ENGENDERING ENGINEERING SUCCESS

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Elizabeth Croft
UBC (Mech. Eng.)
NSERC CWSE (BC/Yukon)

Toni Schmader
UBC (Soc. Psych.)

Michelle Inness
U. Alberta (Business)

Valerie Davidson
U. Guelph (Engineering)

et. al.

OVERALL OBJECTIVE

Engendering Engineering Success will **study**, **develop** and **disseminate policies**, **practices** and **interventions** that both **support** and **reflect** the **real situation of women working in engineering careers**.

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TEAM - INVESTIGATORS

Elizabeth Croft (Principal Investigator)
Professor of Mechanical Engineering, UBC
NSERC CWSE (BC/Yukon)

Toni Schmader
Professor of Social Psychology, UBC
Canada Research Chair, Social Psychology

Michelle Inness
Professor of Business, University of Alberta

Valerie Davidson
Professor Emerita of Engineering, University of Guelph
Former NSERC CWSE (Ontario)

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TRAINEES

Postgraduate Researchers
Kate Block, UBC, Psychology
Dianna Dempsey, University of Alberta, Business
William Hall, UBC, Psychology
Nicole Wilson, University of Alberta, Business

Undergraduate Research Assistant
Sara Ahmadian, UBC, Psychology

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TEAM - COLLABORATORS

Courtnay Hughes

Mining Industry Human Resources Council

Lianne LesFrud

VP, Canadian Center for Women in Science, Engineering, Trades and Technology

Network Coordination Administrator:
Jennifer Pelletier, UBC

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PARTNERS

- Engineers Canada
- National Network of Chairs for Women in Science and Engineering
- Canadian Centre for Women in Science, Engineering, Trades and Technology
- Mining Industry Human Resources Council
- WorleyParsons Canada
- Enbridge Pipelines Inc.

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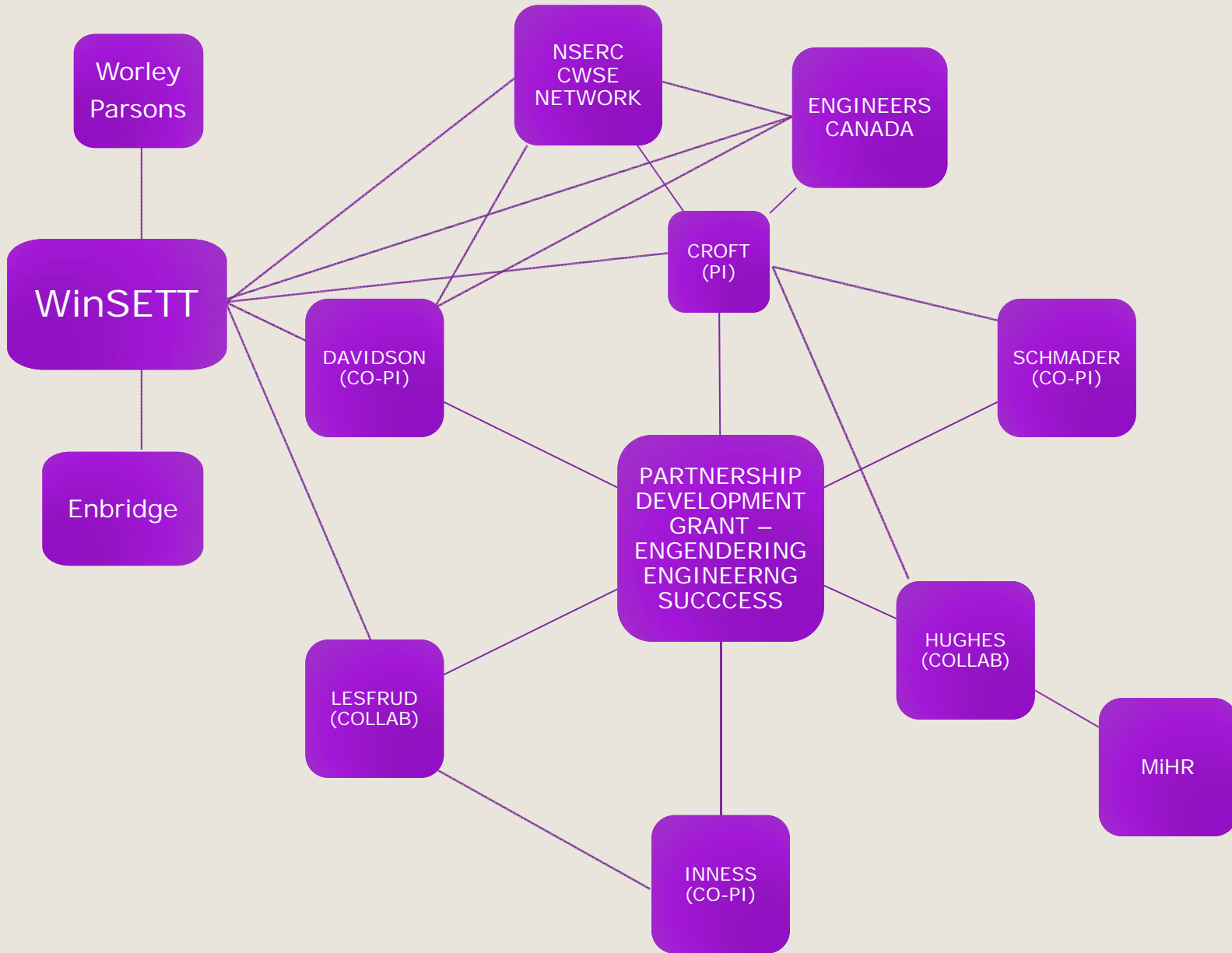
2010 WORKING CONDITIONS STUDY (PRISM –OSPE, PEO, CWSE-ON, EC)

- Men and women equally satisfied with career choice.
- Over 40% of women (compared with ~20% men) reported that leave for family responsibilities negatively affected their career.
- One third of women reported experiencing discrimination affecting their career progression. Nearly 60% women and 27% men report other career related discrimination
- Nearly 40% of men and 50% women reported workplace bullying
- 12.6% of men reported that employment equity policies negatively impacted their careers
- Nearly 21% of engineers report working more than 50 hours per week.
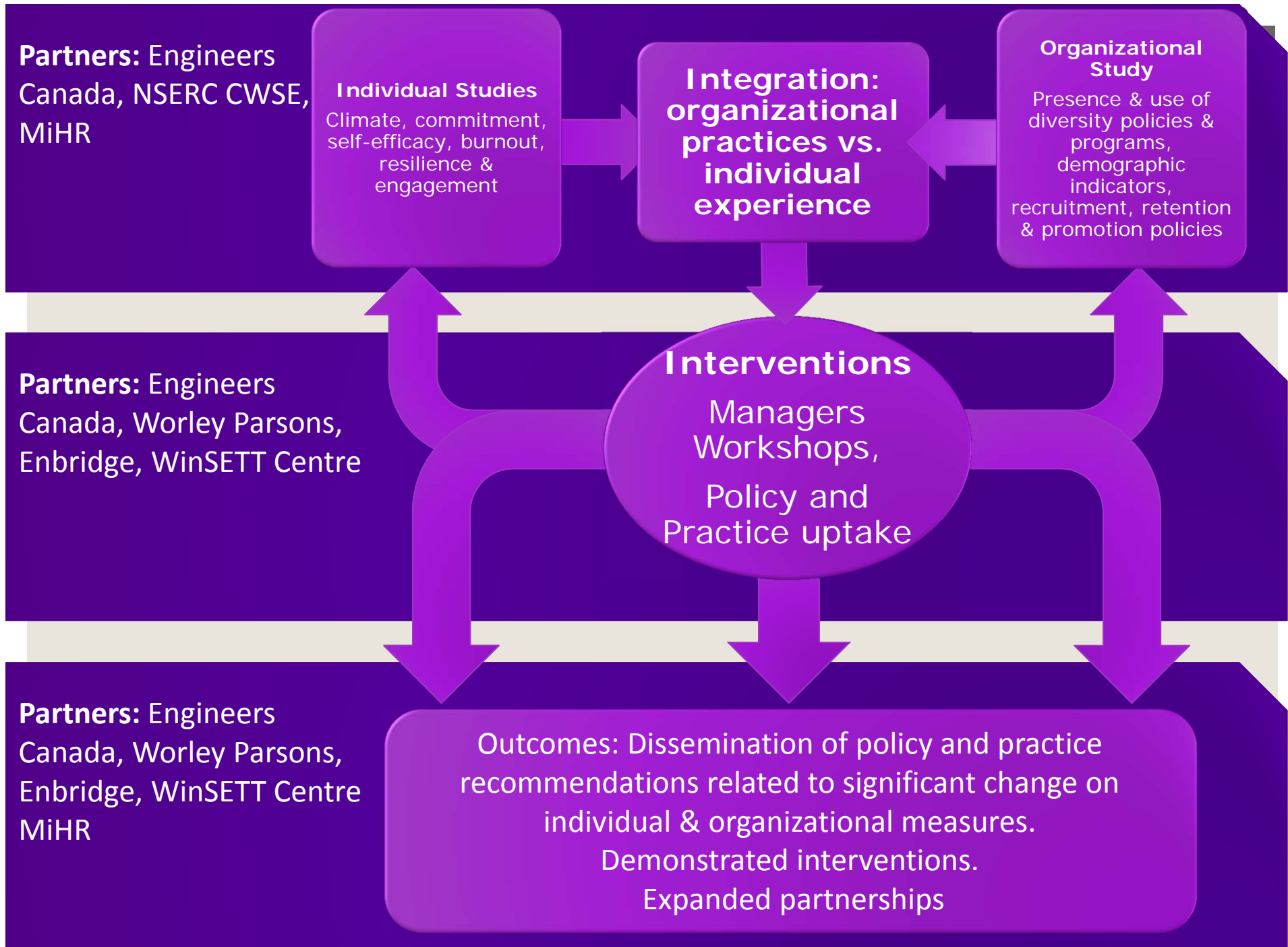
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"REVERSE BRAINSTORM"

What could we do to make our organizations difficult places for women engineers to work?

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"Leave it like it is"

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PROJECT STREAMS

- ORGANIZATIONAL STUDY OF BEST PRACTICES
  - Broad survey of organizational policy.
  - Develop "dashboard statistics" for diversity practices

- CLIMATE SCIENCE: SURVEYING WOMEN'S EXPERIENCE IN ENGINEERING
  - Survey male and female engineers regarding policies and workplace experiences.
  - Identify policies and procedures that correlate with better employment outcomes for women

- PILOT INTERVENTIONS
  - integrate and translate knowledge into workplace interventions

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Partners: Engineers Canada, NSERC CWSE, MiHR

Individual Studies
Climate, commitment, self-efficacy, burnout, resilience & engagement

Integration: organizational practices vs. individual experience

Organizational Study
Presence & use of diversity policies & programs, demographic indicators, recruitment, retention & promotion policies

Partners: Engineers Canada, Worley Parsons, Enbridge, WinSETT Centre

Interventions
Managers Workshops,
Policy and Practice uptake

Partners: Engineers Canada, Worley Parsons, Enbridge, WinSETT Centre MiHR

Outcomes: Dissemination of policy and practice recommendations related to significant change on individual & organizational measures.
Demonstrated interventions.
Expanded partnerships

POLICY FOR DIVERSITY

Best practices for diversity in engineering organizations

7/23/2014

ENGINEERING CULTURE

- Empirical and anecdotal evidence suggests that the culture of engineering firms is:
  - Competitive (e.g., Cheryan, 2012; Diekman, et al., 2010)
  - 'Masculine' - themes of territoriality, aggressive self-promotion, and technical obsession (e.g., Robinson & McIlwee, 1991; McIlwee & Robinson, 1992)

- Preponderance of men in and of itself reinforces that the prototypical engineer is male (Yoshida et al., 2012).

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CULTURE - RETENTION AND ADVANCEMENT LINKS

- **Retention:**
  - Greater retention of female engineers who are willing to act like 'one of the boys', act dominant and non-feminine, accept gender discrimination, demonstrate competence to male colleagues (Powell, et al., 2009).

- **Advancement:**
  - Engineers with masculine traits such as 'instrumentality' had more supervisory roles, higher salary, professional activities, and satisfaction (Jagacinski, 1987).

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ORGANIZATIONAL RESPONSES

- A range of tools, programs and initiatives to advance diversity goals:
  - Awards and recognition
  - Recruitment, selection, and promotion practices
  - Training and development
  - Mentoring
  - Networking groups
  - Work-life balance programs (flextime, job sharing, childcare, leave policies)

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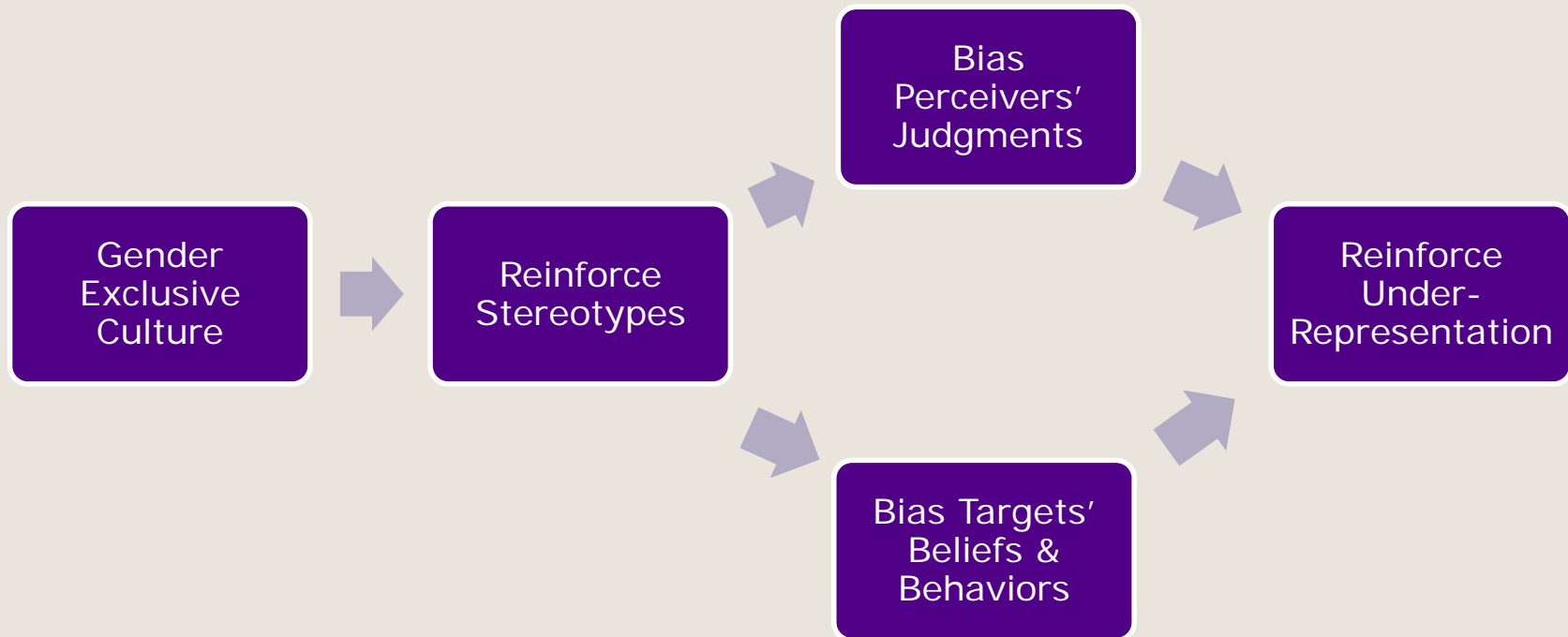# PRIMARY GOAL OF STUDY 1: EXAMINE POLICIES AND OUTCOMES

- To carry out the first systematic quantitative study of organizational policies and diversity programs in engineering

- To examine which (if any) have and positive employment outcomes (retention and advancement) for women in engineering companies.
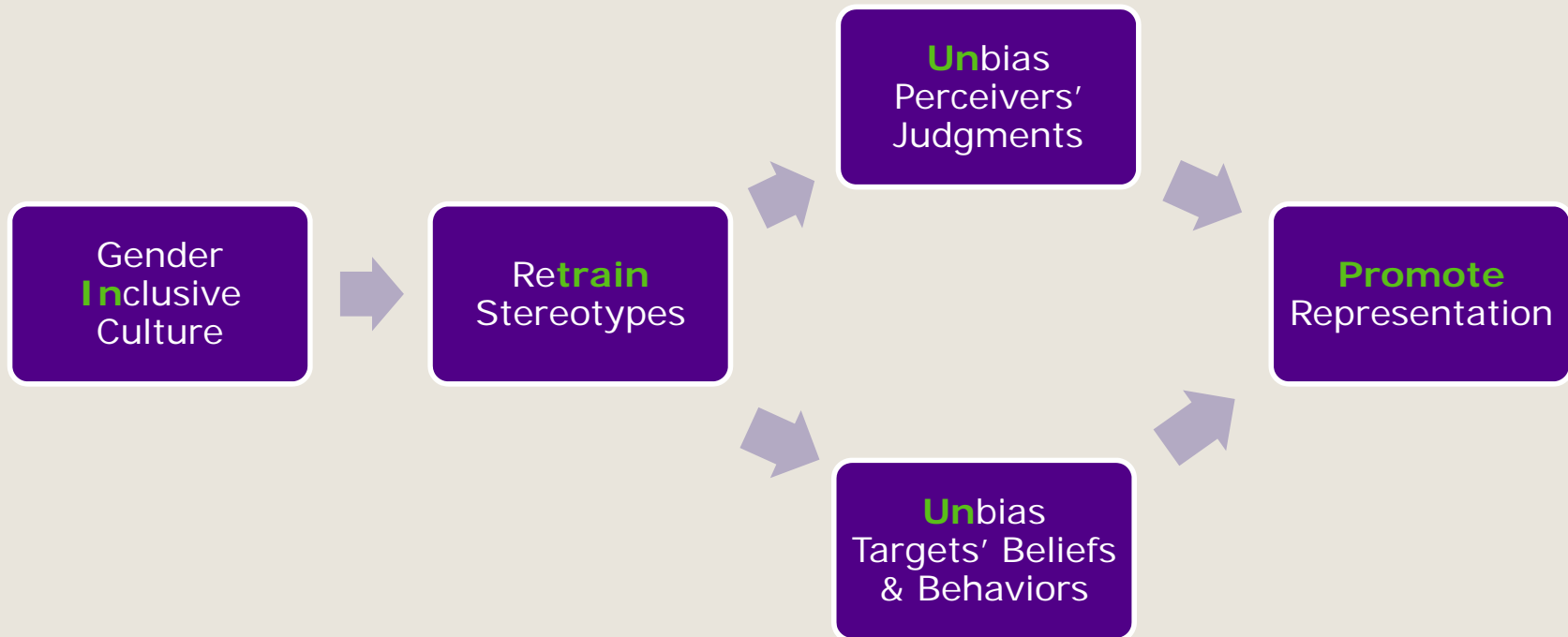
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CLIMATE SCIENCE

Employee Interactions in the Engineering Workplace

What social psychological processes play a role in constraining the advancement of women in engineering?

CYCLE OF STEREOTYPING

Gender Exclusive Culture → Reinforce Stereotypes → Bias Perceivers' Judgments → Reinforce Under-Representation → Bias Targets' Beliefs & Behaviors

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CYCLE OF STEREOTYPING

Gender Inclusive Culture → **Retrain Stereotypes** → **Unbias Perceivers' Judgments** → **Promote Representation**

Unbias Targets' Beliefs & Behaviors

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STEREOTYPE THREAT

Contexts can cue concerns that one might confirm a negative stereotype
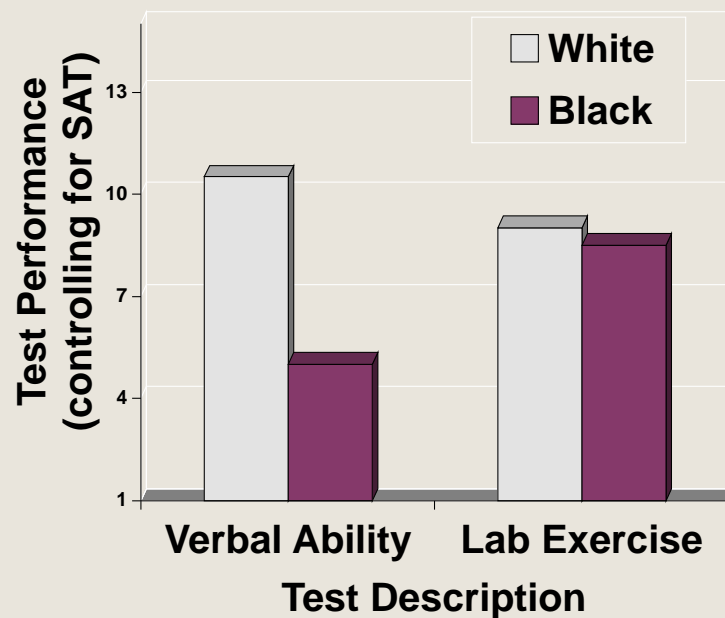(Steele & Aronson, 1995)

Stereotype Threat
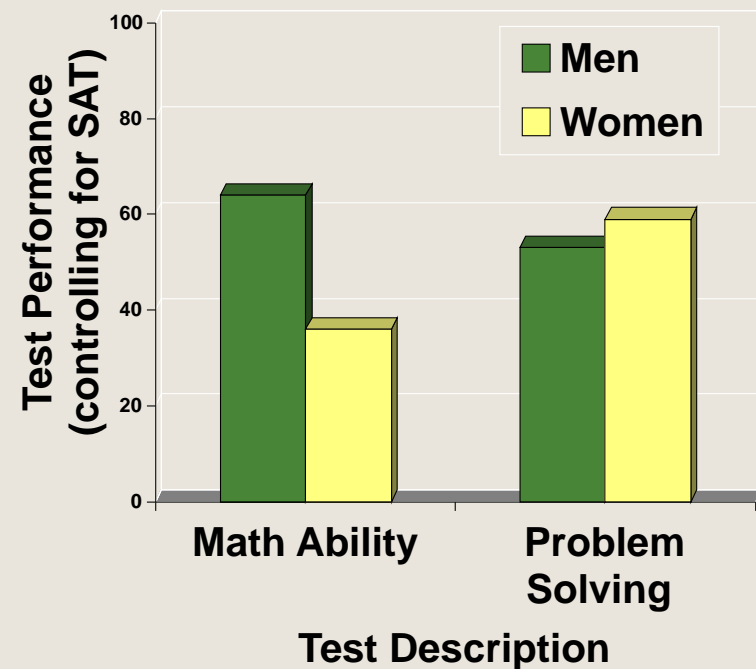
Poor Performance

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TEST PERFORMANCE CAN BE AFFECTED BY HOW THE TASK IS DESCRIBED

Racial Differences in Verbal

Legend: White, Black

Y-axis: Test Performance (controlling for SAT) — 1, 4, 7, 10, 13

X-axis categories: Verbal Ability, Lab Exercise

Test Description

Steele & Aronson (1995)

Gender Differences in Math Performance

Legend: Men, Women

Y-axis: Test Performance (controlling for SAT) — 0, 20, 40, 60, 80, 100

X-axis categories: Math Ability, Problem Solving

Test Description

Johns, Schmader & Martens (2005)

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CONCEPTUAL MODEL

Gender Inclusive Organizational Context → Positive Conversations → Stereotype Threat → Outcomes

Policies that promote inclusion

Representation of women

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CONCEPTUAL MODEL

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┌────────────────┐      ┌────────────────┐      ┌────────────────┐      ┌────────────────┐
│     Gender     │      │                │      │                │      │                │
│    Inclusive   │ ───▶ │    Positive    │ ───▶ │   Stereotype   │ ───▶ │    Outcomes    │
│ Organizational │      │  Conversations │      │     Threat     │      │                │
│    Context     │      │                │      │                │      │                │
└────────────────┘      └────────────────┘      └────────────────┘      └────────────────┘

                        ┌────────────────┐
                        │    Feeling     │
                        │  competent &   │
                        │    accepted    │
                        └────────────────┘

                        ┌────────────────┐
                        │  Interactions  │
                        │    with men    │
                        └────────────────┘
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CONCEPTUAL MODEL

Gender Inclusive Organizational Context → Positive Conversations → Stereotype Threat → Outcomes

Being aware of gender in how people see you

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CONCEPTUAL MODEL

Gender Inclusive Organizational Context → Positive Conversations → Stereotype Threat → Outcomes

- Burnout
- Disengagement
- Organizational Commitment

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WHAT WE LEARNED FROM THE FIRST STUDY (PRE-EES)

Women in engineering experience stereotype threat

- Distinct from general consciousness of gender
- Cued by negative conversations with male colleagues
- Predicts daily burnout

Organizational policies can buffer against threat

- Gender inclusive policies & norms also benefit men

Gender Inclusive Policies	→	Positive Conversations With Men	→	Reduced Stereotype Threat	→	Less Daily Burnout More Org. Commit

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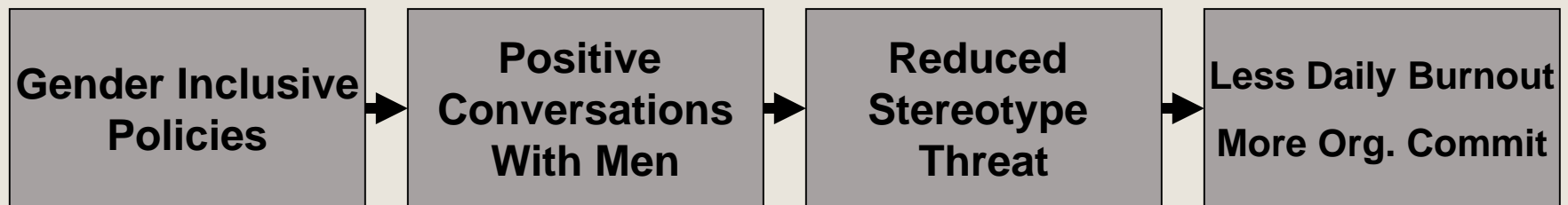
LIMITATIONS OF STUDY 1

- **Organizational variables are reported by participants**
  - Can we contact HR departments to get an independent assessment?
  - Does size of company account for relationships?

- **We don't know what goes on in the conversations**
  - Are men causing the threat or are women perceiving it?
  - Are effects due to conflict, or the result of more subtle processes?

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PRIMARY GOAL OF STUDY 2: EXAMINE CULTURE, BIASES, AND STEREOTYPE THREAT

1) Do gender inclusive policies predict
   - Weaker engineering = male implicit bias?
   - Weaker engineering = competitive bias

2) What accounts for greater positivity of conversations in gender inclusive companies?
   - Weaker implicit biases in men?
   - Less competitive culture?

3) Does daily experience of stereotype threat predict reduction in cognitive resources?

4) Do positive conversations change implicit bias over time?
   - For men, experiencing women as competent
   - For women, experiencing acceptance from men

5) Identifying source of threat (requires having pairs)
   - Do men's implicit biases predict women's experience of stereotype threat?

6) Does more frequent experience of stereotype threat predict less long term organizational commitment?

PUTTING IT TO PRACTICE

Pilot Interventions

OBJECTIVES

- Integrate and translate knowledge from organizational and individual studies into effective policies and practices in the workplace
- Provide tools (e.g. dashboard statistics) and information that will raise awareness and help employers to advance diversity goals
- Facilitate changes in workplace culture through active engagement with members of engineering community (employers, managers, engineers)
- Monitor effectiveness of interventions in terms of recruitment and advancement of women in engineering

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WinSETT CENTRE

- Collects best practices for the recruitment, retention and advancement of women in SETT

- Women in SETT Leadership Program

  Becoming Leaders: An Introduction to Leadership Skills & Strategies

  Effective Communications

  Negotiating for Success

  Navigating the Politics of the Workplace   (in development)

- For managers and supervisors:

  Toward a Respectful and Inclusive Workplace

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PRIMARY GOAL OF STUDY 3: FINDING EFFECTIVE INTERVENTIONS

- Feed back to first two studies based on WinSETT workshops experiences

- Gather benchmarking information

- Knowledge translation to partners and engineering community

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GET INVOLVED

wwest.ca/ees

Organizational Policies and Practices:

Company with 20+ female engineers

1 hour commitment from HR-type person

Employee Experiences:

Enroll in mixed-sex groups (2+) of engineers who work closely together

4 hours each over 2-3 weeks; all online

DISCUSSION

How do we translate best practices to actual practices?

What is the best way for us to disseminate our findings?