Obstacles in the Advancement of Early-Career Female Geoscientists: Research Results from the Earth Science Women's Network (ESWN)

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Abstract

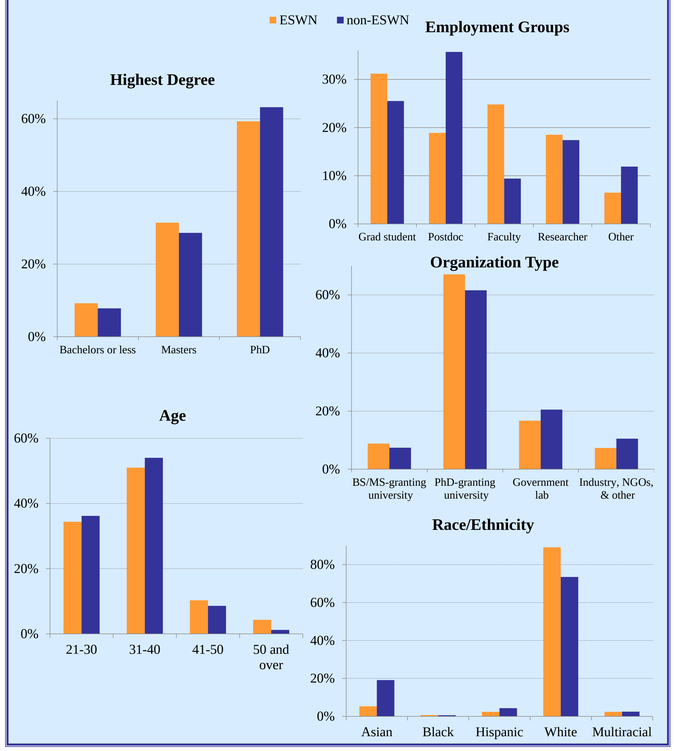
While the number of women receiving advanced degrees in the geosciences has been rising, the faces of scientific leaders in academia remain predominantly male. Women are currently underrepresented in tenure-track positions in Earth science departments at research universities. Additionally, women are less likely to have more senior positions within their academic institutions.

The Earth Science Women's Network (ESWN) is a professional network of early-career female geoscientists that provides its members with a variety of career resources.

We conducted a survey of ESWN members as part of an evaluation-with-research study that aims to determine the career needs of young female geoscientists. We also conducted a survey of the co-ed Earth Science Jobs list also run by ESWN and used the Jobs list's male and female members as comparison samples. The survey data provide insight into critical career junctures for women in geosciences and identify salient issues that institutions will need to address to successfully recruit, retain and promote women scientists.

Demographics

The demographics of the ESWN members and the comparison group are mostly similar, but also differ with some respects:



Department Atmosphere

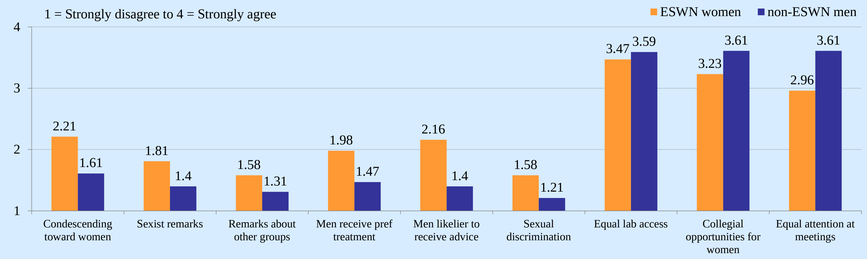
While the comparison group includes both men and women, most statistically significant differences were observed between ESWN women and non-ESWN men. The responses of non-ESWN women mostly fell between the other two groups and did not statistically significantly differ from them, partly due to a small sample size.

Survey Group	ESWN women	Non-ESWN women	Non-ESWN men
Sample Size	491	78	86

ESWN women had more reservations about their academic unit than non-ESWN men:

- *less likely to **recommend their unit** to someone like them*
- *indicated lower levels of **collaboration within** unit, while…*
- *no difference in the levels of **collaboration outside** the unit*
- *rated their **productivity** with respect to to their unit lower*

ESWN women rated their department atmosphere less favorably then non-ESWN men:



Interactions with Colleagues

ESWN women rate their interactions with colleagues less favorably then men:

1-Strongly disagree 4-Strongly agree	Unwritten rules	Reluctance to speak up	Work harder than colleagues	'Fit' in work unit	Isolated in work unit
ESWN women	2.39	2.30	2.33	2.92	2.28
Non-ESWN men	2.03	1.93	2.01	3.30	1.96

12% of ESWN women vs. **1%** of men experienced sexual harassment in the last two years

51% of ESWN women vs. **6%** of men had experienced sexual harassment in their entire career

Role Models

- Lack of mentors and role models is an important barrier to retention of women in science
  - *22% of members marked this as an important obstacle*
- The example of women in senior roles is especially important, since it justifies young women's aspiration to be successful scientists
- Members agreed that women were represented in senior roles less than non-ESWN men:
  - ***31%** of members agreed*
  - ***72%** of non-ESWN men agreed*

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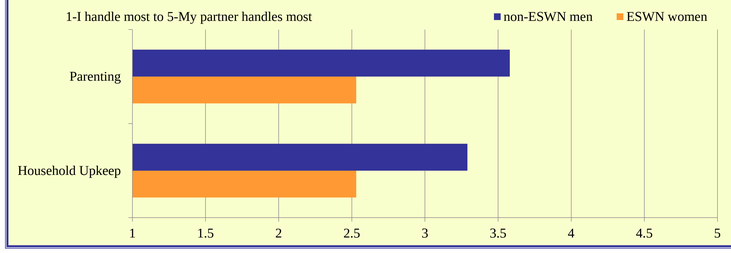
Work/Life Balance

- Attaining work/life balance is a particular concern to early-career scientists, since…
- Tenure clock and the biological clock can coincide
- Family issues may impact the success of women in academic careers, for example limiting travel to meetings and field work
  - *-Most of both non-ESWN men and ESWN women work full time, but…*
  - *-More ESWN women prefer to work part time: **12% vs. 6%***
  - *-More ESWN women have partners who work full time: **83% vs. 57%***
  - *-More ESWN women have partners who prefer to work full time: **91% vs. 59%***
  - *-More ESWN women have partners working in STEM: **66% vs. 47%***
- Women also spend more of their time doing household work



Barriers to Women in Science

Conclusions

- In many respects, members are rather similar to the non-member comparison group, but
- …members rate the atmosphere in their unit less positively than non-member men, and
- …members rate their interactions with colleagues less positively than non-member men, indicating **unconscious bias**.
- Members mostly disagree that women are adequately represented in senior roles, illustrating lack of **role models**.
- Members have less accommodating family arrangements than non-member men, and
- …members spend more time than non-member men on their household responsibilities, complicating **work/life balance**.