EDI: What Faculty Need To Know

Dr. Lisa Willis
Assistant Professor
University of Alberta
Proper language

**Equity** – Providing people what they need to succeed

**Diversity** – People who are different

**Inclusion** – Making sure everyone has the opportunity to participate

**Sex** – Biological attributes: chromosomes, hormones, reproductive organs. Mostly binary (male/female)

**Gender** – Socially constructed roles and identities. Fluid and non-binary

**Racialization/racialized person** – “the process by which societies construct races as real, different and unequal in ways that matter to economic, political and social life” Ontario Human Rights Commission (http://www.ohrc.on.ca)
Unconscious bias: Behavior that is shaped by implicit or unintended biases, stemming from repeated exposure to pervasive cultural stereotypes.

People who value their objectivity and fairness are paradoxically particularly likely to fall prey to biases, in part because they are not on guard against subtle bias.
YOU are biased.

(So am I.)

It matters.
Why is gender parity/diversity important?

8 of 10 drugs withdrawn from the US market between 1997 and 2000 posed greater health risks for women than for men.

Companies perform better with increased diversity

Mckinsey is one of the world’s largest management consulting groups
Data from 2015

Diverse teams:
- Focus More on Facts
- Process Those Facts More Carefully
- Are More Innovative

SOURCE: McKinsey Diversity Database
Gender diversity is important for team science

699 people in teams of various sizes solve tasks (e.g., visual puzzles, brainstorming, making collective moral judgments, and negotiating over limited resources)

A collective intelligence factor predicts group performance better than the IQ of individual group members.

Key components of this factor include the group members’ **social perceptiveness and parity in conversational turn-taking and proportion of females** in the group.

Woolley et al. *Science* 2010
Ethnic diversity is important for team science

• 2.5 million research papers published between 1985 and 2008
  • Authors in US only
  • 11 scientific fields, including biomedicine, physics and geosciences

• Authors with English surnames were more likely have co-authors with English surnames than would occur by chance; those with Chinese names were more likely to have co-authors with Chinese names, and so on. The trend held for seven other groups, including Russian and Korean populations.

• Papers with 4 or 5 authors of different ethnicities had 5–10% more citations on average than papers from authors of all the same ethnicity
Bubbles emerge when traders err collectively in pricing, causing a persistent misfit between the market price and the true value (also known as “intrinsic” or “fundamental” value) of an asset, such as a stock.

“We find that price bubbles are fueled by the ethnic homogeneity of traders. Homogeneity, we suggest, imbues people with false confidence in the judgment of coethnics, discouraging them from scrutinizing behavior.”
What are the numbers in Canada?

<table>
<thead>
<tr>
<th>Program</th>
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<th>Grade/Age</th>
<th>Males Average Score</th>
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</tbody>
</table>
Breakdown of students by STEM field

Figure 2.2 Number of Students Enrolled, or Writing Provincial Exams for Grade 12, Secondary 5 and Cégep, 2013

Attrition rate is higher for women than men in STEM

Figure 2.1 The Canadian Science and Engineering Supply Chain

<table>
<thead>
<tr>
<th>Level</th>
<th>% Female</th>
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</thead>
<tbody>
<tr>
<td>Enrolment</td>
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<td>Bachelor's</td>
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<td>Master's</td>
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<td>Doctoral</td>
<td>20.9</td>
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<tr>
<td>Degrees</td>
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<tr>
<td>Bachelor's</td>
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<tr>
<td>Master's</td>
<td>27.4</td>
</tr>
<tr>
<td>Doctoral</td>
<td>20.2</td>
</tr>
</tbody>
</table>

Source: Statistics Canada

Degrees granted to female students in NSE

Degrees granted to female students in NSE as a percentage of total granted in NSE

Careers for NSE Bachelor Degree Holders (25 – 34 yo)

<table>
<thead>
<tr>
<th>Occupation</th>
<th>% Female</th>
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<tr>
<td>General</td>
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<td>NSE-Related Occupations</td>
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<td>R&amp;D Careers</td>
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<td>Government Scientists</td>
<td>10.7</td>
</tr>
<tr>
<td>Industry Researchers</td>
<td>n/a</td>
</tr>
</tbody>
</table>

Source: Statistics Canada
n/a: not applicable
*: Industry research percentage is for 2003.

Remember:
40% of Bachelor Degree Holders are female

Women are less likely to be hired as professors

Remember:
~40% of PhD Holders in Life and Physical Sciences are female

USask:
Chemistry is 11%
Biology is 16%
Physics and Eng Phys 17%

Source: Statistics Canada-University and College Academic Staff Systems (UCASS)
Women are less likely to publish

Holman *et al.* Plos Biol 2018
https://lukeholman.github.io/genderGap/

Data for all countries – all authors
Women are less likely to publish

Holman et al. Plos Biol 2018
https://lukeholman.github.io/genderGap/
Racialized students and faculty are underrepresented

Percent of students intending to major in natural sciences who do not graduate with a natural sciences degree (National Science Board 2016):

- **1.5 % White**
- **7.0 % Asian**
- **20 % Latino**
- **40 % Black**

Retention for Indigenous students 1\textsuperscript{st} to 2\textsuperscript{nd} year at USask is 75% compared to 85% total.

Henry et al. (2017) *The Equity Myth: Racialization and Indigeneity at Canadian Universities.*
UBC Press.

- **5 – 17% of faculty at Canadian Universities are racialized**
- **In 2016, 22.3% of Canadians self-identified as visible minorities**
What are the barriers to gender parity/diversity?

Hidden Brain Drain—a private sector task force comprising 43 global companies—launched a research project targeting women with degrees in science, engineering, and technology (SET) who have embarked on careers in corporations. Sponsored by Alcoa, Cisco, Johnson & Johnson, Microsoft, and Pfizer. First report in 2008, second in 2014

Over 50% of junior SET employees are female but 32% say they are likely to quit within a year

Reasons were:
- Hostile macho cultures
- Isolation
- Scarcity of effective sponsors
- Difficulty with executive presence

127 biology, chemistry, physics profs in USA were given the resume of an undergrad who intends to go to grad school and has recently applied for a laboratory manager position.

Asked to rank (i) perceived student competence; (ii) salary offers, which reflect the extent to which a student is valued for these competitive positions; and (iii) the extent to which the student was viewed as deserving of faculty mentoring on a scale of 1-7.

½ given John, ½ given Jennifer (double blind)

Offered $26508 to Jennifer and $30238 to John.

Faculty members’ bias was independent of their gender, scientific discipline, age, and tenure status.

Brendan, Greg, Emily and Anne are more employable than Tamika, Aisha, Rasheed and Tyrone.

(Bertrand and Mullainathan, American Economic Review 2004)

Moss-Racusin, et al. PNAS 2012
Bias in STEM – what does it look like?

• Professors ignore requests from members of underrepresented groups at a higher rate than requests from white men (Milkman et al AmPsychAssoc 2015; 6500 US professors)

• Women with identical publication records are less likely to be hired than men (van Dijk et al CurrBiol 2014; 25000 unique names in PubMed)

• In two person conversations, men are more likely to interrupt women (Hancock JLanSoc 2015)

• In two person teams, men are considered to be more influential than women (Heilman and Haynes JApplPsych 2015)

• Men collaborate with men (Araujo et al. PlosOne 2017)

• Women are invited to speak less than men (Nittrouer et al. PNAS 2018; Data from top 50 universities in the US)
  • Committees with female chairs: 49% of colloquium speakers were women
  • Committees with male chairs: 30% of colloquium speakers were women

• Women are perceived as less competent than men as instructors (Rivera and Tilcsik AmSocRev 2019)

• Doctors with foreign accents are perceived as less competent (Baquiran and Nicoladis Health Commun 2019)
In 1996, researchers ran a computer simulation of a hierarchy that began as evenly split among men and women eligible for promotion across eight levels, with a rate of 15% attrition.

The lowest level has 500 employees and the top only 10.

Men and women were assigned a random performance score, but with men on a scale of 1-101 compared to the scale of 1-100 for women.

After 20 simulations, females comprised only 35% of top positions.

**Effect of small bias**
What can we do to improve?

Step 1: Hold yourself accountable
- Take the Implicit Bias test
- Challenge your assumptions
- Justify your decisions
- Be inclusive

Step 2: Hold others accountable
- Create a culture of calling out unconscious bias
- Make others justify decisions
- Make decisions collectively
- Have these conversations

Step 3: Be involved
- Educate yourself
- Be a mentor
- Be an ally
- Listen!
- Advocate for others
# EDI in grant applications

## DISCOVERY GRANTS MERIT INDICATORS

The Merit Indicators should be used in conjunction with the Peer Review Manual, which outlines how reviewers arrive at a rating.

<table>
<thead>
<tr>
<th>EXCEPTIONAL</th>
<th>OUTSTANDING</th>
<th>VERY STRONG</th>
<th>STRONG</th>
<th>MODERATE</th>
<th>INSUFFICIENT</th>
</tr>
</thead>
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<td>Past training is far superior to other applicants in terms of research training environment provided and HQP contributions to research.</td>
<td>Past training is superior to other applicants in terms of the research training environment provided and HQP contributions to research.</td>
<td>Past training compares favourably with other applicants in terms of the research training environment provided and HQP contributions to research.</td>
<td>Past training is modest relative to other applicants in terms of the research training environment provided and HQP contributions to research.</td>
<td>Past training is below an acceptable level in terms of the research training environment provided and HQP contributions to research.</td>
</tr>
<tr>
<td>Most HQP move on to highly impactful positions that require skills gained through the training received.</td>
<td>Most HQP move on to impactful positions that require skills gained through the training received.</td>
<td>HQP generally move on to impactful positions that require skills gained through the training received.</td>
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<td>Some HQP move on to positions that require skills gained through the training received.</td>
<td>HQP rarely move on to positions that require skills gained through the training received.</td>
</tr>
<tr>
<td>Training philosophy and research training plans are of the highest quality. Highly appropriate, clearly defined and expected to produce top quality results in terms of the overall approach and specific projects for HQP; challenges related to equity, diversity and inclusion specific to the institution and field of research are clearly described; and specific actions to support the recruitment of a diverse group of HQP and an inclusive research training environment are clearly defined.</td>
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<td>Training philosophy and research training plans are: not appropriate and not clearly defined in terms of the overall approach and specific projects for HQP; challenges related to equity, diversity and inclusion specific to the institution and field of research are not described; and specific actions to support the recruitment of a diverse group of HQP and an inclusive research training environment are not defined.</td>
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## Graduate student demographics

### University of Alberta

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<th>Masters Thesis-Based</th>
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### USask 2018-2019:
- Undergrads are 15% Indigenous
- Grads are 7.5% Indigenous

### BioSci: 54% female
- Life & Physical Sci: 42%
- Canada Avg: 42%

### BioSci: 53% female
- Life & Physical Sci: 42%
- Canada avg: 54%

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Preventing bias every day

- Use good hiring practices
- Have a code of conduct posted – workshop it with your trainees
- Discuss professionalism and EDI with your group (language, music, pictures, etc)
- Once per semester, have lab meeting focused on EDI-related science
- Ensure ideas from underrepresented groups are heard and actively promote them
- Ensure underrepresented groups have the opportunity to participate in teams
- Be inclusive (food, time of activities, type of activity)
- Have flexible work hours
- Promote people from underrepresented groups (invite to speak, suggest for awards)
- Write gender neutral reference letters – pay attention to emotional language
  - I will refer to the candidate as M. Saxena and they/them to be gender-neutral
- Give helpful feedback
- Be an ally
EDI in your research

- Measure and report sex differences
- Diversity in animal test groups (age, sex, weight)
- Male/Female cells/cell lines/test animals
- Gendered interpretations of behavior
- Gendered interpretation of data
- Applications of research of technology
- Gender in outreach activities
Questions?

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