

Papers Written by Women Authors Are Cited Less Frequently, but the Etiology of this Finding is Complex*

Justin Esarey
Wake Forest University
Department of Politics and International Affairs
justin@justinesarey.com

Kristin Bryant
Rice University
Department of Political Science
kab18@rice.edu

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A recent symposium in *Political Analysis*, anchored around Dion, Sumner and Mitchell (2018), discusses their finding that articles authored by women are more likely to cite at least one paper authored by women. Our contribution to this symposium (Esarey and Bryant, 2018) noted that articles in the Dion, Sumner and Mitchell (2018) data set with at least one female author are cited no more or less often than male-authored articles once we control for the publishing journal and the number of authors. In this paper, we present additional findings that place the results of our original paper into a broader context. This context is important to fully understand how scholarship by women is utilized by the discipline, how scholars' careers are impacted as a result of this utilization, and how we might achieve greater gender parity in the field.

When looking at the the unadjusted data set, articles with at least one woman author *are* in fact cited fewer times on average. It is plausible that this citation gap *does* represent a substantively meaningful barrier to the advancement of women in the discipline. As we reported in *Political Analysis*, papers with women authors are no more or less likely to be cited once the number of authors and the publishing journal are controlled for via linear

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regression. However, simply controlling for author count is insufficient to eliminate the gender disparity in citations: controlling for the publishing journal is crucial. An implication is that women may be systematically disadvantaged in the field, but that this disadvantage is not a function of discrimination against women when articles are chosen to be cited. Instead, consistent with the findings of Teele and Thelen (2017), we find that articles in the most-cited journals of the discipline are less likely to have women authors. The etiology of *that* relationship (and the citation gender gap that it creates among political scientists) is difficult to unravel.

Table 1: Summary of citation counts for published papers in the Dion, Sumner and Mitchell (2018) data set, by gender of authors

| author gender | n | mean | sd | min | Q25 | Median | Q75 | Max |
|--------------------|-------|--------|--------|-----|-----|--------|-----|-----|
| all male | 1,170 | 32.433 | 58.686 | 0 | 5 | 14 | 34 | 875 |
| at least one woman | 736 | 23.370 | 54.344 | 0 | 3 | 8 | 24 | 984 |

Table 1, a simple summary of citations by author gender, illustrates the critical point that female-authored papers are cited less often in the Dion, Sumner and Mitchell (2018) data set. On average, articles in the Dion, Sumner and Mitchell (2018) data set with at least one female author are cited just over 23 times. By comparison, articles with all male authors are cited just over 32 times on average. This difference of ≈ 9 citations is statistically significant ($\alpha = 0.01$, two-tailed), as shown in Model 1 of Table 2. Controlling for the age of the article with year fixed effects (as in Model 2) reduces the size of the gender gap, but does not eliminate it.

Thus, at least among those articles represented in this data set, an article with at least one woman author *is* less frequently cited than its male counterparts. The potential for negative impact on the average career trajectory of female scholars (compared to their male counterparts) is self-evident.

Moreover, simply controlling for the number of authors of an article alone (as in Model

Table 2: Extended regression analysis of citations counts for published papers in the Dion, Sumner and Mitchell (2018) data set

| | <i>Dependent variable:</i> | | | | |
|-------------------------|----------------------------|----------------------|----------------------|-----------------------|----------------------|
| | citation count | | | | |
| | (1) | (2) | (3) | (4) | (5) |
| female author | -9.064*** (2.684) | -6.228** (2.585) | -7.253*** (2.543) | 5.370* (2.958) | 1.313 (2.990) |
| author count | | | 10.826*** (1.309) | | 9.049*** (1.376) |
| APSR | | | | 14.010*** (4.360) | 16.490*** (4.328) |
| Econometrica | | | | 15.326*** (4.169) | 14.240*** (4.127) |
| Political Analysis | | | | 10.982** (4.732) | 10.536** (4.681) |
| Politics and Gender | | | | -15.948*** (4.898) | -7.950 (4.995) |
| Intercept | 32.433*** (1.668) | 70.328*** (4.662) | 49.396*** (5.234) | 55.682*** (5.652) | 38.717*** (6.156) |
| Year FEs | No | Yes | Yes | Yes | Yes |
| Observations | 1,906 | 1,906 | 1,906 | 1,906 | 1,906 |
| R ² | 0.006 | 0.093 | 0.125 | 0.124 | 0.144 |
| Adjusted R ² | 0.005 | 0.088 | 0.119 | 0.118 | 0.137 |

Note:

*p<0.1; **p<0.05; ***p<0.01

Results are coefficients from OLS regression (standard errors in parentheses). Year fixed effects are omitted from the table. *Sociological Methods and Research* is the excluded journal category in Models 4 and 5. APSR = *American Political Science Review*.

3 of Table 2) does not eliminate the problem. Although author count is strongly associated with citations (every additional author is associated with an expected increase of nearly 11 citations), the negative effect of women authors is still substantively strong and statistically significant.

Controlling for the publishing journal has a more substantial effect on the link between author gender and citation rates, as shown in Model 4 of Table 2: the sign of the relationship reverses. Holding the publishing journal constant, articles with at least one woman author receive *more* citations than those without. Indeed, an article with a woman author is expected to have over 5 more citations than an article with no women authors in the same journal, a relationship that is statistically significant ($\alpha = 0.1$, two-tailed).

Only when both the number of authors *and* the publishing journal are controlled for, in Model 5 of Table 2, is the effect of author gender statistically and substantively small. This model also shows that articles in *American Political Science Review*, *Econometrica*, and *Political Analysis* receive substantially more citations than articles in *Sociological Methods and Research* or *Politics and Gender*; these differences are statistically significant ($\alpha = 0.05$, two-tailed).

The relationship between publishing journal and citation count shown in Model 5 of Table 2 becomes especially meaningful once we consider the fact that some journals publish articles by women authors far more than others (Teele and Thelen, 2017). We present the relationship between author gender and journal of publication in the Dion, Sumner and Mitchell (2018) data set in Table 3. As we pointed out in our *Political Analysis* piece (p. 334), an article published in *Econometrica* or *Political Analysis* is more than 9% less likely than an article in *Sociological Methods and Research* (SMR) to have at least one female author, while an article published in *Politics and Gender* is over 57% more likely to have a female author. An article in *American Political Science Review* is just under 5% less likely than an article in SMR to have a female author, although this relationship is not statistically

significant at conventional levels ($p = 0.159$, two-tailed).

Table 3: Relationship between journal of publication and author gender in the Dion, Sumner and Mitchell (2018) data set

| | <i>Dependent variable:</i> |
|-------------------------|-------------------------------------|
| | at least one female author (binary) |
| APSR | -0.047 (0.034) |
| Econometrica | -0.119*** (0.032) |
| Political Analysis | -0.095*** (0.037) |
| Politics and Gender | 0.572*** (0.036) |
| Intercept (SMR) | 0.349*** (0.027) |
| Observations | 1,938 |
| R ² | 0.262 |
| Adjusted R ² | 0.261 |
| <i>Note:</i> | *p<0.1; **p<0.05; ***p<0.01 |

Results are coefficients from OLS regression (standard errors in parentheses). *Sociological Methods and Research* (SMR) is the excluded journal category included in the intercept. APSR = *American Political Science Review*.

Thus, based on the Dion, Sumner and Mitchell (2018) data set, it appears that articles with women authors are receiving fewer citations than articles with all male authors in the aggregate because journals with female authors are less likely to appear in the most-cited journals in the data set (*American Political Science Review*, *Econometrica*, and *Political Analysis*).

It is beyond the scope of our analysis to determine why women are less likely to appear in the pages of the most frequently cited journals. A recent symposium in *PS: Political Science and Politics* by the editors of prestigious political science journals¹ seems to rule out the possibility that reviewers systematically treat female-authored articles differently than male-authored articles, as none of the analyses found an effect of gender on outcomes (König and Ropers, 2018; Peterson, 2018; Samuels, 2018; Nedal and Nexon, 2018; Tudor and Yashar, 2018). Many of these articles (as well as Teele and Thelen (2017) and Djupe, Smith and Sohkey (2018)) point out that women do not submit articles to these journals at the same rate as men, and that this may explain much of the observed publication disparity (and the attendant citation gap). Djupe, Smith and Sohkey (2018) point out that greater risk aversion among women compared to men can produce a gender gap at the most selective journals (i.e., those with the highest chance of rejection) that is driven by submission behavior when the editorial process treats men and women equally. However, Teele and Thelen (2017) argue that extant studies cannot fully rule out gender discrimination, as women submit to elite journals at a lower rate because they anticipate facing greater hurdles to publication and thus send only their very best work to journals like *American Political Science Review*. If this is the case, then perhaps differential treatment by gender is being masked by a selection effect occurring at the submission stage.

Teele and Thelen (2017) also point out that women are less likely to participate in quantitative research, which is disproportionately likely to appear in prestigious journals (p. 443), presumably this disparity would be especially impactful in methodology journals like *Political Analysis*. This finding is further supported by Djupe, Smith and Sohkey (2018), who find that it is particularly in quantitative fields where men submit substantially more articles than women. Based on past research (Esarey, 2018), we think it is unlikely that “there is a

¹The journals are *American Political Science Review*, *World Politics*, *Comparative Political Studies*, *Political Behavior*, and *International Studies Quarterly* (Brown and Samuels, 2018).

‘selection’ issue in which women, on average, are drawn more toward methods or modes of scholarship that are underrepresented in these journals” (Teele and Thelen, 2017, p. 443). The reason is that other highly quantitative fields, like mathematics and statistics, have succeeded in greatly boosting the representation of women in their ranks at the same time that the gender balance of the Society for Political Methodology (SPM) has remained relatively constant (see Figure 3 in Esarey, 2018). That is, although women are certainly underrepresented in the SPM, we do not believe that this disparity exists because of the subject matter studied by scholars in that field.

Our additional results, and the findings of other research that we presented in this article, do not change the overall conclusion of our *Political Analysis* paper (p. 334):

Given the very high citation rates of *Political Analysis* and *Econometrica*, both of which are broadly comparable to *American Political Science Review* in impact factor, our results suggest that boosting the representation of women in citations could be achieved by increasing the diversity of the methods community through active recruitment and mentoring of, and co-authorship with, people from underrepresented groups (including women) who have an interest in methodology.

Given our findings and those of the recent *PS* symposium on gender in the journals, we believe it is most likely that women are treated equally by other scholars when conducting reviews or choosing which papers to cite. We also believe it is most likely that women are not submitting enough of their work to the most prestigious journals and are underrepresented in the subfields that find the most success in those journals. Consequently, we believe that increased partnership with and mentoring of women in the discipline (especially in political methodology) is the most appropriate remedy.

However, we think it is important to provide additional context for this conclusion by underscoring that:

1. there *is* a gender citation gap in political science that plausibly hurts the trajectory of women's careers relative to men's; and
2. we cannot yet definitively rule out differential treatment of women in the review process until we study the selection process by which men and women choose which articles to submit.

We believe that it is only in the context of these additional facts that the role of gender in the publication process can be fully understood.

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