RISE Workplace Culture Survey

Results Across Organizations

December 2018

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ENGENDERING SUCCESS IN STEM

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Executive Summary

How Do We Begin to Understand the Culture of a Workplace?

The 2018 RISE Workplace Culture Survey assessed the culture experienced by female and male scientists and engineers across nine Canadian organizations. Our goal was to dissect organizational culture at three distinct but interconnected levels:

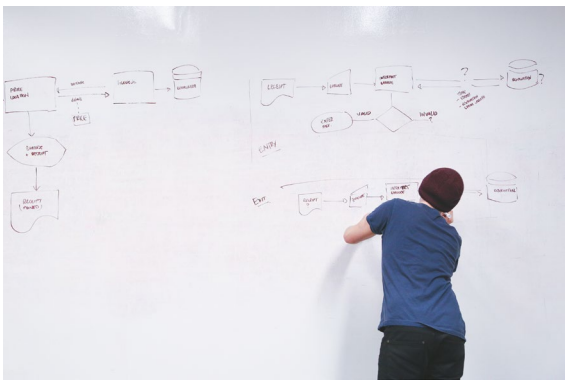
- institutional policies and practices,
- interpersonal relationships among colleagues, and
- individual beliefs and biases of men and women in the workplace.

How do each of these levels help us to understand possible gender gaps between the experiences of women and men in science and engineering?

Are There Gender Differences in Women's and Men's Engagement?

- Women report lower fit and commitment than do men in engineering, but not in science.
- Similarly, women report feeling judged by their gender (i.e., greater social identity threat) especially in engineering.
- Social identity threat and fit more strongly predict organizational commitment for women than for men.

How Does Culture Help Us Understand These Gender Gaps?



Culture Matters at the Institutional Level

- The gender gap in social identity threat narrows among those who report greater awareness of gender-inclusive policies and practices at their organization.
- Both men and women feel more committed to gender-inclusive organizations.

Culture also Matters as Biases in the Minds of Individuals

- Both men and women have an implicit "think STEM, think male" bias.
- This implicit bias is present but weaker for women, especially those in science.
- People with stronger implicit biases socialize less with their female colleagues.

Culture Matters Most in How Individuals Interact with One Another

- Respect from male allies is an important predictor of women's organizational commitment.
- Women experience less identity threat when they perceive male allies and respect from men.
- Both men and women want to be allies to women in STEM, but need more training.

Can These Findings Provide a Roadmap for Changing Culture?

Because culture is multifaceted, changing it can be a challenging, complex process.

Change requires institutional policies that promote inclusive norms of behaviour and evidence-based education about the nature of individual biases and how to counteract them. Critically, however, change also requires active efforts to promote respectful interactions among women and men in the workplace. When women's expertise and contributions are appreciated, their engagement typically equals that of men.

Sample Characteristics

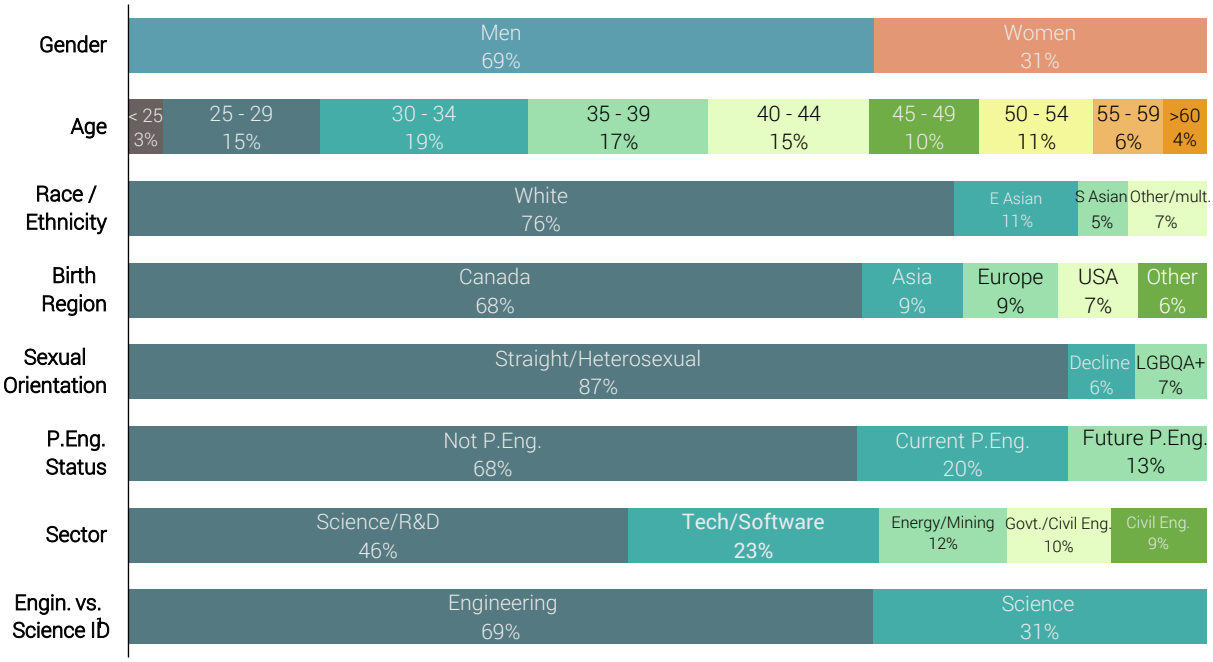
1,259 participants

9 organizations

We surveyed **1,259 professionals** (862 men, 385 women) working **full-time** in science, technology, engineering or math (1,084 provided complete data)

- Recruited from **9 organizations** (subgroup numbers range from 32 to 532)
- Responded to a 30-45 minute online survey (March - August 2018)

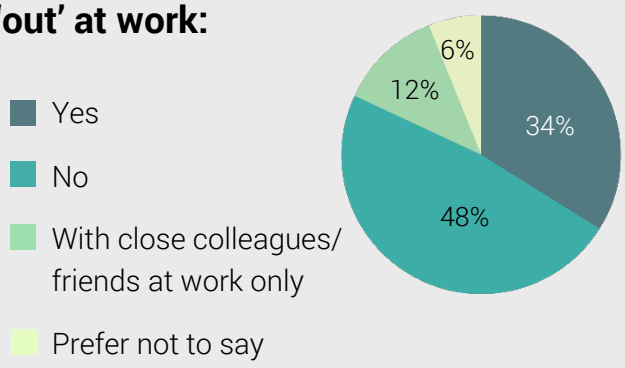
Participant Demographics



We use "men" and "women" to refer to participants' self-identification. No one in the sample self-identified as non-binary. While ESS is focused on advancing gender diversity, other forms of diversity and inclusion in STEM also matter, and when possible, can be analyzed upon request.

For this report, figures using colour represent data for men, and colour represents data for women.

Of employees identifying as LGBQA+, percentage who are 'out' at work:



1. Engin. vs. Science ID = whether participants primarily identify/decribe their work as engineering vs. science.

Do Men and Women Differ in Personal Characteristics?

For more detailed demographics, see p. 23.

Relative to the men in our sample, the women on average reported:

Age being slightly younger (<5 years)

having worked less time in the field (**~3 years**), and at their organization (**~1 year**)

earning less income (<$10,000)

holding slightly lower status within their organization (<1 rung of status ladder)

In Our Sample…

53% Have Children

58% **42%**

69% Describe Their Work as Engineering[1]

74% **60%**

77% Are White

78% **72%**

35% Have Direct Reports

38% **29%**

89% Have a Bachelor's Degree or Higher[2]

87% **93%**

Which Personal Characteristics Explain Gender Differences in Outcomes?

These icons will appear throughout the report. Icons indicate that a presented gender difference becomes non-significant when controlling for that demographic variable.

Years in the field

Whether they have children

Engineering vs. science identification

Education[2]

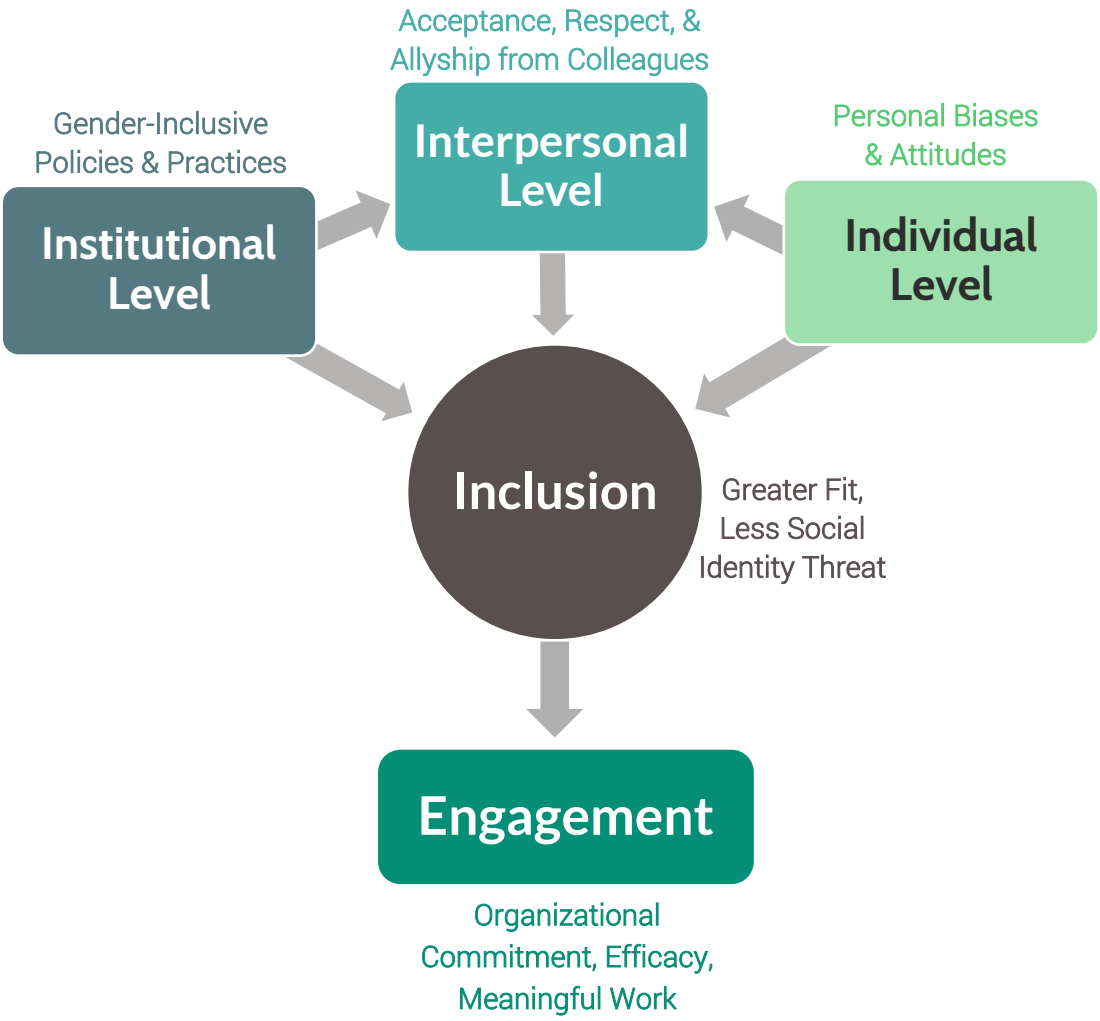
Personal income

1. The remaining percentage of participants describe their work as science.
2. Education = bachelor's degree or higher vs. no bachelor's degree. Only a small percentage of the sample did not have a bachelor's degree, so we recommend against drawing strong conclusions from this metric.

Men
Women

A Framework for Gender-Inclusive Culture

The culture of an organization consists of three interrelated elements: **institutional policies and practices,** ways in which colleagues work together **interpersonally,** and **beliefs and biases** in the minds of individuals.



When inclusive policies and practices are in place and colleagues are respectful, biases are less likely to affect women's daily experiences. As result, women report greater **fit** and are less likely to feel evaluated based on their gender (i.e., **social identity threat).**

Feeling a sense of fit, inclusion, and a lack of identity threat is a key predictor of women's **commitment, self-efficacy,** and **meaningful work.**

(Hall, Schmader, & Croft, 2015; Hall, Schmader, Aday, Inness, & Croft, 2018; Hall, Schmader, Aday, & Croft, 2018)

Key Outcomes

Do women and men differ in their *commitment to their organization?*

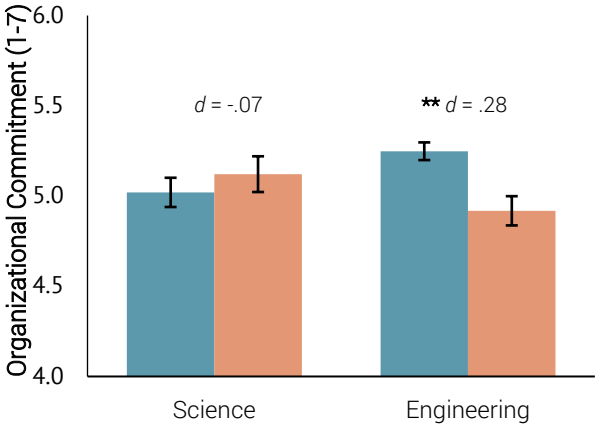
No gender differences emerged in organizational commitment among scientists, but among engineers, women report significantly lower commitment than men.

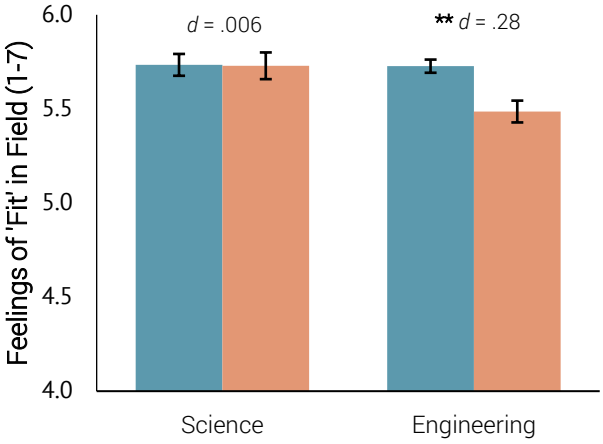
Example statements:

"I would be very happy to spend the rest of my career with this organization."

"I often think about quitting." (reverse scored)

These gender differences become non-significant when controlling for: 





These gender differences become non-significant when controlling for: 

Do women and men differ in their feelings of fit *within their fields?*

No gender differences emerged in feelings of fit in their fields among scientists, but among engineers, women report significantly lower fit than men.

Example statements:

"Being in [science/engineering] suits the way I see myself."

"I generally feel that other people in [science/engineering] accept me for who I am."

Within fields, men and women reported comparable feelings of **self-efficacy** and **finding their work meaningful**.

Years in field | $ Personal income | Having children

Unless otherwise indicated, all items are measured on 1-7 scales; error bars on charts indicate ± 1 standard error (SE)

More info on *d* values on p. 26

Men
Women

* = $p < .05$
** = $p < .01$
*** = $p < .001$

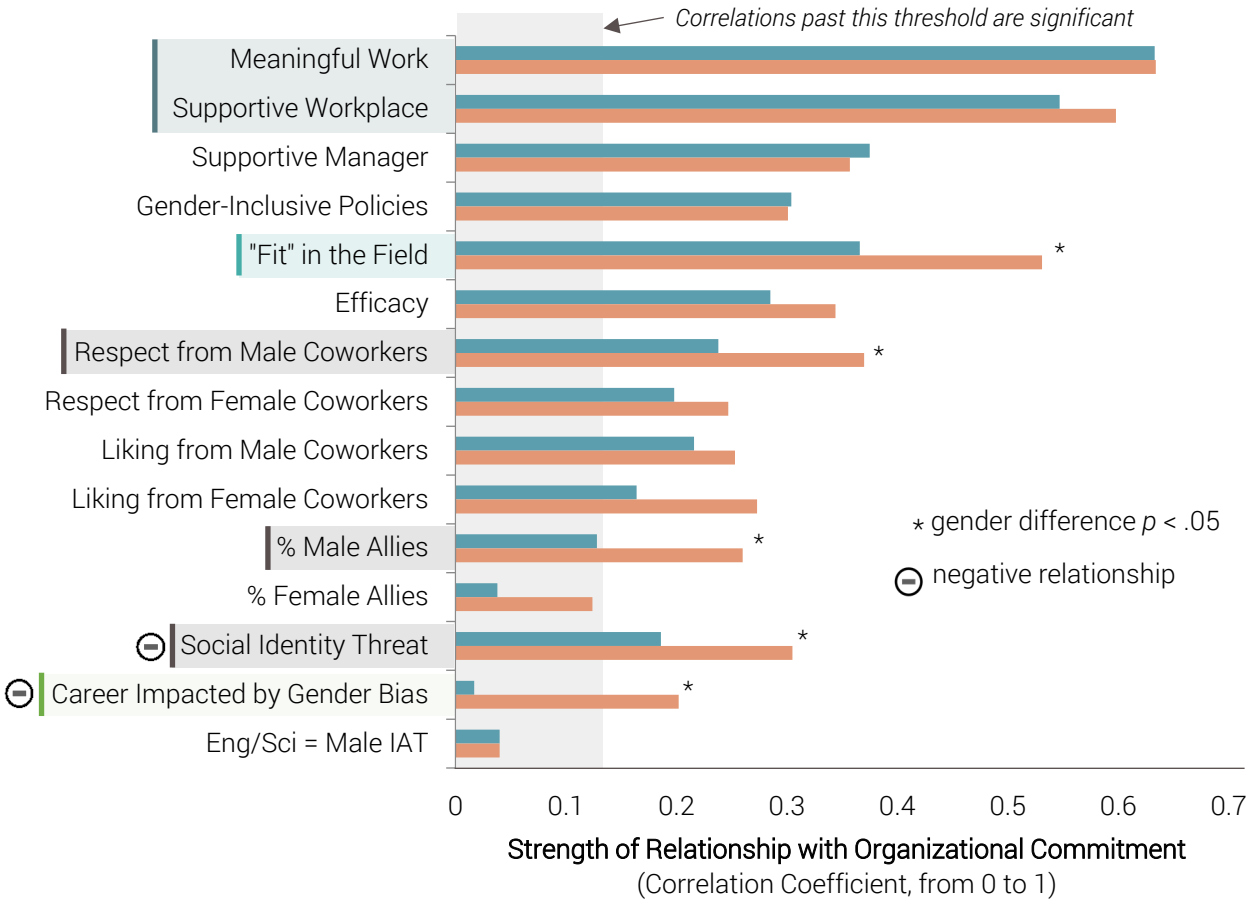
What Predicts Organizational Commitment?

Meaningful Work & Support

Correlational analyses reveal that perceptions of doing **meaningful work** and being in a **supportive workplace** are the **strongest predictors** for both men and women.

"Fit" in the Field

For women, more than for men, commitment is related to feeling their field is a place **where they fit**.



Women, more than men, report **lower organizational commitment** to the extent that they feel less **respected by male colleagues**, experience more **social identity threat**, and report having fewer **male allies**

Women also report lower organizational commitment to the extent that they feel their **career has been negatively impacted by gender bias.**

Unless otherwise indicated, all items are measured on 1-7 scales; error bars on charts indicate ± 1 standard error (SE)

Men
Women

Implicit Bias and Team Dynamics

Who Socializes with Whom Informally?

Social network analysis affords a unique window into dynamics within teams. Men and women nominated up to five teammates and reported whether members of their team socialize with one another.

For example, who seeks out whom to chat during breaks, go for coffee/drinks, or connect outside of work?"

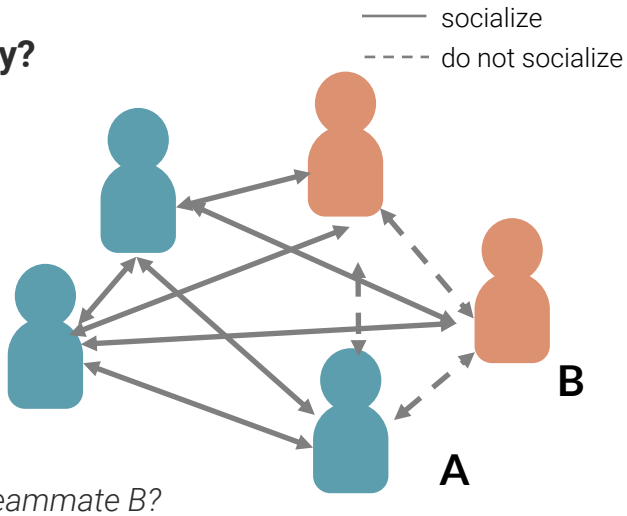
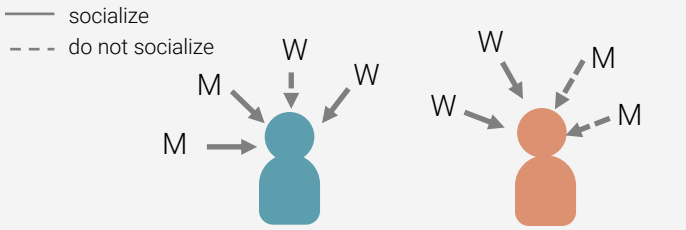
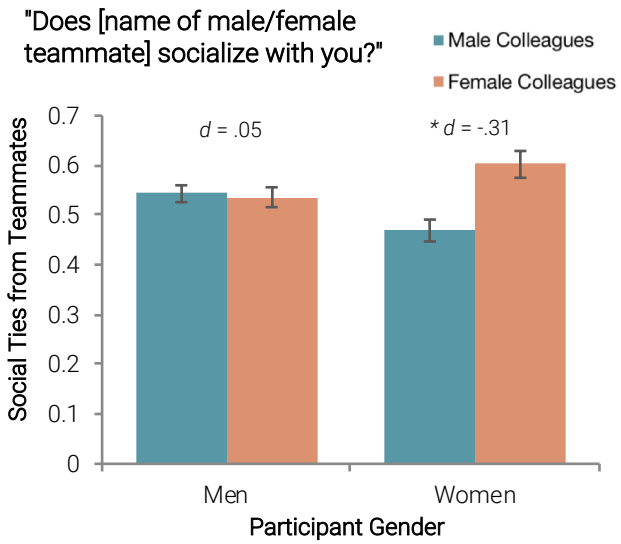


Figure 1: Does Teammate A socialize with Teammate B?

Social Exclusion in Team Dynamics



Women and men's reports of **who** socializes **with them**.



Women report that their **male** colleagues **socialize** with them **less** than **female** colleagues.

Men report that their male and female colleagues **socialize with them equally**.

These gender differences become non-significant when controlling for: **$**

$ Personal income

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More info on *d* values on p. 26

Men
Women

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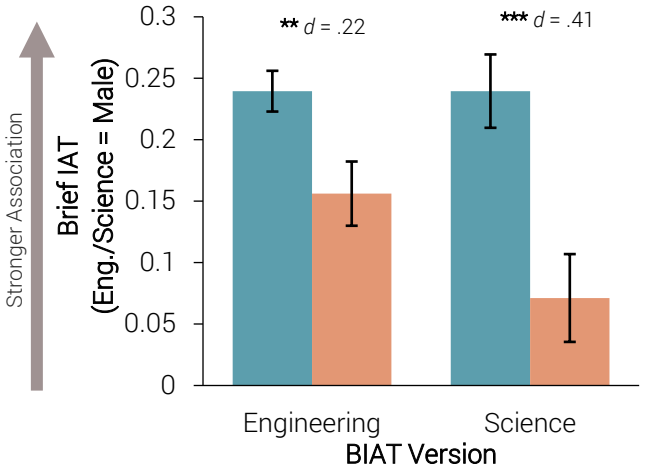
*** = $p < .001$

Evidence of Implicit Bias

The Brief Implicit Association Test (BIAT) measures the automatic tendency to "think STEM, think male."

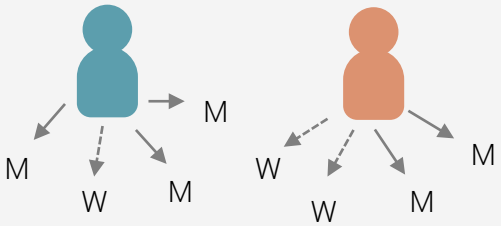
Men **and** women in both science and engineering show this association (all means are significantly above zero).

Men have a stronger STEM = male implicit association than do women.

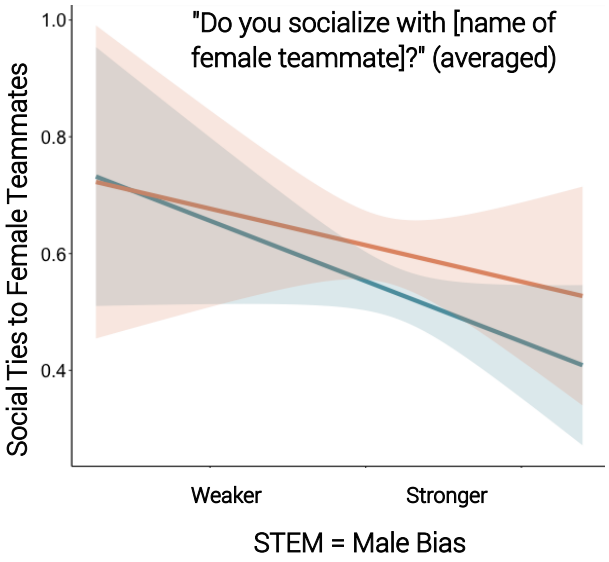


Implicit Bias and Social Exclusion

Regardless of participants' gender, those with stronger **implicit associations** linking STEM to men report **socializing less with female teammates**.



Women and men's reports of **whom they** socialize **with**.



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Gendered Experiences in the Workplace

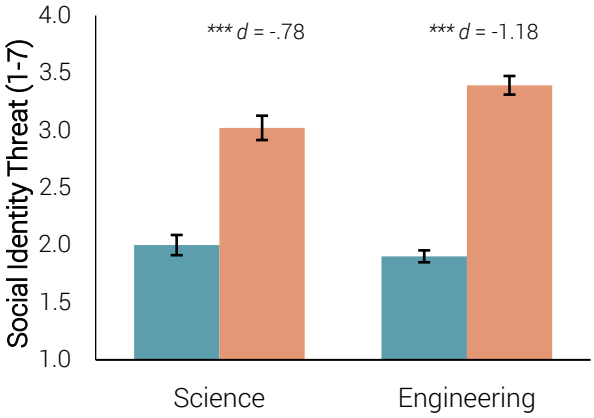
Gender Differences in Social Identity Threat

Women report a greater concern than do men that others evaluate them on the basis of their gender (i.e., social identity threat).

This gender difference in social identity threat is larger in engineering than in science, but is marked for both.

Example statement:

"How often do you think that people at work think about your gender when judging you?"



This gender difference in social identity threat was particularly robust, remaining significant even when controlling for all possible covariates.



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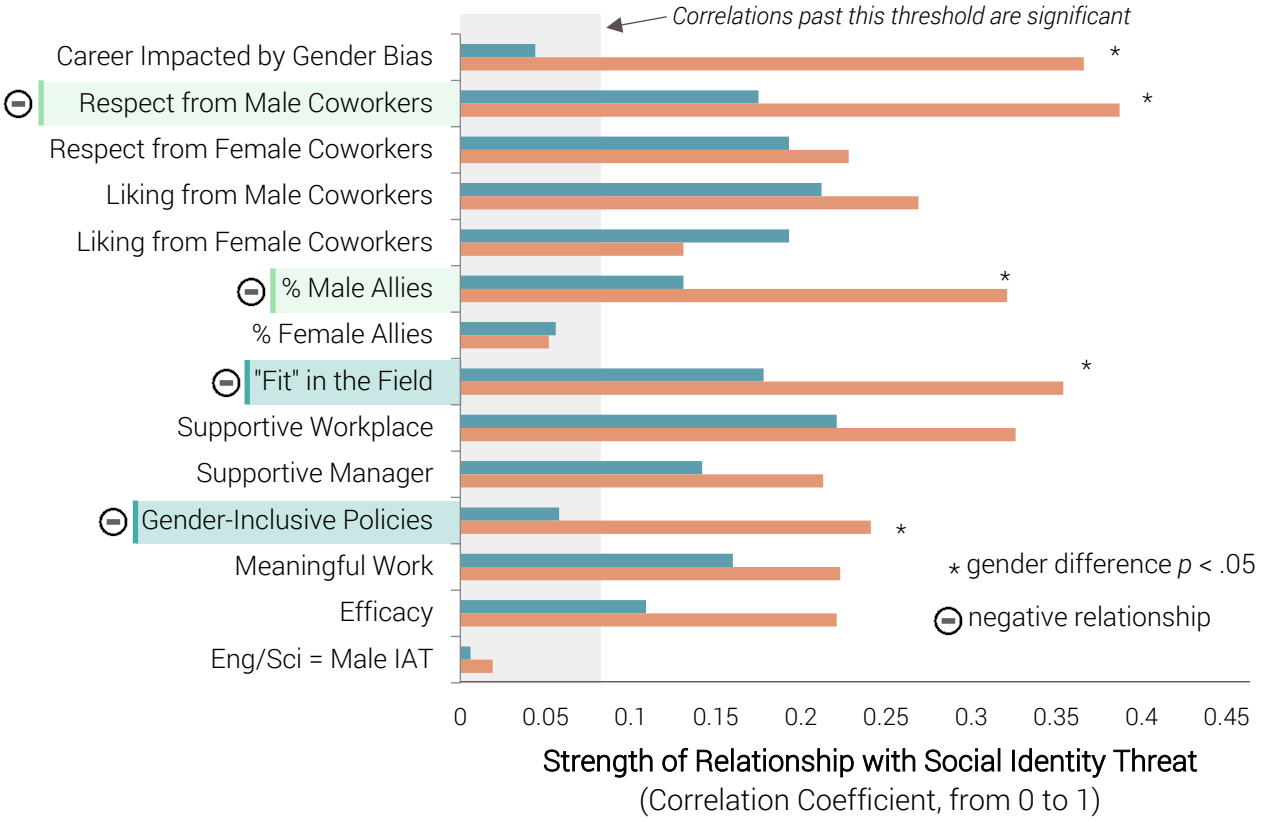
What Predicts Social Identity Threat?

The strongest predictors of social identity threat for women are **interpersonal dynamics within their workplaces** (coworkers who are allies to women in STEM), and **inclusive work environments** (supportive workplaces, whether they feel their career has been negatively impacted by gender bias, and perceiving that their workplaces have gender-inclusive policies).



Interpersonal Dynamics

Women report feeling **lower social identity threat** the more they feel that they **are respected by their male coworkers** and the more that they report **their male colleagues being allies to women in STEM**. Both of these relationships are significantly stronger for women than for men.

Inclusive Environments

Women report feeling **lower social identity threat** to the extent that they feel their **career has *not* been negatively impacted** by **gender bias**, and feel they **fit within their field of work**, and that their workplace has **gender-inclusive policies and practices**. These relationships are significantly stronger for women than for men

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Importance of Allies to Women in STEM

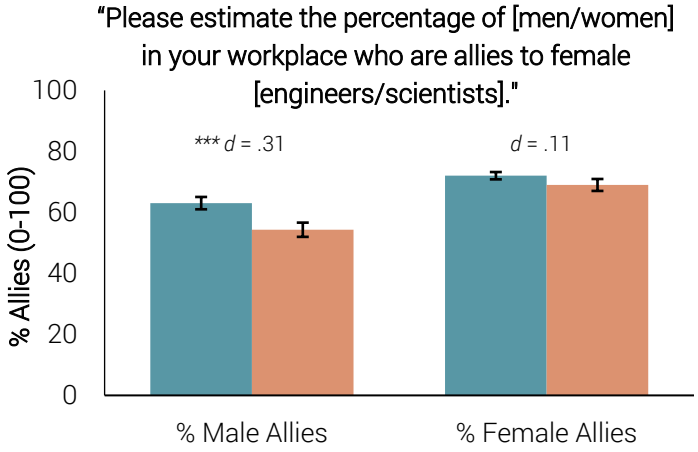
Text shown to survey participants

Allies are coworkers **willing to support** the interests of other individuals in their organization.

We are interested in ways that both men and women can support female [engineers/scientists] by serving as allies. Many behaviours — both proactive and reactive —can potentially make someone an ally,

- Encouraging women to pursue career-related opportunities
- Ensuring that women are represented in important decisions
- Promoting women into higher-paid/supervisory roles
- Including women in social activities inside and outside of work
- Keeping women 'in the loop' on information
- Trusting women's reports of their experiences with bias
- Speaking out against harassment or subtler forms of gender bias

Allies to Women in STEM: A Matter of Perception?

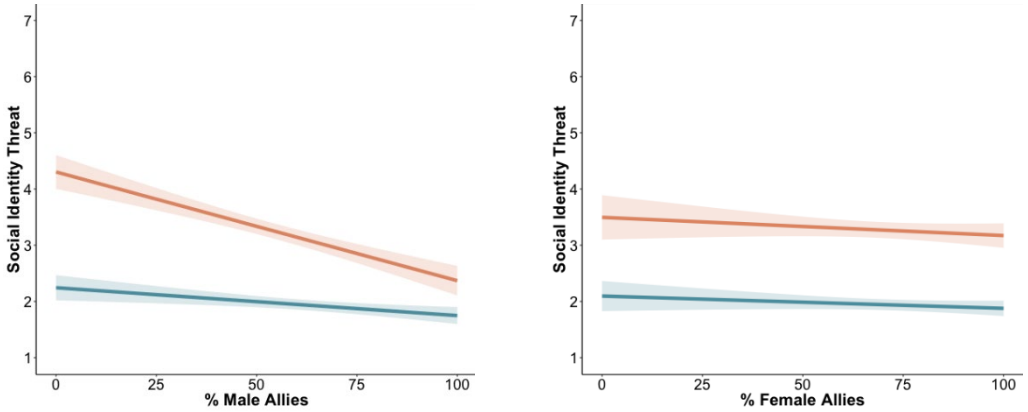


Men and women agree that a high percentage of women are allies to other women in STEM.

There is less agreement on male allies. Men report more men being allies than do women.

Does the Presence of Allies Predict Lower Social Identity Threat?

The presence of **male allies** – more so than female allies – in organization predicts **lower social identity threat** for women.



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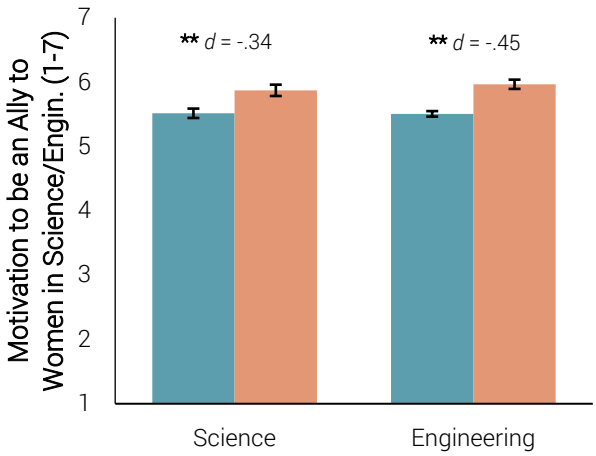
Attitudes toward Allyship & Inclusion

Both Men and Women Are Motivated to Be Allies to Women in STEM…

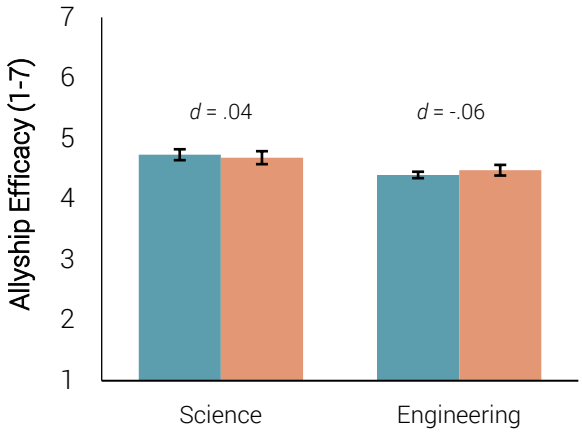
Both men and women report being motivated to be allies to women in science/engineering.

Women report somewhat higher motivation than men.

Example statement:
"I want to be an ally to women at [organization name]."



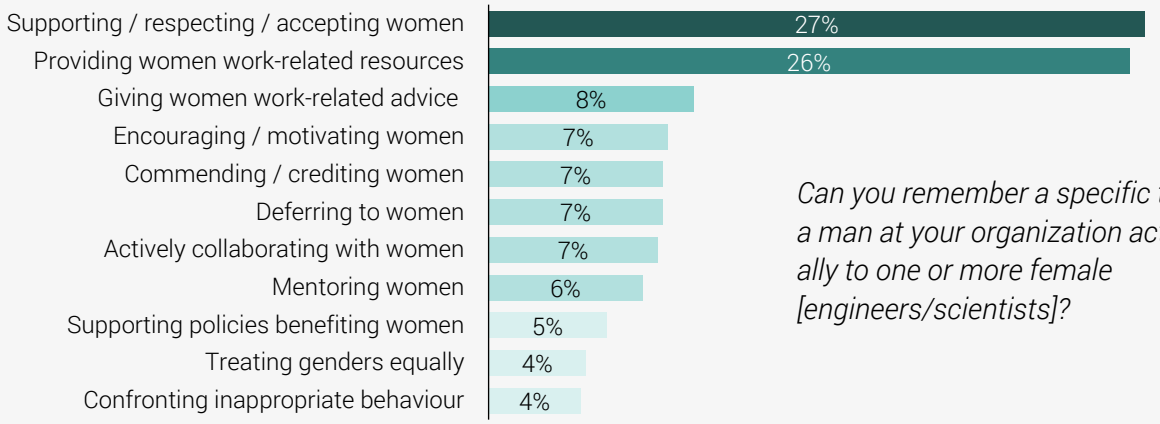
…But They Could Use Some Pointers



Despite relatively high motivation, both men and women are only somewhat confident that they know how to be effective allies to women in engineering/science.

Example statement:
"I feel like I know how to be a strong ally to female [engineers/scientists] at [organization name]."

What Types of Allyship Do Participants Describe Men Doing?



Can you remember a specific time when a man at your organization acted as an ally to one or more female [engineers/scientists]?

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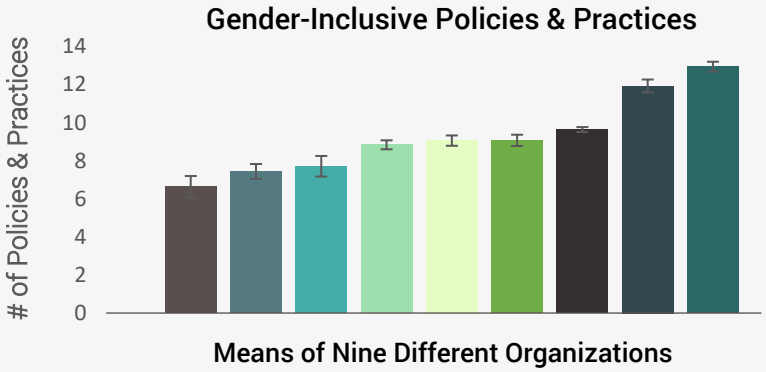
Promoting Inclusion with Policies & Practices

What Are Gender-Inclusive Policies and Practices? (non-exhaustive list)

- ✓ flextime
- ✓ compressed work-week
- ✓ on-site childcare
- ✓ child/family care fund
- ✓ paid parental leave (above legal minimum)
- ✓ formal workplace harassment policy & universal policy training
- ✓ professional development programs
- ✓ mentorship programs
- ✓ diversity/inclusion trainings
- ✓ diverse/inclusive recruitment materials
- ✓ inclusive cultural norms

Do the Organizations Vary?

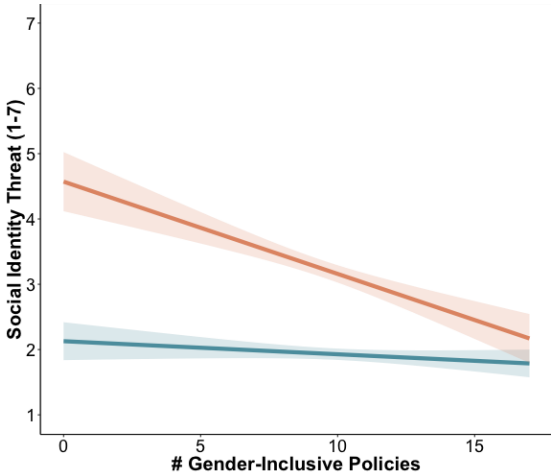
Organizations in the sample significantly vary in the number of gender inclusive policies and practices that employees report.

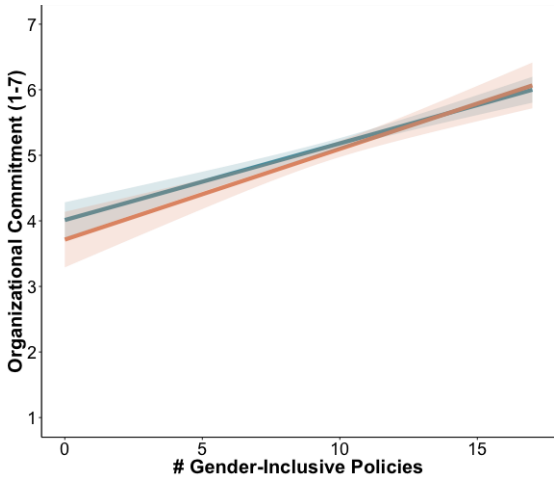


Do Perceived Inclusive Policies Predict Important Outcomes?

When people perceive their organization as having more inclusive policies:

- women experience less social identity threat (on left), and
- both men and women express more organizational commitment (on right).





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Appendices

ENGENDERING SUCCESS IN STEM

Values That Connect Scientists/Engineers to Their Fields

There are several **core values** that connect scientists/engineers to their career. These values broadly separate into three key categories:

Intellectual Stimulation

Most endorsed values:

- Making valued contributions at work
- Finding evidence-based solutions to complex problems
- Satisfying intellectual curiosity

Personal Enrichment

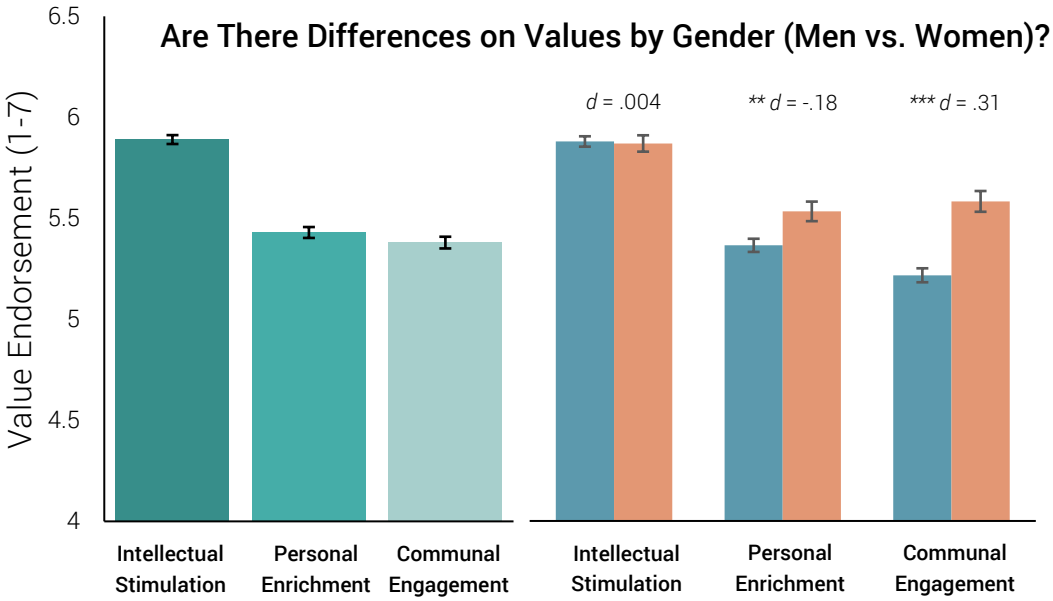
Most endorsed values:

- Pursuing a meaningful, impactful career
- Achieving and sustaining financial security
- Upholding the dignity of the profession

Communal Engagement

Most endorsed values:

- Supporting a sustainable future
- Serving as a positive exemplar to others
- Advancing societal welfare



Participants endorsed **intellectual stimulation** as most important for connecting them to their career, over personal enrichment (*d* = .53***) or communal engagement (*d* = .56***).

Women tended to endorse **personal enrichment** (*d* = .18**) and **communal engagement** (*d* = .31***) values more highly than men.

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Sample Metrics

The table below includes sample survey metrics (where applicable).

	Sample Metric
Appraisals of the work environment	
Organizational commitment	I would be very happy to spend the rest of my career with this organization
Meaningful work	The vision we collectively work towards inspires me.
Efficacy in job/career	Whatever comes my way in my job, I can usually handle it.
Supportive work environment	I feel safe expressing my personal beliefs or values at [organization].
Supportive manager/supervisor	My manager supports me in meeting my work and life commitments.
Fit in the work environment	
Self-concept fit	Being in my field of work suits the way I see myself.
Goal fit	I often feel that working in my field allows me to realize goals that are important to me.
Social fit	I generally feel that other people in my field accept me for who I am.
Overall fit	[Composite of above 3 subscales]
Values	
Helping others/society	Serving the community; supporting a sustainable future
Intellectual fulfillment	Finding evidence-based solutions to complex problems; satisfying intellectual curiosity
Career/financial rewards	Achieving and sustaining financial security, pursuing a meaningful, impactful career
Organization shares my values	[Organization]'s values are a good fit with the things that I value.
Implicit Bias [a]	
Engineering = male IAT	Faster reaction time to associate male (vs. female) names with engineering
Science = male IAT	Faster reaction time to associate male (vs. female) names with science
Overall BIAT	Faster association of male vs. female names with *testing, technology, design, math*
Support for Gender Inclusion	
Support resources for policies/initiatives	Should [org.] expend fewer, more, or the current level of resources to recruit more female [engineers/scientists]?
Backlash against diversity	Demands for gender equality in [science/engineering] are no longer necessary in modern society.
Experiences of Bias	
Social identity threat	How often do you think that people at work think about your gender when judging you?
Career impacted by gender bias	How has [implicit/explicit] gender bias affected your career? [1 = positively, 7 =
Interactions with Specific Teammates [b]	
Social ties from female teammates	Does [name of each female teammate] socialize with you? [averaged]
Social ties from male teammates	Does [name of each male teammate] socialize with you? [averaged]
Social ties to female teammates	Do you socialize with [name of each female teammate]? [averaged]
Social ties to male teammates	Do you socialize with [name of each male teammate]? [averaged]
General Experiences with Coworkers	
Feel liked by male coworkers	My male colleagues respect my abilities and contributions at work.
Feel liked by female coworkers	My female colleagues respect my abilities and contributions at work.
Feel respected by male coworkers	My male colleagues like me as a person and/or friend.
Feel respected by female coworkers	My female colleagues like me as a person and/or friend.
Allyship	
% Male allies	Please estimate the percentage of men in your workplace who are allies to female [engineers/scientists].
% Female allies	Please estimate the percentage of women in your workplace who are allies to female [engineers/scientists].
Motivation to be an ally	I want to be an ally to women at [organization].
Efficacy to be an ally	I feel like I know how to be a strong ally to female [scientists/engineers] at [organization].
Gender-Inclusive Policies & Practices	
Work-life balance	Paid parental leave (i.e., exceeding the legal minimum); On-site child care
Flexible work	Compressed work-week policies (i.e., full-time hours are worked in fewer than five
Professional development	Career planning programs to retain and promote women as well as men in the
Culture of inclusion + diversity	Cultural norms that support positive working relations between men and women.
Total gender-inclusive policies	*[Count of above 17 policies]*
Health & Safety Policies [d]	A whistleblower policy that protects employees who report health and safety violations.

Overall Metrics

Aggregate statistics (across all participants and organizations) for the survey metrics are below.

				Overall		
	Range	# items	∝	*N*	*M*	*SD*
Appraisals of the work environment						
Organizational commitment	1-7	6	.85	1251	5.13	1.22
Meaningful work	1-7	3	.85	1251	5.31	1.16
Efficacy in job/career	1-7	3	.81	1258	5.87	0.86
Supportive work environment	1-7	8	.87	1204	4.86	1.10
Supportive manager/supervisor	1-7	2	.89	1204	5.64	1.29
Fit in the work environment						
Self-concept fit	1-7	3	.86	1258	5.94	1.02
Goal fit	1-7	3	.64	1257	5.58	1.04
Social fit	1-7	3	.81	1257	5.51	1.11
Overall fit	1-7	9	.85	1258	5.68	0.89
Values						
Helping others/society	1-7	5	.82	1241	5.38	1.02
Intellectual fulfillment	1-7	4	.73	1242	5.90	0.78
Career/financial rewards	1-7	4	.70	1241	5.43	0.95
Organization shares my values	1-7	3	.96	1247	5.20	1.20
Implicit Bias [a]						
Engineering = male IAT	SD	-	-	738	0.22	0.38
Science = male IAT	SD	-	-	322	0.17	0.41
Overall BIAT	SD	-	-	1060	0.20	0.39
Support for Gender Inclusion						
Support resources for policies/initiatives	1-5	3	.89	1183	3.52	0.71
Backlash against diversity	1-7	3	.83	1179	2.46	1.21
Experiences of Bias						
Social identity threat	1-7	4	.87	1195	2.33	1.42
Career impacted by gender bias	1-7	2	.83	1185	4.30	0.84
Interactions with Specific Teammates [b]						
Social ties from female teammates	0-1	1-5	-	776	0.56	0.45
Social ties from male teammates	0-1	1-5	-	1190	0.53	0.37
Social ties to female teammates	0-1	1-5	-	769	0.57	0.45
Social ties to male teammates	0-1	1-5	-	1169	0.54	0.37
General Experiences with Coworkers						
Feel liked by male coworkers	1-7	1	-	1130	5.65	0.93
Feel liked by female coworkers	1-7	1	-	1130	5.67	0.93
Feel respected by male coworkers	1-7	1	-	1130	5.82	0.88
Feel respected by female coworkers	1-7	1	-	1130	5.86	0.82
Allyship						
% Male allies [c]	0-100%		-	1052	60.21	28.29
% Female allies [c]	0-100%		-	1035	70.89	27.32
Motivation to be an ally	1-7	4	.81	1119	5.63	1.05
Efficacy to be an ally	1-7	2	.73	1115	4.51	1.26
Gender-Inclusive Policies & Practices [d]						
Work-life balance	0-4	4	-	1197	1.18	1.04
Flexible work	0-3	3	-	1198	1.95	0.85
Professional development	0-4	4	-	1195	2.09	1.30
Culture of inclusion + diversity	0-6	6	-	1196	4.59	1.46
Total gender-inclusive policies	0-17	*17*	-	1198	9.80	3.07
Health & Safety Policies [d]	0-5	5	-	1197	3.19	1.35

a Implicit bias measured using a speeded categorization task, scored in standard deviation units. Values above zero indicate bias in the direction of the stereotype.

b Calculated from coworker networks: Participants indicated which teammates *highly respect* and/or *socialize with* each other. Responses of 'No' or 'Maybe' were recoded to zero.

c Single item (0-100 slider); not a composite.

d Presence of policies and practices were reported as 'Yes' (coded 1) / 'No' (coded 0) / 'Maybe' (coded 0).

Metrics for Men & Women

	Men			Women			Gender Differences?			
	N	*M*	*SD*	*N*	*M*	*SD*	*t*	*p*	*d*	Interpretation [c]
Appraisals of the work environment										
Organizational commitment	860	5.19	1.20	380	5.00	1.28	2.44'	.015	.15	M > W
Meaningful work	859	5.33	1.16	381	5.27	1.16	0.80	.424	.05	
Efficacy in job/career	862	5.91	0.82	384	5.79	0.92	2.15'	.032	.14	M > W
Supportive work environment	828	4.90	1.06	366	4.78	1.19	1.62'	.105	.11	
Supportive manager/supervisor	828	5.67	1.28	366	5.58	1.32	1.06	.288	.07	
Fit in the work environment										
Self-concept fit	861	6.00	0.96	385	5.82	1.12	2.78	.006	.18	M > W
Goal fit	861	5.62	1.00	385	5.51	1.10	1.68	.093	.11	
Social fit	861	5.56	1.05	385	5.42	1.20	2.05	.041	.13	M > W
Overall fit	861	5.73	0.84	385	5.58	0.96	2.55	.011	.16	M > W
Values										
Helping others/society	853	5.29	1.02	377	5.60	1.00	-5.00	< .001	-.31	M < W
Intellectual fulfillment	854	5.90	0.77	377	5.89	0.80	0.06	.955	.00	
Career/financial rewards	853	5.37	0.95	377	5.55	0.94	-2.97	.003	-.18	M < W
Organization shares my values	857	5.21	1.20	380	5.17	1.20	0.60	.549	.04	
Implicit Bias [a]										
Engineering = male IAT	534	0.24	0.38	200	0.16	0.37	2.65	.008	.22	M > W
Science = male IAT	185	0.24	0.41	132	0.07	0.41	3.62	<.001	.41	M > W
Overall BIAT	719	0.24	0.39	332	0.12	0.39	4.54	<.001	.30	M > W
Support for Gender Inclusion										
Support resources for policies/initiatives	811	3.41	0.67	362	3.79	0.72	-8.64	<.001	-.55	M < W
Backlash against diversity	808	2.56	1.20	361	2.24	1.20	4.16	<.001	.26	M > W
Experiences of Bias										
Social identity threat	819	1.93	1.08	366	3.24	1.65	-16.34	<.001	-1.03	M < W
Career impacted by gender bias	812	4.15	0.79	363	4.61	0.87	-9.01	<.001	-.57	M < W
Interactions with Specific Teammates										
Social ties from female teammates	484	0.54	0.46	286	0.60	0.42	-1.95	.051	-.14	
Social ties from male teammates	820	0.56	0.36	360	0.48	0.39	3.37	.001	.22	M > W
Social ties to female teammates	480	0.54	0.46	283	0.61	0.42	-2.20	.028	-.16	M < W
Social ties to male teammates	806	0.56	0.36	353	0.48	0.39	3.33	.001	.21	M > W
General Experiences with Coworkers										
Feel liked by male coworkers	773	5.68	0.87	347	5.63	1.02	0.81	.418	.05	
Feel liked by female coworkers	773	5.62	0.91	347	5.79	0.97	-2.80	.005	-.18	M < W
Feel respected by male coworkers	773	5.92	0.75	347	5.62	1.08	4.80	<.001	.35	M > W
Feel respected by female coworkers	773	5.87	0.79	347	5.87	0.90	-0.02	.986	.00	
Allyship										
% Male allies	716	63.04	28.23	327	54.31	27.45	4.67	<.001	.31	M > W
% Female allies	703	72.03	27.52	323	68.99	26.41	1.66	.096	.11	
Motivation to be an ally	764	5.51	1.05	345	5.93	0.99	-6.30	<.001	-.41	M < W
Efficacy to be an ally	760	4.48	1.25	345	4.56	1.30	-0.91	.361	-.06	
Gender-Inclusive Policies & Practices [b]										
Work-life balance	821	1.15	1.06	366	1.27	1.00	-1.83	.068	-.11	
Flexible work	822	1.97	0.83	366	1.93	0.89	0.74'	.461	.05	
Professional development	821	2.23	1.30	364	1.80	1.25	5.28	<.001	.33	M > W
Culture of inclusion + diversity	821	4.68	1.47	365	4.42	1.40	2.82	.005	.18	M > W
Total gender-inclusive policies	822	10.02	3.13	366	9.40	2.81	3.24	.001	.20	M > W
Health & Safety Policies [b]	821	3.19	1.37	366	3.22	1.28	-0.35'	.728	-.02	

a Values above zero indicate bias in the direction of the stereotype.

b Values in table are counts per category of policies/practices that participants indicated their organization as having.

c Direction of gender difference. 'M > W' indicates men are higher than women; 'M < W' indicates men are lower than women.

Percentage Breakdown: Simplified Patterns of Responses

	% of Sample			% of Men			% of Women		
	Disagree	*Neutral*	*Agree*	*Disagree*	*Neutral*	*Agree*	*Disagree*	*Neutral*	*Agree*
Appraisals of the work environment									
Organizational commitment	12	13	75	11	13	77	15	14	70
Meaningful work	9	11	80	9	10	81	9	12	78
Efficacy in job/career	2	5	93	2	4	94	2	6	91
Supportive work environment	13	18	68	12	19	69	17	17	66
Supportive manager/supervisor	10	4	86	9	4	87	10	5	85
Fit in the work environment									
Self-concept fit	3	7	90	3	6	91	4	9	87
Goal fit	4	12	85	3	11	86	5	12	83
Social fit	6	13	81	5	11	84	8	17	75
Overall fit	2	9	88	2	8	90	3	12	84
Values									
Helping others/society [a]	4	16	80	4	18	78	3	12	85
Intellectual fulfillment [a]	1	3	96	1	3	96	2	3	96
Career/financial rewards [a]	4	11	85	5	11	84	3	9	88
Organization shares my values	9	16	75	9	15	76	8	19	74
Support for Gender Inclusion									
Support resources for policies/initiatives [b]	3	61	36	4	66	30	1	50	49
Backlash against diversity	81	13	6	79	14	7	85	9	6
Experiences of Bias									
Social identity threat [c]	81	9	11	90	5	5	58	17	25
Career impacted by gender bias [d]	9	59	32	11	68	20	5	37	58
Experiences with Coworkers									
Feel liked by male coworkers	2	9	89	2	9	90	3	10	87
Feel liked by female coworkers	2	10	88	2	11	87	2	8	89
Feel respected by male coworkers	2	4	93	1	3	96	5	6	88
Feel respected by female coworkers	1	6	93	1	5	94	1	7	92
Allyship									
Motivation to be an ally	3	11	86	4	11	85	2	8	90
Efficacy to be an ally	25	26	49	25	27	48	25	23	51

a "Disagree" = rated as unimportant; "Agree" = rated as important
b "Disagree" = fewer; "Neutral" = no change; "Agree" = more
c "Disagree" = infrequently; "Agree" = frequently
d "Disagree" = positive impact; "Agree" = negative impact

Intersections of Identity: Metrics by Gender & Ethnicity

	White		East & South Asian		Other Visible Minority Groups	
	Men	Women	Men	Women	Men	Women
	M (SD)	*M (SD)*	*M (SD)*	*M (SD)*	*M (SD)*	*M (SD)*
Appraisals of the work environment						
Organizational commitment	5.22 (1.20)	4.94 (1.32)	5.04 (1.24)	4.98 (1.26)	5.13 (1.27)	5.29 (1.07)
Meaningful work	5.31 (1.15)	5.26 (1.19)	5.34 (1.16)	5.25 (1.19)	5.45 (1.16)	5.47 (0.91)
Efficacy in job/career	5.88 (0.80)	5.79 (0.93)	5.93 (0.84)	5.82 (0.96)	6.14 (0.88)	5.78 (0.85)
Supportive work environment	4.92 (1.05)	4.73 (1.23)	4.89 (1.08)	4.81 (1.05)	4.76 (1.15)	5.02 (1.07)
Supportive manager/supervisor	5.67 (1.29)	5.63 (1.33)	5.68 (1.15)	5.42 (1.36)	5.76 (1.22)	5.65 (1.19)
Fit in the work environment						
Self-concept fit	5.99 (0.96)	5.87 (1.14)	5.99 (0.89)	5.54 (1.14)	6.08 (1.11)	5.90 (0.87)
Goal fit	5.59 (1.00)	5.49 (1.17)	5.72 (0.96)	5.54 (0.89)	5.80 (1.06)	5.64 (0.96)
Social fit	5.52 (1.04)	5.42 (1.24)	5.75 (0.92)	5.35 (1.10)	5.54 (1.27)	5.50 (1.19)
Overall fit	5.70 (0.83)	5.59 (1.00)	5.82 (0.81)	5.48 (0.91)	5.81 (1.02)	5.68 (0.82)
Values						
Helping others/society	5.23 (1.02)	5.54 (0.99)	5.40 (1.04)	5.77 (0.95)	5.62 (0.96)	5.74 (1.11)
Intellectual fulfillment	5.85 (0.76)	5.83 (0.81)	6.04 (0.77)	6.05 (0.75)	6.06 (0.81)	6.05 (0.82)
Career/financial rewards	5.27 (0.94)	5.42 (0.96)	5.67 (0.86)	5.94 (0.77)	5.72 (0.98)	5.79 (0.87)
Organization shares my values	5.24 (1.16)	5.15 (1.21)	5.04 (1.26)	5.00 (1.10)	5.22 (1.54)	5.52 (1.36)
Implicit Bias						
Engineering = male IAT	0.23 (0.40)	0.16 (0.38)	0.32 (0.30)	0.18 (0.36)	0.20 (0.40)	*n = 20*
Science = male IAT	0.25 (0.40)	0.04 ('0.42)	*n* = 18	*n* = 16	*n = 7*	*n* = 10
Overall BIAT	0.24 (0.40)	0.11 (0.40)	0.31 (0.31)	0.20 (0.34)	0.12 (0.43)	0.08 (0.37)
Support for Gender Inclusion						
Support resources for policies/initiatives	3.43 (0.69)	3.78 (0.73)	3.30 (0.57)	3.78 (0.71)	3.63 (0.66)	3.94 (0.65)
Backlash against diversity	2.46 (1.18)	2.17 (1.18)	2.97 (1.24)	2.38 (1.25)	2.33 (1.08)	2.45 (1.24)
Experiences of Bias						
Social identity threat	1.96 (1.06)	3.26 (1.60)	1.79 (1.14)	3.34 (1.89)	1.99 (1.21)	2.99 (1.57)
Career impacted by gender bias	4.11 (0.77)	4.61 (0.81)	4.38 (0.90)	4.71 (1.02)	3.99 (0.68)	4.56 (1.10)
Interactions with Specific Teammates						
Social ties from female teammates	0.51 (0.45)	0.58 (0.42)	0.62 (0.47)	0.57 (0.46)	*n* = 21	*n* = 27
Social ties from male teammates	0.54 (0.36)	0.47 (0.38)	0.65 (0.31)	0.48 (0.39)	0.46 (0.36)	0.50 (0.42)
Social ties to female teammates	0.51 (0.46)	0.60 (0.42)	0.62 (0.47)	0.59 (0.47)	0.58 (0.47)	0.71 (0.39)
Social ties to male teammates	0.54 (0.36)	0.47 (0.38)	0.65 (0.32)	0.49 (0.39)	0.44 (0.38)	0.48 (0.41)
Experiences with Coworkers						
Feel liked by male coworkers	5.66 (0.83)	5.64 (1.01)	5.78 (0.93)	5.58 (1.00)	5.59 (1.16)	5.71 (1.04)
Feel liked by female coworkers	5.61 (0.89)	5.81 (0.92)	5.70 (0.93)	5.69 (1.12)	5.44 (1.16)	5.90 (0.91)
Feel respected by male coworkers	5.93 (0.72)	5.62 (1.08)	5.89 (0.85)	5.58 (0.97)	5.83 (0.83)	5.68 (1.14)
Feel respected by female coworkers	5.88 (0.76)	5.87 (0.92)	5.83 (0.90)	5.81 (0.84)	5.66 (0.91)	5.97 (0.88)
Allyship						
% Male allies	63.98 (27.04)	55.32 (27.58)	56.39 (31.85)	50.78 (27.14)	58.46 (33.24)	51.79 (29.27)
% Female allies	74.48 (25.21)	70.48 (25.46)	59.19 (34.74)	63.34 (29.75)	72.09 (27.97)	66.38 (28.40)
Motivation to be an ally	5.59 (1.00)	5.98 (0.98)	5.14 (1.16)	5.78 (1.04)	5.51 (1.00)	5.83 (1.08)
Efficacy to be an ally	4.46 (1.28)	4.62 (1.27)	4.42 (1.10)	4.31 (1.37)	4.50 (1.26)	4.52 (1.44)
Gender-Inclusive Policies & Practices						
Work-life balance	1.18 (1.07)	1.34 (0.97)	1.00 (1.00)	1.12 (1.07)	1.11 (1.04)	1.00 (1.03)
Flexible work	1.99 (0.83)	1.92 (0.89)	1.95 (0.80)	1.89 (0.90)	1.84 (0.86)	2.00 (0.84)
Professional development	2.22 (1.30)	1.72 (1.22)	2.27 (1.24)	1.95 (1.33)	1.89 (1.43)	2.14 (1.14)
Culture of inclusion + diversity	4.79 (1.39)	4.42 (1.37)	4.20 (1.63)	4.39 (1.55)	4.30 (1.76)	4.43 (1.36)
Total gender-inclusive policies	10.19 (3.08)	9.37 (2.70)	9.36 (3.15)	9.34 (3.20)	9.13 (3.59)	9.58 (2.69)
Health & Safety Policies						
Health and safety policies	3.34 (1.21)	3.35 (1.22)	2.62 (1.41)	3.00 (1.41)	2.89 (1.53)	2.60 (1.38)
Highest/max # of participants in group:	*n* = 645	*n* = 270	*n* = 125	*n* = 66	*n* = 48	*n* = 38

Detailed Participant Demographics by Gender

Group-Based Demographics

	% Men in Group		% Women in Group		Gender Differences?					
	A	*B*	*A*	*B*	χ^2	*p*	*V*	*d*	*OR*	Interpretation
Professional Demographics (Group A vs. B)										
Full Time vs. Not Full Time	93	7	92	8	0.44	.506	.020	.04	.85	No gender differences
Work Onsite vs. Not Onsite	92	8	92	8	0.00	.975	.001	.00	.99	No gender differences
Has Direct Reports vs. Not	38	62	30	70	6.23	.013	.08	.15	.70	**Women are 30% less likely to have direct reports**
Senior Leadership vs. Not	8	92	5	95	2.80	.094	.05	.10	.63	No gender differences
Bachelor's Degree or Higher vs. Not	88	12	93	7	7.11	.008	.08	.15	1.81	**Women are 80% more likely to have at least a bachelor's degree**
ID with engineering vs. science	73	27	60	40	23.29	< .001	.14	.28	.54	**Women are 46% more likely to identify with science**
PEng: Licensed + Intend vs. No PEng	32	68	32	68	0.03	.858	.01	.01	.98	No gender differences
PEng: Licensed vs. Intend to License	62	38	57	43	0.98	.322	.05	.11	.79	No gender differences
Field: Eng + Tech vs. Science	78	22	64	36	24.90	< .001	.14	.29	.51	**Women are 49% more likely to be in science vs. engineering or tech**
Field: Eng + Tech vs. All Other	76	24	61	39	30.54	< .001	.16	.32	.49	**Women are 51% less likely to be in engineering and technology**
Personal Demographics (Group A vs. B)										
White vs. Visible Minority	78	22	70	30	7.99	.005	.08	.16	.67	**Women are 33% more likely to be visible minorities**
Partnered vs. Not Partnered	80	20	76	24	1.86	.173	.04	.08	.81	No gender differences
… Partner Local vs. Not Local	95	5	96	4	0.01	.903	.00	.01	1.05	No gender differences
Has Kids vs. No Kids	58	42	43	57	21.58	< .001	.14	.29	.54	**Women are 46% less likely to have kids**
Sexual orientation: Straight vs. LGBQ+	94	6	92	8	0.60	.438	.02	.05	.81	No gender differences
Country of birth: Canada/US vs. Other	73	27	69	31	1.526	.217	.04	.08	.83	No gender differences

Numeric Demographics

		Overall			Men			Women			Gender Differences?			
	Range	*N*	*M*	*SD*	*N*	*M*	*SD*	*N*	*M*	*SD*	*Coeff.*	*p*	*d*	Interpretation
Professional Demographic Variables														
# of years in the field	0 to 45.8	1067	13.84	9.806	730	14.79	10.14	327	11.77	8.7	4.947	< .001	.31	M > W
# of STEM professionals in org.	0 to 500	1064	141.3	168.6	731	139.9	173.3	324	146.4	159.2	-0.58	.565	-.04	
# of years in the organization	0 to 50	1072	8.339	7.842	735	8.679	7.968	329	7.542	7.546	2.186	.029	.15	M > W
% women in the organization	0 to 100	1052	24.07	16	723	22.79	15.35	320	26.87	16.99	-3.69	< .001	-.26	M < W
Status in the organization	1 to 7	1075	3.672	1.454	737	3.818	1.471	329	3.344	1.355	4.986	< .001	.33	M > W
Personal Demographic Variables														
Age	<25 to >65	1048	~37	~10.5	721	4.74	2.151	320	4.18	1.928	-3.8	< .001	.27	M > W
Household income	<35k to 200k+	914	~175k	~21.0	631	6.426	1.311	278	6.363	1.574	-0.19	.849	.05	
Personal income	<35k to 200k+	919	~75k	~15.4	635	4.742	1.354	280	4.221	1.334	-5.26	< .001	.39	M > W
# of kids living at home	0 to 8	530	1.572	1.027	393	1.562	1.072	135	1.593	0.883	-0.32	.746	-.03	

Glossary

Definitions

BIAT: The "Brief Implicit Association Test" (Sriram & Greenwald, 2009) is a reaction-time measure of participants' implicit or automatic associations. Our BIAT tested participants' relative speed in associating 'Engineering' or 'Science' with men vs. women.

Meaningful work: Participants' feelings that the work they do in their organization is meaningful, inspiring, and worthwhile, key components of workplace engagement.

Fit: Participants' feelings that they fit in their fields. Fit assesses how well participants feel their self-concepts, goals, and values align with their fields, and how well they feel they are accepted by others in their field.

Self-efficacy: Participants' appraisals that they are well-prepared for their jobs/careers and that they have the skills and abilities to be successful.

Social identity threat: Participants' worries or concerns that they will be evaluated on the basis of gender stereotypes or that their own behaviour will reflect on other men/women.

Symbols/Abbreviations

Symbols/abbreviations used and their meanings

Symbol	What is it?
N	Sample size (number of participants)
M	Mean
SD	Standard deviation
SE	Standard error of the mean (SD/√(N))
∝	"Alpha" (measure of scale consistency)
t	"*t* -statistic" (coefficient for a type of statistical test)
p	"*p* -value" (indicator for statistical significance)
d	"*d* " (measure of effect size)
Coeff.	Short for 'coefficient' (used when table reports multiple types of tests)
χ^2	Chi-Squared (coefficient for a type of statistical test)
V	Cramer's *V* (measure of effect size; interpreted similarly to *r*)
OR	*Odds ratio* (measure of effect size)
r	Pearson's *r* (coefficient for a correlation; ranges from -1 to +1)
*	Asterisk; used to indicate statistical significance at $p < .05$
**	Asterisk; used to indicate statistical significance at $p < .01$
***	Asterisk; used to indicate statistical significance at $p < .001$

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Hall, W. M., Schmader, T., & Croft, E. (2015). Engineering exchanges: Daily social identity threat predicts burnout among female engineers. *Social Psychological and Personality Science*, *6*, 528-534. doi: 10.1177/1948550615572637

Hall, W., Schmader, T., Aday, A., Inness, M., & Croft, E. (2018). Climate control: The relationship between social identity threat and cues to an identity-safe culture. *Journal of Personality and Social Psychology*, *115*, 446-467. doi: 10.1037/pspi0000137

Hall, W. M., Schmader, T., Aday, A., and Croft, E. (Online First). Decoding the dynamics of social identity threat in the workplace: A within-person analysis of women's and men's interactions in STEM. *Social Psychological and Personality Science*. doi/10.1177/1948550618772582

Sriram, N., & Greenwald, A. G. (2009). The Brief Implicit Association Test. *Experimental Psychology*, *56,* 283-294. doi: 10.1027/1618-3169.56.4.283

Recommended Academic Articles

Block, K., Hall, W.H, Schmader, T., Inness, M., & Croft, E. (In Press). Should I stay or should I go? Women's implicit stereotypic associations predict their commitment and fit in STEM. *Social Psychology*.

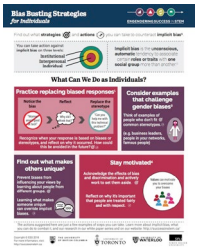
Fouad, N. A., Singh, R., Cappaert, K., Chang, W., & Wan, M. (2016). Comparison of women engineers who persist in or depart from engineering. *Journal of Vocational Behavior*, *92*, 79-93. doi: 10.1016/j.jvb.2015.11.002

Holleran, S. E., Whitehead, J., Schmader, T., & Mehl, M. R. (2011). Talking shop and shooting the breeze: A study of workplace conversation and job disengagement among STEM faculty. *Social Psychological and Personality Science*, 2, 65-71. doi: 10.1177/1948550610379921

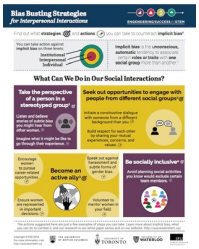
Sojo, V. E., Wood, R. E., & Genat, A. E. (2016). Harmful workplace experiences and women's occupational well-being: A meta-analysis. *Psychology of Women Quarterly*, *40*, 10-40. doi: 10.1177/0361684315599346

Recommended White Papers

successinSTEM.ca/resources

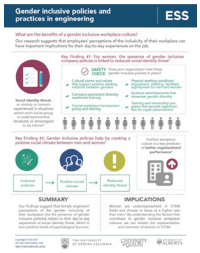


Bias Busting Strategies for Individuals



Bias Busting Strategies for Interpersonal Interactions

Bias Busting Strategies for Institutions



Gender-Inclusive Policies & Practices

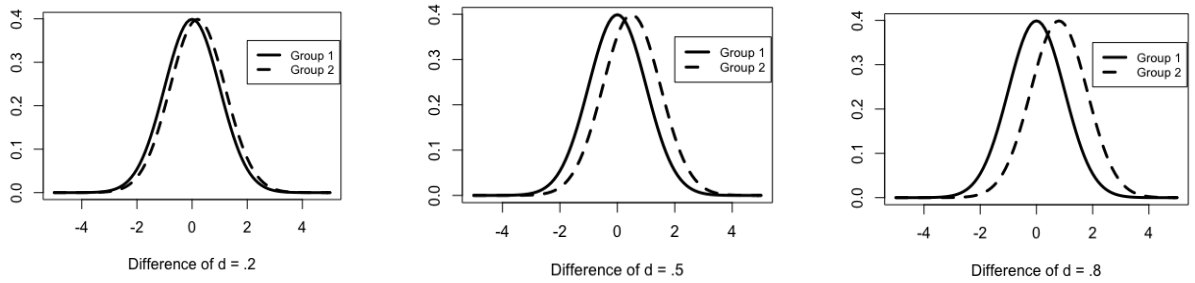
Interpretation Guide: Effect Sizes

Cohen's *d*

d is a measure of the size of the difference between two groups (e.g., Group 1 & Group 2)

Effect size interpretations

Values of *d*	Interpretation
.2	Small effect
.5	Medium effect
.8	Large effect



Assuming normally distributed groups, each with a standard deviation of 1, the figures above show the degree of overlap between two groups for effect sizes of d = .2, d = .5, and d = .8

Pearson's *r*, Cramer's V

r is a measure of the strength of the relationship between two variables (e.g., Variables X and Y)

Effect size interpretations

Values of *r*	Interpretation
.00 to .19	Very weak relationship
.20 to .39	Weak relationship
.40 to .59	Moderate relationship
.60 to .79	Strong relationship
.80 to 1.0	Very strong relationship

Effect size interpretations from Evans (1996).

Interpreting Variance Explained:

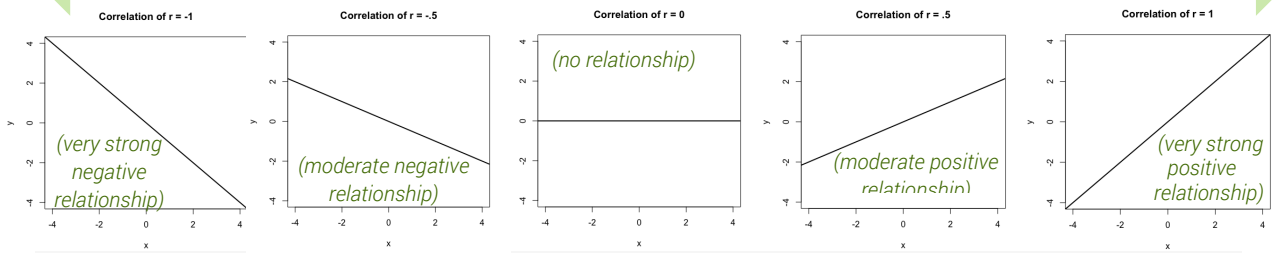
How much does change in Variable Y correspond to change in Variable X? (And vice versa)

Percentage of variance explained

Values of *r*	r^2	% var. expl.
.00	.00	0%
.10	.01	1%
.20	.04	4%
.30	.09	9%
.40	.16	16%
.50	.25	25%
.60	.36	36%
.70	.49	49%
.80	.64	64%
.90	.81	81%
1.00	1.00	100%

Cramer's V indexes the strength of the relationship between variables that are analyzed as counts (e.g., demographic groups). Cramer's V and Pearson's *r* are interpreted comparably.

1:1 Negative Relationship — Strength of Relationship — *1:1 Positive Relationship*



Assuming that both Variable X and Variable Y have a mean of zero and a standard deviation of 1, the above figures show correlations of *r* = -1.0, *r* = -.5, *r* = 0, *r* = .5, and *r* = 1.0

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