AGUPUBLICATIONS

Supporting Information for

Association between Author Diversity and Acceptance Rates and Citations in Peer-reviewed Earth Science Manuscripts

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Introduction

[Type or paste your text here. The introduction gives a brief overview of the supporting information. You should include information about as many of the following as possible (when appropriate):

- a general overview of the kind of files;
- information about when and how the data were collected or created;
- a general description of processing steps used;
- any known imperfections or anomalies in the data and uncertainties

Text S1: Demographic Categories.

The career stage of members was calculated based on the "Student" or "Retired" status of the AGU membership profile. If the member is not a "Student" nor "Retired", career stage is calculated from years since last degree earned. "Early Career" is defined as someone less than 10 years after graduation at the time of activity in the authorship database. "Mid-Career" is 10 to 24 years after graduation, and "Experienced" is an individual who graduated 25 years or more ago and aren't "Retired". A false positive may occur for student status where a member has not changed the status in their profile, or the false label of "Experienced" where the member has not changed their profile to "Retired". Where the AGU membership profile has no student status, retirement status, or graduation date data, we calculated the age at time of activity and grouped these into (< 30), (>29 & <40), (>39 & < 55), (>54 & <70), and (>69) years as Student, Early Career, Mid-Career, Experienced, and Retired, respectively. We recognized that this is a proxy for true career stage which may not account for non-linear or non-traditional career paths, which might particularly affect the career paths of minority or underrepresented groups.

Text S2: Missingness of data.

The acceptance rate increases from 44.1% to about 54.5% with more demographic matching. The increase in acceptance rate from single-author to single-nation to multi-national teams is consistent between matched subsets, although the percent increase is not as large for the demographically matched group.
The average citations decrease slightly from 9.0 to 8.8 with demographic matching. The magnitude and direction of differences between single-author, single-nation and multinational teams does not change significantly with demographic matching.

Acceptance rates by matching type and by national collaboration type								
Collaboration Type	**Matching Type**	$n_{accepted}$ manuscripts	$n_{rejected}$ manuscripts	**Acceptance Rate**	n manuscripts	**95% Confidence Interval**	**χ^2-value (in comparison to row $i+1$)**	**P-value (in comparison to row $i+1$)**
All Manuscripts	All Manuscripts Nations	40283	51144	44.1%	91427	0.6%		
Single-Author	Matched	1470	3482	29.7%	4952	2.5%	247.61	0.00000
Single Nation Collaboration	Nations Matched	17372	24723	41.3%	42095	0.9%	446.27	0.00000
International Collaboration	Nations Matched	17568	18425	48.8%	35993	1.0%		
Single-Author	Nation, Gender, Career Stage Matched	1072	1519	41.4%	2591	3.8%	151.38	0.00000
Single Nation Collaboration	Nation, Gender, Career Stage Matched	6327	5233	54.7%	11560	1.8%	32.89	0.00000
International Collaboration	Nation, Gender, Career Stage Matched	4011	2778	59.1%	6789	2.3%		
Single Nation Collaboration	Nation, Gender, Age Matched for Small Groups	5247	4612	53.2%	9859	2.0%	9.11	0.00254
International Collaboration	Nation, Gender, Age	2608	2058	55.9%	4666	2.8%		

Matched for
Small Groups

Table S1. Acceptance rates of manuscripts are shown by demographic matching type and by national collaboration type.

Citations by matching type and by national collaboration type						
Collaboration Type	**Matching Type**	**n manuscripts**	**Mean-Citations (2019)**	**95% Confidence Interval**	**T-value (in comparison to row *i+1*)**	**P-value (in comparison to row *i+1*)**
All Manuscripts	All Manuscripts	38184	9.00	0.17		
Single-Author	Nations Matched	1360	7.56	0.75	-0.76	0.44888
Single Nation Collaboration	Nations Matched	16403	8.04	0.19	-8.60	0.00000
International Collaboration	Nations Matched	16713	9.42	0.23		
Single-Author	Nation, Gender, Age Matched	1007	8.20	0.93	-0.28	0.77661
Single Nation Collaboration	Nation, Gender, Age Matched	6052	8.68	0.34	-4.25	0.00002
International Collaboration	Nation, Gender, Age Matched	3843	9.59	0.46		
Single Nation Collaboration	Nation, Gender, Age Matched for Small Groups	5018	8.39	0.36	-3.06	0.00221
International Collaboration	Nation, Gender, Age Matched for Small Groups	2492	9.63	0.59		

Table S2. Citations of manuscripts are shown by matching type and by national collaboration type.

Text S3: Effects of Team Size.

In the main text, authorship teams of 2–4 were grouped to increase statistical power. When separating each group size out individually, there are several instances where acceptance rates and citation rates are lower with diversity than with non-diverse groups.

The few instances of negative differences for acceptance rates were generally less than 1%, and none were significant (where p < 0.10). Acceptance rates for career stage diversity was lower from 0.8–2.5% for diverse groups as compared to homogenous teams ($p_{group\ size}$ of 2,3,4 > 0.4). Negative difference in citations were fewer than 2 and had p > 0.2.

<Insert Table S3>

Table S3. Acceptance rate of manuscripts by group size and collaboration type. Collaboration types with n > 100 were removed.

<Insert Table S4>

Table S4. Citations of manuscripts by group size. Collaboration types with n > 100 were removed.

Text S4: Related References.

The authors would like to note the following related manuscripts:

1. Bennett, L. M., H. Gadlin, and S. Levine-Finley. 2010. Collaboration and team science: a field guide. NIH Office of the Ombudsman, Center for Cooperative Resolution, Bethesda, Maryland, USA
2. McLeod, Poppy Lauretta, Sharon Alisa Lobel, and Taylor H. Cox Jr. "Ethnic diversity and creativity in small groups." Small group research 27.2 (1996): 248-264.
3. Ford, H.L., Brick, C., Blaufuss, K. and Dekens, P.S., 2018. Gender inequity in speaking opportunities at the American Geophysical Union Fall Meeting. Nature communications, 9(1), p.1358.
4. King, M.M., Bergstrom, C.T., Correll, S.J., Jacquet, J. and West, J.D., 2017. Men set their own cites high: Gender and self-citation across fields and over time. Socius, 3, p.2378023117738903.