

1 **Gender Representation of Speaking Opportunities at the American Geophysical Union**
2 **Fall Meeting**

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4

5 **Implicit and explicit biases impede the participation of women in geoscience(1).**

6 **Documented biases include the quality of postdoctoral recommendation letters(2) and**

7 **opportunities to review research articles(3). Across career stages, attending conferences**

8 **and presenting research are ways to spread scientific results, find job opportunities and**

9 **funding, and gain awards and recognition. However, biases in geoscience conference**

10 **presentations are currently unknown. Here we present an analysis of the American**

11 **Geophysical Union (AGU) Fall Meeting abstract dataset from 2014 to 2016 of invited**

12 **authors and oral and poster presentations. Our results indicate that overall, women**

13 **were invited and assigned oral presentations less often than men for the AGU Fall**

14 **Meetings. However, when we control for career stage, we see similar rates between**

15 **women and men and women sometimes outperform men. Women also elect for poster**

16 **only presentations more than men. Male primary conveners (from students to more**

17 **senior career stages) allocate invited abstracts and oral presentations to women less**

18 **often and below the proportion of women authors. Our results show the need to provide**

19 **equal opportunity to women in speaking roles at scientific conferences as part of the**

20 **overall effort to advance and retain women in STEM fields.**

21

22 There are conscious efforts underway to increase gender equity in science, technology,

23 engineering and mathematics (STEM) fields such as the National Science Foundation's

24 ADVANCE: Increasing the Participation and Advancement of Women in Academic Science

25 and Engineering Careers program. However, despite numerous initiatives to increase the

26 enrollment and retention of women in STEM, the causes of the continued gender disparity is
27 difficult to ascertain. Implicit and explicit biases hinder the participation of women in STEM
28 fields(1). Many gender related biases are documented from disparities in the strength of
29 letters of recommendation(2), solicitation to review research articles(3), and academic pay(4).

30

31 Attending and presenting at conferences is one way researchers expand their network, seek
32 collaborators, connect with mentors, and improve research visibility. In particular, presenting
33 research as an invited speaker and giving an oral presentation are ways to efficiently
34 disseminate scientific results and build one's career. Speaking at a conference is important to
35 career advancement across career stages, particularly for finding job opportunities, funding,
36 and gaining awards and recognition.

37

38 The American Geophysical Union (AGU) Fall Meeting is the world's largest geoscience
39 conference with over 22,000 abstract submissions each year. The meeting covers a wide
40 breadth of Earth and space sciences such as atmospheric sciences, volcanology and space
41 physics. Thus, the AGU Fall Meeting provides a high-powered test for equality in the
42 allocation of speaking opportunities to men and women across a broad range of geosciences.

43

44 **The Abstract Database**

45

46 AGU is an international scientific association with 60,000 members from 137 countries.
47 Since 2013, AGU has asked its members to self-report sex (female, male), highest degree
48 obtained, including year, and other demographic data. For the AGU Fall Meeting 2014 to
49 2016 abstract database (here after referred to as the abstract database), 98% ($n = 65,247$) of
50 abstract authors self-identify as male or female, of which 98% provided career information (n

51 = 64,209). Note that although authors self-identify their sex, our binary analysis
52 (female/women/male/men) does not capture the spectrum of gender identity.

53

54 Career stage is self-identified as student or retired, or calculated based on number of years
55 since highest degree obtained: early career (0-10 years), mid-career (10-20 years),
56 experienced (>20 years). AGU defines these career stages for award eligibility.

57

58 Women submitted 32% of all abstracts ($n = 20,900$) and are concentrated in the student and
59 early career stages (77% of women vs. 60% of men, Figure 1). This distribution of women
60 reflects the “leaky pipeline” and the historical barriers for participation for women in STEM
61 fields(5).

62

63 For the AGU Fall Meeting, topical sessions are proposed by a self-organized group of up to
64 four members, led by a primary convener who must be an AGU member. Traditionally, there
65 are two types of sessions: oral and poster. The primary convener and the co-convener(s) can
66 also invite a limited number of authors.

67

68 During abstract submission, authors opt to be assigned an oral or poster presentation by the
69 conveners or may opt for a “poster only” presentation. The primary convener and co-
70 convener(s) then assign abstract submissions as either oral or poster presentation. When an
71 author opts for a “poster only” abstract submission, it typically remains a poster presentation
72 (99%).

73

74 The AGU membership is representative of those actively engaged in academic, government
75 and industry research within the United States(3). Women are 28% of the AGU membership,

76 which is similar to the percentage of women currently employed in physical sciences
77 (chemists and material scientists: 30%; environmental scientists and geoscientists: 24%; other
78 physical scientists 38%)(6) and science and engineering occupations (28%)(7).

79

80 **Speaking at Conferences**

81

82 Overall, fewer women than men are given the opportunity to highlight their research through
83 invited abstracts and oral presentations (Figure 2, Supplementary Materials for all statistical
84 tests and tables). However, this result is impacted by the gender demographics of AGU. The
85 most common career category for women is student (39% of women authors are students vs.
86 25% of men) and students have fewer speaking opportunities overall (i.e. students are 4.8%
87 of invited abstracts and 15% oral presentations).

88

89 Women were invited to submit abstracts at a lower rate than men [10% vs. 12%, Figure 2A,
90 $\chi^2(1, 65246) = 96.8, p < 0.001$]. AGU states the objective of invited authors are to 1) raise
91 the profile of the session and to 2) attract “authors who would not otherwise submit an
92 abstract to a session in an effort to, for example, enhance diversity or interdisciplinary
93 perspectives or feature early-career scientists.”

94

95 Of invited authors ($n = 7,539$), 31% were early career ($n = 2,363$) and 38% were mid-career
96 ($n = 2,859$). We find women are invited at a significantly higher rate than men within the
97 early career (10.9 vs. 9.9%) and mid-career (20.4 vs. 18.9%) stages. The early career stage
98 includes postdoctoral training, which for women is the “leakiest” part of the STEM career
99 pipeline(8). Women are also more likely than men to spend more time in postdoctoral
100 positions before securing tenure-track jobs(9).

101

102 In 2016, for logistical reasons, the AGU reduced the number of invited abstracts a primary
103 convener could invite from four to two. Notably, this change was associated with a reduction
104 in the gender bias for invited abstracts. That is, although women continued to be invited to
105 submit abstracts at a lower overall rate than men, the difference between women and men
106 was less in 2016 than 2014/2015 [2014/2015: $\chi^2(43,535) = 81.0, p < 0.001$; 2016: $\chi^2(21,710)$
107 $= 14.1, p < 0.001$; difference: $\chi^2(1) = 66.9, p < .001$].

108

109 Of all authors that opt to be assigned to an oral or poster presentation by the conveners ($n =$
110 31,348), women were assigned oral presentations at a lower rate than men [41.1% vs. 44.5%,
111 Figure 2B $\chi^2(1, 31347) = 31.1, p < 0.001$]. When we control for career stage, we see no
112 significant difference between women and men.

113

114 **The Role of the Primary Convener**

115

116 The primary convener leads the decision to invite and assign oral or poster presentations for a
117 specific session. Although we have gender and career stage information for the primary
118 convener, the abstract database does not include gender and career stage information for co-
119 conveners. We therefore do not test for possible co-convener influence on gender parity.

120

121 Male and female primary conveners invited women authors 24% ($n = 1,302$) and 34% ($n =$
122 716) of the time, respectively (Figure 3A). Men primary conveners invited fewer women
123 authors at early career, mid-career and experienced career stages. Male and female primary
124 conveners assigned women authors oral presentations 29% ($n = 3,769$) and 37% ($n = 1,733$)

125 of the time, respectively (Figure 3C). Men primary conveners assigned fewer women authors
126 oral presentations at student, early career, mid-career and experienced career stages.

127

128 We also examined whether there were differences in inviting and assigning oral presentations
129 by career stage of the primary conveners themselves. From student to more senior career
130 stages, men primary conveners invited (Figure 3B) and assigned (Figure 3D) fewer women
131 than women primary conveners. Thus, regardless of primary convener career stage, primary
132 convener men provided fewer opportunities to women.

133

134 Male primary conveners allocated 72% of all abstracts ($n = 47,812$). Because men primary
135 conveners control a larger portion of abstracts, their higher preference for other men
136 (compared to female primary conveners) has a disproportionate impact on the visibility of
137 women as invited or oral presentation speakers.

138

139 **Women Opt Out**

140

141 Women elect for poster only presentations more than men [32% vs. 26%, Figure 2C, χ^2 (1,
142 43514) = 134.9, $p < 0.001$]. This relationship is significant across the student (44% vs. 41%),
143 mid-career (22% vs. 20%) and experienced (20% vs. 15%) career stages.

144

145 The “confidence gap”(10) may explain why women disproportionately opt for poster
146 presentations. Women tend to underestimate their ability and performance in science(11).
147 Electing to present a poster may be more desirable if women feel their science is “not ready”
148 for an oral presentation and/or an oral presentation feels like a high stakes performance.

149 Alternatively, women may opt for poster only presentations because presentation times are
150 more flexible and/or they feel posters might provide more networking opportunities.

151

152 **A Path Forward**

153

154 Overall, our results suggest that female scientists are offered fewer speaker opportunities than
155 men. However, these results are influenced by the gender demographics of AGU where
156 women disproportionately occupy the student career stage. Ninety-three percent of invited
157 abstracts and 83% oral presentations are allocated to more senior career stages where there
158 are fewer women due to the “leaky pipeline” and the historical barriers women face in STEM
159 fields. When we control for career stage, early and mid-career women are invited at a higher
160 rate than men and we do not see any other statistically significant differences between
161 women and men for invited abstracts and oral presentations. Women also elect for poster
162 only presentations more often than men.

163

164 Male conveners offered fewer invited abstracts and speaking opportunities to women; this is
165 discouraging because men control >70% of the abstract allocations. This implies the reason
166 AGU has gender parity when we control of career stage is because women disproportionately
167 invite other women. This means the underrepresented gender is doing the burden of gender
168 parity efforts.

169

170 Attending conferences and interacting with colleagues is vital to the exchange of ideas within
171 the science community. By giving oral presentations, scientists increase professional
172 visibility, widely disseminate results and improve their communication skills. The

173 opportunity to speak is fundamental to career advancement across career stages for job
174 opportunities, collaborations, awards and recognition.
175
176 Reducing gender bias in speaking roles is critical for the advancement of women in science.
177 Promoting student and early career stages for invited abstracts and oral presentations may
178 help as women are concentrated in these career stages. Encouraging more women to act as
179 primary conveners may also reduce the overall gender imbalance. All conveners may benefit
180 from interventions and/or implicit bias training prior to inviting and assigning oral
181 presentations to speakers. For instance, after an analysis of gender bias in peer review within
182 AGU publications(3), AGU now includes a statement asking authors to help improve the
183 diversity of the reviewer pool during the manuscript submission process(12). This small
184 intervention improved the gender diversity of the suggested reviewer pool, particularly for
185 male authors.

186

187 **Figure Captions**

188 **1. American Geophysical Union Fall Meeting Gender Demographics.** Proportion of total
189 abstracts by career stage (A) and proportion of abstracts by gender by career stage (B).

190 **2. Author submissions to American Geophysical Fall Meeting.** Proportion of invited
191 authors (A), authors assigned oral presentations (B) and authors opting for posters (C) by
192 gender by career stage. Total here is the proportion of total abstracts.

193 **3. Primary convener allocations for American Geophysical Fall Meeting.** Proportion of
194 women across career stages invited by primary convener gender (A). Proportion of women
195 invited by primary conveners' gender and career stage (B). Proportion of women across
196 career stages assigned oral presentations by primary convener gender (C). Proportion of
197 women assigned oral presentations by primary conveners' gender and career stage (D).

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223

Figure 1

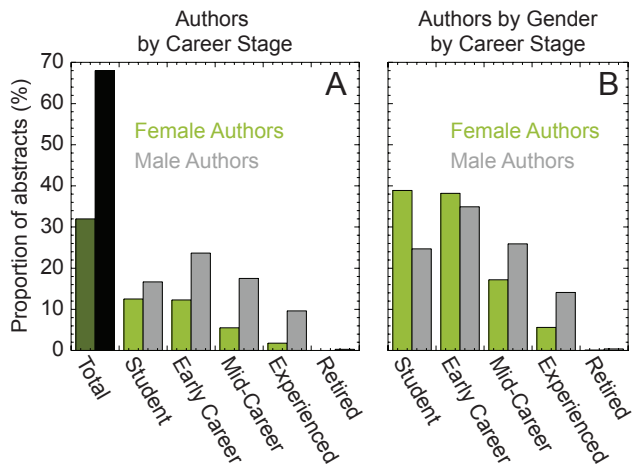
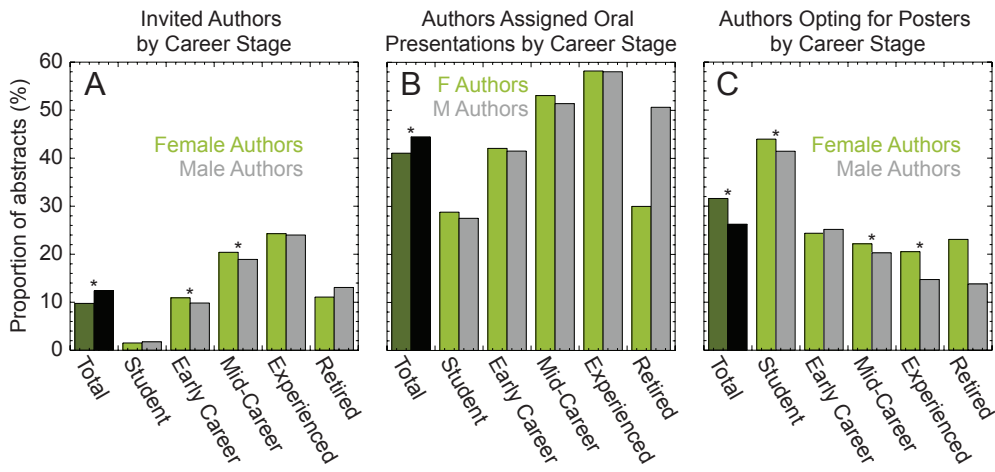


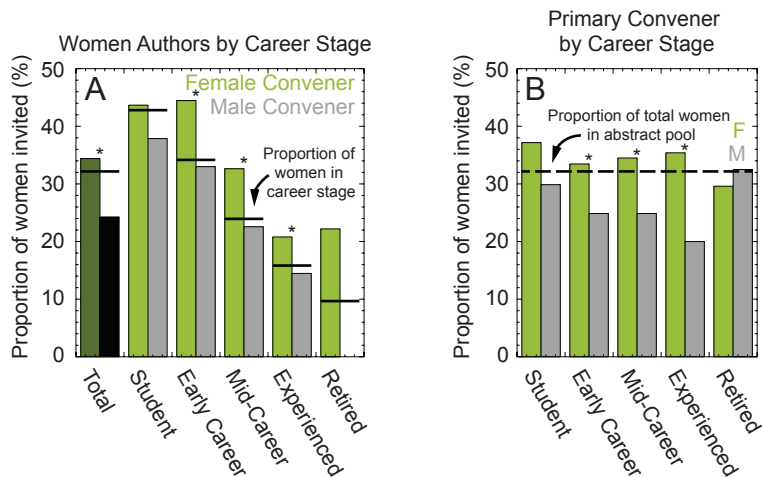
Figure 2



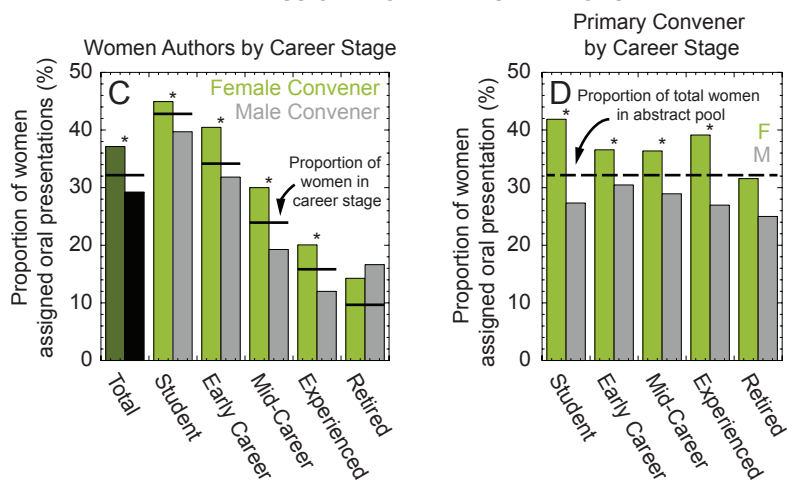
* Significant difference between females and males ($p < 0.05$)

Figure 3

INVITED ABSTRACTS



ASSIGNED ORAL PRESENTATIONS



* Significant difference between females and males ($p < 0.05$)

Supplementary Information

Materials and Methods

The American Geophysical Union (AGU) organizes the largest physical sciences meeting internationally with over 22,000 abstracts submitted each year in our 2014-2016 database. Since 2013, AGU has asked its members to self-report demographic information including gender, highest earned degree, and year in which highest degree was earned. AGU membership is required to submit an abstract and to act as a primary convener of a session.

The AGU organizes sessions within Sections and Focus Groups. According to AGU, these Section and Focus Groups “are responsible for fostering scientific discussion and collaboration among members who affiliate with them.” The primary convener and co-convener(s) submit a session proposal to a particular Section/Focus Group in April. A session proposal is self-organized around a scientific topic that may be of broad interest within a Section/Focus Group. In June, the session proposal is reviewed for approval by the Program Committee.

After approval, the primary convener and co-convener(s) may invite authors (up to four in 2014 and 2015, up to two in 2016) to submit abstracts. We call these Invited Authors. Members of the broader AGU community are able to submit abstracts to a session until the submission deadline in August. At the time of submission, authors request “Assigned by Program Committee (Oral or Poster)” or “Poster Only.” The author that submits an abstract (invited or otherwise) we call the First Author.

After the submission deadline, the Program Committee determines the available number of oral and poster sessions for each Section/Focus Group based on the submission numbers and available space within the convention center. The Secretary within a Section/Focus Group then allocates the available oral and poster sessions to each session proposal. If only a few abstracts are submitted to a proposed session, proposed sessions may merge at this time. As a session is only allowed up to four conveners, some individuals will relinquish their convening role. One primary convener will typically stay on as primary convener while the other remains as a co-convener. We are unable to investigate the potential impact this may have on our results.

Once the oral and poster sessions have been delegated within a Section/Focus Group, the primary convener and co-convener(s) allocate the oral and poster presentations.

For these analyses, the data was accessed in March 2017. At the time, the “Requested Format – Assigned by Program Committee (Oral or Poster) and Poster Only” were not available for 2016. Therefore, the gender analyses on oral presentation allocation is done on the 2014 and 2015 data only.

Our variables are:

- First Author Gender (Female, Male)
- First Author Career Stage (Student, Early Career, Mid-Career, Experienced and Retired)
- Invited (Yes, No)
- Requested Format (Assigned by Program Committee (Oral or Poster) and Poster Only)

- Primary Convener Gender (Female, Male)
- Primary Convener Career Stage (Student, Early Career, Mid-Career, Experienced and Retired).

Career Stage for First Author and Primary Convener is self-identified as Student or Retired, or calculated based on number of years since highest degree obtained: Early Career (0-10 years), Mid-Career (10-20 years), Experienced (>20 years). Student member status is confirmed annually by a faculty member. Unfortunately, using this method to calculate career stage overlooks career breaks that members may have taken to raise families, out of medical necessity and/or a myriad of other reasons. Figure 1 shows the distribution of women and men by career stage.

Statistics

We used χ^2 to test the *hypotheses* numerated below. In the tables, significant results are in bold.

1. *Women are invited to submit abstracts at a lower rate than men.*

$$\mu_{\text{female}} = 1.098, \sigma = 0.297, n_{\text{female}} = 20900$$

$$\mu_{\text{male}} = 1.124, \sigma = 0.330, n_{\text{male}} = 44347$$

$$\chi^2 (1, 65246) = 96.8, p < 0.001$$

We also repeated this test for 2014/2015 and 2016:

2014/15

$$\mu_{\text{female}} = 1.111, \sigma = 0.314, n_{\text{female}} = 13791$$

$$\mu_{\text{male}} = 1.142, \sigma = 0.350, n_{\text{male}} = 29745$$

$$\chi^2 (1, 43535) = 81.0, p < 0.001$$

2016

$$\mu_{\text{female}} = 1.072, \sigma = 0.258, n_{\text{female}} = 7109$$

$$\mu_{\text{male}} = 1.087, \sigma = 0.282, n_{\text{male}} = 14602$$

$$\chi^2 (1, 21710) = 14.1, p < 0.001$$

$$\chi^2 = 81.0 - 14.1 = \chi^2 = 66.9, p < .001$$

2. *Women are invited to submit abstracts at a lower rate than men at all career stages.*

Women are invited to present at a higher rate in the Early Career and Mid-Career stage (Supplementary Table 1).

3. *Women are less likely to be assigned an oral presentation than men after requesting "Assigned by Program Committee (Oral or Poster)"*

$$\mu_{\text{female}} = 1.589, \sigma = 0.492, n_{\text{female}} = 9424$$

$$\mu_{\text{male}} = 1.555, \sigma = 0.485, n_{\text{male}} = 21924$$

$$\chi^2 (1, 31347) = 31.1, p < 0.001$$

We also repeated this test by omitting the invited speakers:

$$\mu_{\text{female}} = 1.680, \sigma = 0.47, n_{\text{female}} = 7907$$

$$\mu_{\text{male}} = 1.659, \sigma = 0.47, n_{\text{male}} = 17711$$

$$\chi^2(1, 25617) = 11.0, p = 0.001$$

4. *Women are less likely to be assigned an oral presentation than men at all career stages after requesting "Assigned by Program Committee (Oral or Poster)"*

There are no significant relationships at any career stage (Supplementary Table 2).

5. *Male primary conveners invite male abstract submissions at a higher rate than female primary conveners.*

$$\mu_{\text{female}} = 0.656, \sigma = 0.475, n_{\text{female}} = 2081$$

$$\mu_{\text{male}} = 0.7571, \sigma = 0.429, n_{\text{male}} = 5361$$

$$\chi^2(1, 7441) = 77.7, p < 0.001$$

6. *This effect emerges for each First Author (FA) career stage.*

This is significant at for the First Author Early Career, Mid-Career and Experienced career stages (Supplementary Table 3).

7. *This effect emerges for each Primary Convener (PC) career stage.*

This is significant at for the Primary Convener Early Career, Mid-Career and Experienced career stages (Supplementary Table 4).

8. *Male primary conveners assign male speakers oral presentations at a higher rate than female primary conveners.*

$$\mu_{\text{female}} = 0.6285, \sigma = 0.483, n_{\text{female}} = 4665$$

$$\mu_{\text{male}} = 0.7076, \sigma = 0.458, n_{\text{male}} = 12888$$

$$\chi^2(1, 17552) = 88.5, p < 0.001$$

9. *This effect emerges for each First Author (FA) career stage.*

This is significant at for the First Author Student, Early Career, Mid-Career and Experienced career stages (Supplementary Table 5).

10. *This effect emerges for each Primary Convener (PC) career stage.*

This is significant at for the Primary Convener Student, Early Career, Mid-Career and Experienced career stages (Supplementary Table 6).

11. *Women request poster presentations at a higher rate than men.*

$$\mu_{\text{female}} = 1.32, \sigma = 0.465, n_{\text{female}} = 13784$$

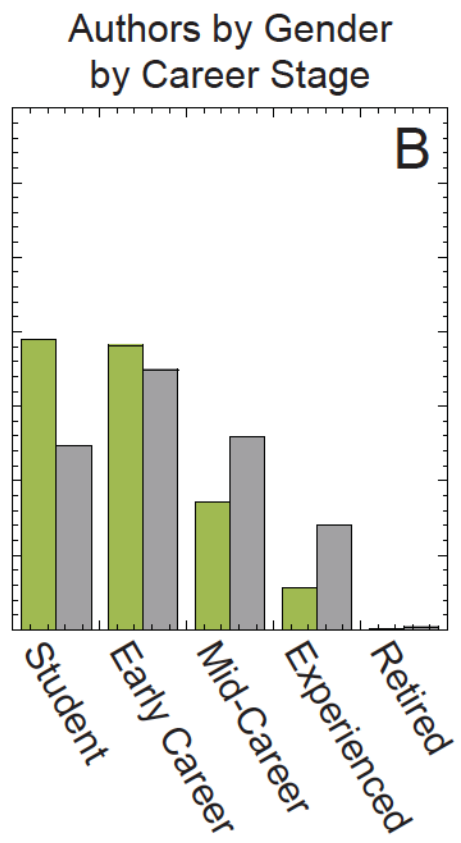
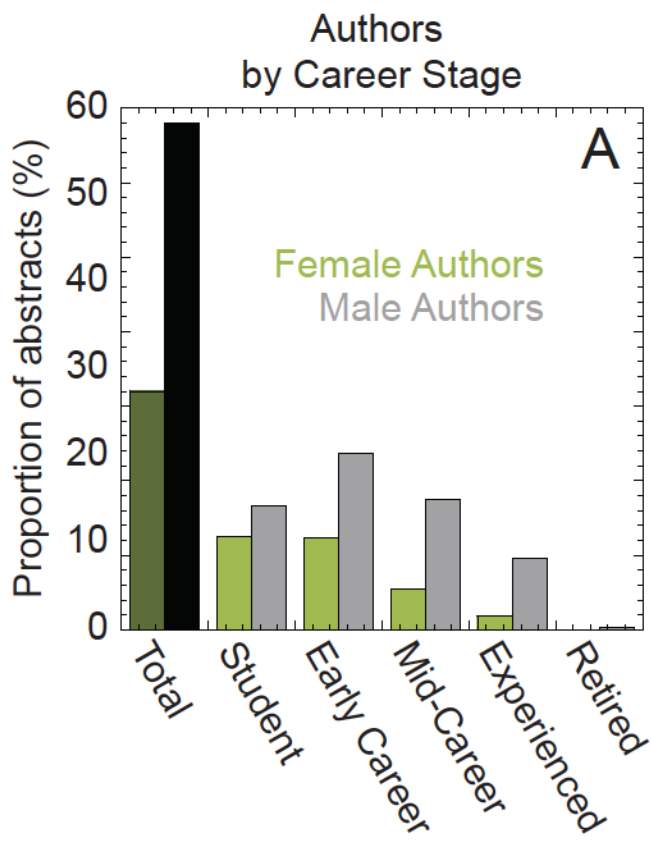
$$\mu_{\text{male}} = 1.26, \sigma = 0.440, n_{\text{male}} = 29731$$

$$\chi^2(1, 43514) = 134.9, p < 0.001$$

12. *Women request poster presentations at a higher rate than men at all career stages.*

This is significant at the Student, Mid-Career and Experienced stages (Supplementary Table 7).

Figure 1. Demographics of American Geophysical Union Fall Meeting authors



Supplementary Table 1. Analysis of Invited Authors by First Author Career Stage

	<i>Total</i>		<i>Student</i>		<i>Early Career</i>		<i>Mid-Career</i>		<i>Experienced</i>		<i>Retired</i>	
<i>Total Abstracts</i>	65,247		18789		23112		14815		7307		186	
	F	M	F	M	F	M	F	M	F	M	F	M
	20900	44347	8042	10747	7900	15212	3548	11267	1157	6150	18	168
	32%	68%	43%	57%	34%	66%	24%	76%	16%	84%	10%	90%
<i>Invited Authors</i>	2040	5499	124	192	862	1501	725	2134	281	1477	2	22
<i>Invited Authors %</i>	9.8%	12.4%	1.5%	1.8%	10.9%	9.9%	20.4%	18.9%	24.3%	24.0%	11.1%	13.1%
<i>mean</i>	1.10	1.12	1.02	1.02	1.11	1.10	1.20	1.19	1.24	1.24	1.11	1.13
<i>std</i>	0.297	0.330	0.123	0.132	0.312	0.298	0.403	0.392	0.429	0.427	0.323	0.338
<i>χ²</i>	96.8		1.66		6.18		3.87		0.0391		0.0570	
<i>p-value</i>	<0.001		0.197		0.013		0.049		0.843		0.811	

Supplementary Table 2. Analysis of Oral Presentations by First Author Career Stage

	<i>Total</i>		<i>Student</i>		<i>Early Career</i>		<i>Mid-Career</i>		<i>Experienced</i>		<i>Retired</i>	
<i>Total Abstracts</i>	31348		7275		11293		7913		4138		85	
	F	M	F	M	F	M	F	M	F	M	F	M
	9424	21924	3017	4258	3880	7413	1808	6105	584	3554	10	75
	30%	70%	41%	59%	34%	66%	23%	77%	14%	86%	12%	88%
<i>Assigned Oral</i>	3874	9759	869	1173	1633	3080	960	3138	340	2064	3	38
<i>Assigned Oral %</i>	41.1%	44.5%	28.8%	27.5%	42.1%	41.5%	53.1%	51.4%	58.2%	58.1%	30.0%	50.7%
<i>mean</i>	1.59	1.55	1.71	1.72	1.58	1.58	1.47	1.49	1.42	1.42	1.70	1.49
<i>std</i>	0.492	0.485	0.453	0.447	0.494	0.493	0.499	0.500	0.494	0.494	0.483	0.503
χ^2	31.1		1.38		0.304		1.61		0.00430		1.51	
<i>p-value</i>	<0.001		0.24		0.581		0.205		0.948		0.219	

Supplementary Table 3. Analysis of Primary Convener Allocation of Invited Authors by First Author Career Stage

	<i>Total</i>		<i>FA Student</i>		<i>FA Early Career</i>		<i>FA Mid-Career</i>		<i>FA Experienced</i>		<i>FA Retired</i>	
<i>Total Abstracts</i>	7442		314		2336		2818		1733		24	
<i>Female Primary Convener</i>	2081	28%	87	28%	695	30%	790	28%	447	26%	9	38%
	F	M	F	M	F	M	F	M	F	M	F	M
<i>Invited Authors</i>	716	1365	38	49	309	386	258	532	93	354	2	7
<i>Invited Authors %</i>	34%	66%	44%	56%	44%	56%	33%	67%	21%	79%	22%	78%
<i>mean</i>	0.656		0.563		0.555		0.673		0.792		0.778	
<i>std</i>	0.475		0.499		0.497		0.469		0.406		0.441	
<i>Male Primary Convener</i>	5361	72%	227	72%	1641	70%	2028	72%	1286	74%	15	63%
	F	M	F	M	F	M	F	M	F	M	F	M
<i>Invited Authors</i>	1302	4059	86	141	542	1099	458	1570	186	1100	0	15
<i>Invited Authors %</i>	24%	76%	38%	62%	33%	67%	23%	77%	14%	86%	0%	100%
<i>mean</i>	0.757		0.621		0.670		0.774		0.855		1.00	
<i>std</i>	0.429		0.486		0.470		0.418		0.352		0.000	
χ^2	77.7		0.883		27.6		30.4		9.88		3.64	
<i>p-value</i>	<0.001		0.347		<0.001		<0.001		0.002		0.057	

Supplementary Table 4. Analysis of Primary Convener Allocation of Invited Authors by Primary Convener Career Stage

	<i>PC Student</i>		<i>PC Early Career</i>		<i>PC Mid-Career</i>		<i>PC Experienced</i>		<i>PC Retired</i>	
<i>Total Abstracts</i>	358		3068		2580		1217		67	
<i>Female Primary Convener</i>	164	46%	1069	35%	533	21%	257	21%	27	40%
	F	M	F	M	F	M	F	M	F	M
<i>Invited Authors</i>	61	103	358	711	184	349	91	166	8	19
<i>Invited Authors %</i>	37%	63%	33%	67%	35%	65%	35%	65%	30%	70%
<i>mean</i>	0.628		0.665		0.655		0.646		0.704	
<i>std</i>	0.485		0.472		0.476		0.479		0.465	
<i>Male Primary Convener</i>	194	54%	1999	65%	2047	79%	960	79%	40	60%
	F	M	F	M	F	M	F	M	F	M
<i>Invited Authors</i>	58	136	497	1502	509	1538	192	768	13	27
<i>Invited Authors %</i>	30%	70%	25%	75%	25%	75%	20%	80%	33%	68%
<i>mean</i>	0.701		0.751		0.751		0.800		0.675	
<i>std</i>	0.459		0.432		0.432		0.400		0.474	
χ^2	2.13		25.8		20.1		27.0		0.0617	
<i>p-value</i>	0.144		<0.001		<0.001		<0.001		0.804	

Supplementary Table 5. Analysis of Primary Convener Allocation of Oral Presentations by First Author Career Stage

	<i>Total</i>		<i>FA Student</i>		<i>FA Early Career</i>		<i>FA Mid-Career</i>		<i>FA Experienced</i>		<i>FA Retired</i>	
<i>Total Abstracts</i>	17553		5187		6519		3784		1713		44	
<i>Female Primary Convener</i>	4665	27%	1357	26%	1749	27%	1023	27%	448	26%	14	32%
	F	M	F	M	F	M	F	M	F	M	F	M
<i>Assigned Authors</i>	1733	2932	610	747	708	1041	307	716	90	358	2	12
<i>Assigned Authors %</i>	37%	63%	45%	55%	40%	60%	30%	70%	20%	80%	14%	86%
<i>mean</i>	0.629		0.550		0.595		0.700		0.799		0.857	
<i>std</i>	0.483		0.498		0.491		0.459		0.401		0.363	
<i>Male Primary Convener</i>	12888	73%	3830	74%	4770	73%	2761	73%	1265	74%	30	68%
	F	M	F	M	F	M	F	M	F	M	F	M
<i>Assigned Authors</i>	3769	9119	1521	2309	1519	3251	532	2229	152	1113	5	25
<i>Assigned Authors %</i>	29%	71%	40%	60%	32%	68%	19%	81%	12%	88%	17%	83%
<i>mean</i>	0.708		0.603		0.682		0.807		0.880		0.833	
<i>std</i>	0.455		0.489		0.466		0.394		0.325		0.379	
χ^2	99.5		11.4		42.4		49.9		17.8		0.0404	
<i>p-value</i>	<0.001		0.001		<0.001		<0.001		<0.001		0.841	

Supplementary Table 6. Analysis of Primary Convener Allocation of Oral Presentations by Primary Convener Career Stage

	<i>PC Student</i>		<i>PC Early Career</i>		<i>PC Mid-Career</i>		<i>PC Experienced</i>		<i>PC Retired</i>	
<i>Total Abstracts</i>	785		7717		5921		2598		118	
<i>Female Primary Convener</i>	339	43%	2471	32%	1228	21%	503	19%	38	32%
	F	M	F	M	F	M	F	M	F	M
<i>Assigned Authors</i>	142	197	904	1567	447	781	197	306	12	26
<i>Assigned Authors %</i>	42%	58%	37%	63%	36%	64%	39%	61%	32%	68%
<i>mean</i>	0.581		0.634		0.636		0.608		0.684	
<i>std</i>	0.494		0.482		0.481		0.489		0.471	
<i>Male Primary Convener</i>	446	57%	5246	68%	4693	79%	2095	81%	80	68%
	F	M	F	M	F	M	F	M	F	M
<i>Assigned Authors</i>	122	324	1599	3647	1359	3334	565	1530	20	60
<i>Assigned Authors %</i>	27%	73%	30%	70%	29%	71%	27%	73%	25%	75%
<i>mean</i>	0.726		0.695		0.710		0.730		0.750	
<i>std</i>	0.446		0.460		0.454		0.444		0.436	
χ^2	18.2		28.6		25.4		29.1		0.564	
<i>p-value</i>	<0.001		<0.001		<0.001		<0.001		0.453	

Supplementary Table 7. Analysis of Poster Only Selection by First Author by Career Stage

	<i>Total</i>		<i>Student</i>		<i>Early Career</i>		<i>Mid-Career</i>		<i>Experienced</i>		<i>Retired</i>	
<i>Total Abstracts</i>	43515		12660		15039		9982		4903		100	
	F	M	F	M	F	M	F	M	F	M	F	M
	13784	29731	5386	7274	5130	9909	2323	7659	735	4168	13	87
	32%	68%	43%	57%	34%	66%	23%	77%	15%	85%	13%	87%
<i>Poster Only</i>	4360	7807	2369	3016	1250	2496	515	1554	151	614	3	12
<i>Poster Only %</i>	32%	26%	44%	41%	24%	25%	22%	20%	21%	15%	23%	14%
<i>mean</i>	1.32	1.26	1.44	1.41	1.24	1.25	1.22	1.20	1.21	1.15	1.23	1.14
<i>std</i>	0.465	0.440	0.496	0.493	0.429	0.434	0.415	0.402	0.404	0.354	0.439	0.347
χ^2	135		8.05		1.22		3.83		16.0		0.765	
<i>p-value</i>	<0.001		0.005		0.269		0.050		<0.001		0.382	