

Strengthening Research Excellence through Equity, Diversity and Inclusion

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Natural Sciences and Engineering
Research Council of Canada

Conseil de recherches en sciences
naturelles et en génie du Canada

Canada

Outline

- Why NSERC is changing
- Changing research teams and research design
- What are the challenges?
- NSERC's actions
- What this means for our community



Why NSERC is changing

- Evidence shows that increasing equity, diversity & inclusion in NSE requires big changes
 - Cannot de-marginalize EDI without re-defining research excellence & the model under which it is evaluated
- Evidence-based policy making
 - From WISE to EDI
- NSERC is part of formal and informal networks
 - In Canada: CWSEs, WISE societies, universities, etc.
 - Internationally: Gender Summits, GenderNet Plus, Global Research Council, Sea Change, national granting agencies, etc.



Why NSERC is changing

- To increase excellence in NSE research as well as its social relevance
 - integration of **equity, diversity and inclusivity** analysis into the development and evaluation of policies, processes and programs
- Institutional change mechanisms include:
 - Statement on equity, diversity and excellence
 - Strategic plan's commitment to building a diversified and competitive research base (NSERC 2020)
 - 8-point Framework on equity, diversity and inclusion



Sex vs. Gender

- **Sex** refers to biological attributes.

Primarily associated with physical and physiological features.

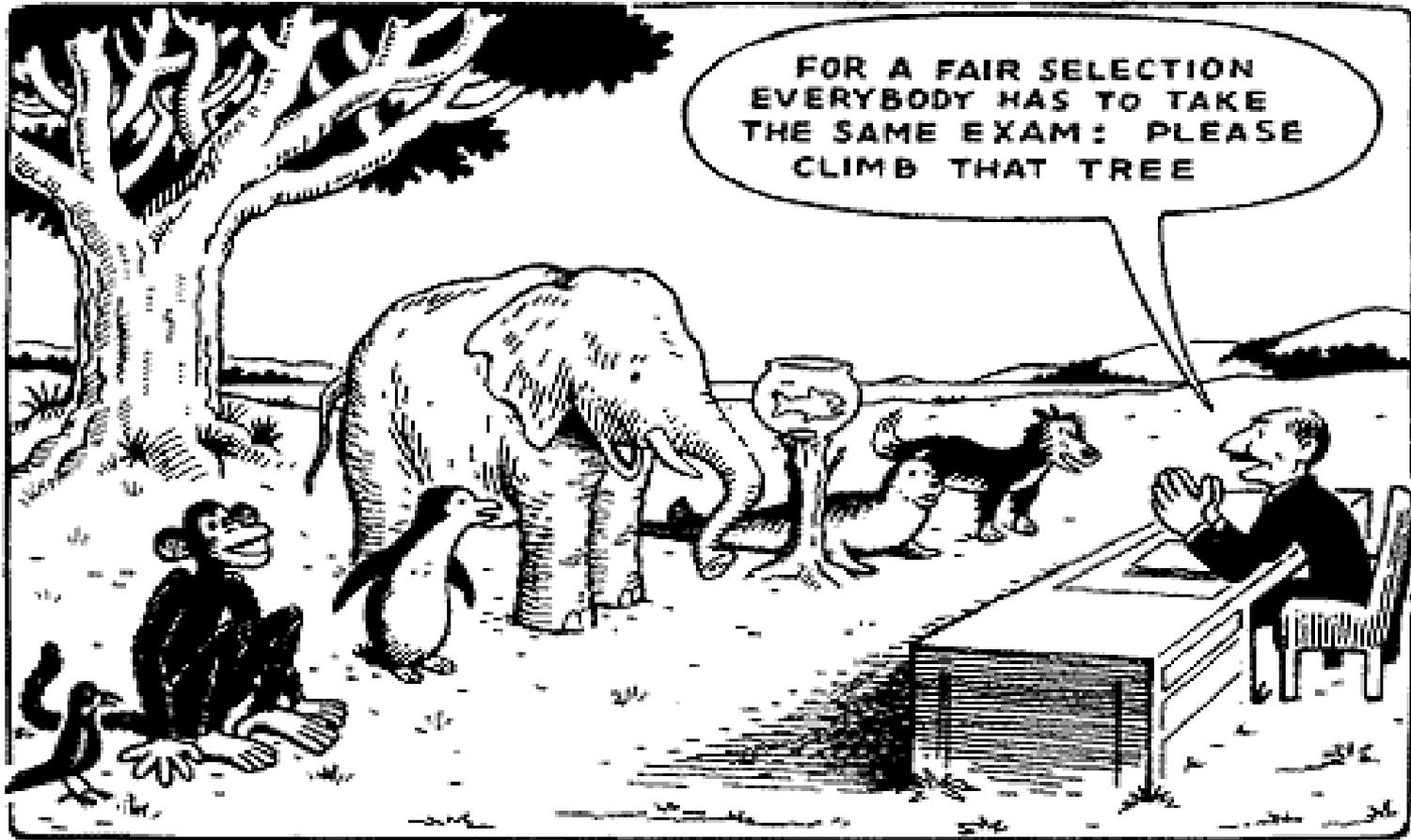
- **Gender** refers to the socially constructed roles, behaviours, expressions and identities of girls, women, boys, men, and gender diverse people.



What is Gender Equity?

- Fair process of allocating resources and decision making
- Measures necessary to eliminate discrimination and inequalities between women, men and gender diverse people
- Equal opportunities
- *Equity* is a means. *Equality* is the result we are striving for





Source: Fircroft College of Adult Education, Diversity Training, Birmingham, UK, 2011



Why equity, diversity and inclusion among researchers?

Access to More Talent



2006 Canadian Census¹⁶

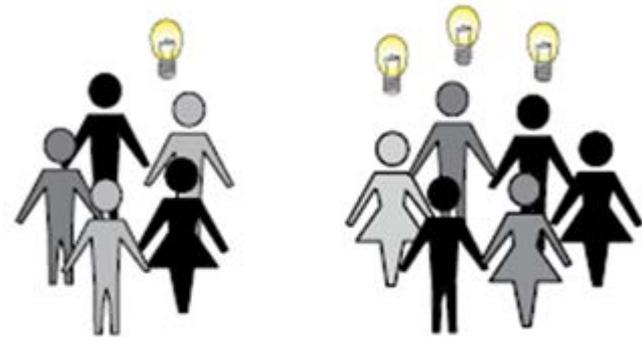
♀ 47.4% of workforce

♀ 21.9% of engineering & science workforce

Diverse hiring increases the recruiting pool¹⁷ and is a more effective use of talent and leadership¹⁸

More Innovation

If a group includes more women, the collective intelligence rises¹⁹



Gender diversity has a positive effect on team innovation in radical research²⁰

Having a critical mass of 30% or at least 2 or 3 women on a board decreases

groupthink²¹



Why sex, gender & diversity in NSE research

- Integrating consideration of gender and sex into research designs when appropriate has the potential to enhance the scientific quality and usefulness of NSE research. Accounting for sex and gender where relevant thus contributes to research excellence (Canadian Institutes of Health Research)
- Extrapolation of the results to the population as a whole, when they actually only apply to a portion of the population, is misleading and could have serious implications (Irish Research Council)

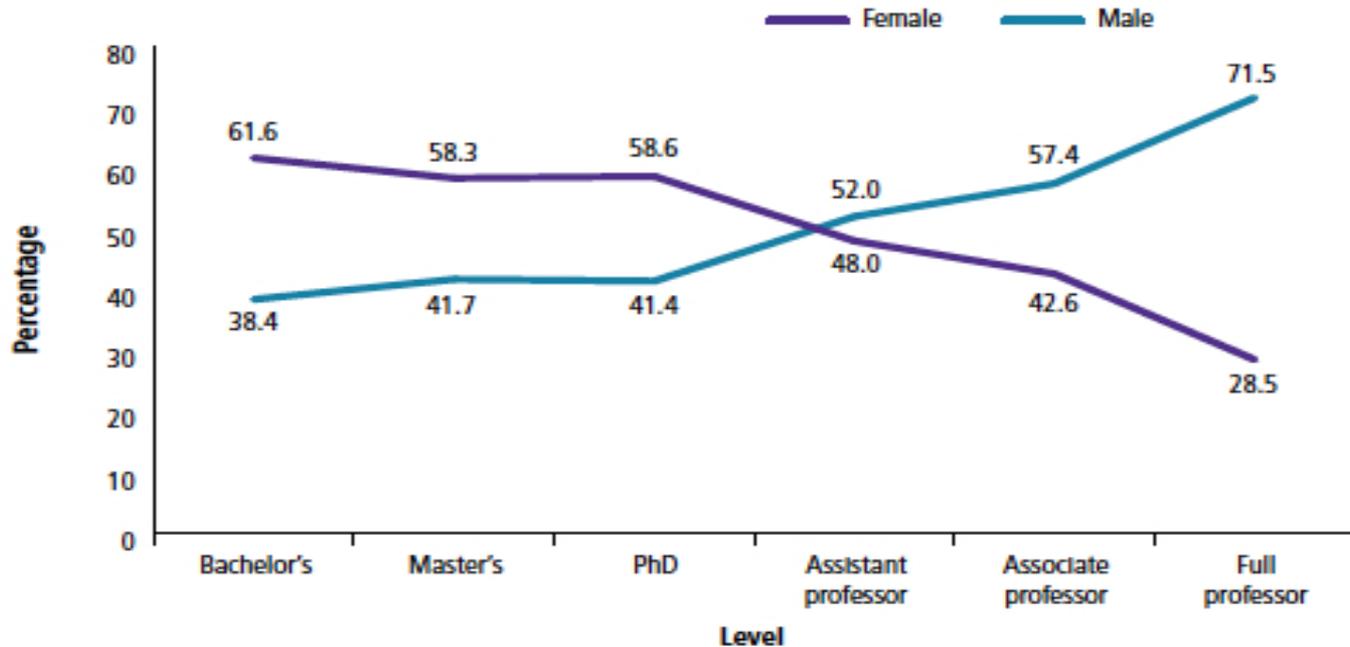


Equity, Diversity and Inclusion among Researchers:

What are the challenges?



Participation of females & males in SSH and education by academic & career level



(Data Source: Statistics Canada, n.d.d., n.d.b.)

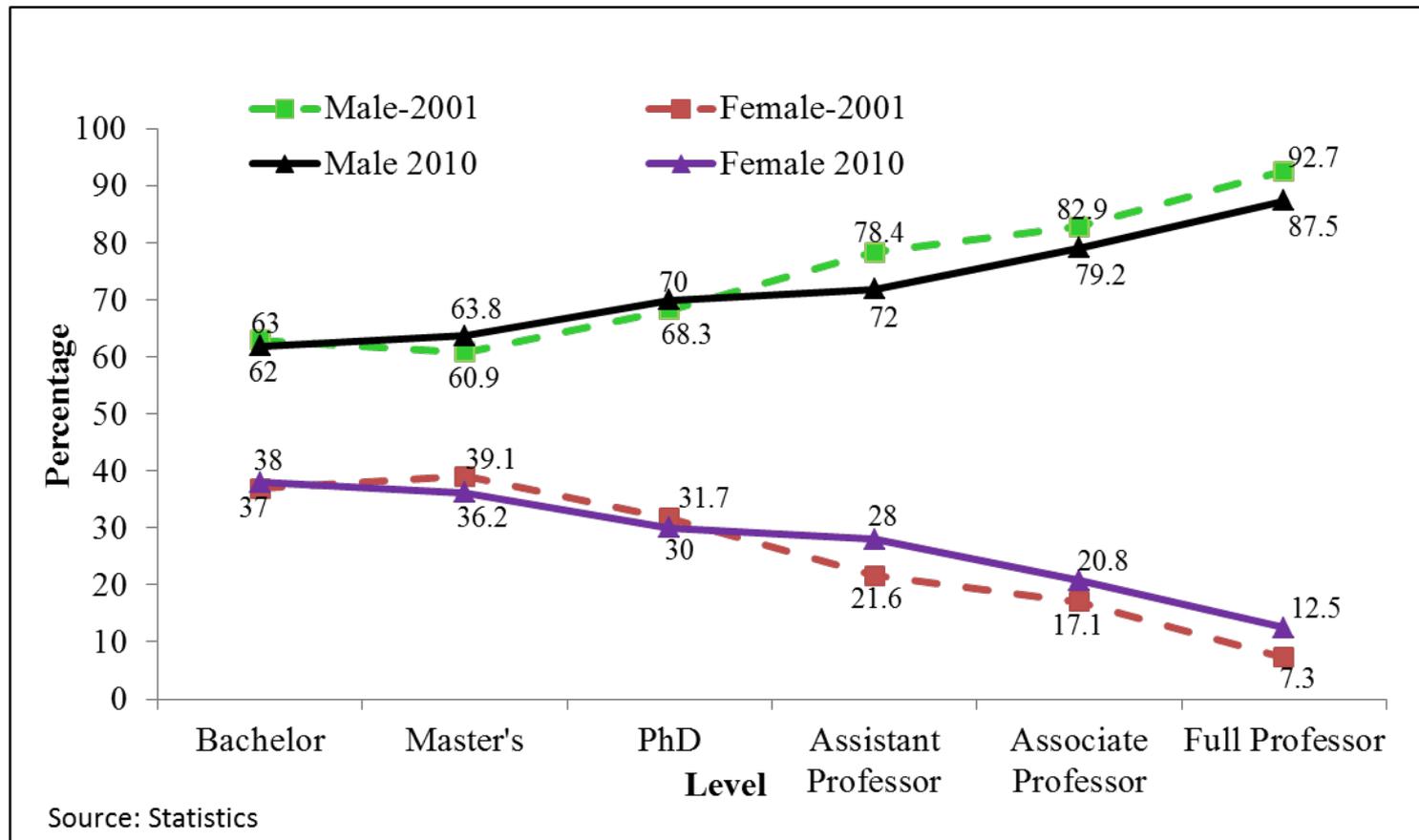
Figure 3.2

Percentage of Women and Men at Different Academic Levels in HSE

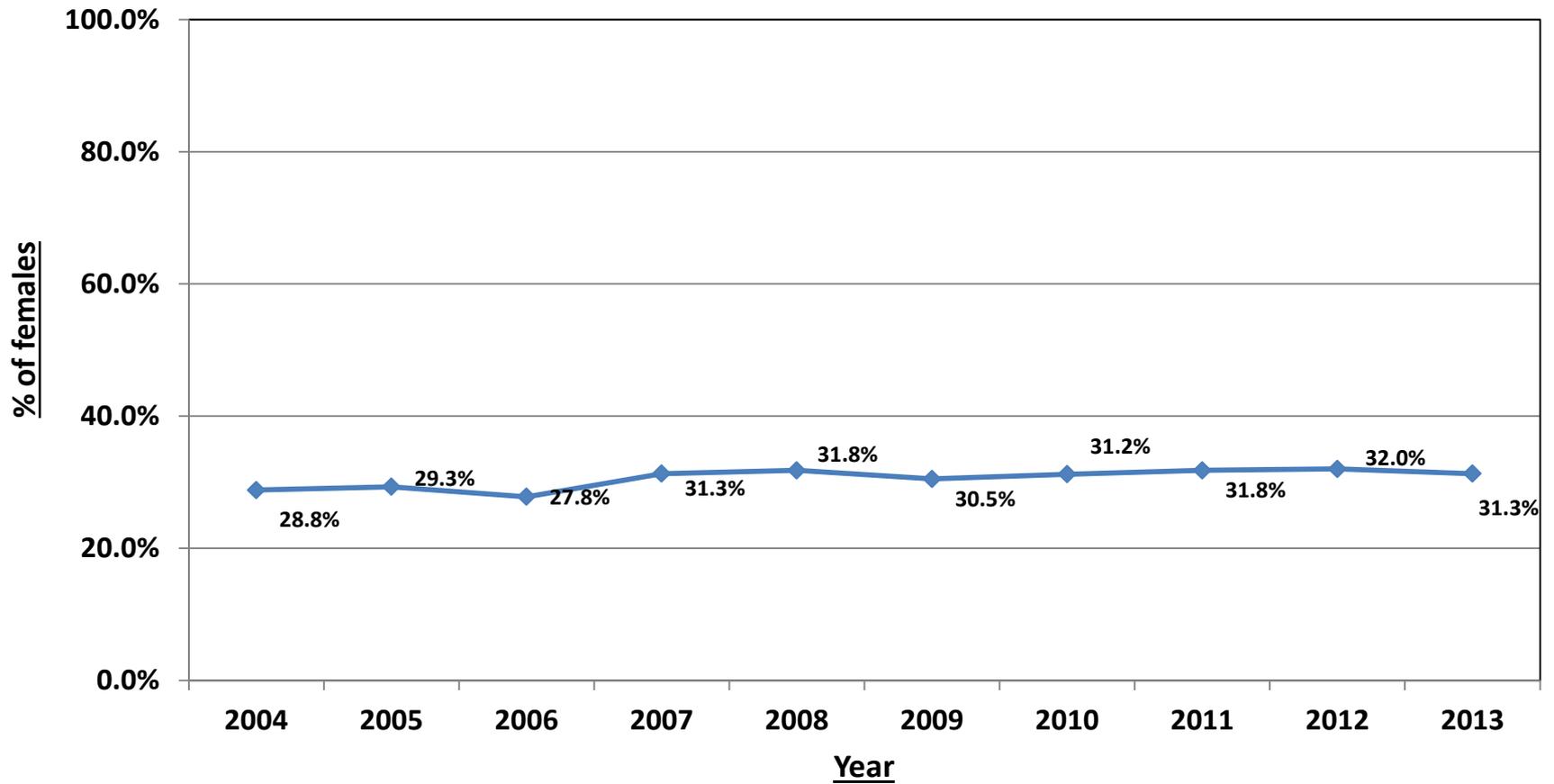
This figure displays the percentage of women and men in humanities, social sciences, and education in 2008–2009 at various stages of the academic career in Canadian universities.



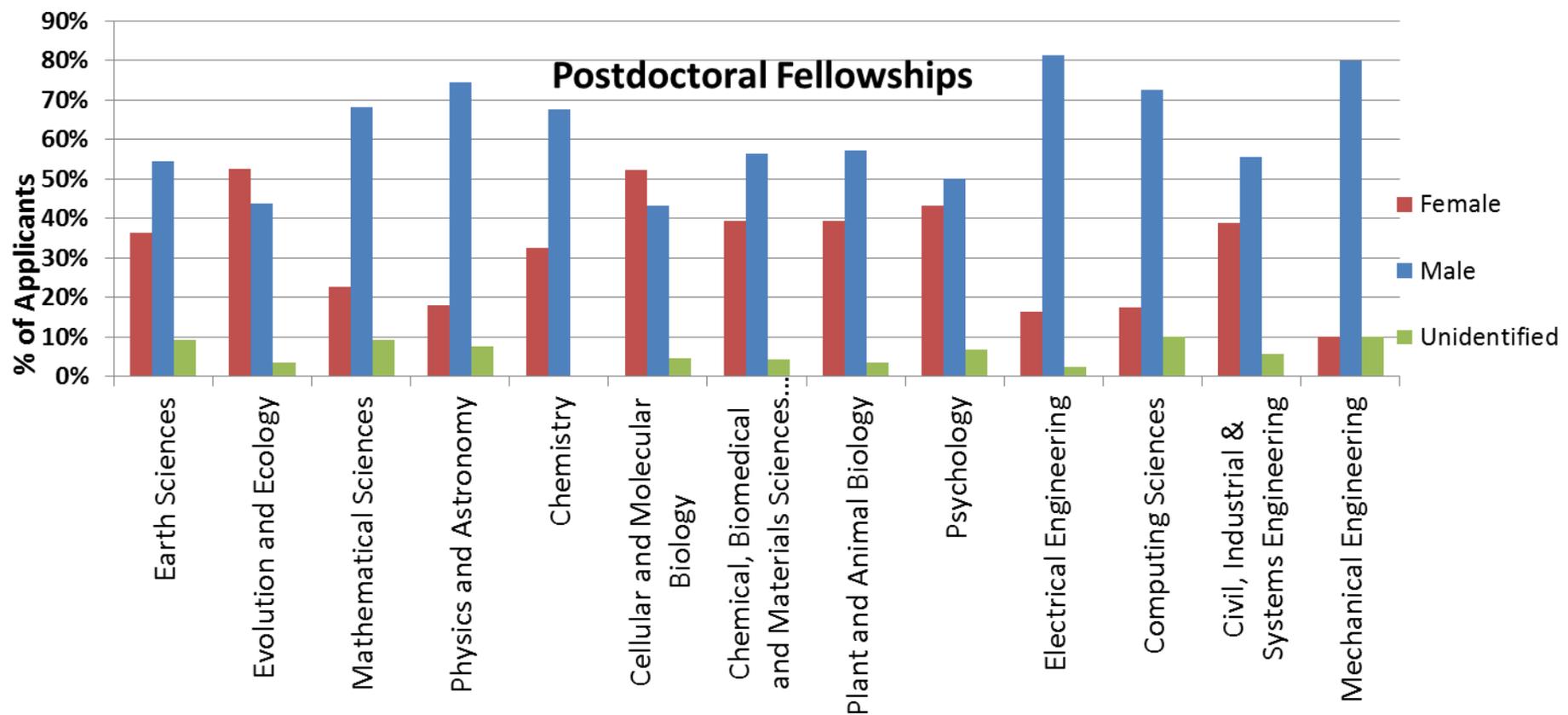
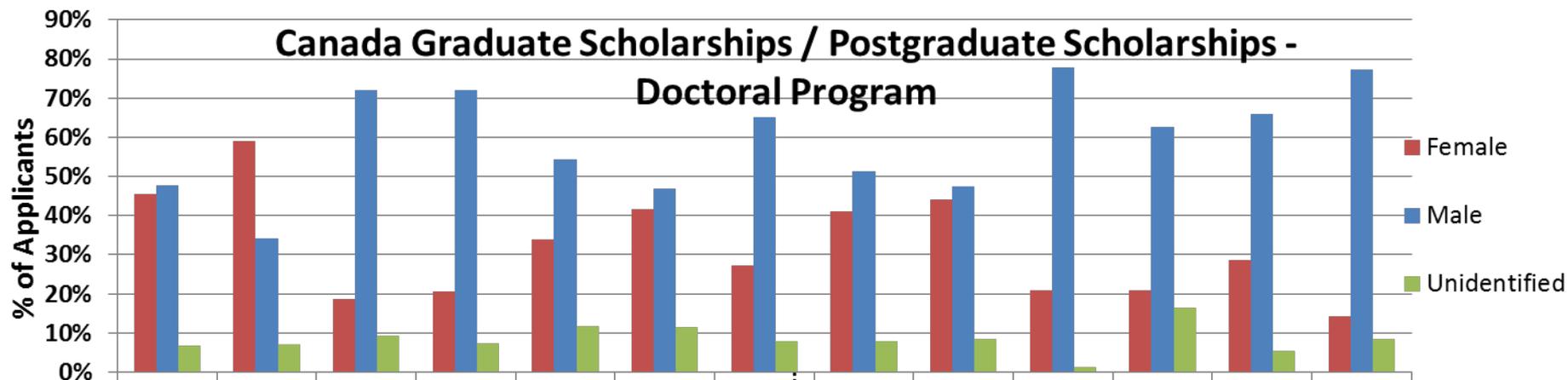
Participation of females & males in *NSE* at various levels of education & academic career, 2001-02 and 2010-11



Participation of females in NSE, PhD level

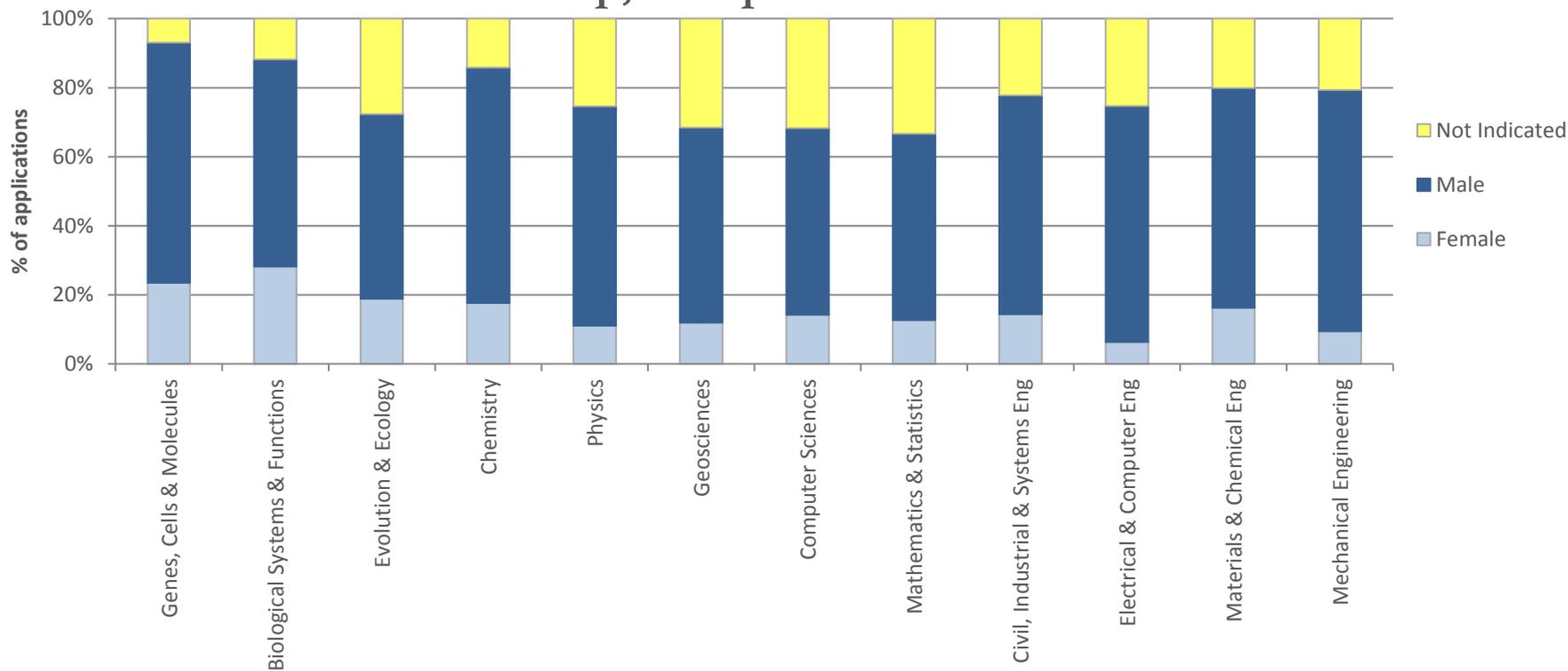


Male & female scholarships applicants 2017



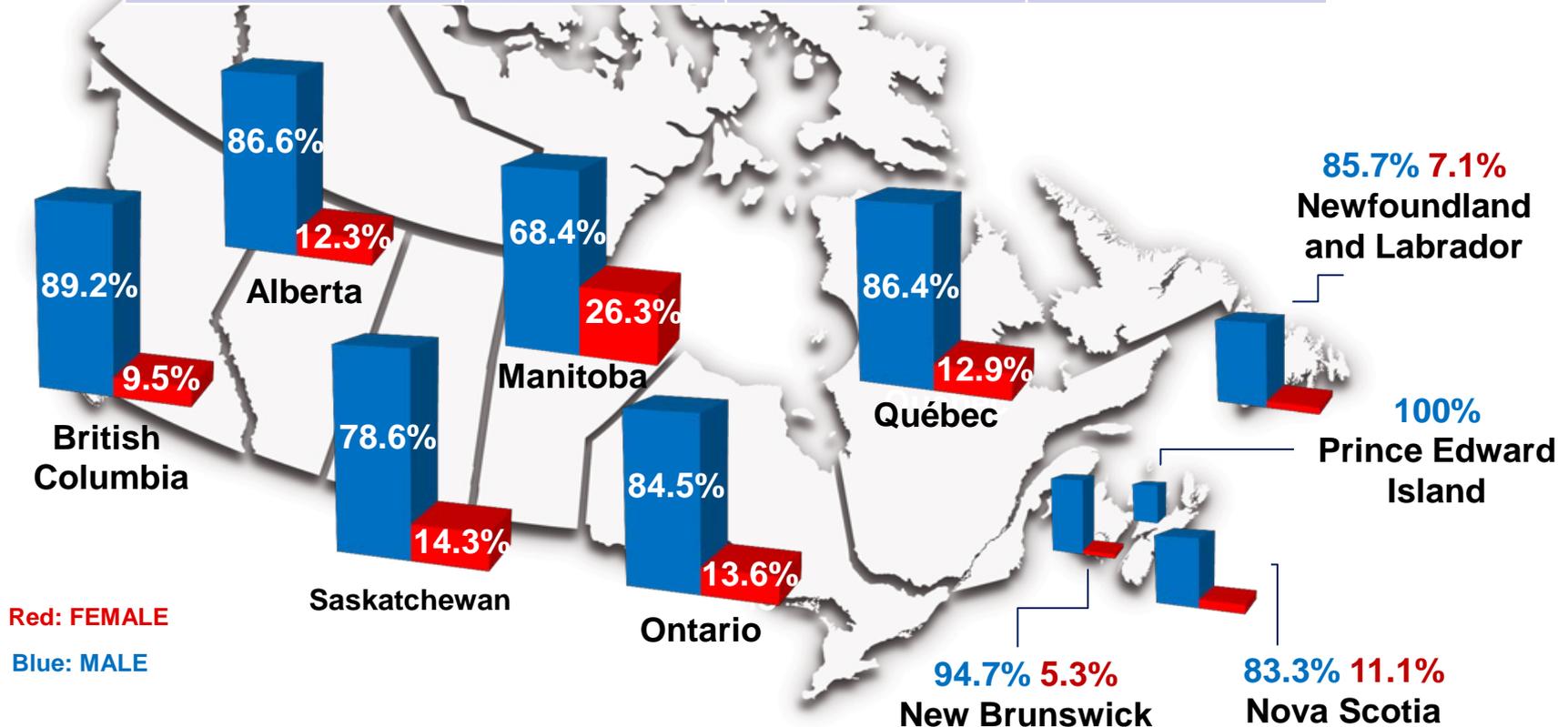
Discovery Grant applicants

Percentage of male and female DG applicants per Evaluation Group, Competition 2017



Collaborative Research and Development (CRD) male and female principal investigators (PIs)

Total CRDs (2011-15)	Total male PIs	Total female PIs	Percent female PIs
2138	1825	275	12.9%



Some total percentages do not equal 100% due to female/male identity not being disclosed by some PIs.

“The issue isn’t that women and other underrepresented minorities are uninterested in science. It’s that science pushes them away.”

– Shannon Palus, Quartz, 2016



Commonly experienced barriers

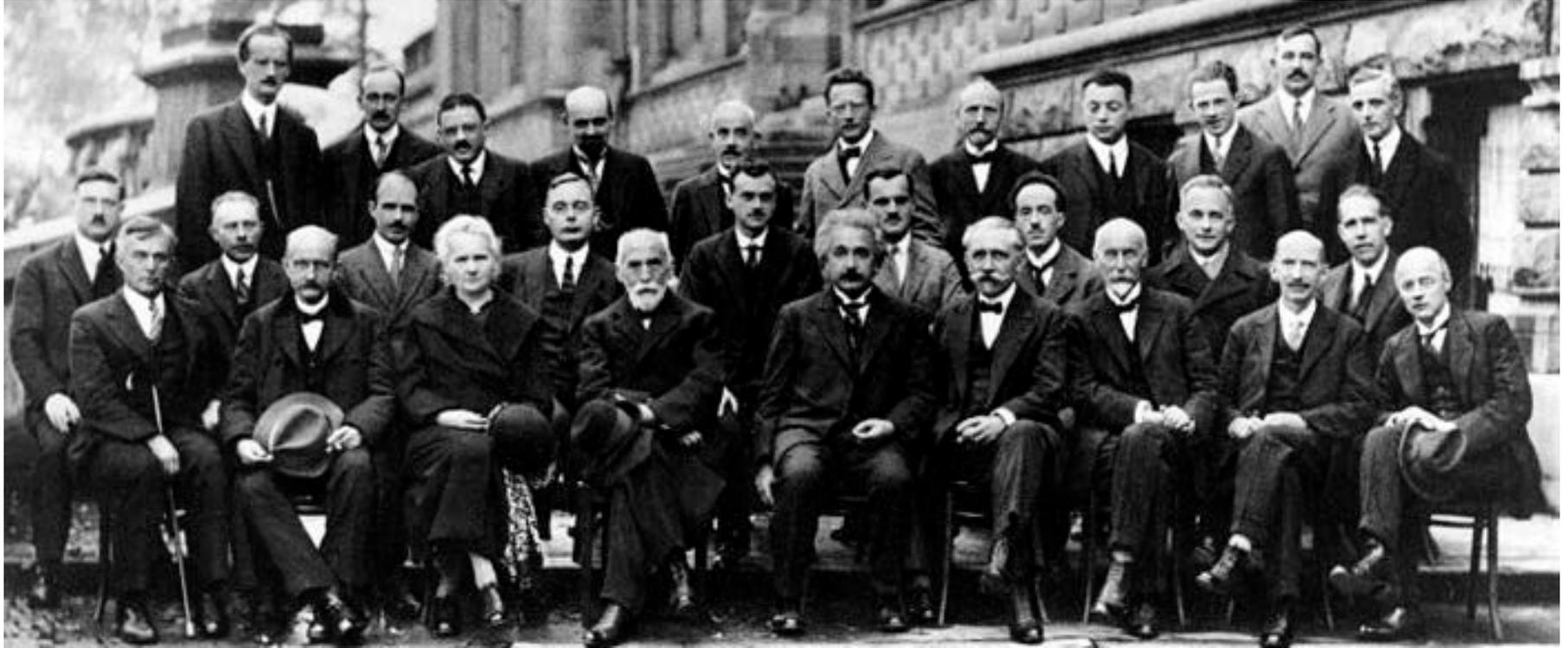
Multiple factors contribute to low % of women, people with disabilities, visible minorities, Indigenous peoples and gender-diverse people in NSE

- Few role models
- Unconscious biases
- Gendered language
- Microaggressions
- Stereotype threat
- Biased indicators of excellence
- Assumed linearity norm of scientific career paths or *flexibility stigma*
- Need to move from one city to another at each step
- Overburden from service roles (with little credit received)

[WVest's Gender Diversity in STEM](#), co-authored by CWSE past chair Elizabeth Croft



Few role models

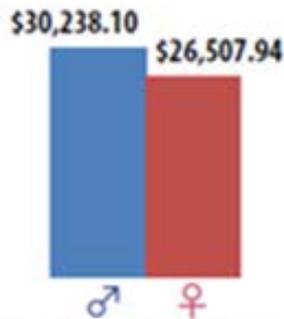


1927 Solvay Conference: Marie Curie
2011: 16% women faculty in physical sciences in Canada

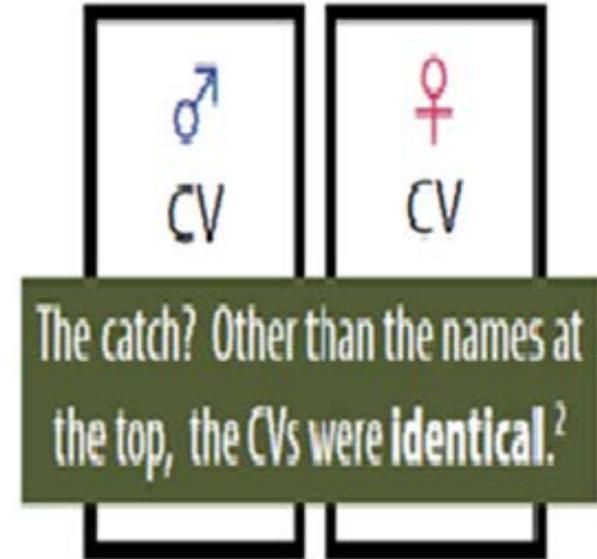


Unconscious bias

US science professors were asked to evaluate a CV for a **lab manager**:²



The male candidate was offered a **higher salary**...



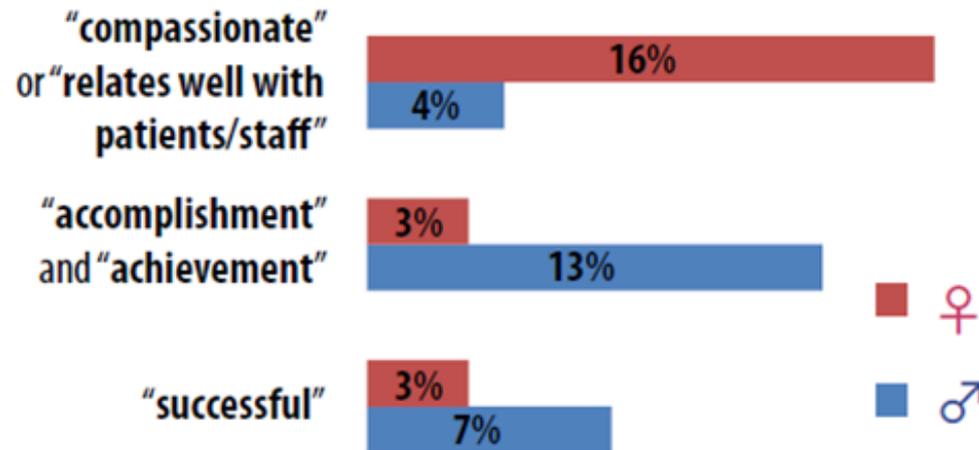
Source: Westcoast Women in Engineering, Science & Technology



Unconscious bias

Reference letters for female medical faculty were **shorter**, more **vague**, and placed **less emphasis on research** than those for males.⁶

Percentage of letters that contained the phrase:



The average letter length for women was **227** words, compared to **253** words for men.⁶



Barriers at work

“The trouble with girls working in science labs... You fall in love with them, they fall in love with you and when you criticize them, they cry.”

Tim Hunt, 2001 Nobel Laureate, 2015



Biased Indicators of Excellence

Did you know:

- Underrepresented groups are more likely to face systemic barriers that limit their lab time, result in less research funding and contend with the view that their publications are less significant.
- Women self-promote their own works at a lower level and their publications receive lower recognition (citations) from the scientific community despite being published in journals with higher impact factors
- Women reviewers are less likely to be asked to review works by male academics.
- Greater diversity leads to better research.



Bias against career leaves

- Members of underrepresented populations are more likely to face career interruptions for parental, family, community or medical reasons.
- One specific impact of gender disadvantage comes from the assumed linearity of scientific career paths
 - Due to the pervasive gendered construction of social roles, women are more likely to interrupt their career (SAGE Handbook of Research Management, 2015)
- Two equally qualified candidates may not have the same impact in the same time frame, but this does not make the candidate with a career leave any less excellent and competent.
- By not considering this reality, we are pushing women and others away from science, closing the door to perspectives that would likely make our science and society better.



Inspiring the Future-Redraw the Balance



<https://www.youtube.com/watch?v=qv8VZVP5csA>

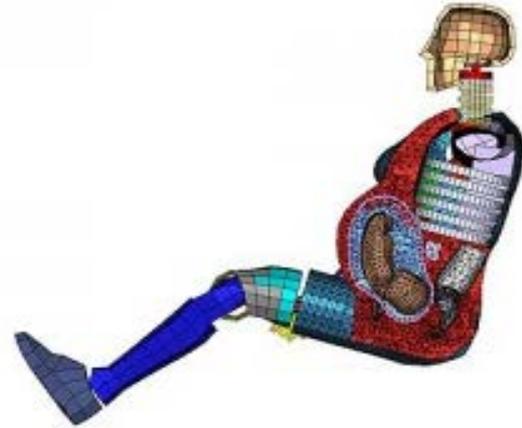


Sex, gender and diversity in NSE research

Examples



Sex and Gender in NSE research

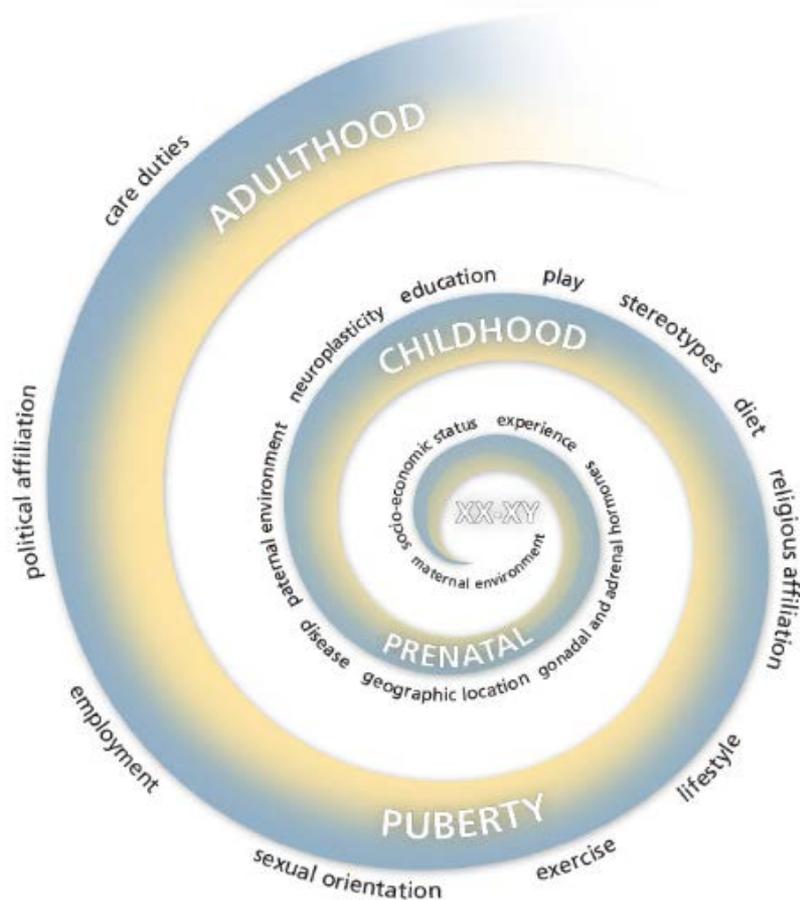


Absence of pregnant crash test dummies: motor vehicle crashes are leading cause of fetal death related to maternal trauma

Source: [Gendered Innovations](#)



How Sex, Gender and diverse Factors Interact in Brain Development



Sex (genes, chromosomes, hormones, etc.) converges with gender (parental stimuli, media, education, etc.) across an individual's life and location to influence brain development.

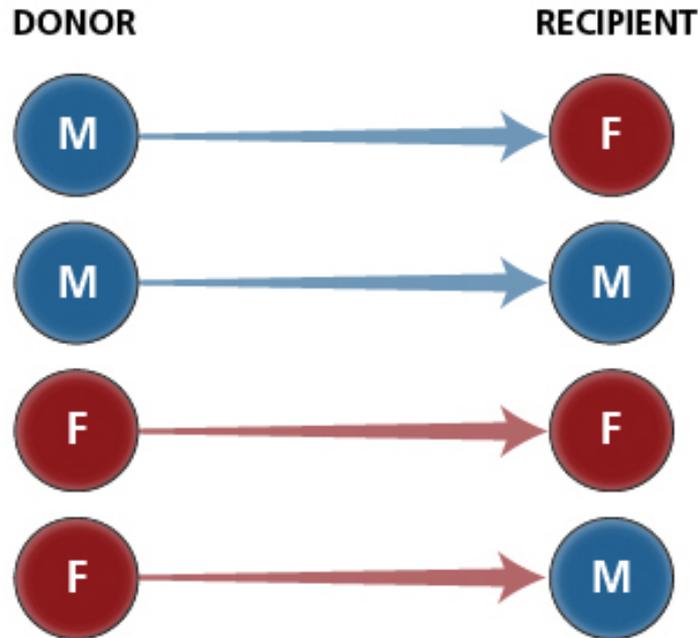
Source: Gendered Innovations



Stem Cells: Analyzing Sex

Considering Sex in Stem Cell Therapy

All combinations of donor/recipient sex interaction should be tested before being ruled out

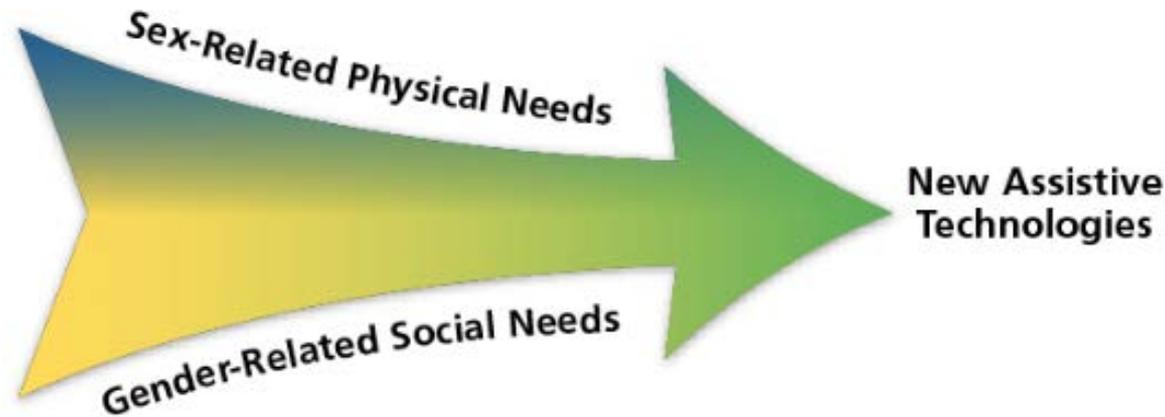


Researchers who reported and analyzed sex at the cellular level have identified sex differences in cell behavior that may be of relevance in developing therapeutics.

Gendered Innovations



Sex and Gender in Assistive Technology Design



Analyzing sex (physical needs) and gender (social needs) of diverse elderly people, and how these needs combine in individual women and men helps researchers design the most effective assistive technologies.

Source: Gendered Innovations



**NSERC's actions on
equity, diversity and inclusion,
and
integrating sex, gender and diversity
in NSE research**



NSERC's Actions

WISE initiatives & programs

1989 – ongoing

Chairs

WFA

Science promotion

Gender Summits

Institutional change:

Equity, diversity and inclusion in research policy and personnel; sex, gender & diversity in research

2011 - ongoing

Policy

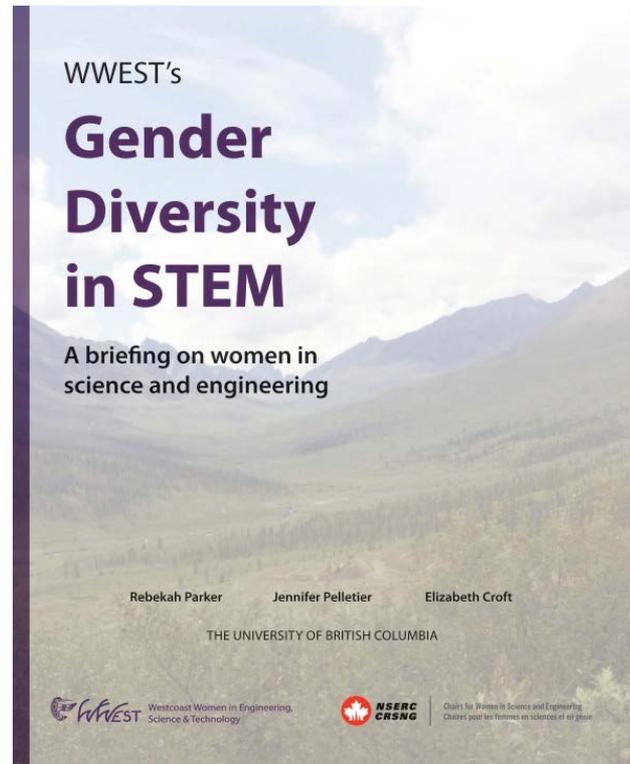
Framework

EDI/SGBA+



Raising Awareness & Training Tools

- Raise awareness and continue to translate current evidence into user-friendly tools





- We need to see what we do from a **equity, diversity and inclusivity perspective**
- This is a **competency** we need to develop
- **GBA+ is an approach** developed by Status of Women Canada to guide this analytical process and help us build this competency
- Integrating GBA+ into how we work **is part of our job**
- Take the online [SWC GBA+ Training Module](#)
- [Demystifying GBA+ job aid](#)



NSERC 2020 A STRATEGIC PLAN



United Nations
Educational, Scientific and
Cultural Organization



SWEDEN



GENDER-BASED ANALYSIS PLUS



GENDER-NET

PROMOTING GENDER EQUALITY IN RESEARCH INSTITUTIONS AND
INTEGRATION OF THE GENDER DIMENSION IN RESEARCH CONTENTS

Framework on Equity, Diversity and Inclusion

1. Implement GBA+ Agency-wide; monitor progress;
2. Collect, analyze and report gender and designated equity group data for all participants in NSERC programs;
3. Increase diversity and gender equity on committees and panels;



Framework on Equity, Diversity and Inclusion

7. Ensure that work/life balance circumstances do not impact how accomplishments, contributions, competencies and expertise are assessed.
8. Consult and engage relevant stakeholders and experts in the implementation of the Framework.
engagement of stakeholders.





Embracing Pluralism and Thriving Through Diversity - Shaping Science and Innovation

Montreal - November 6-8, 2017

Over 600 international advocates for excellence in research and business discuss engaging topics:

- How LGBTQ2 perspectives strengthen research and innovation
- Perspectives on how gender/EDI can spark innovation in the private sector
- Towards EDI in academia – what concrete measures are needed
- Advancing research by and with Indigenous peoples: a step toward reconciliation
- Intersectionality-informed research policy
- Shifting power: EDI and senior leadership teams and boards

What this means for the community

- It means helping to define and contribute to a dynamic process of enhancing research excellence
 - Increasing diversity among researchers
 - Increasing recognition of sex, gender and diversity dimensions in research design
 - Being aware of your own (unconscious) biases
 - Taking the [SWC GBA+ Training Module](#) and the online course on [unconscious bias](#)
 - Taking the [Harvard Implicit Association Test](#)



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