



CLIMBS UP
**PSYCHOLOGY
REPORT**

CLIMATE FOR INCLUSION





CLIMBS UP
Climate For Inclusion

Inclusive Climate and Career Outcomes Study



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CLIMATE FOR INCLUSION REPORT

PSYCHOLOGY

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EXECUTIVE SUMMARY

Despite the many benefits of diversity for STEM fields and society more broadly, women, underrepresented racially minoritized persons (URMs) and people from other marginalized groups remain a numerical minority in many disciplines.¹ For example, the recent Women, Minorities, and Persons with Disabilities in Science and Engineering document produced by the National Science Foundation (NSF 2021) reported that only 8.2% of doctoral degrees in psychology were earned by Black or African Americans in 2018, whereas they represented 12.5% of the general U.S. population. Similarly, 12.4% of doctoral degrees in psychology were earned by Latinx scholars in 2018, whereas they represented 18.5% of the general U.S. population.²

Research has shown that the climate of an organization (i.e., the organization's perceived norms, attitudes, and expectations; Thayer et al. 2018) can have an important impact on the experiences of those working in it.

Our research focused on a particular facet of climate, inclusive climate, which is associated with increased productivity, job commitment, and job satisfaction, as well as lower turnover intentions (McKay et al. 2007, 2008; Nishii 2013). Our own research highlights the experiences of marginalized scholars in psychology and reveals potential steps that can be taken to foster a more inclusive climate, and in turn positively impact the career outcomes and persistence of marginalized scholars in the field.

We examined perceptions of **inclusive climate at three levels: research group, department, and professional field**. Within psychology, our key findings included:

1) Women in psychology perceive that diversity is valued less in their departments and perceive less scholarly inclusion in their profession than men; gender non-binary participants perceive less

psychological safety in their research team and that diversity is valued less in their department than men; gender non-binary participants also perceive less scholarly inclusion in their profession than men and women;

2) Underrepresented minority participants (URM) perceive that diversity is valued less in their departments and perceive less scholarly inclusion in their profession than Asian and White participants; Asian participants perceive less scholarly inclusion in their profession than White participants;

3) Sexual minority participants perceive diversity is valued less in their department and perceive less scholarly inclusion in their profession than straight participants;

4) PhD students perceive less psychological safety in their research team than assistant professors; PhD students perceive diversity is valued less in their department than postdoctoral students and assistant professors.

In response to these findings we present a set of highly actionable recommendations for creating a more inclusive climate within the field of psychology at each of the three levels (research group, department, and professional field).

Due to the central role played by publications in scientific careers, our research also focused on three facets of scholars' experiences as authors (i.e., **authorship climate**): fairness of processes related to authorship (**procedural justice**); transparency of communication about authorship (**informational justice**); and fairness of authorship outcomes (**distributive justice**). In psychology, our results indicated that:

1) Women and non-binary participants perceive processes related to authorship to be less fair than men, and women perceive less transparent communication about authorship and less fairness of authorship outcomes than men;

2) PhD students perceive processes related to authorship to be less fair and perceive less transparent communication about authorship and less fairness of authorship outcomes than assistant professors, PhD students perceive processes related to authorship to be less fair and perceive less fairness of authorship outcomes than postdoctoral researchers, and postdoctoral researchers perceive processes related to authorship to be less fair than assistant professors.

Below in [Table 1](#), we offer several recommendations to foster more inclusive climates in the field of psychology with the goal of helping to improve career outcomes and diversify the field.

TABLE 1.

RECOMMENDATIONS TO FOSTER MORE INCLUSIVE CLIMATES IN PSYCHOLOGY

Research groups:

- Develop guidelines and policies for authorship, communication, conflict resolution, and access to research material
 - Foster a culture of respect through team meetings, collaborative writing sessions, and practice talks
-

Departments:

- Provide training to promote Diversity, Equity, Inclusion, and Belonging (DEI&B) through search practices, research group best practices, and faculty meeting facilitation
 - Promote leadership development for all department members through mentorship programs, career coaching, and research support
 - Examine existing department policies and norms through an “equity lens”
-

Scholarly societies:

- Include marginalized scholars in leadership positions
 - Develop a DEI&B mission statement and feature it on society websites
 - Center diversity, equity, and inclusion in conference programming and conference resources
 - Center DEI&B in journals and periodicals through topical focus areas and authorship policies
 - Create new awards or honors for research areas and methods historically undervalued by the field of psychology
-

Ways to improve authorship climate across multiple levels:

- Create authorship policies in research teams
 - Develop journal policies that promote transparency around author roles
 - Provide workshops on responsible authorship practices at society meetings
-

BACKGROUND

The academic community has struggled to make meaningful progress toward creating more inclusive and supportive environments that allow for greater participation of marginalized groups in STEM. Evidence suggests that various forms of diversity, including heterogeneity in gender, race/ethnicity, and disciplinary background, can help teams approach problems more creatively and effectively (Hofstra et al. 2020; Nielsen et al. 2017a; Page 2008; Woolley et al. 2010; Yang et al. 2022). In addition, developing a scientific workforce that more closely represents the population can increase the likelihood that scientists will address the full range of issues and challenges that face society (Nielsen et al. 2017b). Promoting diversity in STEM can also improve learning experiences for students from a variety of backgrounds (Bumpus 2015). Moreover, increasing the representation of women and URMs in STEM can help prevent negative “token effects” that can arise when women and URMs are unique within their work environment (Cain & Le lahey 2014; Nielsen et al. 2017a). Despite the many benefits of diversity for STEM fields and society, women, URMs, and people from other marginalized groups remain a numerical minority in many disciplines. Although there has been an increase in the number of women and URM graduate students completing PhDs across many science and engineering disciplines, these increases have failed to translate to greater diversity amongst faculty (National Science Board 2018). In fact, a recent article declared the gender gap in math, physics, and computer science “likely to persist for generations” (Holman et al. 2018, p. 1; see also Wapman et al. 2022).

Research from the fields of organizational psychology and team science suggest that climate (i.e., **the perceived norms, attitudes, and values in an organization**) could be an important part of the problem, which suggests meaningful avenues for improving the situation. Previous research has shown that the climate of an organization can have an important impact on the experiences of those working in it. For example, although the literature on climate is vast and has many nuances, **inclusive climates are associated with increased productivity, job commitment, and job satisfaction, as well as lower turnover intentions** (McKay et al. 2007, 2008; Nishii 2013). Because of the historical and continued exclusion and discrimination that marginalized groups have experienced, individuals from these groups are especially attentive to whether climates are inclusive (Purdie-Vaughns et al. 2008). **Researchers studying the climate within organizations consistently find that members of traditionally underrepresented groups perceive the climate more negatively than those from majority groups and subsequently have worse career outcomes** (Mor-Barak & Cherin 1998; McKay et al. 2007; Settles et al. 2019). These findings raise the concern that if academic environments lack an inclusive climate, those from marginalized groups may feel especially unwelcome, with negative consequences for their career outcomes and persistence.

To gain a better understanding of the impacts of climate on underrepresented and marginalized groups in the field of psychology, **we surveyed 935 early-career psychologists** (i.e., graduate students, postdoctoral researchers, and assistant professors) **about their perceptions of climate, particularly with respect to concerns around inclusion in their research groups, their departments, and the discipline as a whole** (see the Appendix for more details about our methodology).

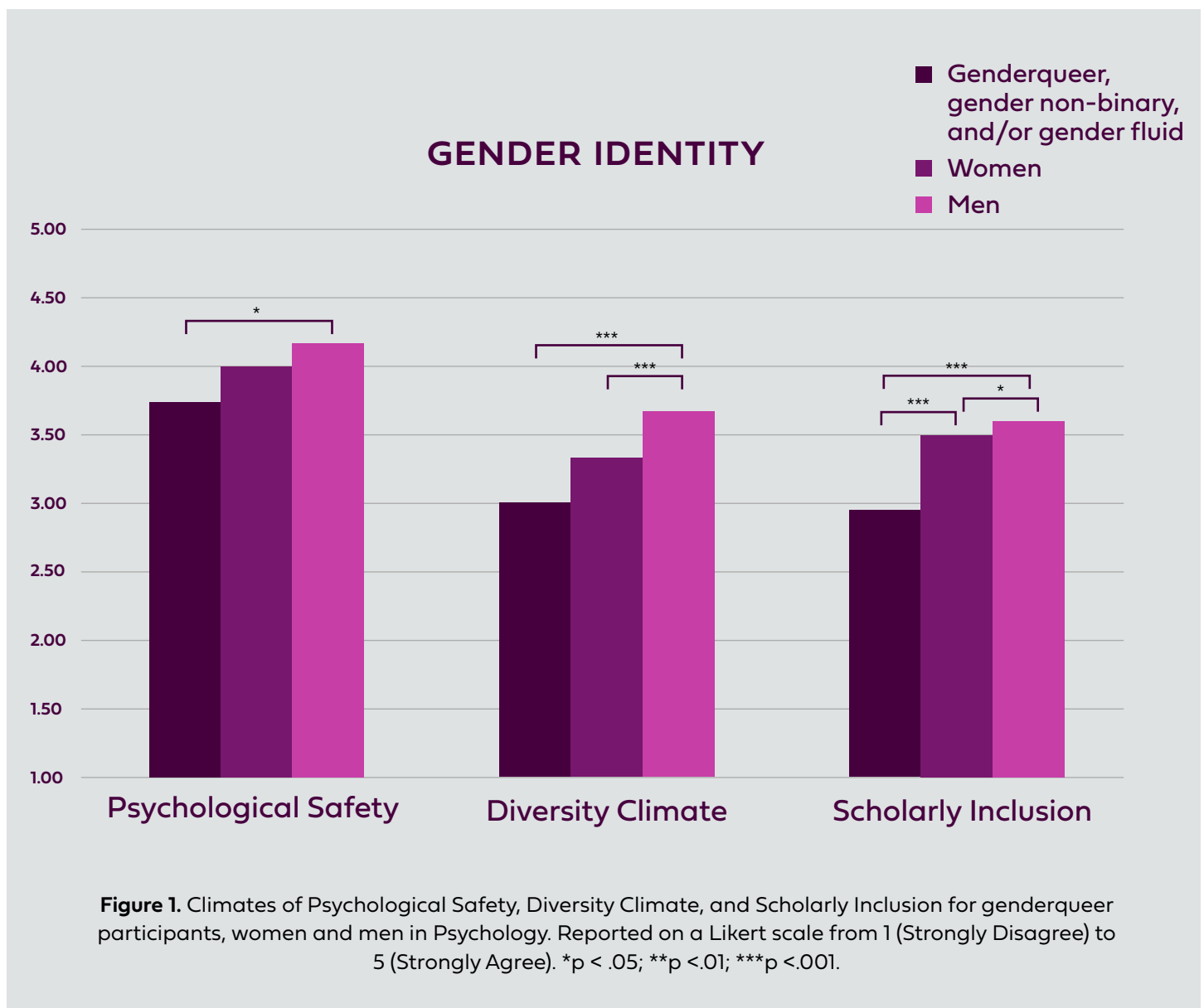
We asked about inclusive climate in ways that make sense for these varying contexts. For example, **at the level of the research group, we inquired about psychological safety (i.e., the ability to take risks, to make mistakes, and to ask others for help)**. This is important to study because psychological safety has been associated with greater group productivity, innovation, and knowledge sharing (Bradley et al. 2012; Burningham and West 1995; Xue et al. 2011), as well as greater individual job satisfaction, commitment, and involvement (Braun et al. 2013; Parker et al. 2003). **At the department level, we asked about the climate of diversity, which addresses the ease with which scholars from different backgrounds can fit in, be accepted, and receive resources and opportunities**. Previous research on STEM faculty and students have found positive associations between department climate and job satisfaction, productivity, and psychological well-being (Settles et al. 2006, 2007, 2013). **Finally, at the discipline level, we inquired about scholarly inclusion, which captures whether people feel like their values, their research, and people like them are represented and respected in their professional field**. Although little research has previously been done on the relationships between scholarly inclusion and career outcomes, emerging evidence points to important relationships between this form of climate and career attitudes (Douglas et al. 2024a).

Authorship of scientific articles is central to recognition, hiring, and career advancement in all academic fields, including psychology (e.g., Babor et al. 2017; Smith et al. 2019, 2020; Wilcox 1998), so we also asked our survey respondents about their perceptions of authorship practices in their research teams. This is an important topic to investigate

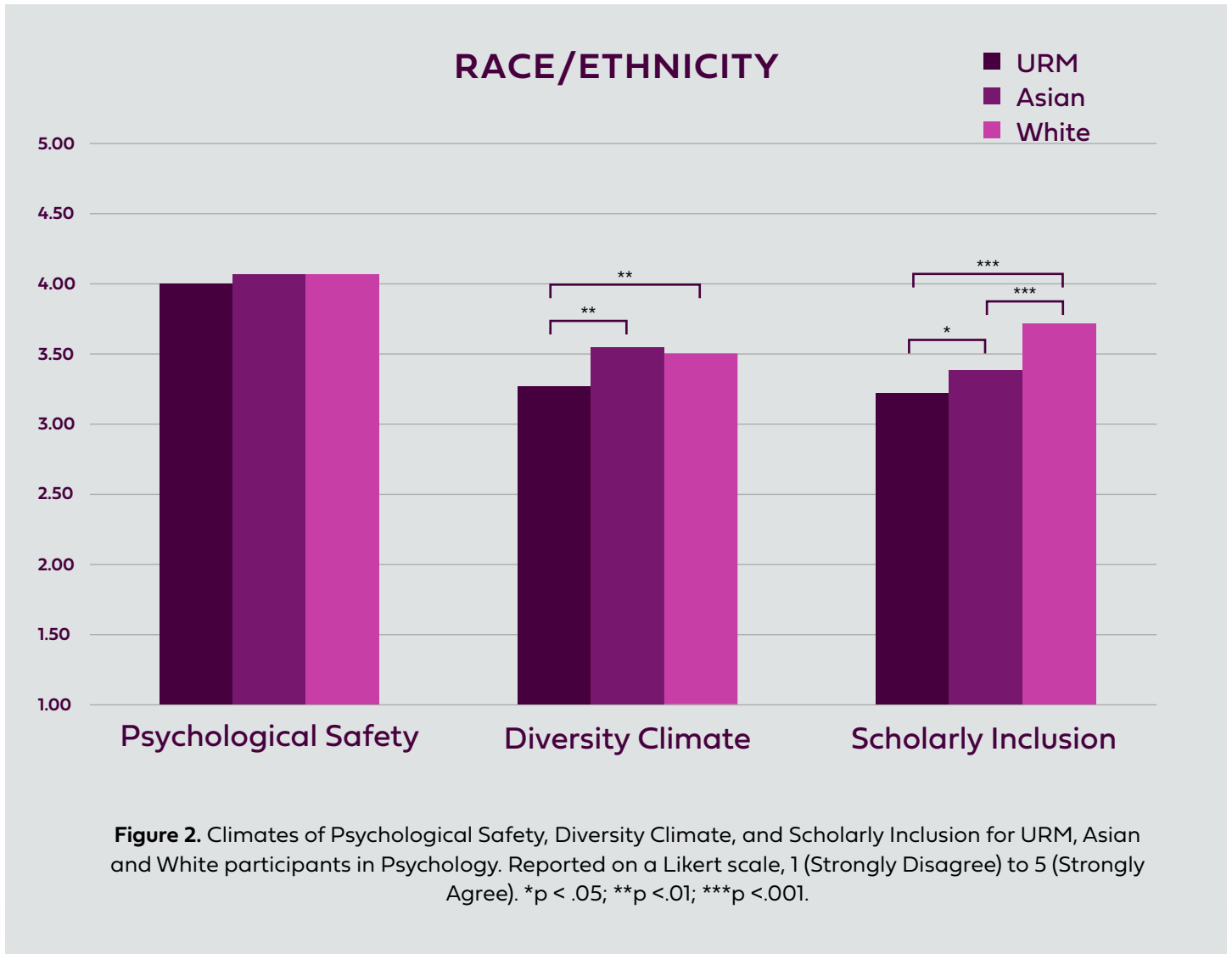
because previous research has documented inequities in the credit given to authors from marginalized groups (Sarsons 2017; West et al. 2013), and our own previous research indicates that those who bring diversity to STEM research teams tend to be less satisfied with authorship practices (e.g., including and ordering authors on papers) than other team members (Settles et al. 2019). **In our survey of psychologists, we asked about three facets of authorship climate (Douglas et al. 2024b): fairness of processes related to authorship (procedural justice), transparency of communication about authorship (informational justice), and fairness of authorship outcomes (distributive justice)**.

SUMMARY OF FINDINGS: CLIMATE

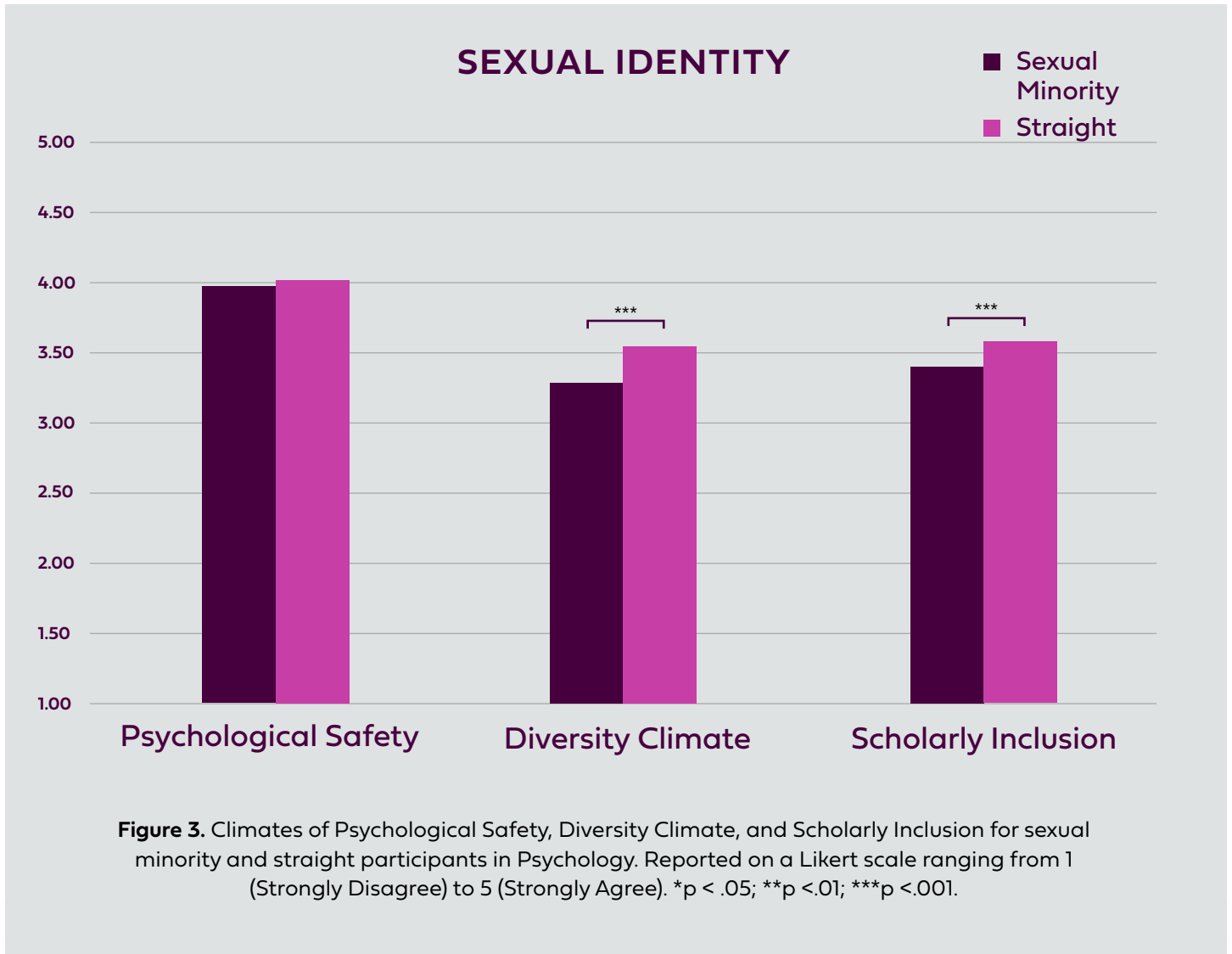
Our survey results indicate that **women in psychology perceive that diversity is valued less in their departments and perceive less scholarly inclusion in their profession than men.** Our results also indicate that **gender non-binary participants perceive less psychological safety in their research teams and perceive that diversity is valued less in their departments than men.** Finally, **gender non-binary participants also perceive less scholarly inclusion in their profession than men and women.**³



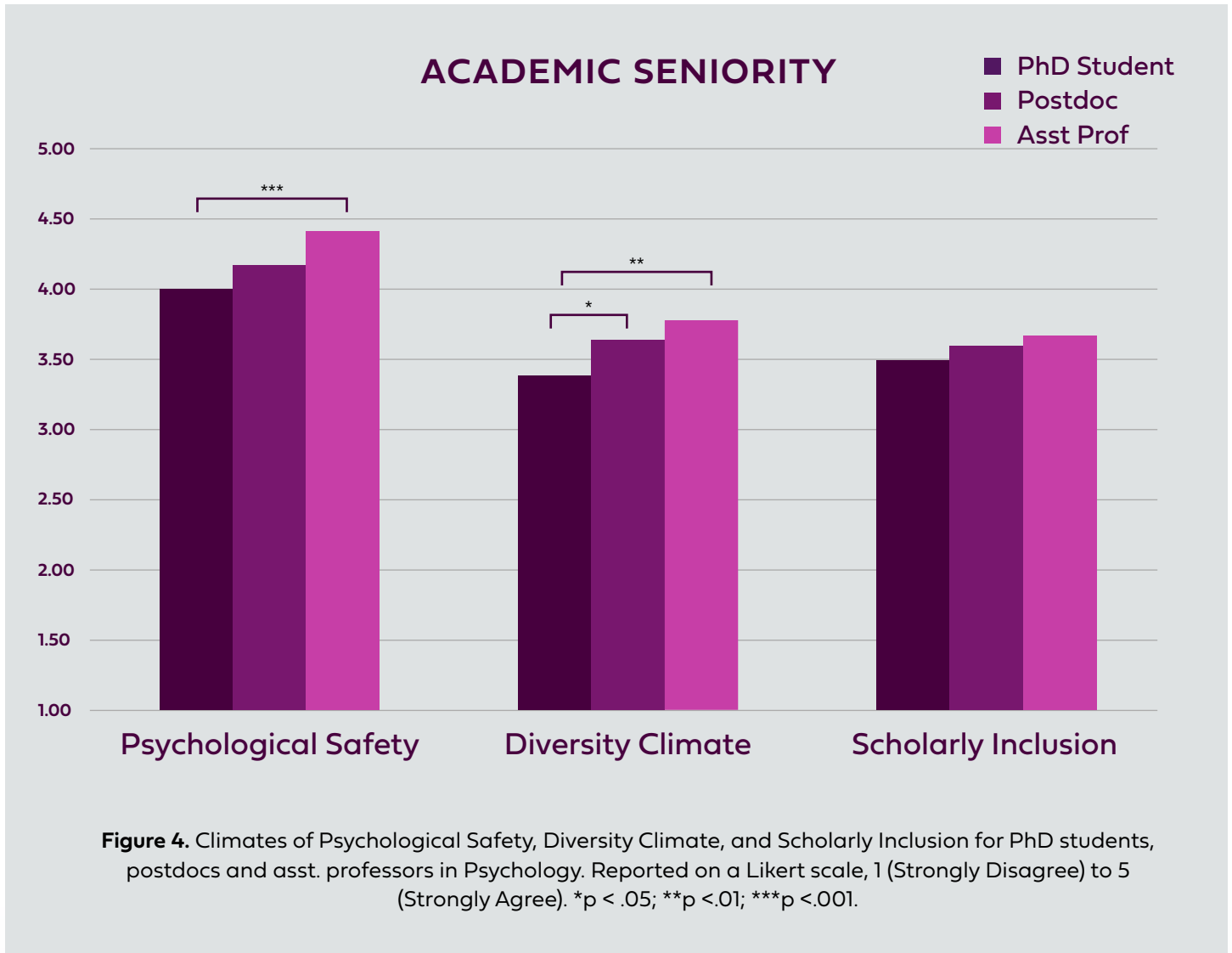
Our findings indicate that **underrepresented minority (URM) participants perceive that diversity is valued less in their departments and perceive less scholarly inclusion in their profession than Asian and White participants.** Our findings also indicate that **Asian participants perceive less scholarly inclusion in their profession than White participants.**⁴



Our results indicate that **sexual minority participants perceive that diversity is valued less in their departments and perceive less scholarly inclusion in their profession than straight participants.**⁵



We found that **PhD students perceive less psychological safety in their research teams than assistant professors**. Our findings also indicate that **PhD students perceive that diversity is valued less in their departments than postdoctoral students and assistant professors**.⁶



SUMMARY OF FINDINGS: AUTHORSHIP

We found that **women and non-binary participants perceive processes related to authorship to be less fair than men**. We also found that **women perceive less transparent communication about authorship and less fairness of authorship outcomes than men**.⁷

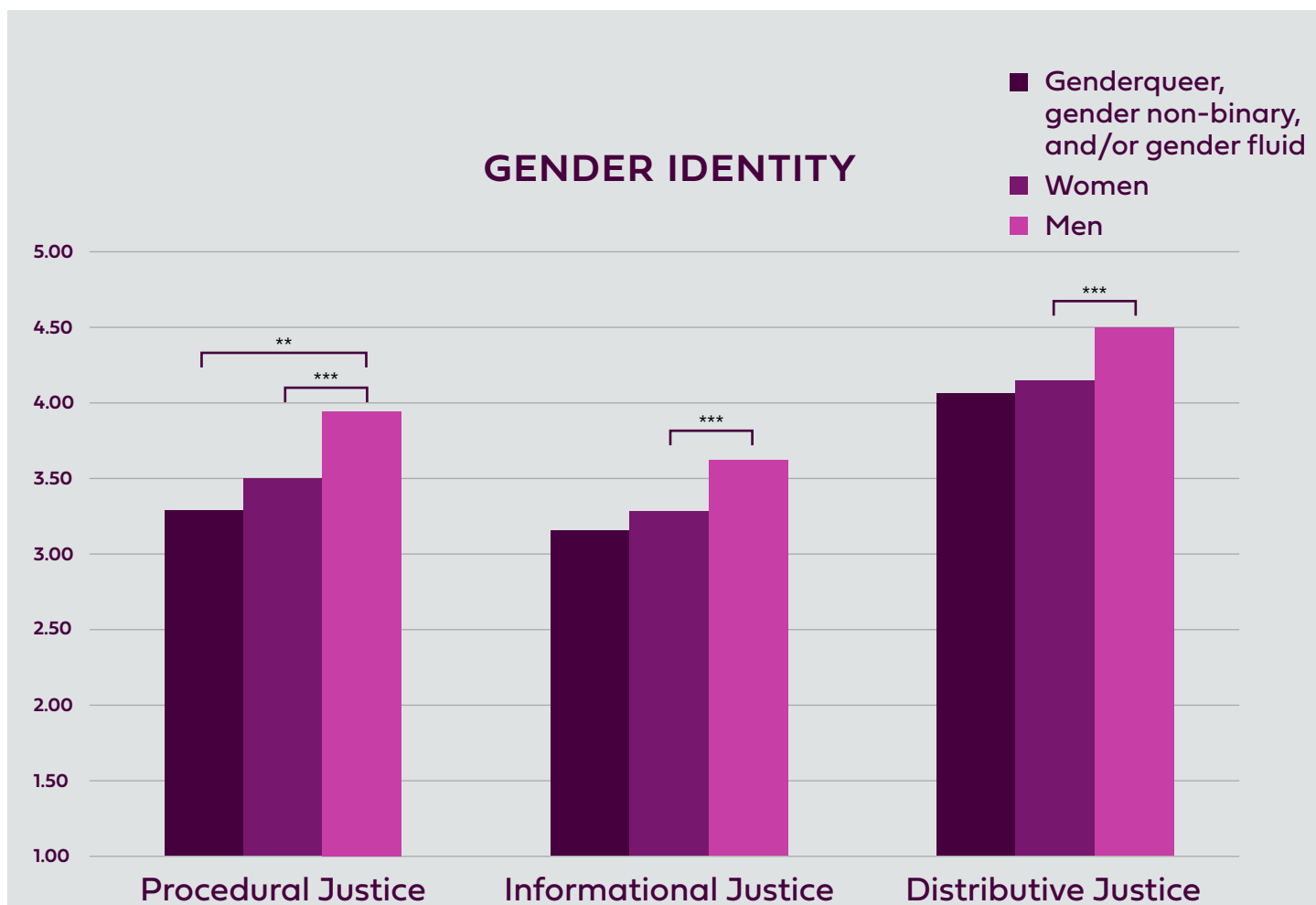
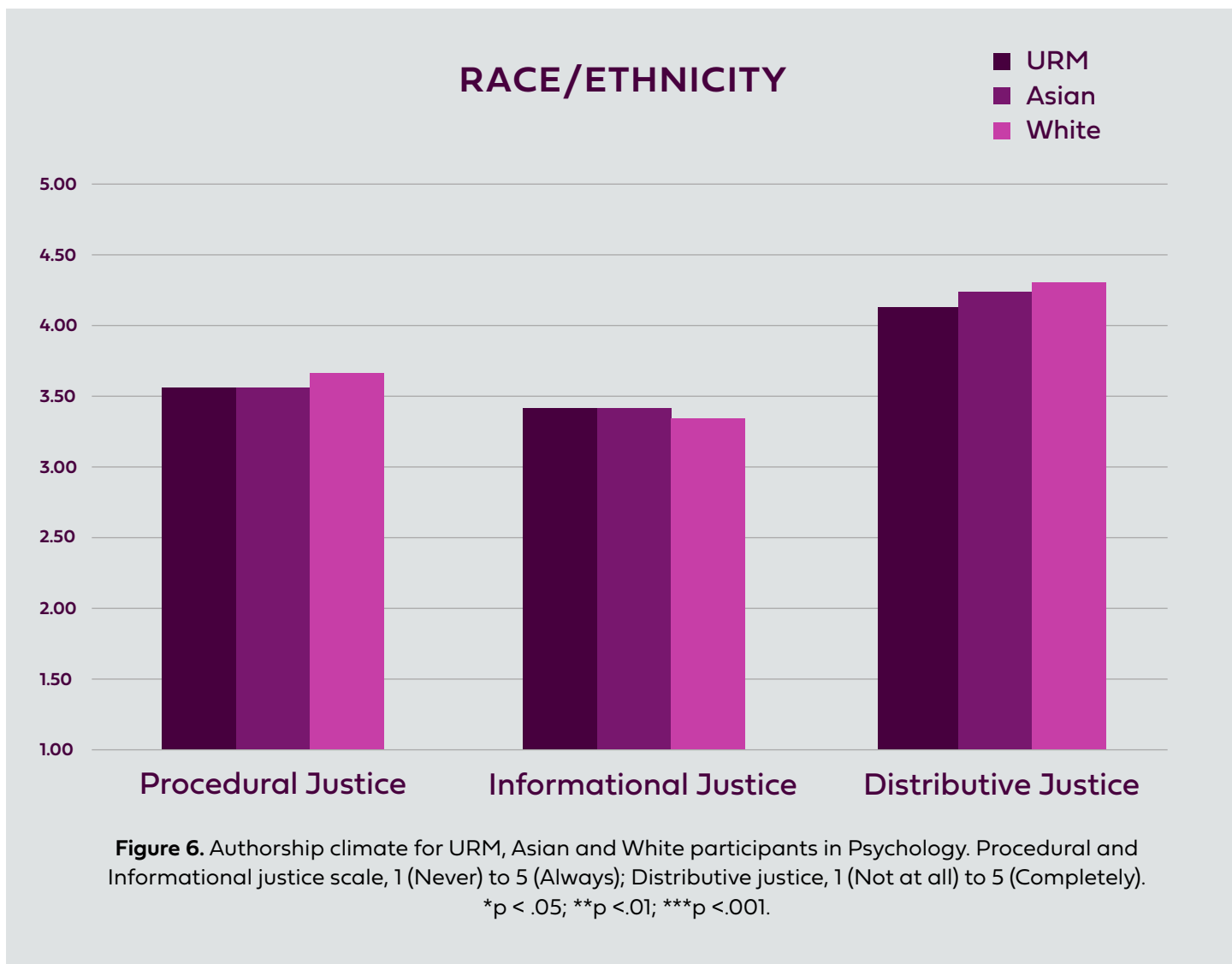
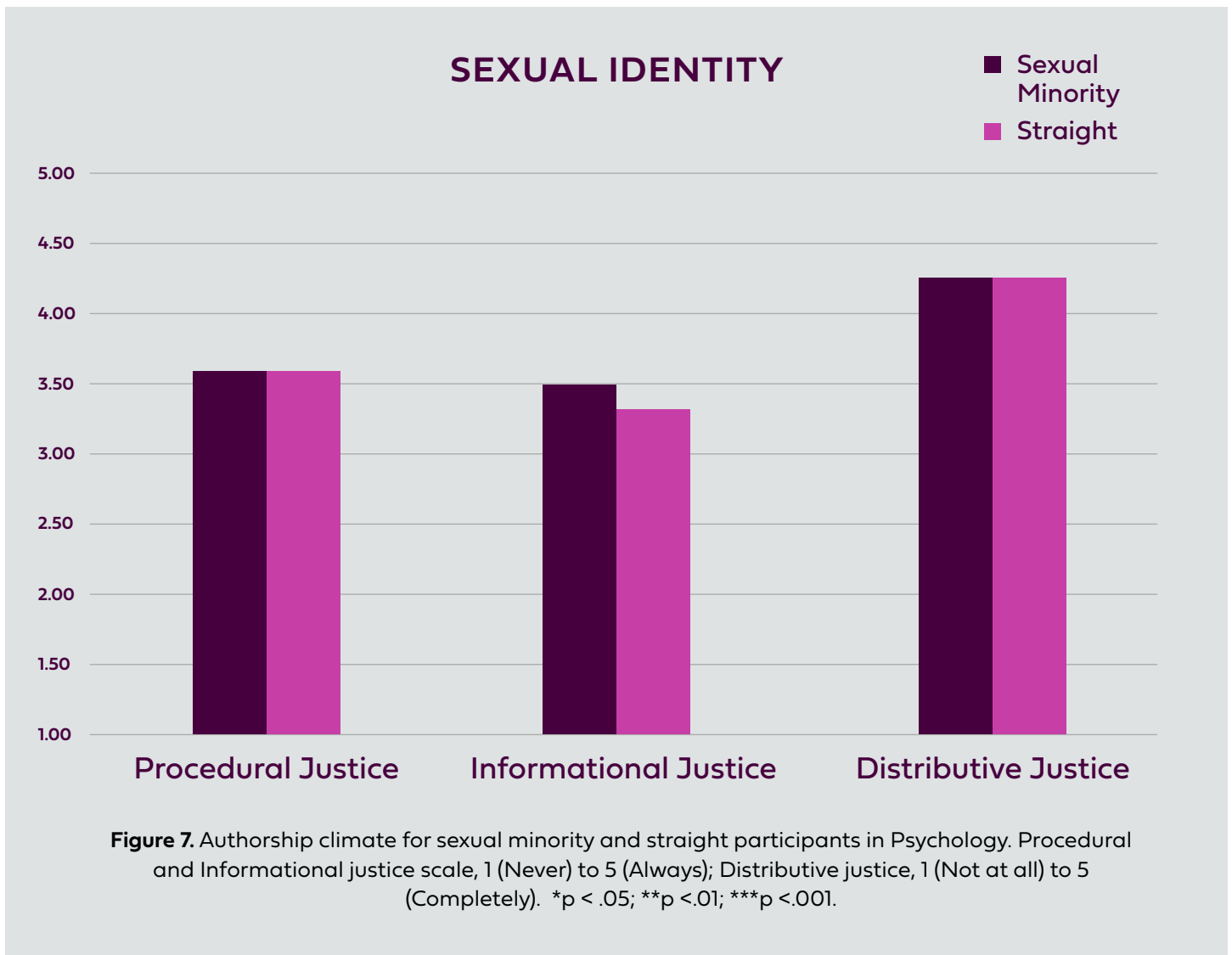


Figure 5. Authorship climate for genderqueer participants, women and men in Psychology. Procedural and Informational justice on Likert scale, 1 (Never) to 5 (Always); Distributive justice, 1 (Not at all) to 5 (Completely). *p < .05; **p < .01; ***p < .001.

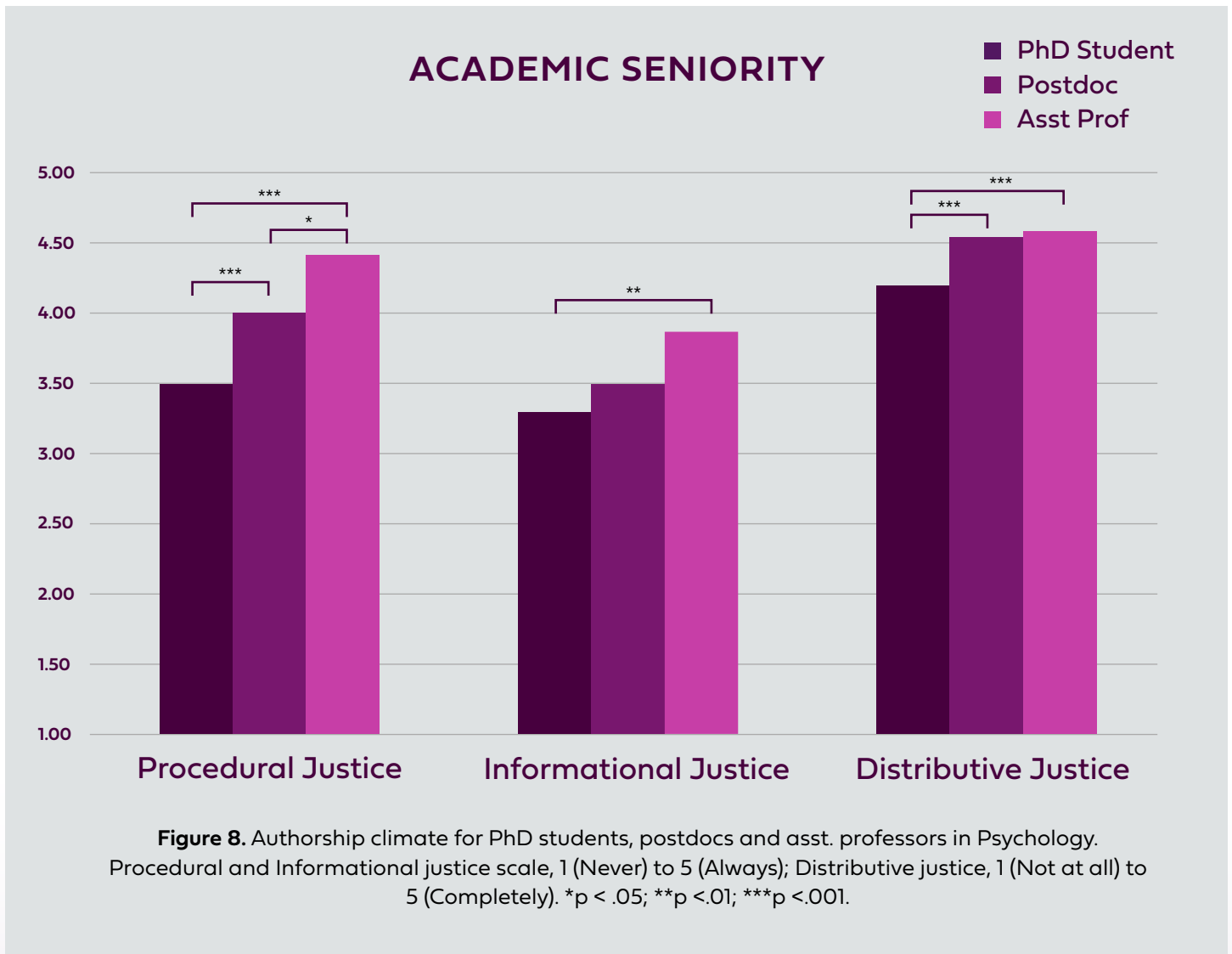
We found no significant differences by race/ethnicity on our authorship measures.⁸



We found no significant differences by sexual identity on our authorship measures.⁹



We also found that **PhD students perceive processes related to authorship to be less fair, and they perceive less transparent communication about authorship and less fairness of authorship outcomes than assistant professors.** In addition, we found that **PhD students perceive processes related to authorship to be less fair and perceive less fairness of authorship outcomes than postdoctoral researchers.** Finally, **postdoctoral researchers perceive processes related to authorship to be less fair than assistant professors.**¹⁰ These results could be related to the different levels of control that scholars at different career stages typically have over the authorship process (Settles et al. 2018).



RECOMMENDATIONS

Our results suggest that members of underrepresented and marginalized groups perceive aspects of the climate in their research teams, departments, and the discipline more negatively than other psychologists, and these negative climate perceptions include authorship practices. These perceptions could hinder efforts to diversify the field.

To help foster more inclusive climate experiences for all scholars in psychology, we offer several recommendations (Table 1; see also Douglas et al. 2024a; Douglas et al. 2024b).

1. Research groups should introduce policies and practices to help foster psychological safety

Research groups can create more inclusive environments for all team members by developing and maintaining policies and practices that foster an inclusive environment. We specifically recommend including all team voices in 1) the development and dissemination of collaboratively written authorship agreements (Douglas et al., 2024b; Elliott et al. 2017; Oliver et al. 2018; Soranno & Cheruvellil, 2019); and 2) the development and dissemination of guidelines for best practices for communication, conflict resolution, and access to research resources. Providing an inclusive process for developing such agreements and guidelines increases job satisfaction, especially for marginalized scholars, and helps to make cultural norms in the research group clear to all (Fallin-Bennet, 2015;

Settles et al., 2007; White & Lowenthal, 2011).

In addition to creating clear policies, research groups can hold regular team meetings, collaborative writing sessions, and practice talks during which all team members are encouraged to share their perspectives, ask questions, and provide feedback. **Creating a culture of respect and inclusivity where giving and receiving constructive feedback is modeled and practiced can enhance team dynamics and foster a sense of community within the research group.**

2. Psychology departments should provide training and demonstrate commitment to fostering an inclusive environment

Psychology departments can contribute to making the climate more inclusive for all their community members through training and professional support. We recommend (1) providing diversity, equity, and inclusion (DEI&B) department-level training around topics such as search practices, research group best practices, and faculty meeting facilitation; (2) ensuring opportunities for leadership development and professional growth such as mentorship programs, career coaching, and research support; and (3) adopting an equity-lens (i.e., fairly implementing employment practices, integrating differences, and being inclusive in decision making; Nishii, 2013) to examine existing department policies and norms, take

accountability for current limitations, and commit to reforming department practices as needed to create a more inclusive environment.

3. Professional societies in psychology should model inclusive practices

In addition to work at the research group and department level, our research has highlighted the role of professional societies in shaping the career outcomes for marginalized scholars (Douglas et al. 2024a). To promote an inclusive climate at the professional field level we recommend societies in psychology (1) include marginalized scholars in professional leadership positions (Madzima and MacIntosh 2021); (2) ensure society websites feature a DEI&B mission statement; (3) center DEI&B in their conference programming (as reflected in conferences' topical themes, panels, keynote addresses) and by providing resources such as mentoring workshops and supports such as travel and child care grants; (4) center DEI&B in their journals and periodicals as reflected in authorship guideline policies and topical focus areas; and (5) consider creating new awards or honors for research areas and methods historically undervalued by the field of psychology.

4. Research teams, departments, and professional societies should take steps to foster positive authorship climates

Given the importance of scholarly publications to psychologists' careers and the evidence that historically marginalized and early-career scholars perceive aspects of the authorship process more negatively than others, it is important to seek opportunities for improvement.

To improve authorship climate we recommend that research teams create authorship policies that state their principles for deciding who to include as authors on papers and how the authors should be ordered (Oliver et al. 2018; Soranno and Cheruvelil 2019). We also recommend regularly revisiting authorship policies to create opportunities for team members to voice any

concerns or questions and in turn help to influence their team's authorship practices (Elliott et al. 2017).

Scholarly societies in psychology can also positively influence authorship climate through journal policies and meeting practices. For example, journals can implement policies to make authorship roles more transparent, such as by requiring authorship contribution statements with published papers or encouraging researchers to include information about their paper contributions in their CVs (McNutt et al. 2018). Our results suggest that these forms of transparency could be particularly valuable for those who tend to have less power (e.g., postdoctoral scholars) and who may experience authorship climate more negatively (see also Settles et al. 2018). Societies can also organize workshops to discuss norms and challenges related to authorship, and they can provide documents, toolkits, and case studies about authorship practices on their websites (e.g., Cheruvelil et al. 2019).

METHODOLOGICAL APPENDIX

We conducted a representative survey of doctoral students, postdoctoral researchers, and assistant professors from a stratified random sample of 124 departments of biology, economics, physics, and psychology from 94 different U.S. institutions. The survey was distributed via email between April and May 2021 through the Qualtrics platform. Each participant received a unique link to ensure they could not take the survey multiple times. Participants received an initial recruitment email, and three reminder emails were sent to all who had not yet completed the survey. Of the 10,658 persons contacted, we received 3,531 responses (33.1% response rate). Within this sample, 63 participants were no longer in the department from which they were recruited, but we retained them as they remained in our target population (i.e., doctoral student, postdoctoral researcher, or assistant professor in biology, economics, physics, or psychology). The online questionnaire consisted of demographic questions and measures related to well-being, academic job outcomes, academic climate, and productivity.¹¹

ABOUT THE AUTHORS

We are an interdisciplinary team of scholars from four institutions committed to broadening participation in STEM. You can read more about our work here: <https://ee-stem.weebly.com/climbs-up.html>

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*** Lead authors, to be cited in reverse alphabetical order**

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ENDNOTES

1. We follow the U.S. National Science Foundation's definition of underrepresented minorities as "Races or ethnicities whose representation in STEM employment and S&E education is smaller than their representation in the U.S. population. This includes Blacks or African Americans, Hispanics or Latinos, and American Indians or Alaska Natives" (NCSES 2023).
2. The NSF report's statistics for the U.S. population as a whole came from 2019.
3. A one-way ANOVA revealed that there were statistically significant differences in psychological safety between at least two groups ($F(2, 892) = 4.53, p = .01$). Tukey's HSD Test for multiple comparisons found that the mean value of psychological safety was significantly different between gender queer participants ($M=3.73, SD = 1.00, n = 25$) and men ($M=4.14, SD = .73, n = 234$), ($p = .03, 95\% \text{ C.I.} = -.78, -.03$). Men perceive significantly more psychological safety than gender queer participants. A one-way ANOVA revealed that there were statistically significant differences in perceived department diversity climate between at least two groups ($F(2, 906) = 14.32, p < .001$). Tukey's HSD Test for multiple comparisons found that the mean value of department diversity climate was significantly different between gender queer participants ($M=3.01, SD = 1.00, n = 27$) and men ($M=3.67, SD = .84, n = 237$), ($p < .001, 95\% \text{ C.I.} = -1.07, -.24$). Men perceive significantly more department diversity climate than gender queer participants. Tukey's HSD Test also found that the mean value of department diversity climate was significantly different between women ($M=3.35, SD = .90, n = 645$) and men ($M=3.67, SD = .84, n = 237$), ($p < .001, 95\% \text{ C.I.} = -.47, -.15$). Men perceive significantly more department diversity climate than women. A one-way ANOVA revealed that there were statistically significant differences in perceived scholarly inclusion between at least two groups ($F(2, 915) = 13.50, p < .001$). Tukey's HSD Test for multiple comparisons found that the mean value of scholarly inclusion was significantly different between gender queer participants ($M=2.96, SD = .70, n = 27$) and men ($M=3.60, SD = .62, n = 243$), ($p < .001, 95\% \text{ C.I.} = .34, .93$). Men perceive significantly more scholarly inclusion than gender queer participants. Tukey's HSD Test also found that the mean value of scholarly inclusion was significantly different between women ($M=3.49, SD = .62, n = 648$) and gender queer participants ($M=2.96, SD = .70, n = 27$), ($p < .001, 95\% \text{ C.I.} = .24, .81$). Women perceive significantly more scholarly inclusion than gender queer participants. Finally, Tukey's HSD Test found that the mean value of scholarly inclusion was significantly different between women ($M=3.49, SD = .62, n = 648$) and men ($M=3.60, SD = .62, n = 243$), ($p = .04, 95\% \text{ C.I.} = -.21, -.0007$). Men perceive significantly more scholarly inclusion than women.
4. A one-way ANOVA revealed that there were statistically significant differences in perceived department diversity climate between at least two groups ($F(2, 897) = 6.41, p = .002$). Tukey's HSD Test for multiple comparisons found that the mean value of department diversity climate was significantly different between URM participants ($M=3.22, SD = 1.00, n = 190$) and white participants ($M=3.48, SD = .85, n = 549$), ($p = .002, 95\% \text{ C.I.} = -.43, -.08$).

White participants perceive significantly more department diversity climate than URM participants. Tukey's HSD Test also found that the mean value of department diversity climate was significantly different between URM participants ($M=3.22$, $SD = 1.00$, $n = 190$) and Asian participants ($M=3.49$, $SD = .91$, $n = 161$), ($p = .01$, 95% C.I. = $-.49$, $-.04$). Asian participants perceive significantly more department diversity climate than URM participants. A one-way ANOVA revealed that there were statistically significant differences in perceived scholarly inclusion between at least two groups ($F(2, 906) = 52.62$, $p < .001$). Tukey's HSD Test for multiple comparisons found that the mean value of scholarly inclusion was significantly different between URM participants ($M=3.19$, $SD = .65$, $n = 194$) and white participants ($M=3.67$, $SD = .60$, $n = 554$), ($p < .001$, 95% C.I. = $.35$, $.58$). White participants perceive significantly more scholarly inclusion than URM participants. Tukey's HSD Test also found that the mean value of scholarly inclusion was significantly different between URM participants ($M=3.19$, $SD = .65$, $n = 194$) and Asian participants ($M=3.35$, $SD = .55$, $n = 161$), ($p = .02$, 95% C.I. = $-.30$, $-.01$). Asian participants perceive significantly more scholarly inclusion than URM participants. Finally, Tukey's HSD Test also found that the mean value of scholarly inclusion was significantly different between Asian participants ($M=3.35$, $SD = .55$, $n = 161$) and white participants ($M=3.67$, $SD = .60$, $n = 554$), ($p < .001$, 95% C.I. = $-.43$, $-.18$). White participants perceive significantly more scholarly inclusion than Asian participants.

5. A two-sample t-test was performed to compare department diversity climate for straight and sexual minority participants. There was a significant difference in department diversity climate between straight participants ($M = 3.49$, $SD = .89$, $n = 666$) and sexual minority participants ($M = 3.27$, $SD = .87$, $n = 247$); $t(911) = 3.33$, $p < .001$. Straight participants perceive significantly more department diversity climate than sexual minority participants. A two-sample t-test was performed to compare scholarly inclusion for straight and sexual minority participants. There was a significant difference in scholarly inclusion between straight participants ($M = 3.55$, $SD = .61$, $n = 671$) and sexual minority participants ($M = 3.37$, $SD = .65$, $n = 251$); $t(920) = 3.97$, $p < .001$. Straight participants perceive significantly more scholarly inclusion than sexual minority participants.

6. A one-way ANOVA revealed that there were statistically significant differences in perceived psychological safety between at least two groups ($F(2, 896) = 9.22$, $p < .001$). Tukey's HSD Test for multiple comparisons found that the mean value of psychological safety was significantly different between PhD students ($M=3.99$, $SD = .80$, $n = 757$) and assistant professors ($M=4.38$, $SD = .42$, $n = 64$), ($p < .001$, 95% C.I. = $-.62$, $-.16$). Assistant professors perceive significantly higher psychological safety than PhD students. A one-way ANOVA revealed that there were statistically significant differences in perceived department diversity climate between at least two groups ($F(2, 910) = 8.10$, $p < .001$). Tukey's HSD Test for multiple comparisons found that the mean value of department diversity climate was significantly different between PhD students ($M=3.38$, $SD = .90$, $n = 770$) and assistant professors ($M=3.76$, $SD = .92$, $n = 65$), ($p = .003$, 95% C.I. = $-.64$, $-.11$). Assistant professors perceive significantly more department diversity climate than PhD students. Tukey's HSD Test also found that the mean value of department diversity climate was significantly different between PhD students ($M=3.38$, $SD = .90$, $n = 770$) and post-doctoral students ($M=3.65$, $SD = .70$, $n = 78$), ($p = .03$, 95% C.I. = $.01$, $.51$). Post-doctoral students perceive significantly more department diversity climate than PhD students.

7. A one-way ANOVA revealed that there were statistically significant differences in procedural justice between at least two groups ($F(2, 804) = 15.76$, $p < .001$). Tukey's HSD Test for multiple comparisons found that the mean value of procedural justice was significantly different between gender queer participants ($M=3.29$, $SD = .90$, $n = 20$) and men ($M=3.91$, $SD = .84$, $n = 213$), ($p = .01$, 95% C.I. = $.09$, 1.14). Men perceive significantly more procedural justice than gender queer participants. Tukey's HSD Test also found that the mean value of procedural justice was significantly different between women ($M=3.49$, $SD = 1.00$, $n = 574$) and men ($M=3.91$, $SD = .84$, $n = 213$), ($p < .001$, 95% C.I. = $-.59$, $-.23$). Men perceive significantly more procedural justice than women. A one-way ANOVA revealed that there were statistically significant differences in informational justice between at least two groups ($F(2, 798) = 6.43$, $p = .002$). Tukey's HSD Test for multiple comparisons found that the mean value of informational justice was significantly

different between women ($M=3.28$, $SD = 1.33$, $n = 572$) and men ($M=3.64$, $SD = 1.20$, $n = 209$), ($p < .001$, 95% C.I. = $-.60, -.12$). Men perceive significantly more informational justice than women. A one-way ANOVA revealed that there were statistically significant differences in distributive justice between at least two groups ($F(2, 797) = 12.46$, $p < .001$). Tukey's HSD Test for multiple comparisons found that the mean value of distributive justice was significantly different between women ($M=4.17$, $SD = .90$, $n = 570$) and men ($M=4.50$, $SD = .70$, $n = 210$), ($p < .001$, 95% C.I. = $-.47, -.16$). Men perceive significantly more distributive justice than women.

8. A one-way ANOVA revealed that there were no statistically significant differences in procedural justice between URM participants ($M= 3.54$, $SD = .92$, $n = 159$), Asian participants ($M=3.54$, $SD = .96$, $n = 136$), and White participants ($M=3.63$, $SD = .99$, $n = 506$) ($F(2, 798) = .775$, $p = .46$). A one-way ANOVA revealed that there were no statistically significant differences in informational justice between URM participants ($M= 3.40$, $SD = 1.27$, $n = 159$), Asian participants ($M=3.39$, $SD = 1.30$, $n = 136$), and White participants ($M=3.35$, $SD = 1.30$, $n = 500$) ($F(2, 792) = .08$, $p = .92$). A one-way ANOVA revealed that there were no statistically significant differences in distributive justice between URM participants ($M= 4.15$, $SD = .83$, $n = 158$), Asian participants ($M=4.25$, $SD = .83$, $n = 136$), and White participants ($M=4.30$, $SD = .81$, $n = 500$) ($F(2, 791) = 1.98$, $p = .13$).

9. Two sample t-tests were performed to compare our authorship measures for sexual minority participants and straight participants. There were no statistically significant differences in procedural justice between sexual minority participants ($M= 3.60$, $SD = 1.01$, $n = 216$), and straight participants ($M=3.61$, $SD = .96$, $n = 594$), ($t(810) = .26$, $p = .80$). There were no statistically significant differences in informational justice between sexual minority participants ($M= 3.52$, $SD = 1.28$, $n = 214$), and straight participants ($M=3.32$, $SD = 1.29$, $n = 590$), ($t(804) = -1.88$, $p = .06$). There were no statistically significant differences in distributive justice between sexual minority participants ($M=4.30$, $SD= .83$, $n = 214$), and straight participants ($M=4.25$, $SD = .82$, $n = 589$), ($t(803) = -.21$, $p = .83$).

10. A one-way ANOVA revealed that there were statistically significant differences in procedural justice between at least two groups ($F(2, 807) = 32.87$, $p < .001$). Tukey's HSD Test for multiple comparisons found that the mean value of procedural justice was significantly different between PhD students ($M=3.48$, $SD = 1.00$, $n = 669$) and assistant professors ($M=4.37$, $SD = .55$, $n = 65$), ($p < .001$, 95% C.I. = $-1.17, -.60$). Assistant professors perceive significantly more procedural justice than PhD students. Tukey's HSD Test also found that the mean of procedural justice was significantly different between post-doctoral students ($M=3.95$, $SD = .81$, $n = 76$) and assistant professors ($M=4.37$, $SD = .55$, $n = 65$), ($p < .02$, 95% C.I. = $-.79, -.04$). Assistant professors perceive significantly more procedural justice than post-doctoral students. Finally, Tukey's HSD Test found that the mean of procedural justice was significantly different between PhD students ($M=3.48$, $SD = 1.00$, $n = 669$) and post-doctoral students ($M=3.95$, $SD = .81$, $n = 76$), ($p < .001$, 95% C.I. = $.20, .73$). Post-doctoral students perceive significantly more procedural justice than PhD students. A one-way ANOVA revealed that there were statistically significant differences in informational justice between at least two groups ($F(2, 801) = 6.17$, $p = .002$). Tukey's HSD Test for multiple comparisons found that the mean value of informational justice was significantly different between PhD students ($M=3.31$, $SD = 1.32$, $n = 665$) and assistant professors ($M=3.87$, $SD = 1.02$, $n = 65$), ($p = .002$, 95% C.I. = $.16, .95$). Assistant professors perceive significantly more informational justice than PhD students. A one-way ANOVA revealed that there were statistically significant differences in distributive justice between at least two groups ($F(2, 800) = 11.78$, $p < .001$). Tukey's HSD Test for multiple comparisons found that the mean value of distributive justice was significantly different between PhD students ($M=4.19$, $SD = .90$, $n = 666$) and assistant professors ($M=4.58$, $SD = .51$, $n = 64$), ($p < .001$, 95% C.I. = $.14, .64$). Assistant professors perceive significantly more distributive justice than PhD students. Tukey's HSD Test also found that the mean value of distributive justice was significantly different between PhD students ($M=4.19$, $SD = .90$, $n = 666$) and post-doctoral students ($M=4.55$, $SD = .53$, $n = 73$), ($p = .001$, 95% C.I. = $.11, .58$). Post-doctoral students perceive significantly more distributive justice than PhD students.

11. The text for the methodological appendix is from the Methods section of Douglas et al. (2024b).

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