

## Supplementary Information for Mapping Social Exclusion in STEM to Men's Implicit Bias and Women's Career Costs

Emily N. Cyr, Hilary B. Bergsieker, Tara C. Dennehy, Toni Schmader  
Corresponding author: Emily N. Cyr; encyr@uwaterloo.ca

### This PDF file includes:

- Supplementary text
- Figure S1
- Tables S1 to S11
- SI References

**Preregistration.** This project tests a subset of hypotheses in our preregistration (<https://osf.io/q9gsi>) that are related to network structure, with remaining hypotheses to be reported in papers on other topics. Specifically, we tested hypotheses concerning how implicit stereotypes predict network ties (e.g., “Men with stronger implicit STEM=Male associations have fewer positive ties (or more negative ties) to women.”) and positionality in one's network predicts key workplace outcomes (e.g., “Among women, there is a significant indirect path from team structure (centrality, % female, cross-group density) through social fit to positive outcomes.”). This SI Appendix provides more detail on the operationalization of network variables, such as cross-gender indegree, a metric integrating our predictions that better outcomes for women would be associated with more (positive) cross-gender social (also described as “liking”) ties within their team and higher personal centrality (i.e., indegree). We have included preregistered exploratory tests of gender moderation and additional robustness checks (e.g., covarying for network-based and demographic variables, moderating by organizational and relative status). Few univariate outliers emerged (<1% of cases; none for degree or density network variables) so raw variables were retained for the reported models, but winsorized analyses yield the same pattern of results.

**Sample characteristics.** Leaders within 9 STEM organizations (ranging from government research institutes to “big five” tech companies) emailed our survey to full-time employees working in STEM (i.e., not administrative) roles. Initially, 1,325 respondents completed at least one-third of the survey (response rate = 29%). Excluding 12 persons of unknown gender, plus preregistered data-dependent exclusions (29 multivariate outliers, 37 negative person-total correlations), yielded a sample of 1,247. Most participants worked in Science/R&D (46%), Tech/Software (23%), public sector engineering (19%), or Energy/Mining (12%), and held a bachelor's (40%) or higher (47%) degree. (Fewer than 2% of participants had not trained as a scientist or engineer; excluding these 22 individuals did not alter reported results.) Official employee counts and gender breakdowns were not available from these organizations, but participants reported, on average, that 24% of scientists and engineers in their organizations were women. Relative to the women, men were slightly older (by < 5 years), had worked for longer in their fields (~ 3 years) and organizations (~1 year), earned higher incomes (< \$10,000), and reported slightly higher status on a 7-rung MacArthur ladder (1) within their organizations (< 1 rung).

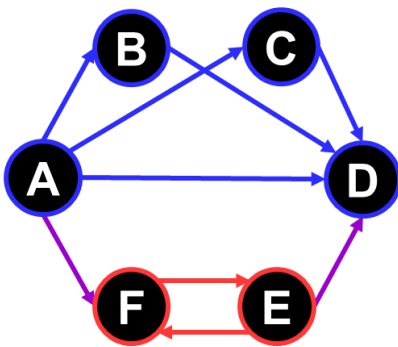
**BIAT stimuli and procedure.** Using established procedures (2), in each trial two focal categories (“Science” or “Engineering” and either “Male” or “Female”) remained at the top of the screen, with a stimulus word appearing below from one of 4 categories: science / engineering (*testing, math, design, technology*), family (*children, spouse, marriage, parent*), male names (*Ben, Paul, John, Daniel*), or female names (*Julia, Anna, Emily, Michelle*). Participants indicated whether the stimulus word was included in (keypress = “I”) or excluded from (“E”) the two categories listed above. After errors, an “X” displayed until the correct key was pressed. After two 12-trial practice blocks came four 20-trial critical blocks (alternating “male” and “female” as the focal category). This 4-block scoring format eliminated order effects in prior testing. *D* scores were computed using the recommended scoring algorithm (3), with positive values indicating stereotypic associations (science / engineering & male) and negative values, counter-stereotypic associations (science / engineering & female).

**Computation of social network metrics.** We assessed gender-related social network properties with two types of indices: density and centrality. Following prior intergroup research (4), we computed cross-group (in this case, cross-gender) density by summing the number of reported ties between men and women and dividing by the number of cross-gender ties that were possible, given the

number of men and women (including the participant) listed. For example, in a team with 4 men and 2 women, 16 cross-gender ties are possible (8 from men to women + 8 from women to men). To test the specificity of associations with cross-gender density, we covaried for same-gender density, rather than rely on comparisons with overall density (4), a metric that subsumes cross-gender density.

Our key metric of gender-specific workplace centrality was the number of ties (vs. non-ties) between the participant and all listed teammates, disaggregated into outdegree (ties *from* participants toward teammates) and indegree (ties from teammates *toward* participants). This method of computing distinct metrics based on tie directionality (i.e., inward vs. outward ties) is commonly used in the social network literature (5, 6). Following prior work computing network metrics for relationships between demographic subgroups (4, 7), here we extend standard degree measures to examine gender dynamics. Specifically, we computed gendered out- and indegree by separately summing each participant's number of reported outbound or inbound ties involving same- or different-gender teammates, then dividing each sum by the number of possible such ties. Each of these four normalized centrality metrics (same-gender outdegree, cross-gender outdegree, same-gender indegree, cross-gender indegree) thus ranges from 0 (no ties) to 1 (all possible ties). For example, a male participant who seeks out half of his female teammates and all his male teammates for informal socializing has a cross-gender outdegree of 0.5 and a same-gender outdegree of 1.0 (see Member A in Figure S1). This cross-gender indegree metric integrates our preregistered predictions that better outcomes for women would be linked to more (positive) cross-gender social ties within their team *and* higher personal centrality (i.e., indegree).

Notably, because they reflect proportions (observed divided by possible ties), density and normalized centrality metrics are unrelated to the size of participants' teams or gender subgroups. Additionally, if no ties were possible (i.e., a team with only men has no possible cross-gender ties), metrics had a denominator of 0 and were therefore undefined. Parallel density and in- or outdegree metrics were computed for respect ties, which are used as covariates to isolate effects specific to social inclusion, and tested separately in this SI Appendix.



Member	Density		Outdegree		Indegree	
	C-G	S-G	C-G	S-G	C-G	S-G
A	0.13	0.50	0.50	1.00	0.00	0.00
B	0.13	0.50	0.00	0.33	0.00	0.33
C	0.13	0.50	0.00	0.33	0.00	0.33
D	0.13	0.50	0.00	0.00	0.50	1.00
E	0.13	0.50	0.25	1.00	0.00	1.00
F	0.13	0.50	0.00	1.00	0.25	1.00

**Figure S1. Illustrative team network structure and metrics.** Ties between members indicated with 3 cross-gender (C-G) and 3 same-gender (S-G) social network indices. Red denotes female team members (E, F) and female-to-female ties; blue, male team members (A, B, C, D) and male-to-male ties; and purple, cross-gender ties. Arrows indicate the direction of each tie.

**Workplace outcomes.** Details of workplace outcome measures can be seen in Table S1.

Measure	Items	$\alpha$
Organizational commitment <sup>a</sup>	[...] please rate your agreement with each statement using the scale below. 1. I would be very happy to spend the rest of my career with this organization. 2. I really feel as if this organization's problems are my own. 3. I do not feel "emotionally attached" to this organization. (R) 4. I will probably look for a new job in the next year. (R) 5. I will likely actively look for a new job in the next year. (R) 6. I often think about quitting. (R)	.84
Meaningful work <sup>a</sup>	[...] please rate your agreement with each statement using the scale below. 1. I feel inspired at work. 2. What we do is worthwhile. 3. The vision we collectively work towards inspires me.	.84
Workplace efficacy <sup>a</sup>	Please rate your agreement with the following statements using the scale below. 1. Whatever comes my way in my job, I can usually handle it. 2. My past experiences in [Specific Field] have prepared me well to pursue my career aspirations. 3. I feel prepared for most of the demands in my job.	.80
Social fit <sup>a</sup>	Please rate your agreement with the following statements using the scale below. 1. I feel I do NOT fit in with other people from [Specific Field]. (R) 2. I feel connected to people who work in [Specific Field]. 3. I generally feel that other people in [Specific Field] accept me for who I am.	.80
Supportive workplace <sup>a</sup>	Please rate your agreement with the following statements using the scale below. 1. My manager supports me in meeting my work and life commitments. 2. My manager genuinely cares about my wellbeing. 3. I feel safe expressing my personal beliefs or values at [Company Name]. 4. I believe the performance review process at [Company Name] is fair. 5. I believe the promotion practices at [Company Name] are fair. 6. [Company Name] values my individual contributions. 7. [Company Name] shows very little concern for me. (R) 8. [Company Name] cares about my general satisfaction at work. 9. I know someone in my organization I can confide in if I need support. 10. I sometimes feel isolated at work, without anyone I can go to for help. (R)	.89
Gender-based social identity threat <sup>b</sup>	Please answer the following questions using the scale below. 1. How often do you think that people at work think about your gender when judging you? 2. How often do you worry that people at work will judge you because of what they think of your gender? 3. How often do you worry that people at work will judge your gender because of your behavior? 4. How often do you worry that other people at work of your gender will act in ways that confirm gender stereotypes?	.87

**Table S1. Full details for scale-based workplace outcome measures.** <sup>a</sup> Measured from 1 (*Strongly Disagree*) to 7 (*Strongly Agree*). <sup>b</sup> Measured from 1 (*Never*) to 7 (*Always*).

## Supplemental Results

**Cell sizes and means by gender for primary and secondary variables.** Descriptive statistics are in Table S2 and zero-order correlations in Table S3, reported separately by gender.

Parameters	Male participants		Female participants		Difference <i>d</i>
	<i>n</i>	<i>M (SD)</i>	<i>n</i>	<i>M (SD)</i>	
<b>Primary measures</b>					
Implicit STEM = male associations	719	0.24 (0.39)	332	0.12 (0.39)	0.30***
Cross-gender social outdegree	480	0.54 (0.46)	353	0.48 (0.39)	0.14*
Cross-gender social indegree	484	0.54 (0.46)	360	0.48 (0.39)	0.14*
Social fit	861	5.56 (1.05)	385	5.42 (1.20)	0.13*
Workplace engagement	860	5.26 (1.06)	381	5.14 (1.10)	0.11†
Self-efficacy	862	5.91 (0.82)	384	5.79 (0.92)	0.14*
Social identity threat	819	1.93 (1.08)	366	3.24 (1.65)	1.03***
Workplace support	828	5.05 (1.02)	366	4.94 (1.12)	0.11†
<b>Secondary measures</b>					
Proportion women on team	834	0.20 (0.20)	375	0.32 (0.25)	0.57***
Cross-gender social density	491	0.34 (0.31)	363	0.39 (0.33)	0.14*
Same-gender social density	826	0.42 (0.30)	369	0.40 (0.30)	0.05
Cross-gender respect density	488	0.66 (0.29)	364	0.66 (0.26)	0.01
Same-gender respect density	823	0.69 (0.25)	368	0.67 (0.26)	0.08
Same-gender social outdegree	806	0.56 (0.36)	283	0.61 (0.42)	0.14†
Same-gender social indegree	820	0.56 (0.36)	286	0.60 (0.42)	0.11†
Cross-gender respect outdegree	479	0.78 (0.37)	352	0.76 (0.30)	0.06
Same-gender respect outdegree	807	0.81 (0.26)	282	0.76 (0.35)	0.18*
Cross-gender respect indegree	480	0.72 (0.41)	358	0.64 (0.37)	0.22**
Same-gender respect indegree	816	0.70 (0.36)	284	0.70 (0.40)	0.01
Organizational commitment	860	5.19 (1.20)	380	5.00 (1.28)	0.15*
Meaningful work	859	5.33 (1.16)	381	5.27 (1.16)	0.05

**Table S2. Descriptive means by participant gender for primary and secondary measures.** Cell sizes and descriptive means by participant gender, with tests of gender differences (Cohen's *d*). Organizational commitment and meaningful work are subscales of workplace engagement (combined in the main text). †  $p < 0.10$ ; \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$

	Variables							
	1	2	3	4	5	6	7	8
<b>(a) Primary variables</b>								
1. Implicit stereotypes		-0.09 <sup>†</sup>	-0.08	0.07 <sup>†</sup>	0.04	-0.02	0.01	0.06
2. C-G social outdegree	-0.02		0.89 <sup>***</sup>	0.05	0.07	0.01	-0.03	0.14 <sup>**</sup>
3. C-G social indegree	-0.03	0.91 <sup>***</sup>		0.10 <sup>*</sup>	0.10 <sup>†</sup>	0.04	-0.04	0.16 <sup>***</sup>
4. Social fit	-0.03	0.26 <sup>***</sup>	0.29 <sup>***</sup>		0.40 <sup>***</sup>	0.38 <sup>***</sup>	-0.20 <sup>***</sup>	0.37 <sup>***</sup>
5. Workplace engagement	-0.08	0.24 <sup>***</sup>	0.29 <sup>***</sup>	0.44 <sup>***</sup>		0.37 <sup>***</sup>	-0.19 <sup>***</sup>	0.62 <sup>***</sup>
6. Self-efficacy	-0.02	0.09 <sup>†</sup>	0.15 <sup>**</sup>	0.43 <sup>***</sup>	0.41 <sup>***</sup>		-0.11 <sup>**</sup>	0.25 <sup>***</sup>
7. Social identity threat	-0.02	-0.09 <sup>†</sup>	-0.15 <sup>**</sup>	-0.40 <sup>***</sup>	-0.29 <sup>***</sup>	-0.22 <sup>***</sup>		-0.22 <sup>***</sup>
8. Workplace support	-0.11 <sup>†</sup>	0.26 <sup>***</sup>	0.32 <sup>***</sup>	0.42 <sup>***</sup>	0.64 <sup>***</sup>	0.32 <sup>***</sup>	-0.33 <sup>***</sup>	
<b>(b) Secondary variables (among men)</b>								
9. Prop. women on team	-0.04	-0.01	0.00	-0.07 <sup>†</sup>	-0.06 <sup>†</sup>	-0.03	0.06 <sup>†</sup>	0.01
10. C-G social density	-0.08	0.73 <sup>***</sup>	0.73 <sup>***</sup>	0.13 <sup>**</sup>	0.09 <sup>†</sup>	0.04	-0.10 <sup>*</sup>	0.14 <sup>**</sup>
11. S-G social density	-0.04	0.53 <sup>***</sup>	0.51 <sup>***</sup>	0.14 <sup>***</sup>	0.14 <sup>***</sup>	0.10 <sup>**</sup>	-0.11 <sup>**</sup>	0.15 <sup>***</sup>
12. C-G respect density	-0.04	0.21 <sup>***</sup>	0.20 <sup>***</sup>	0.18 <sup>***</sup>	0.22 <sup>***</sup>	0.21 <sup>***</sup>	-0.19 <sup>***</sup>	0.26 <sup>***</sup>
13. S-G respect density	-0.03	0.13 <sup>**</sup>	0.13 <sup>**</sup>	0.18 <sup>***</sup>	0.27 <sup>***</sup>	0.15 <sup>***</sup>	-0.16 <sup>***</sup>	0.28 <sup>***</sup>
14. S-G social outdegree	-0.05	0.49 <sup>***</sup>	0.47 <sup>***</sup>	0.15 <sup>***</sup>	0.11 <sup>**</sup>	0.10 <sup>**</sup>	-0.07 <sup>*</sup>	0.14 <sup>***</sup>
15. S-G social indegree	-0.02	0.46 <sup>***</sup>	0.49 <sup>***</sup>	0.19 <sup>***</sup>	0.15 <sup>***</sup>	0.14 <sup>***</sup>	-0.05	0.16 <sup>***</sup>
16. C-G respect outdegree	0.06	0.16 <sup>***</sup>	0.14 <sup>**</sup>	0.04	0.16 <sup>***</sup>	0.16 <sup>***</sup>	-0.04	0.20 <sup>***</sup>
17. S-G respect outdegree	-0.03	0.10 <sup>†</sup>	0.07	0.09 <sup>**</sup>	0.24 <sup>***</sup>	0.08 <sup>*</sup>	-0.10 <sup>**</sup>	0.28 <sup>***</sup>
18. C-G respect indegree	-0.01	0.16 <sup>***</sup>	0.18 <sup>***</sup>	0.15 <sup>***</sup>	0.18 <sup>***</sup>	0.25 <sup>***</sup>	-0.05	0.17 <sup>***</sup>
19. S-G respect indegree	-0.02	0.04	0.06	0.22 <sup>***</sup>	0.15 <sup>***</sup>	0.22 <sup>***</sup>	-0.06	0.10 <sup>**</sup>
<b>(c) Secondary variables (among women)</b>								
9. Prop. women on team	0.01	-0.04	-0.01	0.12 <sup>*</sup>	-0.02	0.01	-0.13 <sup>*</sup>	-0.07
10. C-G social density	-0.04	0.87 <sup>***</sup>	0.86 <sup>***</sup>	0.20 <sup>***</sup>	0.25 <sup>***</sup>	0.08	-0.11 <sup>*</sup>	0.26 <sup>***</sup>
11. S-G social density	-0.06	0.55 <sup>***</sup>	0.56 <sup>***</sup>	0.18 <sup>***</sup>	0.15 <sup>**</sup>	0.08	-0.15 <sup>**</sup>	0.17 <sup>**</sup>
12. C-G respect density	-0.09 <sup>†</sup>	0.43 <sup>***</sup>	0.38 <sup>***</sup>	0.29 <sup>***</sup>	0.30 <sup>***</sup>	0.17 <sup>**</sup>	-0.09 <sup>†</sup>	0.32 <sup>***</sup>
13. S-G respect density	-0.05	0.27 <sup>***</sup>	0.25 <sup>***</sup>	0.17 <sup>***</sup>	0.22 <sup>***</sup>	0.09 <sup>†</sup>	-0.11 <sup>*</sup>	0.24 <sup>***</sup>
14. S-G social outdegree	-0.06	0.33 <sup>***</sup>	0.34 <sup>***</sup>	0.22 <sup>***</sup>	0.08	0.08	-0.09	0.20 <sup>***</sup>
15. S-G social indegree	-0.04	0.28 <sup>***</sup>	0.32 <sup>***</sup>	0.16 <sup>**</sup>	0.07	0.05	-0.11 <sup>†</sup>	0.19 <sup>**</sup>
16. C-G respect outdegree	-0.07	0.30 <sup>***</sup>	0.26 <sup>***</sup>	0.16 <sup>**</sup>	0.24 <sup>***</sup>	0.03	-0.04	0.29 <sup>***</sup>
17. S-G respect outdegree	-0.05	0.15 <sup>*</sup>	0.12 <sup>*</sup>	0.18 <sup>**</sup>	0.22 <sup>***</sup>	0.06	-0.07	0.25 <sup>***</sup>
18. C-G respect indegree	-0.10 <sup>†</sup>	0.30 <sup>***</sup>	0.31 <sup>***</sup>	0.37 <sup>***</sup>	0.22 <sup>***</sup>	0.34 <sup>***</sup>	-0.11 <sup>*</sup>	0.20 <sup>***</sup>
19. S-G respect indegree	0.01	0.16 <sup>**</sup>	0.15 <sup>*</sup>	0.28 <sup>***</sup>	0.14 <sup>*</sup>	0.27 <sup>***</sup>	-0.13 <sup>*</sup>	0.15 <sup>*</sup>

**Table S3. Zero-order correlations among primary and secondary variables by participant gender.** Panel (a) reports correlations among primary variables for men above the diagonal and for women below the diagonal. Correlations of secondary to primary variables are provided for men in Panel (b) and women in Panel (c). C-G denotes cross-gender and S-G denotes same-gender variables. <sup>†</sup>  $p < 0.10$ ; \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ .

**Part 1: Implicit stereotyping and social versus respect cross-gender outdegree.** Full mixed factorial model of tie type (social vs. respect, as a repeated measure), implicit stereotyping (continuous BIAT d score), and participant gender predicting cross-gender outdegree are reported in Table S4. Simple effects are reported in the main text.

Parameter	$F(1, 695)$	$p$
Implicit STEM = male association	0.90	0.343
Participant gender	4.11	0.043
Outdegree tie type	0.07	0.791
Implicit association x gender	0.05	0.817
Implicit association x tie type	2.11	0.147
Gender x tie type	0.17	0.682
Implicit association x gender x tie type	4.58	0.033
Implicit association x tie type for men	7.59	0.006
Implicit association x tie type for women	0.21	0.650

**Table S4. Mixed model linking implicit stereotyping to ties with (cross- or same- gender) teammates, for social and respect networks.** Exploratory mixed factorial general linear model testing whether cross-gender social versus respect ties from male versus female participants to their teammates are differentially linked to their implicit STEM = male associations.

**Part 2: Team gender composition and workplace outcomes.** The impact of team gender composition on women's key outcomes was tested using the proportion of women on each team as a predictor. Team gender composition was associated with 2 outcomes for women (in the hypothesized direction): Working on more numerically male-dominated teams was linked to women's higher social identity threat and lower social fit,  $ps < 0.010$ , but not other outcomes,  $ps > 0.138$ . Moreover, gender differences emerged for only social identity threat and social fit,  $ps < 0.002$  (see Table S5 for full results). Proportion of female teammates was the only reported variable with significant non-independence across organizations (ICC = 0.10,  $p = 0.050$ ), but parallel models with this variable re-centered to reflect individuals' deviations from their organization's mean confirmed the same pattern of results.

Model	Workplace engagement	Social identity threat	Self-efficacy	Social fit	Workplace support
Gender composition model					
Participant gender	-0.05	0.70***	-0.06*	-0.09*	-0.05
Proportion female	-0.21	-0.26	-0.04	0.12	-0.14
<b><i>Proportion female x gender</i></b>	<b>0.11</b>	<b>-0.57***</b>	<b>0.09</b>	<b>0.46**</b>	<b>-0.18</b>
<b>Prop. female for women</b>	<b>-0.10</b>	<b>-0.83**</b>	<b>0.04</b>	<b>0.57**</b>	<b>-0.32</b>
Prop. female for men	-0.32†	0.31	-0.13	-0.34†	0.05
C-G density basic model					
Participant gender	-0.05	0.65***	-0.04	-0.04	-0.06†
C-G density	0.58***	-0.45**	0.17†	0.59***	0.66***
<b><i>C-G density x gender</i></b>	<b>0.27*</b>	<b>-0.09</b>	<b>0.05</b>	<b>0.15</b>	<b>0.21†</b>
<b>C-G density for women</b>	<b>0.84***</b>	<b>-0.55*</b>	<b>0.23</b>	<b>0.74***</b>	<b>0.87***</b>
C-G density for men	0.31†	-0.36†	0.12	0.44**	0.45**
C-G density full model					
Participant gender	-0.05	0.64***	-0.03	-0.03	-0.06†
S-G density	0.30†	-0.37†	0.28*	0.45**	0.14
C-G density	0.39*	-0.24	0.00	0.30†	0.57***
<b><i>C-G density x gender</i></b>	<b>0.29*</b>	<b>-0.13</b>	<b>0.07</b>	<b>0.17</b>	<b>0.22†</b>
<b>C-G density for women</b>	<b>0.68***</b>	<b>-0.37</b>	<b>0.08</b>	<b>0.48*</b>	<b>0.79***</b>
C-G density for men	0.10	-0.11	-0.07	0.13	0.36†

**Table S5. Regression coefficients for team-level social network indices predicting workplace outcomes.** Estimates come from regressing each outcome on proportion of female teammates or cross-gender (C-G) social density, including participant gender and noted interactions, with corresponding exploratory tests of moderation italicized. The full model covaries for same-gender (S-G) social density. Boldface indicates preregistered predictions. Indented lines indicate follow-up tests of simple effects. †  $p < 0.10$ ; \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$

**Part 2: Demographic and network controls.** Controlling for various demographic covariates (e.g., years or status in the organization; see Table S6) and network covariates (e.g., same-gender social and respect indegree; see Table S7) within our most conservative model allowed us to address potential confounds. Cross-gender social indegree was associated with significantly better workplace outcomes for women on all measures except efficacy, and this relationship was consistently moderated by gender, reflecting weaker or null corollary effects for men.

	Covariate							
	None	Eng. vs. sci.	Org. status	Years org.	Years field	Age bracket	Income bracket	Women at site
<b>Workplace engagement</b>								
Participant gender	-0.02	-0.02	0.02	0.00	0.02	0.02	0.01	-0.01
Covariate	—	0.00	0.15***	0.01*	0.02***	0.09***	0.07*	-0.36
C-G indegree	0.53***	0.53***	0.51***	0.52***	0.53***	0.53***	0.53***	0.53***
<b><i>C-G indegree x gender</i></b>	<b>0.29**</b>	<b>0.29**</b>	<b>0.30**</b>	<b>0.31**</b>	<b>0.30**</b>	<b>0.31**</b>	<b>0.29**</b>	<b>0.32*</b>
<b>C-G for women</b>	<b>0.81***</b>	<b>0.81***</b>	<b>0.81***</b>	<b>0.83***</b>	<b>0.83***</b>	<b>0.84***</b>	<b>0.82***</b>	<b>0.85***</b>
C-G for men	0.24*	0.24*	0.21†	0.21†	0.22†	0.22†	0.24†	0.22†
<b>Social identity threat</b>								
Participant gender	0.63***	0.63***	0.63***	0.62***	0.61***	0.62***	0.60***	0.64***
Covariate	—	0.00	0.00	-0.01*	-0.01*	-0.07**	0.10**	-0.66*
C-G indegree	-0.35**	-0.35**	-0.34**	-0.37**	-0.36**	-0.34**	-0.32*	-0.38*
<b><i>C-G indegree x gender</i></b>	<b>-0.26*</b>	<b>-0.26*</b>	<b>-0.25*</b>	<b>-0.27*</b>	<b>-0.26*</b>	<b>-0.28*</b>	<b>-0.19</b>	<b>-0.28*</b>
<b>C-G for women</b>	<b>-0.61**</b>	<b>-0.61**</b>	<b>-0.60**</b>	<b>-0.63**</b>	<b>-0.62**</b>	<b>-0.62**</b>	<b>-0.50*</b>	<b>-0.67***</b>
C-G for men	-0.09	-0.09	-0.09	-0.10	-0.10	-0.06	-0.13	-0.10
<b>Self-efficacy</b>								
Participant gender	-0.04	-0.04	-0.01	-0.04	-0.02	-0.02	-0.03	-0.04
Covariate	—	0.01	0.12***	0.01†	0.01***	0.05***	0.08***	0.09
C-G indegree	0.22**	0.21**	0.22**	0.22**	0.22**	0.22**	0.21*	0.24*
<b><i>C-G indegree x gender</i></b>	<b>0.14†</b>	<b>0.14†</b>	<b>0.11</b>	<b>0.13†</b>	<b>0.13†</b>	<b>0.11</b>	<b>0.13</b>	<b>0.14†</b>
<b>C-G for women</b>	<b>0.35**</b>	<b>0.35**</b>	<b>0.33**</b>	<b>0.36**</b>	<b>0.35**</b>	<b>0.34**</b>	<b>0.33*</b>	<b>0.37*</b>
C-G for men	0.08	0.08	0.11	0.09	0.09	0.11	0.08	0.10
<b>Social fit</b>								
Participant gender	-0.01	-0.01	0.02	0.00	0.02	0.02	0.02	-0.03
Covariate	—	0.04	0.14***	0.02***	0.02***	0.09***	0.05	0.43†
C-G indegree	0.56***	0.56***	0.59***	0.60***	0.61***	0.62***	0.62***	0.64***
<b><i>C-G indegree x gender</i></b>	<b>0.33***</b>	<b>0.32***</b>	<b>0.35***</b>	<b>0.35***</b>	<b>0.34***</b>	<b>0.34***</b>	<b>0.32**</b>	<b>0.36***</b>
<b>C-G for women</b>	<b>0.89***</b>	<b>0.88***</b>	<b>0.94***</b>	<b>0.95***</b>	<b>0.95***</b>	<b>0.96***</b>	<b>0.95***</b>	<b>0.99***</b>
C-G for men	0.24*	0.24*	0.24*	0.26*	0.27*	0.27*	0.30*	0.28*
<b>Workplace support</b>								
Participant gender	-0.03	-0.02	-0.03	-0.05	-0.06	-0.06	-0.04	-0.05
Covariate	—	-0.11**	0.07**	-0.01**	-0.01†	-0.04*	0.04	-0.40†
C-G indegree	0.64***	0.65***	0.63***	0.64***	0.66***	0.66***	0.65***	0.66***
<b><i>C-G indegree x gender</i></b>	<b>0.28**</b>	<b>0.29***</b>	<b>0.28**</b>	<b>0.28**</b>	<b>0.28**</b>	<b>0.27**</b>	<b>0.24*</b>	<b>0.28*</b>
<b>C-G for women</b>	<b>0.92***</b>	<b>0.94***</b>	<b>0.91***</b>	<b>0.92***</b>	<b>0.94***</b>	<b>0.94***</b>	<b>0.88***</b>	<b>0.94***</b>
C-G for men	0.36***	0.35***	0.36***	0.36***	0.38***	0.39***	0.41***	0.39***

**Table S6. Regression coefficients for cross-gender inclusion on workplace outcomes: Demographic controls.** Estimates come from regressing each outcome on C-G (cross-gender) social indegree, including participant gender, and noted interactions, covarying (separately) for participants' field ("Eng." = engineering, coded -1; "Sci." = science, coded 1), status within their organization ("Org."), years worked in their current organization and field, age bracket, income bracket, and estimated proportion of women scientists/engineers at participants' local work site. Indented lines indicate follow-up tests of simple effects. Bolded effects were preregistered predictions for women, with corresponding exploratory tests of moderation italicized. †  $p < 0.10$ ; \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ .

	Covariate			
	None	S-G social indegree	C-G social outdegree	C-G respect indegree
<b>Workplace engagement</b>				
Participant gender	-0.02	-0.04	-0.03	-0.01
Covariate	—	0.16	-0.22	0.43***
C-G social indegree	0.53***	0.49***	0.73***	0.44***
<b>C-G social indegree x gender</b>	<b>0.29**</b>	<b>0.31**</b>	<b>0.31***</b>	<b>0.26**</b>
<b>C-G social indegree for women</b>	<b>0.81***</b>	<b>0.80***</b>	<b>1.05***</b>	<b>0.71***</b>
C-G social indegree for men	0.24*	0.18	0.42*	0.18
<b>Social identity threat</b>				
Participant gender	0.63***	0.60***	0.63***	0.62***
Covariate	—	-0.07	0.31	-0.14
C-G social indegree	-0.35**	-0.37**	-0.62*	-0.33**
<b>C-G social indegree x gender</b>	<b>-0.26*</b>	<b>-0.31*</b>	<b>-0.25*</b>	<b>-0.24*</b>
<b>C-G social indegree for women</b>	<b>-0.61**</b>	<b>-0.68***</b>	<b>-0.87**</b>	<b>-0.57**</b>
C-G social indegree for men	-0.09	-0.07	-0.36	-0.09
<b>Self-efficacy</b>				
Participant gender	-0.04	-0.04	-0.05	-0.02
Covariate	—	0.19*	-0.37*	0.60***
C-G social indegree	0.22**	0.12	0.55***	0.08
<b>C-G social indegree x gender</b>	<b>0.14†</b>	<b>0.12</b>	<b>0.14†</b>	<b>0.10</b>
<b>C-G social indegree for women</b>	<b>0.35**</b>	<b>0.24†</b>	<b>0.69***</b>	<b>0.18</b>
C-G social indegree for men	0.08	0.00	0.40*	-0.01
<b>Social fit</b>				
Participant gender	-0.01	0.02	-0.01	0.02
Covariate	—	0.41***	-0.33	0.60***
C-G social indegree	0.56***	0.44***	0.85***	0.43***
<b>C-G social indegree x gender</b>	<b>0.33***</b>	<b>0.36***</b>	<b>0.34***</b>	<b>0.27**</b>
<b>C-G social indegree for women</b>	<b>0.89***</b>	<b>0.81***</b>	<b>1.19***</b>	<b>0.69***</b>
C-G social indegree for men	0.24*	0.08	0.52*	0.16
<b>Workplace support</b>				
Participant gender	-0.03	-0.04	-0.03	-0.01
Covariate	—	0.26*	-0.12	0.33***
C-G social indegree	0.64***	0.58***	0.75***	0.57***
<b>C-G social indegree x gender</b>	<b>0.28**</b>	<b>0.32***</b>	<b>0.29**</b>	<b>0.25**</b>
<b>C-G social indegree for women</b>	<b>0.92***</b>	<b>0.90***</b>	<b>1.04***</b>	<b>0.82***</b>
C-G social indegree for men	0.36***	0.26*	0.46*	0.32**

**Table S7. Regression coefficients for cross-gender inclusion on workplace outcomes: Network controls.** Estimates come from regressing each outcome on cross-gender social ties from teammates (C-G social indegree), covarying (separately) for *same-gender* social ties from teammates (S-G social indegree), cross-gender social ties *to* teammates (C-G social outdegree), or cross-gender *respect* ties from teammates (C-G respect indegree), in columns 2-4, respectively; with participant gender and noted interactions. Boldface indicates preregistered predictions, with corresponding exploratory tests of moderation italicized. Indented lines indicate follow-up tests of simple effects. †  $p < 0.10$ ; \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ .

**Moderation by own and teammate status.** Moderating our core models by status (participant status or an aggregate of relative status of different-gender teammates compared to the participant) allowed us to address potential status-related constraints on cross-gender ties. Relative status was collected via participants rating each teammate as -1 (*lower*), 0 (*equal*) or +1 (*higher*) than themselves in the workplace hierarchy. Our key Part 1 and Part 2 effects persisted: Men's implicit biases were still linked with lower outgoing cross-gender ties (Table S8), and women's experiences of cross-gender exclusion were still associated with negative workplace outcomes (Table S9). Moreover, although participants' own higher status was associated with more positive workplace outcomes, status (regardless of type) failed to interact with participant gender to predict our key effects. These results suggest that the observed gender-specific effects do not reflect a confounding influence of gender differences in status that could constrain men's ability to socialize with women in their network.



Parameter	Participant status	Teammate relative status
Participant gender	-0.04*	-0.04
C-G respect outdegree	0.26***	0.26***
Implicit stereotypes	-0.07	-0.09†
Implicit stereotypes x gender	0.06	0.05
<b>Implicit stereotypes for men</b>	<b>-0.12*</b>	<b>-0.14*</b>
Implicit stereotypes for women	-0.01	-0.05
Status	0.01	0.01
Implicit stereotypes x status	-0.02	0.02
Gender x status	0.00	-0.02
<i>Implicit stereotypes x status x gender</i>	<i>0.02</i>	<i>0.01</i>

**Table S8. Regression coefficients for implicit stereotypes on cross-gender (C-G) social outdegree, moderated by status.** Estimates come from regressing cross-gender social outdegree on status (participant status or cross-gender teammate relative status), participant implicit stereotyping, participant gender and noted interactions (covarying for cross-gender respect outdegree). Italics indicate tests of status moderation, with key effects bolded. Indented lines indicate follow-up tests of simple effects. †  $p < 0.10$ ; \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ .

	Workplace engagement	Social identity threat	Self-efficacy	Social fit	Workplace support
Moderation by participant status					
Participant gender	0.02	0.62***	0.00	0.03	-0.03
C-G indegree	0.52***	-0.34**	0.21**	0.56***	0.64***
<b>C-G indegree x gender</b>	<b>0.30**</b>	<b>-0.23†</b>	<b>0.10</b>	<b>0.32**</b>	<b>0.28**</b>
<b>C-G indegree for women</b>	<b>0.82***</b>	<b>-0.57**</b>	<b>0.31*</b>	<b>0.87***</b>	<b>0.92***</b>
C-G indegree for men	0.21†	-0.11	0.11	0.24*	0.37***
Status	0.15***	-0.01	0.14***	0.14***	0.07**
C-G indegree x status	0.03	0.10	-0.06	-0.12†	-0.01
Gender x status	0.01	-0.06	0.06**	0.04	0.01
<i>C-G indegree x status x gender</i>	<i>0.04</i>	<i>-0.02</i>	<i>0.01</i>	<i>-0.13†</i>	<i>0.04</i>
Moderation by teammates' relative status					
Participant gender	-0.05	0.61***	-0.05	-0.01	-0.04
C-G indegree	0.58***	-0.47***	0.23*	0.58***	0.63***
<b>C-G indegree x gender</b>	<b>0.23*</b>	<b>-0.34*</b>	<b>0.21*</b>	<b>0.45***</b>	<b>0.22*</b>
<b>C-G indegree for women</b>	<b>0.81***</b>	<b>-0.81***</b>	<b>0.44**</b>	<b>1.03***</b>	<b>0.85***</b>
C-G indegree for men	0.35**	-0.13	0.03	0.13	0.41**
Status	0.00	-0.07	0.09	0.14*	0.00
C-G indegree x status	0.01	-0.26	0.19	0.29†	0.16
Gender x status	0.16*	-0.10	0.05	-0.02	0.13†
<i>C-G indegree x status x gender</i>	<i>0.07</i>	<i>-0.12</i>	<i>-0.03</i>	<i>0.10</i>	<i>0.31†</i>

**Table S9. Regression coefficients for cross-gender (C-G) social indegree on career outcomes, moderated by status.** Estimates come from regressing each dependent variable on status (participants' own status within their organization or the relative status of their different-gender teammates), cross-gender social indegree, participant gender, and noted interactions. Italics indicate tests of status moderation, with key effects bolded. Indented lines indicate follow-up tests of simple effects. †  $p < 0.10$ ; \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ .

**Multi-level models.** To account for potential interdependence of responses within organizations (despite non-significant ICCs), we also ran our core analyses using multi-level models (MLMs), including random intercepts for each organization (which account for systematic within-organization clustering on the dependent variable). MLM results replicated the GLMs previously reported (see Table S10). Regarding Part 1 findings, men's implicit stereotypes again correlated with their social exclusion of women (i.e., lower cross-gender outdegree),  $b = -0.12$ ,  $p = 0.028$ , and the gender moderation was again non-significant,  $b = 0.06$ ,  $p = 0.151$ . MLMs also yielded convergent evidence for our Part 2 findings: Receiving more cross-gender social ties was associated with increased engagement, self-efficacy, social fit, and workplace support, as well as reduced identity threat for women; these relationships were significantly or marginally (for self-efficacy) attenuated for men relative to women.

Parameter	Workplace engagement	Social identity threat	Self-efficacy	Social fit	Workplace support
Participant gender	-0.01	0.62***	-0.04	-0.01	-0.01
C-G social indegree	0.50***	-0.37**	0.21**	0.55***	0.68***
<b><i>C-G social indegree x gender</i></b>	<b><i>0.28**</i></b>	<b><i>-0.25*</i></b>	<b><i>0.14†</i></b>	<b><i>0.32***</i></b>	<b><i>0.26**</i></b>
<b>C-G social indegree for women</b>	<b>0.78***</b>	<b>-0.61***</b>	<b>0.35**</b>	<b>0.88***</b>	<b>0.94***</b>
C-G social indegree for men	0.22*	-0.12	0.07	0.23*	0.42***

**Table S10. Regression coefficients for cross-gender inclusion on workplace outcomes: Multi-level models.** Estimates come from regressing each outcome on C-G (cross-gender) social indegree, including participant gender and noted interactions, and random effects accounting for organization-level intercepts. Indented lines indicate follow-up tests of simple effects. Bolded effects were preregistered predictions for women, with corresponding exploratory tests of moderation italicized. †  $p < 0.10$ ; \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ .

**Specificity of social (vs. respect) ties.** The established pattern of results linking cross-gender social ties both to men’s implicit stereotypes and women’s workplace outcomes is specific to *social* ties (see Table 1), not respect ties (see Part 1 robustness checks in the main text and Table S11 below). As previously reported, men’s implicit gender stereotypes were unrelated to their respect for female colleagues,  $p = 0.194$ ,  $d = 0.10$ . Further, although receiving more male teammates’ respect was linked to positive workplace outcomes for women, men also benefited from receiving respect from more female peers. In models testing the impact of cross-gender respect indegree on workplace outcomes, cross-gender respect positively predicted all 5 variables, with participant gender emerging as a moderator only twice, for self-efficacy and fit. For example, efficacy—the only variable showing descriptively stronger moderation by gender of cross-gender respect (vs. social) indegree—receiving more cross-gender respect ties was significantly linked to greater efficacy for both men and women across both models, whereas the link between efficacy and cross-gender social ties (though smaller in magnitude) emerged only among women. Cross-gender respect was generally linked to better workplace outcomes for both men and women, like a “tide that lifts all boats,” whereas cross-gender social inclusion more specifically benefited women.

Model	Max. <i>n</i>	Workplace engagement	Social identity threat	Self-efficacy	Social fit	Workplace support
<b>Basic Model</b>						
Participant gender	838	-0.01	0.63***	-0.01	0.01	-0.03
C-G indegree	838	0.57***	-0.30*	0.68***	0.79***	0.51***
C-G indegree x gender	838	0.08	-0.17	0.17*	0.40***	0.09
C-G indegree for women	358	0.65***	-0.47*	0.85***	1.19***	0.59***
C-G indegree for men	480	0.49***	-0.12	0.51***	0.39**	0.42***
<b>Full Model</b>						
Participant gender	755	-0.05	0.61***	-0.02	0.03	-0.05
S-G indegree	755	0.23†	-0.25†	0.35***	0.54***	0.09
C-G indegree	755	0.53***	-0.17	0.52***	0.53***	0.52***
C-G indegree x gender	755	0.15	-0.16	0.17*	0.38***	0.14
C-G indegree for women	275	0.68***	-0.32	0.70***	0.91***	0.66***
C-G indegree for men	480	0.39**	-0.01	0.35***	0.16	0.38**

**Table S11. Regression coefficients for cross-gender respect indegree on workplace outcomes.** Unstandardized estimates come from regressing each outcome on cross-gender (C-G) respect indegree, including participant gender and noted interactions. Indented lines indicate follow-up tests of simple effects. †  $p < 0.10$ ; \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ .

## SI References

1. N. E. Adler, E. S. Epel, G. Castellazzo, J. R. Ickovics, Relationship of subjective and objective social status with psychological and physiological functioning: preliminary data in healthy white women. *Health Psychol. Off. J. Div. Health Psychol. Am. Psychol. Assoc.* **19**, 586–592 (2000).
2. K. Block, W. M. Hall, T. Schmader, M. Inness, E. Croft, Should I stay or should I go? Women's implicit stereotypic associations predict their commitment and fit in STEM. *Soc. Psychol.* **49**, 243–251 (2018).
3. B. A. Nosek, Y. Bar-Anan, N. Sriram, J. Axt, A. G. Greenwald, Understanding and using the brief implicit association test: Recommended scoring procedures. *PloS One* **9**, e110938 (2014).
4. T. H. Stark, The density of social networks moderates effects of intergroup contact. *Int. J. Intercult. Relat.* **55**, 133–147 (2016).
5. S. Borgatti, Cultural Domain Analysis. *J Quant Anthr. Kluwer Acad Publ.* **4**, 261–278 (1994).
6. W. Zhang, X. Wang, D. Zhao, X. Tang, Graph degree linkage: Agglomerative clustering on a directed graph. *Proc. Eur. Conf. Comput. Vis. ECCV* (2012) (May 28, 2021).
7. L. Repke, V. Benet-Martínez, The (diverse) company you keep: Content and structure of immigrants' social networks as a window into intercultural relations in Catalonia. *J. Cross-Cult. Psychol.* **49**, 924–944 (2018).