → messages from family, peers, teacher, etc
- Physiological States → anxiety, stress, fatigue, or other emotions

Strategies in Literature

Interventions informed by SCCT, that focus on the sources of self-efficacy, may be particularly effective for improving the career-related self-efficacy of underrepresented students (Betz & Schifano, 2000; Falco, Summers, & Bauman, 2010; O'Brien et al., 2000).

Strategies in Literature

- Develop programs and interventions that provide opportunities for success in STEM subjects (Garriot et al., 2013)
  - Design-based learning (Mehalik, Doppelt, & Schunn, 2008)
- Create school-based interventions that emphasize a growth mindset (Aronson, Fried, & Good, 2002; Blackwell, Trzensiewski, & Dweck, 2007)
  - Use process-directed praise—praise that emphasizes effort, work, and actions, as opposed to person-directed praise
- Use process of individuation to reduce the impact of stereotype threat on student performance (Ambady, Shih, Kim, & Pittinsky, 2001)
- Ensure presence of mentors, role models, and social support for learning (Carlone & Johnson, 2007; Milam, 2012)

My Career Intervention: 8-Week Career Outreach Program Series

- Target audience:
  - Female college students in STEM majors / intending to major in STEM
- Logistics:
  - 8 sessions; 1.5 hours per session; facilitated by 2 career counselors
  - Collaboration among Career Center, STEM major departments & Women's Center/Gender Equity Center
- Resources Needed:
  - Career Thoughts Inventory → Pre-test & Post-test

Session Overview

Week 1: Introduction & Understanding Yourself
- Pre-test
- Values, interests, needs, career goals, etc

Week 2: Strengths & Skills
- Soft skills

Week 3: Gain Experience

Week 4: Personal Branding
- Online presence
- How to best present self

Session Overview

Week 5: Networking
- Informational interviewing

Week 6: Salary Negotiation

Week 7: Women in STEM panel

Week 8: Wellness & Celebration
- Growth mindset
- Campus resources: tutoring; support group; career information for women in STEM (eg. specific job search websites)
- Post-test

Questions or comments?

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