

Social Psychological Bulletin

Psychologia Społeczna

Gender Disparities in Middle Authorship

Alexandra Fleischmann^{a§}, Laura Van Berkel^{a§}

[a] *Social Cognition Center Cologne, University of Cologne, Cologne, Germany.*

§*These authors contributed equally to this work.*

Social Psychological Bulletin, 2021, Vol. 16(1), Article e2897, <https://doi.org/10.32872/spb.2897>

Received: 2020-03-02 • Accepted: 2020-10-20 • Published (VoR): 2021-03-30



Handling Editor: Magdalena Formanowicz, University of Bern, Bern, Switzerland

Corresponding Author: Alexandra Fleischmann, Political Psychology, Social Cognition Center Cologne, University of Cologne, Richard-Strauss-Str. 2, 50931 Köln, Germany. E-mail: alexandra.fleischmann@uni-koeln.de

Supplementary Materials: Data, Materials [see [Index of Supplementary Materials](#)]



Abstract

Women increasingly occupy jobs in psychological research, but continue to face career barriers. One such barrier is fewer authorship and publication opportunities, with women often having fewer first authorships than men. In this research, we examine the overlooked role of middle authorship. Middle authorship contributes to various indices of productivity, while having lower costs. Study 1 looks at five years of authorship in two major journals in social and personality psychology. Study 2 examines publication records of all social psychology faculty in the Netherlands. Both studies find that women have fewer authorship possibilities: In Study 1, women were underrepresented as authors in academic journals, while women in Study 2 had shorter publication lists. More importantly, this tendency was exacerbated for middle authorship positions. Furthermore, the percentage of middle authorship publications were positively related to more publications overall. A focus on middle authorship highlights previously underestimated challenges women continue to face in psychological research.

Keywords

social and personality psychology, authorship, bibliometric, gender, collaboration



This is an open access article distributed under the terms of the [Creative Commons Attribution 4.0 International License](#), CC BY 4.0, which permits unrestricted use, distribution, and reproduction, provided the original work is properly cited.

Highlights

- 22% of collaborative publications had all-male authors and 13% had all-female authors.
- Focus on first-authorship may underestimate gender disparities in publication rates.
- Gender disparities in middle authorship may harm women's careers via lower productivity metrics.

Women make up an increasing proportion of researchers in social and personality psychology. The percentage of women in the Society for Personality and Social Psychology (SPSP) has grown from approximately 33% in 1986 (Stricker et al., 1986) to 51% in 2016 (SPSP, 2016). However, women still lag behind men in traditional metrics of research success, such as publication rates, citations, and awards (Brown & Goh, 2016; Cikara et al., 2012; Eagly & Miller, 2016; Johnson et al., 2017; Mayer & Rathmann, 2018). Women are also less likely to have research-focused positions, and tend to spend less time on research than they prefer (SPSP, 2017; Winslow, 2010). While previous research has largely focused on gender disparities in first authorship, metrics of career success are based on overall productivity, including other authorship positions. In the current paper, we therefore examine gender disparities across different authorship positions.

Importance of Middle Author Publications

To study disparities in publication rates, a large body of previous research has mainly focused on first authorship, while concentrating less on last, and neglecting middle authorship positions. For instance, women were less likely than men to be first authors across academic fields (West et al., 2013). A global, cross-discipline bibliometric analysis shows that for every female first-authored paper, there were nearly two male first-authored papers (Larivière et al., 2013). The same trend held within social and personality psychology—men were more likely to be first authors than women in top social and personality psychology journals, though the disparities were smaller (Brown & Goh, 2016). A range of reasons are discussed for this underrepresentation, such as gender bias, discrimination, underrepresentation in senior positions, or gendered behavior (Brown & Goh, 2016; West et al., 2013).

However, it is also important to examine gender disparities in authorship beyond the first author position. Research productivity and impact metrics (e.g., h-index, citation counts) do not weigh publications by contribution or authorship position (Acuna et al., 2012). First and non-first authored publications contribute equally to these indices, while non-first author publications consume fewer resources. For example, researchers with more collaborators tend to also have more publications (Lee & Bozeman, 2005). A lengthy publication record resulting from middle authorships can produce an impression of productivity, although first-author contributions are ostensibly more valued.

Non-first author contributions can also be taken as superficial indices of collegiality and skill as a supervisor. A minority of publications are single authored and so authorship discrepancies cannot be fully understood without considering gender disparities across collaborative authorship positions. Gender inequalities in middle and last authorship positions may stem from similar reasons as inequalities in first authorship (e.g., stereotypes, discrimination, underrepresentation in science). Therefore, the first hypothesis that we test in this paper is that women are underrepresented not only in first, but also in middle and last authorship positions, compared to the percentage of women in the field (as evidenced by membership rates of SPSP; SPSP, 2016).

Gender Disparities in Mixed-Gender Collaborations

Additionally, it is important to understand gender differences in light of collaboration dynamics between men and women. For example, men tend to publish more overall and collaborate more with other men (Araújo, Araújo, Moreira, Herrmann, & Andrade, 2017; Bozeman & Gaughan, 2011). According to the guidelines of the American Psychological Association (APA, 2019), authorship should reflect one's contribution to research and includes anyone involved with research design, data collection and analysis, manuscript drafting, or final approval. Authorship is ordered by the amount of contribution, with first authorship reserved for the person doing the most work, that is, leading the project. Therefore, first authorship is rather clear in most cases. In contrast to that, middle and last authorship is often more ambiguous. APA notes that first authors have primary responsibility for ensuring deserving authors are credited, but leaves it up to the authors to determine authorship and authorship order. The ambiguity and potential complexity of determining what constitutes a "deserving" author and how contributions should be weighted can open the door for stereotyping and prejudice to influence judgement (e.g., Dovidio & Gaertner, 2000).

As middle and last authorship can be ambiguous, the underrepresentation of women may be magnified. This may be especially true when looking at mixed-gender collaborations, as women are often under-credited for their work and are excluded from male collaborative networks. Women are perceived as contributing less when they collaborate with men, and are less likely to receive full credit for contributions—even if they actually spend *more* time on research (Feldon et al., 2017; Haynes & Heilman, 2013; Heilman & Haynes, 2005). For example, women are seen as contributing less to group work when only information about the overall success of the group is given (Heilman & Haynes, 2005). These effects extend to impact job performance evaluations. In economics, where authorship order is usually alphabetical so that individual contributions are unclear, women—but not men—who co-author more are less likely to receive tenure due to biased credit attributions (Sarsons et al., 2021). Similar results are found in accounting (Wiedman, 2020).

Women also may not be sought for collaboration to begin with, which is likely to have a larger effect on middle and last than on first authorship. Men across science fields tend to have more collaborators than women and these collaborators are more often male (Araújo et al., 2017; Bozeman & Gaughan, 2011; Teele & Thelen, 2017). Both male and female faculty collaborate more with men, but women tend to collaborate with women more (Araújo et al., 2017; Bozeman & Corley, 2004). These differences are especially pronounced for international collaborations, which usually result in a broader distribution of research and higher impact measured via citations (Guerrero Bote et al., 2013; Larivière et al., 2013). Due to these misperceptions and social networks, women may be attributed lower authorship than their contribution warrants and may be excluded entirely from authorship, even when they make, or could make, substantial contributions. Consequently, women's authorship in mixed-gender collaborations may predominantly stem from leading projects and thus being first authors. Limiting assessment of gender differences in publication to first authorship can therefore obscure and minimize differences. Thus, while we expect women to be underrepresented overall, our second hypothesis is that this underrepresentation is even stronger for middle and last authorship positions than for first authorship.

The Current Studies

In the current work, we examined gender differences across authorship positions. In Study 1, we assessed authorship in two major social and personality psychology journals. First, based on previous work (e.g., Brown & Goh, 2016), we predicted that women would be underrepresented, compared to the percentage of women in the field, in first, but also in middle and last authorship positions. Second, in mixed-gender collaborations we expected that women would be even *more* underrepresented in non-first than first authorship positions, making first authorship the most likely position for women in mixed-gender collaborations. In Study 2, we assessed authorship and publication rates of all social psychology faculty in the Netherlands. We expected women overall to have fewer publications. We also expected that women would have a higher percentage of first authorships, but a lower percentage of middle and last publications compared to men, even when controlling for years of experience. De-identified data is available at the Open Science Framework (see [Supplementary Materials](#)).

Study 1: Gender Inequality in Publications

Study 1 was a bibliometric analysis of authorship by gender in two major social and personality psychology journals over five years. We examined gender representation across all collaborative publications and in mixed-gender collaborations. We compared the percentage of women in each authorship position relative to the percentage of wom-

en in the field. Then, we examined the percentage of women in first-author positions relative to all other authorship positions. As an exploratory analysis, we also compared the percentage of women to the percentage of men.

Method

We coded five years of articles (2012–2016) in the *Journal of Personality and Social Psychology* (JPSP; $n = 601$; 2342 authors) and *Personality and Social Psychological Bulletin* (PSPB; $n = 617$; 2052 authors) for author gender and authorship position¹. Overall, 1,835 female authors and 2,522 male authors published in both journals². Of these, there were 1280 unique women and 1503 unique men. Both numbers indicate that men were more likely to publish in these top journals than women. Looking at individual journals, 811 women and 1161 men published in PSPB, and 954 women and 1361 men published in JPSP. When controlling for duplicates in authors per journal, 707 women and 822 men remained for PSPB and 751 women and 961 men remained for JPSP. To expand on the scope of previous studies (e.g., Brown & Goh, 2016), we coded every authorship position.

Two research assistants blind to the study hypotheses coded gender for each author. Gender was determined by examining the gender stereotypicality of the author's first name and internet searches for author information (pictures or profiles using gendered pronouns) on personal, research, or university webpages (Brown & Goh, 2016). Inter-rater reliability was high, $\kappa = .93$, and disagreements between coders were resolved by the authors. Thirty articles could not be fully coded – at least one author name was gender ambiguous with no clarifying internet record (as of January 2018). This left a sample of 581 JPSP articles (2103 authors) and 607 PSPB articles (2011 authors). To obtain at least 80% power to detect a medium effect of $\phi = .30$, we assessed authorship positions for which there were at least 87 publications (first to fifth and last position).

While we did not have differing hypotheses for each middle authorship position, we chose to not collapse over middle authorship positions for two reasons: First, examining each position separately allows for a more comparable approach to the binary coding of first and last authorship position, while collapsing would have led to percentages of female and male middle authors on each paper. Second, the percentage due to collapsing would have also been influenced by the number of authors on each paper, unevenly weighting the value of each author, which we avoid by examining each position.

1) Corrections, retractions, and editorial comments were excluded from analysis.

2) We were unable to code the gender of 10 authors in PSPB and 27 authors in JPSP.

Results

Gender Composition of Publications

Across publications³, 97% ($n = 1151$) were collaborative with two or more authors. The other publications were male (2.4%, $n = 28$) and female (0.8%, $n = 9$) solo-authored. Within collaborative publications, 22.2% ($n = 255$) had all-male authors and 12.6% ($n = 145$) had all-female authors. Collaborations that included both men and women (i.e., “mixed-gender collaborations,” $n = 751$) comprised 65.2% of all collaborative publications.

Percentage of Female Authors Compared to the Field

First, to test our first hypothesis and in line with previous research, we examined the percentage of female authors in each position⁴ relative to the percentage of women in the field, for all collaborative publications and for mixed-gender publications. Each position was treated as unique, meaning a position counted either as a first, middle or last authorship position. In other words, a paper with two authors was counted as having a first and last authorship position, a paper with three authors as having a first, a second, and last authorship position, a paper with four authors as having a first, second, third, and last authorship position, and so on.

To approximate the percentage of women in the field, we used the percentage of women provided by SPSP for their membership data. We chose SPSP data for several reasons: First, we followed Brown and Goh (2016), who also chose SPSP as a reference, to make our analysis comparable. Second, SPSP is the biggest association of social and personality psychologists. Third, while other associations are purely associations of social psychology or personality psychology, SPSP covers both fields, which corresponds with the journals we analyzed. Finally, other smaller associations (such as the European Association of Social Psychology) report similar or higher percentages of women (54%, Lantos, Nyul, Kende, Reicher, & Lindholm, 2018), making the SPSP data a conservative estimate.

First, we examined the percentage of women per publication, that is, interval scale data that could vary from 0% women to 100% women, using a t -test. In all collaborative publications, women made up 42.5% of authors per publication on average ($SD = 31.7\%$), significantly less than the expected percentage of women in the field (51%; SPSP, 2016), $t(1150) = -9.08$, $p < .001$, 95% $CI_{Diff} [-0.10, -0.07]$, $d = -0.27$. Next, we examined each authorship position individually, with the person on each position being either a man (0) or a woman (1), using chi-square tests for this dichotomous data. Women were a significantly lower percentage of authors than expected for first, second, third, fourth,

3) For which author gender could be identified.

4) The percentage of female authors in each position was calculated as the number of female authors in this authorship position divided by the number of all authors in this authorship position.

fifth, and last authorship positions, 37.1%–48%; all $\chi^2(1) \geq 4.12$, $ps \leq .042$, $\phi = .06$ –.28 (see Table 1). These results replicate previous work that women overall are underrepresented in first and last authorship positions, and extend this to find that women are also underrepresented in middle authorship positions.

Table 1

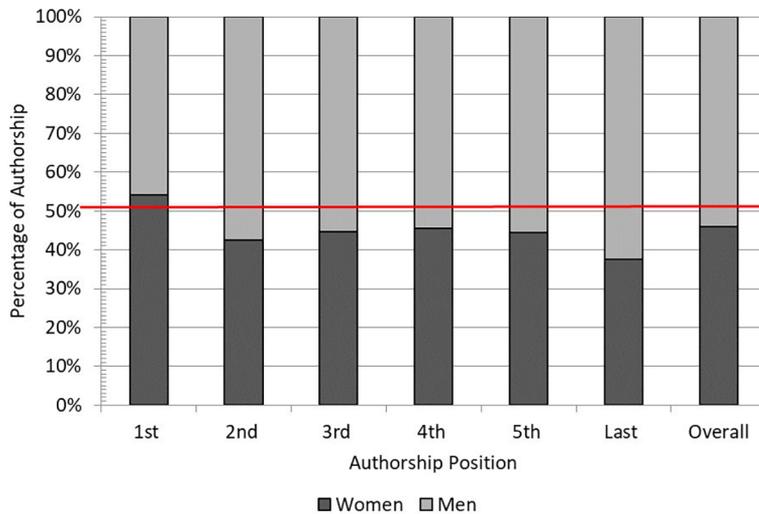
Percentage of Women in Authorship Positions in All Collaborations Compared to Women in the Field (51%)

Position	<i>n</i>	Percentage	$\chi^2(1)$	<i>p</i>	ϕ	95% CI $_{\phi}$
1 st	1151	48.0	4.26	.039	.06	.003, .12
2 nd	786	38.4	49.76	< .001	.25	.18, .32
3 rd	470	40.2	21.89	< .001	.22	.13, .30
4 th	221	43.0	5.68	.017	.16	.03, .29
5 th	109	41.3	4.12	.042	.19	.01, .37
Last	1151	37.1	89.01	< .001	.28	.22, .33

Next, we looked at mixed-gender collaborations, to determine whether women's underrepresentation extends to publications on which men and women collaborated (as underrepresentation could be driven by more male solo-gender collaborative publications). Within mixed-gender collaborations, women comprised 45.8% of collaborators on average per publication ($SD = 16.7\%$), again significantly lower than an expected percentage of 51%, $t(750) = -8.47$, $p < .001$, 95% CI $_{\text{Diff of \%}}$ [-0.06, -0.04], $d = -0.31$. Women were a significantly lower percentage of authors than expected for second, third, and last author positions, 37.5%–44.6%; all $\chi^2(1) \geq 6.08$, $ps \leq .014$, $\phi = .13$ –.27, and marginally for fifth, $\chi^2(1) = 2.91$, $p = .088$, $\phi = .17$, but not for fourth, $\chi^2(1) = 2.26$, $p = .133$, $\phi = .11$. For first authorship, there was a marginal effect in the opposite direction, 54.2%, $\chi^2(1) = 3.07$, $p = .080$, $\phi = .06$ (see Figure 1, see also Table S1 in the Supplementary Materials for more detailed statistics). Overall, these results mainly replicated the results for all collaborative publications, but in line with our second hypothesis, there seemed to be a difference with regard to first authorship. We next turn to the comparison of authorship percentages for different authorship positions to test this difference.

Figure 1

Percentage of Men and Women Authors in Mixed-Gender Collaborations in Study 1



Note. Red line indicates the expected proportion of women of 51%.

Likelihood of First Compared to Middle and Last Authorship

Here, we tested whether women would be even more underrepresented in non-first authorship positions than in first authorship positions, in line with our second hypothesis. We examined this hypothesis in mixed-gender publications, and in all collaborative publications. While our hypothesis concerned mixed-gender publications, we also examined all publications to see whether this effect extended to collaborative publications in general. To do so, we compared percentages of women in each position to the percentage of women in the first authorship position. Again, we treated each position as unique.

A series of chi-square tests indicated that within mixed-gender publications, women were more likely to be in a position of first authorship (54.2%) relative to second, third, fourth, fifth, and last authorship, 37.5%–45.6%, $\chi^2(1) = 5.53$ – 83.87 , $ps \leq .019$, $\phi = .17$ – $.33$. For more details, please see Figure 1 (see also Table S2 in the Supplementary Materials for more detailed statistics). This indicates that in cases when men and women collaborate, women are more likely to be first author. That is, women are more likely to lead the project and work with men as collaborators, than to be sought out for or included in collaborations and receive credit for other contributions.

Within all collaborative publications, somewhat similar findings emerged, showing that the effects of mixed-gender collaborations are strong enough to influence numbers in collaborations overall. Women were more likely to be in a position of first authorship (48%) than second, third, or last authorship, 37.1%–40.2%, $\chi^2(1) = 11.42$ – 54.44 , $ps \leq .001$, ϕ

= .13–.22, but not fourth or fifth authorship (see Table S3 in the [Supplementary Materials](#) for more detailed statistics). These findings do not contradict [Brown and Goh \(2016\)](#), as women are still first author less than men overall. However, these findings show that women are even less likely to be middle authors or last authors. We report a replication of their analysis in a later part of the Results section.

Gender Differences in Authorship Positions

We also tested whether men or women made up a higher percentage of authors for first to fifth and last authorship positions. Again, we treated each position as unique and, in line with our previous analyses, only included collaborative publications (i.e., publications with more than one author) for first authorship (in contrast to [Brown & Goh, 2016](#), who also included single-authored papers for their analysis of first authorship). We report the analyses first for all collaborations, then for mixed-gender collaborations.

In all collaborations, there were statistically equal amounts of men and women in the first authorship position, $\chi^2(1) = 1.92, p = .166, \phi = .04$. However, there were more men in the second to fourth and in the last authorship position, $\chi^2(1) \geq 4.35, ps \leq .037, \phi = .14-.26$ (see Table S4 in the [Supplementary Materials](#) for more detailed statistics), and marginally more men than women in the fifth authorship position, $\chi^2(1) = 3.31, p = .069, \phi = .17$.

We repeated these analyses for mixed-gender collaborations. In mixed-gender collaborations, there were significantly *more* women than men in the first authorship position, $\chi^2(1) = 5.29, p = .022, \phi = .08$. In contrast to that, there were significantly more men in the second, $\chi^2(1) = 12.94, p < .001, \phi = .15$, and third authorship position, $\chi^2(1) = 4.32, p = .038, \phi = .11$. Women and men were statistically equally represented in fourth, $\chi^2(1) = 1.50, p = .221, \phi = .09$, and fifth authorship positions, $\chi^2(1) = 2.27, p = .132, \phi = .15$. In the last authorship position, women were again less represented than men, $\chi^2(1) = 46.56, p < .001, \phi = .25$.

Finally, to compare our results to previous findings ([Brown & Goh, 2016](#)), we also compared the percentage of women's and men's first authorship (in this case, including single-author papers following [Brown & Goh's](#) analysis) with an equal distribution for JPSP and PSPB. [Brown and Goh \(2016\)](#) found that women were underrepresented as first authors both in JPSP (34%) and PSPB (44%). We replicate their findings that women are underrepresented as first authors in JPSP, $\chi^2(1) = 8.19, p = .004, \phi = .12$, though women now make up 44% in JPSP. For PSPB, we do not find a significant difference from an equal distribution, $\chi^2(1) = 0.02, p = .903, \phi = .01$, with women making up approximately 50%. This seems to indicate a positive trend in time, with both journals now having a higher percentage of women in first authorship positions and PSPB even reaching parity.

Discussion

Study 1 provides first evidence that looking only at first authorship underestimates gender disparities in authorship. Overall, we replicate previous findings that compared to

the percentage of women in the field, women were underrepresented in all authorship positions in two top social and personality psychology journals. Similar results are found when comparing the number of men and women to an equal distribution, though there were not fewer women than men in the first authorship position. However, we also find that women were particularly underrepresented in non-first authorship positions. Differences in women's representation between first and non-first authorship were even more pronounced when looking only at mixed-gender collaborations, when women and men worked together on a paper. When women collaborate with men, they might be more likely to lead the research than be credited with non-primary contributions. Finally, we do not completely replicate the findings of [Brown and Goh \(2016\)](#) for PSPB, as there is no gender difference in first authorship in PSPB. We do replicate their findings with regard to JPSP, though with a smaller effect size. This indicates that gender disparities in first authorship seem to be getting smaller with time, at least for these two journals.

Study 2: Gender Inequality in Author CVs

Authorship differences in individual journals could stem from a range of factors, including gendered distributions into subfields and fluctuations over time. Even though we account for this by coding two journals, and coding a range of years, we supplement our analyses in Study 2 with a sample of all social psychology faculty in the Netherlands. We chose the Netherlands because the scientific system in the Netherlands is similar to the U.S. and other Western countries, and universities in the Netherlands rank well in international rankings of psychological research ([Times Higher Education, 2018](#)). Additionally, the Netherlands only has eleven universities with social psychology researchers, so coding all social psychology faculty was feasible. We expected women to have fewer publications overall, but were mainly interested in whether women would have a higher percentage of first- and a lower percentage of middle- and last-author publications, in line with our second hypothesis.

Method

We examined publications ($n = 7796$) for every person in a professor position in social psychology at every university in the Netherlands ($n = 11$) as of April 24, 2017. We excluded professors for whom we could not determine gender ($n = 1$) or who had no publications ($n = 1$), leaving a final sample of 153 professors⁵ (92 men, 61 women).

5) In our analyses, we omitted graduate students because the number of publications among graduate students is relatively low ($M = 2.16$, $SD = 3.26$) and, therefore, the percentage of publications at each authorship position is heavily skewed. We also omitted non-professor positions (e.g., Lecturer) because research expectations and obligations are unclear for these positions. The sample of assistant, associate, full, and emeritus professors allows us to assess gender disparities comprehensively within a nation.

A sensitivity power analysis indicated this sample would provide 80% power ($\alpha = .05$) to detect a small to medium-sized effect of $\eta^2 = .04$ for a MANOVA with an expected large positive correlation ($r = .75$) among repeated measures (a conservative estimate). In contrast to Study 1, in which our unit of analysis was each paper, in Study 2, our unit of analysis was each (male or female) professor. Therefore, in contrast to Study 1, it was possible to calculate for each professor the number of papers with first, middle, and last authorship, without having to differentiate by middle authorship position⁶. As we did not have different predictions for different middle authorship positions, we collapsed over middle authorship positions in Study 2.

We obtained publication records from university and personal websites and research databases (GoogleScholar, PsychInfo, and ResearchGate). We coded only English-language empirical journal articles that were published or in press (where listed). We coded the target author's authorship position (first, middle, or last) for each publication, target gender, target academic position (25.5% Full Professors, 20.9% Associate Professors, 49.0% Assistant Professors, 4.6% Professor Emeriti), and target year of PhD if available (1966–2017; $M = 2003$, $SD = 10.40$). We divided the number of publications at each authorship position by the total number of publications to create a measure of authorship percentages for each researcher. While the fact that women have fewer publications than men has been established in prior work, both in psychology and in other fields (e.g., Larivière et al., 2013; Odic & Wojcik, 2020), in this paper, we were mainly interested in whether the percentage of first, middle, and last authorships differed by gender. While this difference can be less obvious than the number of publications, it can still have important consequences, as middle and last authorships can contribute to a lengthy publication record.

Results

Gender Differences in Different Authorship Positions

Overall, women had significantly fewer publications than men, $t(151) = 3.13$, $p = .002$, 95% CI_{diff} [11.33, 50.22], $d = 0.54$, in line with our first hypothesis (see Table 2 for means and standard deviations). Next, we examined differences in publication percentages and authorship position by gender with a 2 (IV: gender: male vs. female) \times 3 (DV: percentage: first vs. middle vs last) MANOVA (see Figure 2). Women had a significantly higher percentage of first-author publications compared to men (see Table 2), Wilks-Lambda $F(1, 151) = 11.01$, $p = .001$, 95% $CI_{diff\ of\ \%}$ [-0.188, -0.048], $\eta^2 = .068$. In contrast, women had a (marginally) lower percentage of middle-author, Wilks-Lambda $F(1, 151) = 3.29$,

6) Middle authorship was weighted equally for each paper and did not depend on the number of authors as in Study 1.

$p = .072$, 95% $CI_{\text{diff of \%}} [-0.005, 0.105]$, $\eta^2 = .021$ and last-author publications than men, Wilks-Lambda $F(1, 151) = 6.95$, $p = .009$, 95% $CI_{\text{diff of \%}} [0.017, 0.119]$, $\eta^2 = .044$.

Table 2

Gender Differences in Proportions of Publications

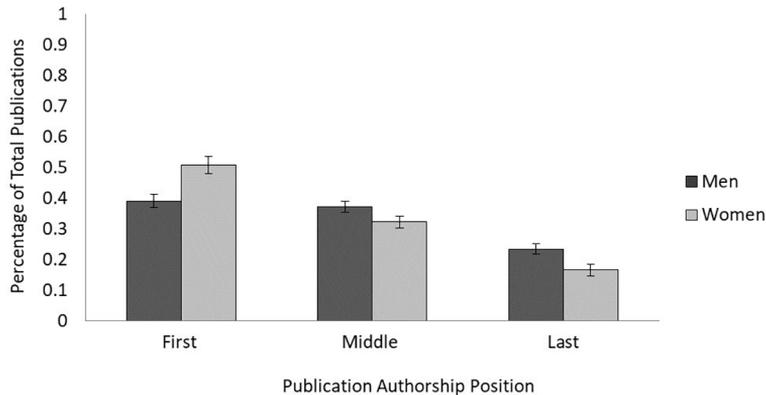
Authorship	Women		Men	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
First author	50.93***	21.61	39.17**	21.37
Middle author	32.33 _†	15.18	37.35 _†	17.72
Last author	16.73**	15.12	23.51**	15.87
Total publications ^a	32.44**	42.38	63.23**	68.70

Note. Means in the same row differ significantly at ** $p = .01$ and *** $p < .001$. Means with a dagger differ marginally.

^aThis row reports the total number of publications, not percentages.

Figure 2

Percentage of Total Publication at Each Authorship Position for Male and Female Professors in the Netherlands in Study 2



Note. Error bars represent standard errors.

Controlling for Years of Experience

Gender differences in publication records may occur because of historic trends in gender representation—men are likely to have been in the field longer and to be in supervisory positions. To assess the extent to which gender differences in authorship and number of publications occurred beyond cohort effects, we included years since PhD as a control variable in an ANCOVA for publications overall and the MANCOVA for percentages of publication positions⁷. When controlling for years since PhD, there were no significant

gender differences in overall publications, $F(1, 148) = 2.41, p = .123, 95\% \text{ CI}_{\text{diff of total articles}} [-3.79, 31.61], \eta^2 = .016$. However, even when controlling for years since earning a PhD, women had a significantly higher percentage of first author publications, Wilks-Lambda $F(1, 148) = 4.44, p = .037, 95\% \text{ CI}_{\text{diff of \%}} [-0.138, -0.004], \eta^2 = .029$, and significantly fewer middle author publications, Wilks-Lambda $F(1, 148) = 3.98, p = .048, 95\% \text{ CI}_{\text{diff of \%}} [0.001, 0.113], \eta^2 = .026$. Women did not have fewer last author publications, Wilks-Lambda $F(1, 148) = 0.41, p = .523, 95\% \text{ CI}_{\text{diff of \%}} [-0.030, 0.059], \eta^2 = .003$.

Does Authorship Predict Total Publications?

Finally, we examined whether gender, authorship percentages, and their interaction predicted an author's total number of articles, controlling for years since obtaining a PhD. We used three regressions, one for first, middle, and last authorship each, and regressed the total number of articles on gender, authorship percentages, their interaction, and years since obtaining a PhD without centering. A higher percentage of first-author publications predicted fewer total publications, $\beta = -0.31, SE = 25.95, t(146) = -3.35, p = .001, 95\% \text{ CI}_b [-138.70, -37.86]$. A higher percentage of middle-author publications, $\beta = 0.17, SE = 31.11, t(146) = 2.07, p = .040, 95\% \text{ CI}_b [2.90, 125.87]$, and last-author publications predicted more total publications, $\beta = 0.22, SE = 38.78, t(146) = 2.17, p = .032, 95\% \text{ CI}_b [7.37, 160.65]$. No interactions with gender were significant ($ps > .60$)—authorship position predicted total publications for both men and women. This indicates that a researcher with a higher percentage of first authored publications overall has a shorter CV, while a researcher with a higher percentage of middle or last authored publications has a longer CV. While this effect is independent of the researcher's gender, women have more first, and men have more middle authorships.

General Discussion

We provide first evidence that women are underrepresented in publication authorship beyond first authorship positions and show gender disparities in middle- and last-authorship positions in social and personality psychology. We also replicate the finding that women have fewer publications overall (e.g., Aiston & Jung, 2015; Cikara et al., 2012; Mayer & Rathmann, 2018; Odic & Wojcik, 2020; van den Besselaar & Sandström, 2017). Importantly, while women were underrepresented in each authorship position compared to women in the field, in mixed-gender collaborations, women were even more

7) While this analysis allows us to control for cohort effects and rule out that men only have fewer first and more middle authorships due to being more senior, other explanations still remain possible. For example, in psychology, there exists a trend of having more authors on a paper over time (e.g., Henriksen, 2016), and publication norms with regard to single authorship, first authorship, and the inclusion of people as authors on a paper might have changed as well.

underrepresented in middle and last authorship positions, making them most likely to be first author relative to other authorship positions. That is, if women and men worked together, women were more likely to lead the project. This is particularly indicative of broad gender inequality in social and personality psychology as previous research has indicated gender disparities in first authorship across all publications (Brown & Goh, 2016; Larivière et al., 2013; West et al., 2013). These disparities are exacerbated in other authorship positions, indicating that previous research might have underestimated the extent of the problem.

Gender differences in authorship percentages were not explained by gender differences in career longevity – men had a lower percentage of first- and a higher percentage of middle-author publications than women, even when controlling for the year a PhD was earned. Crucially, middle and last authorship positively predicted more publications overall, while first authorship predicted fewer publications, regardless of gender. This suggests that middle and last authorship can be beneficial in increasing the total number of publications, and potentially related indices of productivity.

Why Are Women Less Likely to Be Middle Author?

First authorship is usually awarded to the person leading a project and contributing the most work, while middle authorship is awarded for other, smaller contributions (APA, 2019). There are a range of potential reasons why women may be less likely to have middle authorships. Some of those reasons are rooted in gender stereotypes, some are rooted in gender differences in behavior, and some are strategic. We first discuss gender stereotypes of others, then examine gendered behaviors, and finally look at strategic considerations.

Gender Stereotypes

Gender differences in middle authorship might be based both on warmth and on competence stereotypes. With regard to warmth stereotypes, gender stereotypes and social roles paint women as inherently warm and helpful, in contrast to men who are expected to be more independent and self-promoting (Cuddy et al., 2008; Eagly & Steffen, 1984; Fiske et al., 2002; Haines et al., 2016). For example, it is socially desirable for women to be warm and kind; being cooperative is also an intensified prescription. In contrast, these prescriptions are relaxed for men—they are not expected to be as warm, kind, or cooperative (Prentice & Carranza, 2002). Because of these expectations, women may be less likely to receive credit for their contributions because their help is taken for granted. In contrast, men receive extra praise when they help (Heilman & Chen, 2005), which may translate into greater likelihood of receiving formal authorship credit. While this is not likely to occur when women contribute a major part of a paper, it might happen with smaller contributions, for example, for contributions for which it is unclear whether they warrant authorship or only an acknowledgment. Overall, women might receive less

credit for helping behavior due to stereotypes of women being naturally helpful, while the same behavior gets men middle or last authorship.

Next, women might be middle authors less frequently due to competence stereotypes. Women might not only receive less credit for their contributions, but they might also be invited to collaborate on research projects less, especially by men (Araújo et al., 2017; Bozeman & Corley, 2004; Teele & Thelen, 2017). Women are stereotyped as less competent, naturally talented, and brilliant than men (Bian et al., 2018; Cuddy et al., 2008; Haines et al., 2016; Leslie et al., 2015), so others might perceive that they have less to contribute. Furthermore, stereotypes of women are dissimilar to stereotypes of scientists, which may discourage their inclusion in scientific collaboration (Carli et al., 2016). Men also tend to collaborate more with men. For example, male faculty are more likely to collaborate with male graduate students (Araújo et al., 2017; Bozeman & Gaughan, 2011). Overall, women might be less likely to be invited to contribute to research projects because their potential to add substantial intellectual contribution is undervalued, which would lead to fewer middle authorships.

Gender Differences in Behavior

Gender differences in middle authorship might also stem from gender differences in behavior. Men are stereotypically more assertive and agentic (Cuddy et al., 2008; Eagly & Steffen, 1984; Haines et al., 2016; Hentschel et al., 2019), so men may be more likely than women to feel confident enough about their knowledge to offer their help with projects. They might also be more likely to claim authorship for their contributions. Women tend to claim less credit for successful group work, especially when working with men (Haynes & Heilman, 2013). Based on a meta-analysis, women are also less likely to negotiate in general. This effect is especially strong when the situational ambiguity is high (Kugler et al., 2018), as can be the case in negotiations about authorship⁸. Overall, women might be less likely to offer their help for projects or negotiate for authorship.

Women might also have less time to engage in research, so they might not have the time to invest in the projects of others in addition to their own. There might be several reasons for this. For example, women, especially those with children, tend to spend more time on housework and childcare due to unequal distributions of labor (Misra et al., 2012; Sutor et al., 2001). Women may also (be legally permitted to) take longer parental leave than men and therefore invest less time in research immediately after having children. Women also often need to spend more time on teaching as they are often in more teaching-intensive jobs (SPSP, 2017; Sutor et al., 2001; Winslow, 2010), and on service, as service responsibilities are often unequally distributed (Guarino & Borden, 2017). Based

8) Additionally, the same behavior by men and women might yield different outcomes for men and women. For example, an analysis of authors frequently publishing in JPSP showed that for men, negotiating with the editor resulted in more JPSP publications. The same was not true for women (Cikara et al., 2012)

on these other restrictions on their time, women might have less time to invest in the projects of other researchers, leaving them with fewer middle authorships.

Strategic Considerations

Finally, gender differences in middle authorship might be explained by strategic considerations. On a positive note, one such consideration might stem from scientists trying to actively counter the lower number of first-authored publications by women (Brown & Goh, 2016; Cikara et al., 2012; Larivière et al., 2013). The scientific community, and especially psychologists, have likely been aware of this problem for some time. Therefore, it is possible that professors or other senior researchers are trying to encourage women to lead more projects in order to close this gender gap, leaving them less time to contribute to other projects and earn middle authorship.

Another strategic consideration might concern the number of first-authored publications a person needs to advance in their career. In general, women might need more first-authored publications than men to advance in their career, for example, to get a postdoctoral fellowship (Wennerås & Wold, 1997). If women are aware of these discrepancies, they might be more motivated to pursue projects in which they expect to get first authorship⁹. Conversely, they might be less motivated (or simply have less time) to join projects in which they expect to make smaller contributions and gain middle authorship. However, based on our finding that more first authorships are linked with fewer publications overall, this strategy might also backfire.

An additional strategic consideration might be based on the idea that men are more likely to get published. There is some support for this idea both for social and personality journals and more broadly in other fields (Bendels, Müller, Brueggmann, & Groneberg, 2018; Brown & Goh, 2016; Teele & Thelen, 2017). We also find some support for this in our data, as more men published both in PSPB and JPSP. Of course, whether this difference is due to gender bias or a difference in the submitted work remains unclear. Nevertheless, if women are aware of this discrepancy, they might be motivated to invite men to collaborate with them to increase their chances of publication. By the same token, this may also discourage researchers from inviting women to collaborate. Inviting people to collaborate on a project is most likely possible when one is the lead author, so this might also explain why women are more likely to be first than middle authors in mixed-gender collaborations.

Finally, women may strategically cooperate less. This idea seems counterintuitive at first, due to stereotypical assumptions that women are more communal and should cooperate more (Haines et al., 2016; Heilman & Chen, 2005; Prentice & Carranza, 2002). However, recent research with nationally representative samples found that across 12 countries, women were less likely to cooperate in a prisoner's dilemma. In a prisoner's

9) We would like to thank an anonymous reviewer for the idea in this and the next paragraph.

dilemma, good outcomes are achieved if everyone cooperates, but the outcome for a particular person is even better if others cooperate and the person does not. In this case, the non-cooperating person achieves the best outcome, while the cooperating person gets the worst outcome. Mostly, women expected others to cooperate less and cooperated less in return (Dorough & Glöckner, 2019).

In line with this, cooperating on a research project can be seen as a prisoner's dilemma. If everyone cooperates, the diverse expertise of people might lead to more positive outcomes (i.e., higher quality or more efficient research, e.g., Fox & Mohapatra, 2007; Hollis, 2001). But a researcher could gain the best self-interested outcomes if they do not contribute (a lot) to a project and still claim authorship at the expense of other collaborators. Therefore, if women anticipate that others will not contribute adequately—or possibly not credit their contribution with authorship—then they may not expect an advantage in cooperation. Thus, women might be less likely to join such projects of other researchers, making them more likely to be first author in their own projects where they can expect the commensurate outcome for their contribution.

Limitations and Future Research

The two studies we presented were limited to the field of social and personality psychology. Social and personality psychology presents an interesting field to test gender representation as women have been historically underrepresented, but are a slight majority now. Psychologists also have a personal interest in understanding the collaboration and gender dynamics of their own field. However, additional research is needed to examine whether results generalize to other subdisciplines of psychology and to other scientific disciplines. Future research may provide insight into how the gender makeup of a discipline or subdiscipline affects the stereotypes, behaviors, and strategies that may influence authorship and collaboration.

Additionally, these studies are based in real-world journal and publication data. As such, they have high external validity and strong implications for collaboration dynamics within social and personality psychology. However, the data are largely descriptive. Here, we identify patterns in authorship and rule out some potential confounds, such as length of career. Though we speculated on potential causes for women's underrepresentation (i.e., stereotypes, behaviors, and strategies), it is outside the scope of our data to address causality. However, it is essential to understand the causes of these effects to best counteract them. Future research could further examine the drivers of women's underrepresentation as middle and last authors and overrepresentation as first authors in mixed-gender collaborations. Then, interventions could target such mechanisms.

For example, experimental or quasi-experimental research could assess the distribution of tasks or credit given to hypothetical researchers based on gender and gender stereotypes, or invite researchers into the lab to work on a collaborative project. If gender and gender stereotypes drive collaboration patterns, then (potential) collaborators need

to credit women's research "help" as substantial contributions and recognize women's research competencies more. This could potentially be facilitated through improved documentation of contributions to research projects. If gender differences in assertiveness are an important cause for disparities, women might need to further develop negotiation skills and men may need to assess if they are being overly assertive in claiming credit for their contributions or offering unsolicited contributions at the expense of others. Furthermore, clearer guidelines for authorship could help remove ambiguity in assessing whether authorship is negotiable at all. Survey research on publication records, collaboration strategies, and time spent on research (vs. other obligations like childcare responsibilities) could provide insight into strategic or external constraints to gender inequality in authorship and collaboration. If time is the driving factor, changes would need to be implemented on the organizational level (e.g., distribution of teaching and service) and the national level (possibilities for child care, distribution of child care).

Conclusion

We provide initial evidence that women are underrepresented in all authorship positions, but are counterintuitively more often in first-authorship positions than others in mixed-gender collaborations. Studies that only focus on gender differences in first-authorship may therefore obscure the extent of gender differences in publishing. While first-authorship is surely important, women may still face a disadvantage with shorter publication records and lower productivity indices due to fewer middle authorships. First-authorship is a necessary, but likely insufficient, means to research career advancement.

Funding: The authors have no funding to report.

Acknowledgments: We would like to thank Malte Wollermann for assistance with data scraping and data preparation. We would like to thank Andrea Przegendza, Daniel Schulz, Niclas O'Donnokoé, and Maria Buergestein for assistance with coding.

Competing Interests: The authors have declared that no competing interests exist.

Author Note: Laura Van Berkel is now an AAAS Science & Technology Policy Fellow.

Data Availability: For this article, two datasets are freely available (Fleischmann & Van Berkel, 2020).

Supplementary Materials

The Supplementary Materials contain the datasets and codebooks as well as additional materials for both studies (for access see [Index of Supplementary Materials](#) below).

Index of Supplementary Materials

Fleischmann, A., & Van Berkel, L. (2020). *Supplementary materials to "Gender disparities in middle authorship"* [Datasets, codebooks, and materials]. OSF. <https://osf.io/fza84>

References

- Acuna, D. E., Allesina, S., & Kording, K. P. (2012). Predicting scientific success. *Nature*, *489*, 201-202. <https://doi.org/10.1038/489201a>
- Aiston, S. J., & Jung, J. (2015). Women academics and research productivity: An international comparison. *Gender and Education*, *27*, 205-220. <https://doi.org/10.1080/09540253.2015.1024617>
- American Psychological Association. (2019, February 22). Tips for determining authorship credit. Retrieved from <https://www.apa.org/science/leadership/students/authorship-paper>
- Araújo, E. B., Araújo, N. A., Moreira, A. A., Herrmann, H. J., & Andrade, J. S., Jr. (2017). Gender differences in scientific collaborations: Women are more egalitarian than men. *PLoS One*, *12*(5), Article e0176791. <https://doi.org/10.1371/journal.pone.0176791>
- Bendels, M. H. K., Müller, R., Brueggmann, D., & Groneberg, D. A. (2018). Gender disparities in high-quality research revealed by Nature Index journals. *PLoS One*, *13*(1), Article e0189136. <https://doi.org/10.1371/journal.pone.0189136>
- Bian, L., Leslie, S. J., & Cimpian, A. (2018). Evidence of bias against girls and women in contexts that emphasize intellectual ability. *American Psychologist*, *73*, 1139-1153. <https://doi.org/10.1037/amp0000427>
- Bozeman, B., & Corley, E. (2004). Scientists' collaboration strategies: Implications for scientific and technical human capital. *Research Policy*, *33*(4), 599-616. <https://doi.org/10.1016/j.respol.2004.01.008>
- Bozeman, B., & Gaughan, M. (2011). How do men and women differ in research collaborations? An analysis of the collaborative motives and strategies of academic researchers. *Research Policy*, *40*, 1393-1402. <https://doi.org/10.1016/j.respol.2011.07.002>
- Brown, A. J., & Goh, J. X. (2016). Some evidence for a gender gap in personality and social psychology. *Social Psychological & Personality Science*, *7*(5), 437-443. <https://doi.org/10.1177/1948550616644297>
- Carli, L. L., Alawa, L., Lee, Y., Zhao, B., & Kim, E. (2016). Stereotypes about gender and science: Women ≠ scientists. *Psychology of Women Quarterly*, *40*(2), 244-260. <https://doi.org/10.1177/0361684315622645>
- Cikara, M., Rudman, L., & Fiske, S. (2012). Dearth by a thousand cuts? Accounting for gender differences in top-ranked publication rates in social psychology. *The Journal of Social Issues*, *68*(2), 263-285. <https://doi.org/10.1111/j.1540-4560.2012.01748.x>
- Cuddy, A. J. C., Fiske, S. T., & Glick, P. (2008). Warmth and competence as universal dimensions of social perception: The stereotype content model and the BIAS map. *Advances in Experimental Social Psychology*, *40*, 61-149. [https://doi.org/10.1016/S0065-2601\(07\)00002-0](https://doi.org/10.1016/S0065-2601(07)00002-0)

- Dorrough, A. R., & Glöckner, A. (2019). A cross-national analysis of sex differences in prisoner's dilemma games. *British Journal of Social Psychology*, *58*(1), 225-240.
<https://doi.org/10.1111/bjso.12287>
- Dovidio, J. F., & Gaertner, S. L. (2000). Aversive racism and selection decisions: 1989 and 1999. *Psychological Science*, *11*(4), 315-319. <https://doi.org/10.1111/1467-9280.00262>
- Eagly, A. H., & Miller, D. I. (2016). Scientific eminence: Where are the women? *Perspectives on Psychological Science*, *11*(6), 899-904. <https://doi.org/10.1177/1745691616663918>
- Eagly, A. H., & Steffen, V. J. (1984). Gender stereotypes stem from the distribution of women and men into social roles. *Journal of Personality and Social Psychology*, *46*, 735-754.
<https://doi.org/10.1037/0022-3514.46.4.735>
- Feldon, D. F., Peugh, J., Maher, M. A., Roksa, J., & Tofel-Grehl, C. (2017). Time-to-credit gender inequities of first-year PhD students in the biological sciences. *CBE Life Sciences Education*, *16*(1), Article ar4. <https://doi.org/10.1187/cbe.16-08-0237>
- Fiske, S. T., Cuddy, A. J., Glick, P., & Xu, J. (2002). A model of (often mixed) stereotype content: Competence and warmth respectively follow from perceived status and competition. *Journal of Personality and Social Psychology*, *82*, 878-902. <https://doi.org/10.1037/0022-3514.82.6.878>
- Fox, M. F., & Mohapatra, S. (2007). Social-organizational characteristics of work and publication productivity among academic scientists in doctoral-granting departments. *The Journal of Higher Education*, *78*, 542-571. <https://doi.org/10.1353/jhe.2007.0032>
- Guarino, C. M., & Borden, V. M. H. (2017). Faculty service loads and gender: Are women taking care of the academic family? *Research in Higher Education*, *58*, 672-694.
<https://doi.org/10.1007/s11162-017-9454-2>
- Guerrero Bote, V. P., Olmeda-Gómez, C., & de Moya-Anegón, F. (2013). Quantifying the benefits of international scientific collaboration. *Journal of the American Society for Information Science and Technology*, *64*, 392-404. <https://doi.org/10.1002/asi.22754>
- Haines, E. L., Deaux, K., & Lofaro, N. (2016). The times they are a-changing ... or are they not? A comparison of gender stereotypes, 1983-2014. *Psychology of Women Quarterly*, *40*(3), 353-363.
<https://doi.org/10.1177/0361684316634081>
- Haynes, M. C., & Heilman, M. E. (2013). It had to be you (not me)! Women's attributional rationalization of their contribution to successful joint work outcomes. *Personality and Social Psychology Bulletin*, *39*(7), 956-969. <https://doi.org/10.1177/0146167213486358>
- Heilman, M. E., & Chen, J. J. (2005). Same behavior, different consequences: Reactions to men's and women's altruistic citizenship behavior. *The Journal of Applied Psychology*, *90*(3), 431-441.
<https://doi.org/10.1037/0021-9010.90.3.431>
- Heilman, M. E., & Haynes, M. C. (2005). No credit where credit is due: Attributional rationalization of women's success in male-female teams. *The Journal of Applied Psychology*, *90*(5), 905-916.
<https://doi.org/10.1037/0021-9010.90.5.905>
- Henriksen, D. (2016). The rise in co-authorship in the social sciences (1980-2013). *Scientometrics*, *107*, 455-476. <https://doi.org/10.1007/s11192-016-1849-x>

- Hentschel, T., Heilman, M. E., & Peus, C. V. (2019). The multiple dimensions of gender stereotypes: A current look at men's and women's characterizations of others and themselves. *Frontiers in Psychology, 10*, Article 11. <https://doi.org/10.3389/fpsyg.2019.00011>
- Hollis, A. (2001). Co-authorship and the output of academic economists. *Labour Economics, 8*(4), 503-530. [https://doi.org/10.1016/S0927-5371\(01\)00041-0](https://doi.org/10.1016/S0927-5371(01)00041-0)
- Johnson, C. S., Smith, P. K., & Wang, C. (2017). Sage on the stage: Women's representation at an academic conference. *Personality and Social Psychology Bulletin, 43*(4), 493-507. <https://doi.org/10.1177/0146167216688213>
- Kugler, K. G., Reif, J. A. M., Kaschner, T., & Brodbeck, F. C. (2018). Gender differences in the initiation of negotiations: A meta-analysis. *Psychological Bulletin, 144*(2), 198-222. <https://doi.org/10.1037/bul0000135>
- Lantos, N., Nyul, B., Kende, A., Reicher, S., & Lindholm, T. (2018). *Diversity in the European Association of Social Psychology: A preliminary report*. European Association of Social Psychology. Retrieved from https://www.easp.eu/getmedia.php/_media/easp/201806/374v0-orig.pdf
- Larivière, V., Ni, C., Gingras, Y., Cronin, B., & Sugimoto, C. R. (2013). Global gender disparities in science. *Nature, 504*(7479), 211-213. <https://doi.org/10.1038/504211a>
- Lee, S., & Bozeman, B. (2005). The impact of research collaboration on scientific productivity. *Social Studies of Science, 35*, 673-702. <https://doi.org/10.1177/0306312705052359>
- Leslie, S. J., Cimpian, A., Meyer, M., & Freeland, E. (2015). Expectations of brilliance underlie gender distributions across academic disciplines. *Science, 347*(6219), 262-265. <https://doi.org/10.1126/science.1261375>
- Mayer, S. J., & Rathmann, J. M. K. (2018). How does research productivity relate to gender? Analyzing gender differences for multiple publication dimensions. *Scientometrics, 117*, 1663-1693. <https://doi.org/10.1007/s11192-018-2933-1>
- Misra, J., Lundquist, J. H., & Templer, A. (2012). Gender, work time, and care responsibilities among faculty. *Sociological Forum, 27*(2), 300-323. <https://doi.org/10.1111/j.1573-7861.2012.01319.x>
- Odic, D., & Wojcik, E. H. (2020). The publication gender gap in psychology. *American Psychologist, 75*(1), 92-103. <https://doi.org/10.1037/amp0000480>
- Prentice, D. A., & Carranza, E. (2002). What women should be, shouldn't be, are allowed to be, and don't have to be: The contents of prescriptive gender stereotypes. *Psychology of Women Quarterly, 26*, 269-281. <https://doi.org/10.1111/1471-6402.t01-1-00066>
- Sarsons, H., Gërkhani, K., Reuben, E., & Schram, A. (2021). Gender differences in recognition for group work. *Journal of Political Economy, 129*(1), 101-147. <https://doi.org/10.1086/711401>
- Society for Personality and Social Psychology. (2016, December 31). Membership diversity statistics. Retrieved from <https://spsp.org>
- Society for Personality and Social Psychology. (2017, November 9). Graduation outcomes for personality and social psychologists. Retrieved from <https://spsp.org>

- Stricker, L. J., Helmreich, R. L., & Roberts, D. C. (1986). A survey of the Society for Personality and Social Psychology. *Personality and Social Psychology Bulletin*, *12*(1), 131-144.
<https://doi.org/10.1177/0146167286121013>
- Suitor, J. J., Mecom, D., & Feld, I. S. (2001). Gender, household labor, and scholarly productivity among university professors. *Gender Issues*, *19*, 50-67. <https://doi.org/10.1007/s12147-001-1007-4>
- Teele, D. L., & Thelen, K. (2017). Gender in the journals: Publication patterns in political science. *PS: Political Science & Politics*, *50*, 433-447. <https://doi.org/10.1017/S1049096516002985>
- Times Higher Education. (2018). *World University Rankings 2018 by subject: Psychology*. London, United Kingdom: THE World Universities Insights Limited.
- van den Besselaar, P., & Sandström, U. (2017). Vicious circles of gender bias, lower positions, and lower performance: Gender differences in scholarly productivity and impact. *PLoS One*, *12*(8), Article e0183301. <https://doi.org/10.1371/journal.pone.0183301>
- Wennerås, C., & Wold, A. (1997). Nepotism and sexism in peer-review. *Nature*, *387*, 341-343.
<https://doi.org/10.1038/387341a0>
- West, J. D., Jacquet, J., King, M. M., Correll, S. J., & Bergstrom, C. T. (2013). The role of gender in scholarly authorship. *PLoS One*, *8*(7), Article e66212.
<https://doi.org/10.1371/journal.pone.0066212>
- Wiedman, C. (2020). Rewarding collaborative research: Role congruity bias and the gender pay gap in academe. *Journal of Business Ethics*, *167*, 793-807. <https://doi.org/10.1007/s10551-019-04165-0>
- Winslow, S. (2010). Gender inequality and time allocations among academic faculty. *Gender & Society*, *24*(6), 769-793. <https://doi.org/10.1177/0891243210386728>

PSPS
 Polish
 Social
 Psychological
 Society

Social Psychological Bulletin (SPB)
 is an official journal of the Polish
 Social Psychological Society
 (PSPS).



leibniz-psychology.org

PsychOpen GOLD is a publishing
 service by Leibniz Institute for
 Psychology (ZPID), Germany.