Progress and challenges in narrowing the gender publication gap and parity

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Abstract

Purpose – The purpose of this study is to examine the narrowing of the gender publication gap (GPG) and predict when gender publication parity will be achieved. It investigates if women's publication rates are catching up with men's when the proportion of published articles by women will match their representation in the field, and how the gender gap and parity are changing concerning lead authorships. The study analyzes data from 11,097 researchers across 8 management journals from 2002 to 2020, revealing a higher growth rate in women's publications and varying degrees of parity achievement between micro and macro domains.

Design/methodology/approach – We created a database of all researchers who published at least one article in eight management journals from January 2002 through December 2020. It included 11,097 unique researchers who produced 7,357 unique articles, resulting in 21,361 authorships. We used data from the Web of Science to identify articles and their authors, filtering for "articles" and "reviews" only. We used allometric modeling and time series analysis to examine the GPG and forecast gender publication parity.

Findings – We found that the GPG is narrowing, with women's publication rates growing faster than men's. Parity in lead authorships has already been achieved or is within reach for many journals, especially in micro domains. However, macro-oriented journals show slower progress, with some not expected to reach parity until 2045 or later. These improvements are linked to increased representation of women in leadership positions and targeted mentoring programs in micro domains.

Research limitations/implications – While our study focused on publications, it did not account for citations, which could provide a more comprehensive view of research impact. Future research should explore other journals and different time windows and include citation analysis to understand the GPG and parity further?

Practical implications – The narrowing GPG is a positive development for organization studies, particularly in micro domains. This progress can mitigate stereotypes about women's abilities, promote equity in hiring and promotion by considering authorship order and highlight the importance of targeted mentoring programs to reduce barriers for women. Additionally, business schools should identify and address performance situational constraints that disproportionately affect women, using techniques like the critical incidents approach to design effective interventions.

Social implications – The study's societal implications include fostering greater gender equity in academic publishing, which can influence broader social norms and reduce gender stereotypes in academia. Achieving

gender parity in publications can lead to more equitable hiring, promotion and recognition practices. Additionally, it highlights the importance of removing performance situational constraints and biases that hinder women's academic progress, thus promoting a more inclusive and fair academic environment. These changes can inspire other fields to implement similar measures, contributing to societal progress toward gender equality. **Originality/value** – The study's originality/value lies in its longitudinal approach to analyzing the GPG in organization studies, contrasting with prior cross-sectional studies. It provides new insights by predicting when gender parity will be achieved in various journals, showing faster progress in micro domains compared to macro domains. Additionally, the study introduces methodological innovations such as allometric modeling and scenario-based analyses, highlighting the importance of reducing situational constraints for women in academia. These findings offer a nuanced understanding of the ongoing efforts and challenges in achieving gender equity in academic publishing.

**Keywords** Gender gap, Gender parity, Gender equity, Research productivity, Inclusion

Paper type Research paper

Numerous organizations have implemented initiatives to increase women's output in scientific domains and mitigate the gender gap in academia (e.g. Leslie *et al.*, 2017). For example, the National Science Foundation's (NSF) ADVANCE program funds projects to increase women's scientific participation. Since 2001, NSF has invested over $270M to support ADVANCE projects (National Science Foundation, 2024). Similarly, in the business domain, the Association to Advance Collegiate Schools of Business "continues to encourage greater women representation and gender equality and inclusion initiatives across its network of schools" (McLeod, 2016). These initiatives seem effective in increasing women's representation in scientific domains, given that more women than men now earn doctoral degrees in many scientific fields (National Science Foundation, 2019). For example, Figure 1 depicts the steady rise in women's share of Ph.D.s conferred annually in (a) business and management and (b) behavioral and social sciences (American Academy of Arts and Sciences, 2017).

The significant increase in women's representation in doctoral degree attainment has led to a concomitant steady increase in women's representation in the university faculty population.
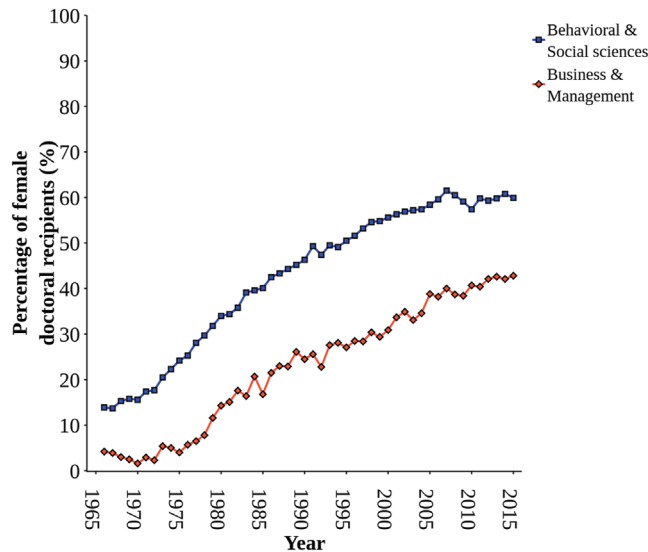
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Figure 1. Women's share of Ph.D.s conferred annually in (a) behavioral and social sciences and (b) business and management from 1965 through 2015

Specifically, women's share of the academic doctoral workforce grew from 32.6% to 37.8% during 2006–2017 (National Science Foundation, 2019). Though the figures vary by discipline—for example, women's faculty representation is higher in management compared to finance (AACSB, 2017)—the phenomenon of women's increased degree attainment and faculty representation is widely documented in business and many other fields.

Despite increased representation, there is concern that the aforementioned and other initiatives may suffer from "translational loss" and may not have succeeded in improving women's *research output*. In other words, are we making progress regarding women's equality regarding publication output? A strong publication record is a primary criterion for hiring, promotion and tenure decisions. In addition, research productivity is also critical for demonstrating competence, credibility and access to resources (e.g. summer support, teaching load reduction) and funding (Ramani *et al.*, 2022). Moreover, publications open doors to networking, collaboration and leadership opportunities. Accordingly, directly related to the issue of equality, we examined three research questions: (1) Is the gender publication gap (GPG) narrowing (i.e. is the growth rate in women's publications similar to men's)? (2) When is the gender publication parity predicted to be achieved (i.e. when will the proportion of articles published by women match the proportion of women in the field)? and (3) How are the GPG and parity changing specifically concerning lead authorships (i.e. women as first authors)?

To clarify, the *gender publication gap* is the extent to which women's publications are growing slower than men's, which we assessed using allometric analysis and replicated using a single ratio variable in time series analysis. Related but different, *gender publication parity* happens when the proportion of publications produced by women matches the proportion of women in the field, which we assessed using scenario-based time series analysis. Even if there is a finding that women's publication rate is growing faster than men's (i.e. the GPG is narrowing), there could still be low levels of gender publication parity to the extent that women's publications do not reflect their representation, which would suggest insufficient progress toward equality. Note that the GPG is about understanding the growth rate in women's publications, the growth rate in men's publications and then comparing them to each other—it is a comparison of within-group growth rates over time. In contrast, parity involves a comparison of publications in relation to representation.

We pause here to make two necessary clarifications about our theorizing. First, extending past research on the relation between gender and research productivity that implemented cross-sectional research designs (e.g. Aguinis *et al.*, 2018; Ceci *et al.*, 2014; Ginther and Hayes, 2003; McDowell *et al.*, 2001; Odic and Wojcik, 2020), we investigated whether the GPG is widening or narrowing *over time*. Similarly, we considered time explicitly when examining parity and when it has (or will be) achieved. In other words, in contrast to most past research in this domain, we are not taking a "still shot" but are "watching a movie" to learn about changes over time. Given the ongoing implementation of initiatives and resources invested in addressing the research productivity of women (e.g. National Science Foundation, 2024), we anticipate that positive changes should have occurred. Second, we do not use the traditional hypothetico-deductive way of theorizing. Instead, we start with an important phenomenon (i.e. Are we making progress about women's equality regarding publication output?). In the Discussion section, we use the performance situational constraints conceptual framework (Bear *et al.*, in press; Peters and O'Connor, 1980; Villanova and Roman, 1993) to explain our results and synthesize the multiple explanations about gender publication gaps proposed to date.

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Empirical and theoretical background: the gender publication gap and gender publication parity

Gender publication gap

Previous research has found a GPG due to different forms of discrimination that constrain women's performance. This is also the case across the social sciences, including management,

where women's representation is relatively higher than in other fields (Aguinis *et al.*, 2018; Odic and Wojcik, 2020). For example, in an analysis of publication data across major psychology sub-disciplines during 2003–2017, a gender gap in publications (i.e. a lower number for women) remained significant even after controlling for factors such as seniority and university affiliation (Odic and Wojcik, 2020). Specifically, Odic and Wojcik (2020, p. 94) reported that although women make up over 70% of master's and doctoral students in psychology, only 44.17% of all authors between 2003 and 2018 are classified as female, whereas 55.83% are classified as male. In the field of economics, Card *et al.* (2020) examined anonymized data on nearly 30,000 submissions to four leading journals (i.e. *Journal of the European Economics Association, Quarterly Journal of Economics, Review of Economic Studies* and *Review of Economics and Statistics*). They found no difference in how referees of different genders assess papers by female and male authors. However, the editorial process does not seem to be gender-neutral given that "women researchers are held to a higher bar by referees (both men and women)," which is possibly reflected in the finding that women-authored articles receive 25% more citations than men-authored papers (Card *et al.*, 2020, p. 324). Similarly, and also based on the economics literature (i.e. 9,123 article abstracts published in the *American Economic Review, Econometrica, Journal of Political Economy* and *Quarterly Journal of Economics*), Hengel (2017) concluded that implicit biases result in women being held to higher standards compared to men. Thus, we sought to answer the following question:

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RQ1. Is the GPG narrowing (i.e. is the growth rate in women's publications similar to men's)?

Gender publication parity
Aguinis *et al.* (2018) examined the individual cumulative output of researchers who had published at least one article in highly influential journals in science, technology, engineering, mathematics and other scientific fields (i.e. applied psychology, mathematical psychology) between 2006 and 2015. In all sampled domains, the lack of gender parity (i.e. a mismatch between the number of authorships and their representation in the field) was larger among top performers than among all performers. In other words, women's smaller output compared to men's became increasingly severe at more elite performance ranges. In addition, the power law with exponential cutoff consistently best fits the observed individual output distributions of both men and women.

The power law with exponential cutoff distribution is created predominantly via the generative mechanism of *incremental differentiation*. Specifically, individuals differ in terms of the total value of an outcome because of their differences concerning the accumulation rate of the outcome, given that individuals' total publications increase approximately linearly based on their publication rates (Joo *et al.*, 2017). In other words, incremental differentiation describes each individual in terms of a distinct output accumulation rate. Additional results indicated that variations in individuals' research outputs are explained predominantly by variations in their accumulation rates. Stated differently, researchers with greater accumulation rates enjoy greater linear output increments than others (Bradley and Aguinis, 2023). Therefore, extending previous research, we sought to answer the following second question:

RQ2. When is the predicted date for the gender publication parity to be achieved (i.e. when will the proportion of articles published by women match the proportion of women in the field)?

Gender publication gap and gender publication parity regarding lead authorships
In light of the importance of lead versus non-lead authorship roles (Milojević *et al.*, 2018), we also extended past research by investigating the number of lead (i.e. first) authorships per year

by women and men as an additional measure of research output. The lead author is usually the main intellectual contributor to a research project in management and related disciplines. Therefore, lead authorships are often important for making administrative decisions such as hiring and promotion. Indeed, lead authorship is not just a measure of quantity in terms of research contributions but a more focused approach to quality and impact, given that the first author is the intellectual leader. Because of these reasons, we also asked the following questions expanding upon Research Question 1 and Research Question 2:

RQ3. Are the GPG and parity changing concerning lead authorships?

Method
Databases
We created a database including all researchers who published at least one article in eight journals from January 2002 through December 2020: *Academy of Management Journal* (AMJ), *Academy of Management Learning and Education* (AMLE), *Academy of Management Perspectives* (AMP), *Academy of Management Review* (AMR), *Group and Organization Management* (GOM), *Journal of Applied Psychology* (JAP), *Journal of Management* (JOM) and *Strategic Management Journal* (SMJ). We decided to include these journals to enhance the generalizability of our results in relation to previous research in management and related fields. Specifically, these journals address micro and macro domains, qualitative and quantitative methodology, empirical and theoretical orientation and narrower and broader coverage of management subfields [1]. For example, JAP "primarily considers empirical and theoretical investigations that enhance understanding of cognitive, motivational, affective, and *behavioral psychological phenomena* [italics added] in work and organizational settings," whereas SMJ "seeks to publish papers that ask and help to answer important and interesting questions in *strategic management* [italics added], develop and/or test theory, replicate prior studies, explore interesting phenomena, review and synthesize existing research, and evaluate the many methodologies used in our field." Moreover, the journals also vary substantially regarding their impact factors, which range from a low of about 4.00 to a high of about 13.00. In addition, these journals have different orientations, such that some publish empirical and conceptual research. In contrast, others publish only or mostly one or the other (e.g. AMR only publishes conceptual research). As a result of our journal choices and time frame, our database contains 11,097 unique researchers who produced 7,357 unique articles. Because, in most cases, there were multiple coauthors per article, our database includes a total of 21,361 authorships (i.e. the number of unique coauthors listed across all articles).

To conduct analyses based on lead authorships, we focused on three subset databases: (1) articles with two coauthors including at least one woman and one man; (2) articles with three coauthors including at least one woman and one man; and (3) articles with four coauthors including at least one woman and one man [2]. During the 19 years from January 2002 to December 2020, 2,865 articles with two co-authors, 2,565 articles with 3 co-authors and 1,247 articles with four co-authors were published across all 8 journals. Our analyses for lead authors were based on all journals combined because sample sizes were too small to conduct meaningful analyses for each journal separately.

Measures
Publications: number of authorships per year by women and by men. We used the same conceptual and operational definition as Sá *et al.* (2020: p. 5), who measured "the total number of papers published per year." That is, we measured publications by counting the number of articles produced by each author and publication year and then summing that number across individuals for women and men. We used the Web of Science database to identify all articles and their authors. We filtered the search results to include "articles" and "reviews" only, excluding all other types of publications such as editorials and errata. We then referred to the

metadata associated with each article to record the publication year and authors' names, using the Open Researcher and Contributor ID to identify unique authors as needed.

Gender. We used the same procedure as Aguinis *et al.* (2018). We recorded each author's gender based on first names and other information—such as a photo—available online (e.g. on the author's faculty webpage or ResearchGate profile). If the gender associated with a first name was still ambiguous and we could not find information online, we used Namepedia.org to find the gender most strongly associated with that name. We acknowledge that considering gender as a binary variable oversimplifies individuals' diverse experiences and identities, but following previous research in this domain (e.g. Aguinis *et al.*, 2018), our methodology was based on two categories only.

Data analytic approaches for examining the gender publication gap: allometric modeling and time series analysis

Allometric modeling. Allometric modeling is an inferential data-analytic approach first implemented in biology to assess the scaling properties of a variable exhibiting disproportionate growth relative to another variable. For example, an isometric or linear scaling relationship is present in organisms whose individual body parts grow in proportion to their total body size (Huxley, 1923). In contrast, there is an allometric or power law scaling relationship between most mammals' basal metabolic rates and body mass, where the former scales to the latter to the power of ¾ (Kleiber, 1932). Thus, allometric analysis is particularly appropriate for examining the GPG because it allows us to compare the growth rates of two variables that display either exponential or linear growth (i.e. women's vs. men's publication growth over time) (Carneiro, 1967).

As Appendix describes, the scaling exponent alpha (α) reflects whether publications grow disproportionately faster for one gender group than the other. Specifically, an α value greater than 1 indicates an allometric scaling relationship where publications grow faster for men than women (i.e. the GPG is *not* narrowing). In contrast, an α value less than 1 indicates that publications are growing faster for women than men (i.e. the GPG *is* narrowing). If $\alpha = 1$, then there is an isometric or linear scaling relationship in which publications grow proportionately the same across genders.

Replication and robustness check using a single ratio variable in time series analysis. As a replication and robustness check, we followed the same procedure used for calculating the *gender wage gap* (Blau and Kahn, 2000; Sitzmann and Campbell, 2021) to examine the GPG by operationalizing it as a single ratio variable: 1 minus women's publications as a proportion of men's publications for each journal. In other words, GPG $= 1$ is the maximum possible value (i.e. maximum GPG), indicating a scenario where men generate all publications while women produce none. Lower positive scores of GPG closer to zero indicate that women's publications are approaching men's publications (i.e. the GPG is narrowing).

To examine GPG changes over time, we used the time series technique of exponential smoothing (i.e. Holt's method) because it assigns greater weight to more recent data points, and it is suitable for time series data with a trend yet no seasonality (Andrawis and Atiya, 2009). Indeed, we deemed it reasonable to give greater weight to more recent data points to reflect the possibility that initiatives to boost women's research output would have a lagging effect (if any) and thus would have had a greater impact over time. Note that these analyses aim to replicate results regarding the GPG (i.e. comparison of growth in publication rates for women vs. men), and not parity (i.e. whether the number of publications of women matches their representation).

Data analytic approach for examining gender publication parity: scenario-based time series analysis

Because parity refers to the situation when the proportion of articles by women matches the proportion of women in the field, calculating parity required us to determine: (1) *Step 1*: The

number of publications for each gender over time (2) *Step 2*: How gender composition (i.e. representation); will evolve in the future; and (3) *Step 3*: When the proportion of publications by women would match their proportion in the field.

For the first step, we predicted the trajectory of publications for each gender by fitting trendlines to the observed data points (i.e. annual publication counts for each gender). In other words, we predicted each gender's future annual authorship count based on the empirically observed exponential growths from 2002 to 2020. We fit exponential trendlines because exponential trendlines had a greater R^2 (i.e. explained more of the variance in annual publications) compared to linear and logarithmic trendlines. This was the case even after binning data into 2-, 3- and 4-year intervals.

For the second step (i.e. how gender composition will evolve in the future), the starting point was to gather information on the share of women among full-time management faculty based on AACSB data (AACSB, 2005–2021). This is the best available category because the "full-time management professor" category includes professors, associate professors, assistant professors and instructors. Moreover, as evidence regarding the validity of using the number of full-time faculty for our projections, the October 2021 AACSB Business School Data Guide shows that among full-time faculty members, there are 61.3% men versus 38.7% women tenure-track and 69.9% men versus 30.1% women already tenured. So, combining the tenure-track with the tenured categories shows that 34.40% of all full-time business school faculty members are women (i.e. 38.7% tenure-track and 30.1% tenured), which is virtually identical to the 35% figure in Table 1 for full-time faculty in general. So, based on data gathered by AACSB, the proportion of tenured and tenure-track women (i.e. 34.40%) is similar to that of full-time women (i.e. 35%). Accordingly, using full-time management professors does not result in a biased proportion favoring women or men. Moreover, most AACSB members are from regions outside of North America (57.89%; AACSB, 2021). Thus, the parity targets we used are representative of the increasing international authorship of management journal articles and do not reflect a North American population only.

We then projected how the parity targets would evolve beyond the year 2020. To this end, we made the following assumption: The share of women in management grows proportionately to that of full-time faculty in business schools. This is a somewhat strong assumption given that gender composition changes are not equivalent across the business subdisciplines (e.g.

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Table 1. Percentages of women among full-time business school faculty by year

Year	Percentage of women
2004	25.10%
2005	25.20%
2006	26.00%
2007	27.80%
2008	28.70%
2009	28.50%
2010	29.20%
2011	29.60%
2012	30.10%
2013	30.60%
2014	32.00%
2015	31.70%
2016	33.60%
2017	34.50%
2018	34.70%
2019	35.00%

Note(s): AACSB International (2005–2021)
Source(s): Table by authors

management versus finance). Nonetheless, we determined that the observed growth of women among business school faculty was the best proxy for women's growth, specifically among management researchers. We obtained data regarding the gender composition of full-time business school faculty from the AACSB's Business School Data Guide for 2004–2019, as reported in AACSB (2005–2021) and shown in Table 1. Continuing the second step for parity analysis, we projected three alternative parity targets (i.e. scenarios) beyond the year 2019, assuming the proportion of women in the field grows at a constant-linear (Scenario #1), increasing-exponential (Scenario #2) or decreasing-logarithmic (i.e. Scenario #3) rate. Although we created three scenarios for completeness, Scenario #3 is the most realistic in that the proportion of female faculty members would grow more slowly. The reason is that evidence already indicates that the growth rate is decreasing over time. Specifically, as shown in Figure 1, the proportion of women Ph.D. earners in business and management grew from 1.6% to 16.8% during 1970–1985, about a 900% increase in relative representation. Moreover, this proportion grew "only" from 30.9% to 42.8% during 2000–2015, roughly a 40% increase in relative representation. Indeed, assuming that growth of women's representation will decelerate leads to realistic projections; a decreasing trend projects women to be making up 40–45% within the next several decades (up 5–10% points from 2019s percentage of 35%). In contrast, the other two possible scenarios—a constant or accelerating growth rate of women's representation—imply that women will not only achieve 50% but will constitute a strong majority of business faculty within a matter of decades. Specifically, 65% of women's representation by 2059 assumes a constant growth rate or, even more extreme, at least 90% of women's representation by 2059 assumes an increasing growth rate, which is unrealistic.

For the third step, we identified the year when women's projected publications would match women's projected proportion in the management field based on the two previous steps. We did this for all publications across all journals combined and each of the eight journals separately.

Finally, to answer Research Question 3, we conducted publication gap and parity analyses similar to those described above. Based on the three subset databases described earlier, we focused on subsets of articles including two, three and four co-authors.

Results

Descriptive results

Figure 2 depicts the total number of publications by women and men over time in each of the eight journals. During the 19 years from January 2002 to December 2020, women accounted for 31.3% of all authorships.

Results for Research Question 1: is the gender publication gap narrowing?

Allometric modeling. Based on all articles across all journals, the results of allometric analysis were as follows: $\alpha(\text{SE}) = 0.55(0.10)$, $t = 13.57$ ($p = 0.00001$) and $R^2 = 0.66$. Results for each of the eight journals were as follows: (1) AMJ: $\alpha(\text{SE}) = 0.50(0.11)$, $t = 7.50$ ($p = 0.00001$), $R^2 = 0.54$; (2) AMLE: $\alpha(\text{SE}) = 0.76(0.12)$, $t = 18.57$ ($p = 0.00001$), $R^2 = 0.71$; (3) AMP: $\alpha(\text{SE}) = 0.29(0.13)$, $t = 1.07$ ($p = 0.15$) and $R^2 = 0.24$; (4) AMR: $\alpha(\text{SE}) = 0.28(0.21)$, $t = 0.16$ ($p = 0.44$), $R^2 = 0.10$; (5) GOM: $\alpha(\text{SE}) = 0.43(0.17)$, $t = 1.37$ ($p = 0.07$), $R^2 = 0.27$; (6) JAP: $\alpha(\text{SE}) = 0.60(0.13)$, $t = 8.73$ ($p = 0.00001$), $R^2 = 0.57$; (7) JOM: $\alpha(\text{SE}) = 0.77(0.09)$, $t = 32.72$ ($p = 0.00001$), $R^2 = 0.80$; and (8) SMJ: $\alpha(\text{SE}) = 0.65(0.06)$, $t = 57.44$ ($p = 0.00001$), $R^2 = 0.87$. Although there were some differences across journals, results were replicated in that all α values were smaller than 1.0. In other words, women's output has grown faster than men's. Thus, results based on allometric analyses provide an affirmative answer to Research Question 1: The GPG is narrowing over time.

Replication and robustness check using a single ratio variable in time series analysis. Replicating the allometric analysis results, time series analysis also showed a decreasing trend

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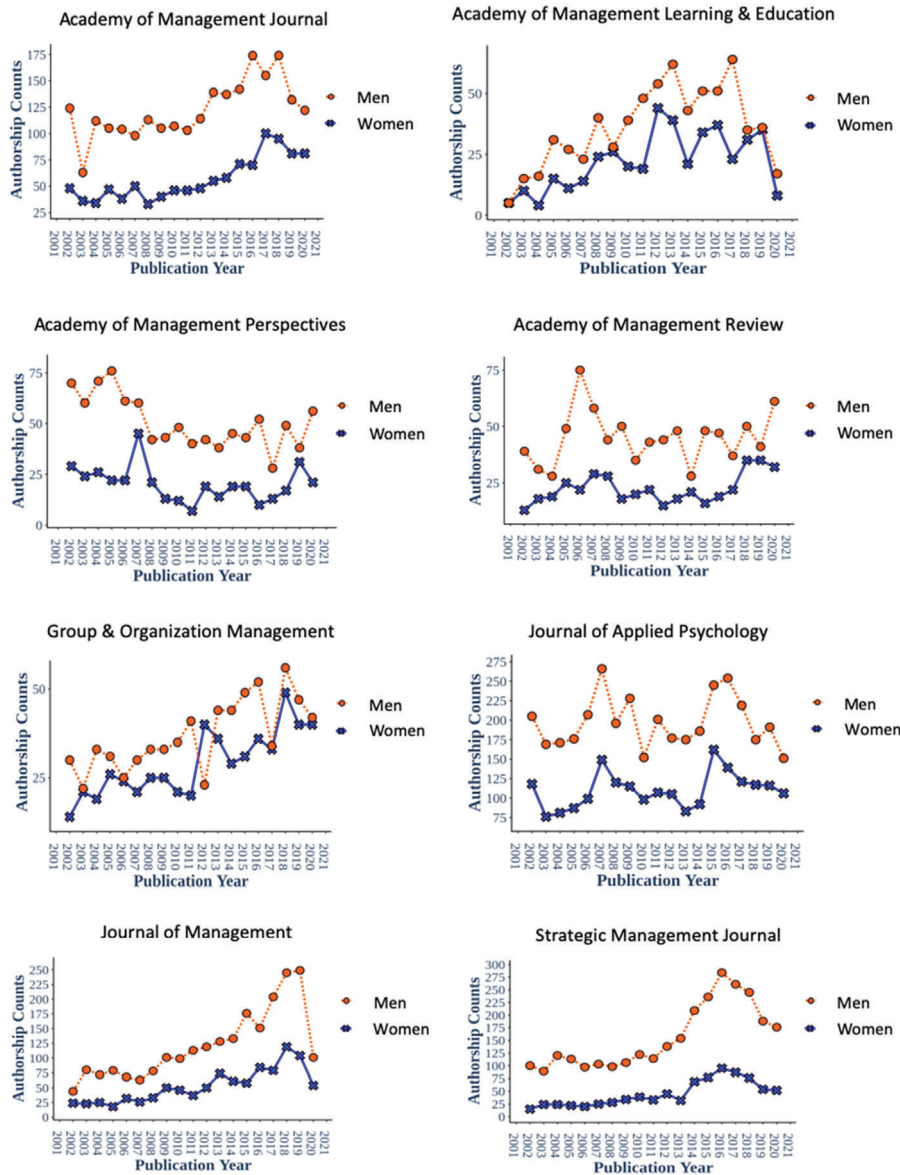
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Figure 2. Authorship counts by gender, year and journal (2002–2020)

for the GPG variable (i.e. GPG) over time and forecast a continuously decreasing trend beyond
the year 2020. The top-left panel in Figure 3 shows GPG overall (i.e. the total number of
publications across all eight journals) and a continuously decreasing trend showing the
narrowing of the GPG.

    We conducted a simple ordinary least squares regression linear model to further understand
the time series analysis results, using time to predict GPG overall. The slope was negative,

F3
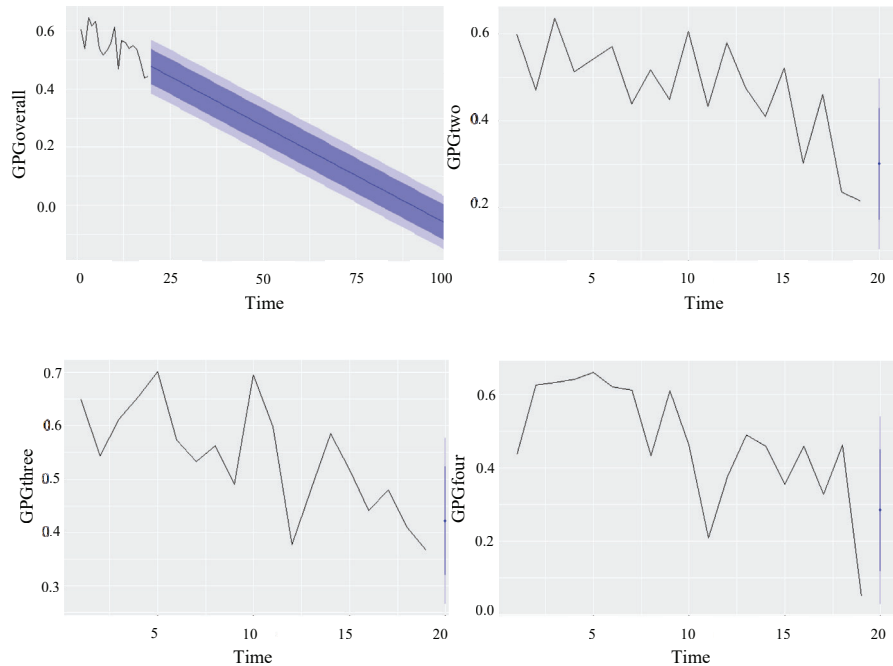
Note(s): GPG: 1 minus women's publications as a percentage of men's publications.
GPGoverall: Total number of publications. GPGtwo: Lead-authored articles consisting of
two co-authors. GPGthree: Lead-authored articles consisting of three co-authors. GPGfour:
Lead-authored articles consisting of four co-authors
Source(s): Figure by authors

Figure 3. GPG over time: time series analysis (Holt's method)

$\beta = -0.69$, $p = 0.001$, consistent with the decreasing trend. In sum, robustness checks using a
single GPG variable in a time series replicated allometric analysis results, showing that the
GPG is narrowing over time (i.e. higher growth rate for women than men).

*Results for Research Question 2: when is the gender publication parity predicted to be
achieved?*
Table 2 includes women's annual share of total authorships from 2021 to 2051 per journal. As   T2
described earlier, we generated these projections by fitting exponential trendlines to the
observed data points for authorships by gender per journal during 2002–2020 (i.e. as shown in
Figure 2) and extending those lines into the future. Specifically, Table 2 shows that women are
projected to produce between 30.8% and 57.5% of authorships by 2051, depending on the
journal.

Next, we used representation data from AACSB included in Table 1 to project parity targets
beyond the year 2019 according to the following three scenarios: The proportion of women in
management grows at a (1) constant-linear (Scenario #1), (2) increasing-exponential
(Scenario #2) or (3) decreasing-logarithmic rate (Scenario #3). So, we overlaid linear,
exponential and logarithmic trendlines to AACSB's data on women's share among full-time
management faculty in business schools—with each trendline representing gender
composition change under each of the three scenarios.

Table 2. Women's projected share of publications (i.e. authorships) by year and journal

Year	AMJ	AMLE	AMP	AMR	GOM	JAP	JOM	SMJ
2021	36.2%	39.3%	28.28%	36.4%	47.0%	38.9%	32.8%	26.3%
2023	37.2%	39.8%	28.45%	37.1%	47.7%	39.5%	33.5%	27.4%
2025	38.3%	40.2%	28.61%	37.8%	48.4%	40.2%	34.2%	28.5%
2027	39.5%	40.7%	28.77%	38.5%	49.1%	40.8%	34.9%	29.7%
2029	40.6%	41.2%	28.94%	39.2%	49.8%	41.5%	35.6%	30.9%
2031	41.7%	41.7%	29.10%	39.9%	50.5%	42.1%	36.3%	32.1%
2033	42.8%	42.1%	29.27%	40.6%	51.2%	42.8%	37.0%	33.3%
2035	44.0%	42.6%	29.43%	41.3%	51.9%	43.5%	37.7%	34.6%
2037	45.1%	43.1%	29.60%	42.0%	52.6%	44.1%	38.4%	35.9%
2039	46.3%	43.6%	29.77%	42.7%	53.3%	44.8%	39.1%	37.2%
2041	47.4%	44.1%	29.94%	43.4%	54.0%	45.5%	39.9%	38.5%
2043	48.6%	44.6%	30.10%	44.1%	54.7%	46.2%	40.6%	39.9%
2045	49.8%	45.0%	30.27%	44.9%	55.4%	46.8%	41.3%	41.2%
2047	50.9%	45.5%	30.44%	45.6%	56.1%	47.5%	42.1%	42.6%
2049	52.1%	46.0%	30.61%	46.3%	56.8%	48.2%	42.8%	44.0%
2051	53.3%	46.5%	30.78%	47.0%	57.5%	48.9%	43.6%	45.4%

Note(s): *AMJ: Academy of Management Journal, AMLE: Academy of Management Learning and Education, AMP: Academy of Management Perspectives, AMR: Academy of Management Review, GOM: Group and Organization Management, JAP: Journal of Applied Psychology, JOM: Journal of Management and SMJ: Strategic Management Journal*
Source(s): Table by authors

Results for the projected representation of women faculty in each of the three scenarios are included in Table 3. For example, in the scenario where the proportion of women grows at a constant rate, women are predicted to constitute 50.5% of all full-time faculty by 2037; in other words, 50.5% is the parity target for that year. In the alternative scenario where the proportion of women grows at an increasing rate, 56.4% is the parity target for 2037. In the scenario where the proportion of women grows at a decreasing rate, 39.9% is the parity target for 2037.

Table 4 summarizes the results of parity analyses and when parity will be reached. Based on the three scenarios, we projected the year when women's share of authorships will match the parity targets shown in Table 3. As shown in Table 4, in the less realistic scenario where the proportion of women grows constantly and linearly, parity will not be reached for any journals by 2051 (the sole exception is GOM, for which parity has already been achieved in 2021). Results were identical for the second less realistic scenario in which there is an exponentially increasing rate of female faculty: Parity will not be achieved by 2051 for any of the eight journals except for GOM.

Table 4 also shows results for parity under the more realistic assumption that there will be a decreasing growth rate in the proportion of women faculty. Under this scenario, three journals (AMLE, GOM and JAP) achieved parity in the year 2021, two journals will reach parity within this decade (AMJ by 2025 and AMR in 2029), two journals will do so in the next generation (JOM by 2043 and SMJ by 2045) and one journal will not even by 2051 (AMP).

Results for Research Question 3: gender publication gap and parity based on lead-authorship publications
Regarding the question of whether the GPG is narrowing in terms of lead authorships, our results from allometric analyses are as follows: (1) articles consisting of two coauthors: $\alpha(SE) = 0.26(0.30)$, $t = 0.03$ ($p = 0.4982$), $R^2 = 0.04$; (2) articles consisting of three coauthors: $\alpha(SE) = 0.40(0.11)$, $t = 3.99$ ($p = 0.0004$), $R^2 = 0.43$; and (3) articles consisting of four coauthors: $\alpha(SE) = 0.52(0.09)$, $t = 15.51$ ($p = 0.00001$), $R^2 = 0.68$. Given that α values smaller than 1.0 indicate women's output growing faster than men's, these results provide

Table 3. Projected percentage of women among full-time business school faculty beyond 2021 among full-time business school faculty based on three growth scenarios for women

Year	Scenario 1: Constant-linear growth	Scenario 2: Increasing-exponential growth	Scenario 3: Decreasing-logarithmic growth
2021	39.60%	40.20%	37.50%
2023	40.90%	41.90%	37.90%
2025	42.30%	43.70%	38.20%
2027	43.70%	45.60%	38.60%
2029	45.00%	47.60%	38.90%
2031	46.40%	49.60%	39.20%
2033	47.70%	51.80%	39.40%
2035	49.10%	54.10%	39.70%
2037	50.50%	56.40%	39.90%
2039	51.80%	58.90%	40.10%
2041	53.20%	61.50%	40.30%
2043	54.50%	64.20%	40.50%
2045	55.90%	67.00%	40.70%
2047	57.20%	70.00%	40.90%
2049	58.60%	73.10%	41.10%
2051	59.90%	76.40%	41.20%

Source(s): Table by authors

Table 4. Predicted year of gender publication parity by journal—total authorships

	AMJ	AMLE	AMR	AMP	GOM	JAP	JOM	SMJ
Scenario 1: Constant-linear growth rate	Not even 2051	Not even 2051	2021 (46.99%)	Not even 2051	Not even 2051	Not even 2051	Not even 2051	Not even 2051
Scenario 2: Increasing-exponential growth rate	Not even 2051	Not even 2051	2021 (46.99%)	Not even 2051	Not even 2051	Not even 2051	Not even 2051	Not even 2051
Scenario 3: Decreasing-logarithmic growth rate	2025 (38.34%)	2021 (39.30%)	2021 (46.99%)	2029 (39.18%)	2021 (38.85%)	2045 (41.22%)	2043 (40.60%)	Not even 2051

Note(s): Constant, increasing and decreasing growth rates in the proportion of female faculty were measured using linear, exponential and logarithmic functions, respectively. Each cell indicates per journal the year when parity is predicted to be achieved under a specific assumption of growth and women's predicted share/percentage of total authorships (i.e. annual publications) by that year. JAP: *Journal of Applied Psychology*, AMJ: *Academy of Management Journal*, JOM: *Journal of Management*, AMR: *Academy of Management Review*, GOM: *Group and Organization Management*, SMJ: *Strategic Management Journal*, AMLE: *Academy of Management Learning and Education* and AMP: *Academy of Management Perspectives*
Source(s): Table by authors

evidence that the GPG in terms of lead authorship is narrowing as well (although the *p*-value for articles with two coauthors is not statistically significant).

To further examine the GPG, we aimed to replicate these analyses by conducting robustness checks using time series. Results are displayed in Figure 3. The upper right quadrant (two coauthors), lower left quadrant (three coauthors) and lower right quadrant (four coauthors) also show decreasing trends for GPG. As yet another robustness check, we regressed time on GPG and found that the slopes were negative and statistically significant at $p < 0.05$:

$\beta = -0.70$, $p = 0.001$ among articles consisting of two coauthors; $\beta = -0.70$, $p = 0.001$ among articles consisting of three coauthors; and $\beta = -0.68$, $p = 0.001$ among articles consisting of four coauthors.

Finally, regarding when gender publication parity is likely to be reached regarding lead authorships, time series results in Table 5 generally show that parity has already been achieved in 2021–2023. Women account for 51% of all lead authorships, whereas the predicted proportions of full-time women faculty in business schools in the same year are in the high 30% or low 40%—with three exceptions outside the most realistic scenario of logarithmic growth in the proportion of women faculty. Thus, women publish significantly more lead-authored papers for articles with two, three or four coauthors than their relative representation in the field.

Analyses to explore factors that May explain our results

As mentioned briefly in the Introduction, we use the situational constraints conceptual framework as a plausible explanation for our findings. We believe these mechanisms result in gender-based situational constraints at various stages of scientific research production, as Bear *et al.* (in press) explained in detail. In an attempt to improve our understanding of possible mechanisms that reduce situational constraints for women (i.e. gap-narrowing mechanisms), we examined the following issues aimed at minimizing gender-based situational constraints: (a) differential research funding, (b) differential mentoring programs in micro versus macro domains and (c) differential representation in leadership positions.

Differential research funding. We examined whether women receive fewer resources in the form of research funding, which may serve as a situational constraint. We initially examined footnotes in the articles to collect data on the extent to which women and men have received funding over time. Unfortunately, we could not proceed with further analysis because the information was not precise enough. For example, for the period from 2002 through October 2022, we identified and coded a total of 318 articles that mentioned funding in their footnotes. In doing so, our goal was to compare JAP ($N = 225$ articles) and SMJ ($N = 93$ articles) to check if there were any micro-macro differences. However, precisely who among multiple coauthors received the funding was not specified in 43% of the JAP articles and 25% of the SMJ articles. In other words, the footnotes generally state that the research project has received funding but do not specify which coauthors were the funding recipients. As a result of these data limitations, we could not explore whether there has been an increase over time in the number of women-authored publications that credit research funding.

As an alternative and informative data source, we identified 72 projects funded by the National Science Foundation's Science of Organizations (SoO) program. We observed that 51.4% of the principal investigators were women. The fact that women received equal NSF-SoO grants as men—coupled with our findings that the GPG is narrowing and parity is largely

Table 5. Predicted year of gender publication parity—lead authorships

	Two coauthors	Three coauthors	Four coauthors
Scenario 1: Constant-linear growth rate	2021 (40.14%)	Not even 2051	2021 (42.25%)
Scenario 2: Increasing-exponential growth rate	Not even 2051	Not even 2051	2021 (42.25%)
Scenario 3: Decreasing-logarithmic growth rate	2021 (40.14%)	2023 (38.32%)	2021 (42.25%)

Note(s): Constant, increasing and decreasing growth rates in the proportion of female faculty were measured using linear, exponential and logarithmic functions, respectively. Each cell indicates the year when parity is predicted to be achieved under a specific growth assumption and women's predicted percentage of lead authorships (i.e. annual lead publications) by that year
Source(s): Table by authors

within reach—provides preliminary evidence that mitigating differential research funding may have contributed to narrowing the GPG.

Differential mentoring programs in micro versus macro domains. Job-related information from supervisors and peers is a critical resource that, when absent, serves as a performance situational constraint. So, we examined mentoring programs focused on encouraging or helping women scholars' research performance in 2022. The Academy of Management (AOM) Website lists professional development workshops at the 2022 annual meetings. The divisions sponsoring the workshops were Organizational Behavior (OB); Human Resources (HR); Diversity, Equity and Inclusion (DEI, formerly known as Gender and Diversity in Organizations); Careers (CAR); Managerial and Organizational Cognition (MOC); and Organization and Management Theory (OMT). Except for OMT, these divisions are mostly micro. We also searched for mentoring programs encouraging women's research performance at two other conferences in 2022: The micro-oriented Society for Industrial and Organizational Psychology (SIOP) and the macro-oriented Strategic Management Society (SMS). While we found two sessions (i.e. a community of interest and a panel discussion) offered by SIOP in 2022, none were offered by SMS. The only recent and relevant mentoring program we could find on the SMS website was a webinar conducted in 2020. In summary, while there are several mentoring programs for women in microdomains, there are fewer mentoring programs for supporting women in macro domains.

We then explored whether the micro versus macro divide regarding mentoring programs is associated with micro versus macro differences in GPG and parity. For this purpose, we compared two journals serving a clear micro mission (i.e. JAP and GOM) with another journal serving a clear macro mission (i.e. SMJ). Although checking how results differ across a handful of journals meant a sample size too small to perform formal statistical testing, we could still conduct exploratory comparisons. In terms of allometric analysis results on the issue of the GPG, α values (where lower values smaller than 1.0 indicate a faster narrowing of the GPG) are 0.52, averaging GOM and JAP, compared to 0.65 for SMJ. This comparison suggests that macro domains are experiencing a slower narrowing of the GPG. Next, in terms of gender publication parity, differences between micro and macro were even more pronounced. For GOM and JAP parity has already been achieved by the year 2021 (based on the most realistic scenario that the proportion of women in the field will grow at a slower pace moving forward). In contrast, SMJ results predict that parity will be reached by 2045 (again, based on the realistic assumption of decelerating growth in women's representation in the field). This suggests that gender publication parity is being achieved more slowly in macro domains.

Differential representation in leadership positions. Insufficient role models and support from others, including leadership support, are additional performance situational constraints. We uncovered that higher representation of women in leadership positions (i.e. editorial boards for journals) is aligned with a faster narrowing of the GPG and greater parity. Specifically, the percentage of women serving on the editorial boards is reported in Table 6. As shown in Table 6, if we consider the top four journals in terms of having greater percentages of women on editorial boards (i.e. GOM, AMJ, AMR and JAP) and compare them to the bottom four (i.e. AMP, AMLE, JOM and SMJ), we uncovered differences in GPG and parity. Regarding the GPG, where again lower values of α smaller than 1.0 indicate a faster narrowing of the GPG, the top four journals showed an average α value of 0.45. The bottom four journals had an average α value of 0.62. Note that AMP is an anomaly regarding this trend given that it is primarily a macro journal and, given that $\alpha = 0.29$, women are closing the publication gap faster compared to AMLE, JOM and SMJ, which are the other three journals with the lowest percentages of women serving on the editorial board. This result can also be explained by the fact that AMP has the largest percentage of women on the board among the bottom-four journals (i.e. 36%), which is similar to two of the three journals in the top-four category (i.e. AMR and JAP, both with 37%).

Regarding gender publication parity, Table 6 shows that the top four journals are all predicted to achieve parity in the 2020 decade. In contrast, for the bottom four journals except one, parity is expected to be achieved in the next generation (i.e. 2040s) or later.

T6

Table 6. Exploratory analysis of differences in GPG over time and parity based on percentage of women serving on journal editorial boards

	Percentage of women on the journal's editorial board	GPG over time (α)	Expected year for achieving parity
Top four			
GOM	40%	0.43	2021
AMJ	38%	0.50	2025
AMR	37%	0.28	2029
JAP	37%	0.60	2021
		Average α for top four $= 0.45$	
Bottom four			
AMP	36%	0.29	Not even 2051
AMLE	33%	0.76	2021
JOM	29%	0.77	2043
SMJ	25%	0.65	2045
		Average α for bottom four $= 0.62$	

Note(s): "Top four" refer to the top four journals in terms of having greater percentages of women on editorial boards (i.e. GOM, AMJ, AMR and JAP). "Bottom four" refers to the bottom four journals with lower percentages of women on editorial boards (i.e. AMP, AMLE, JOM and SMJ). Lower α (<1.0) per journal indicates a faster narrowing of the GPG. Each year per journal indicates when parity is predicted to be achieved based on the most realistic scenario: the proportion of women in the field will grow slower moving forward. GOM: *Group and Organization Management,* AMJ: *Academy of Management Journal,* AMR: *Academy of Management Review,* JAP: *Journal of Applied Psychology,* AMP: *Academy of Management Perspectives,* AMLE: *Academy of Management Learning and Education,* JOM: *Journal of Management* and SMJ: *Strategic Management Journal*
Source(s): Table by authors

Discussion

Empirical contributions: the what

A key empirical contribution of our study is that, by adopting a "movie" instead of a traditional "still shot" approach, we learned that the GPG is narrowing. Table 2, reporting the predicted share of publications by year in each journal, suggests that by 2051, women's output will be around 45%, with a low of 30.78% for AMP and a high of 57.50% for GOM. In fact, across all journals combined, allometric analysis (i.e. $\alpha = 0.55$) suggests that if women's research outputs increased twofold over a given period, men's publications during the same period would increase by only 1.46 (i.e. $2.^{55}$). As a second example to illustrate the meaning and significance of our results in terms of narrowing the GPG, if women's authorships increased threefold, men's authorships would increase by a smaller value of 1.83 (i.e. $3.^{55}$). Consider the following concrete example: If a randomly selected female researcher publishes eight articles in the seven years between becoming an assistant professor and her tenure review, our results show that a randomly selected male researcher will likely publish fewer than five (i.e. $8.^{55} = 4.86$). In addition, women are narrowing the publication gap faster at micro journals (e.g. JAP and GOM) compared to journals with an explicit (i.e. SMJ) or implicit (i.e. AMP) macro orientation.

A second empirical contribution is that we showed how gender publication parity (i.e. the extent to which the proportion of publications produced by women matches the proportion of women in the field) is a work in progress. Although parity is within reach in micro journals, it seems more elusive in the macro ones. Under the realistic assumption that the rapid growth in the proportion of women faculty we have seen to date will decelerate moving forward, GOM and JAP reached parity in terms of total authorships by 2021, two journals will do it within this decade (AMJ in 2025 and AMR in 2029), two others in the next generation (JOM in 2043 and SMJ in 2045). The only exception is AMP, for which parity is not expected to be achieved even

by 2051. As described earlier, it is most realistic to assume that the proportion of female faculty will grow more slowly in the future because evidence indicates that the growth rate is decreasing over time (as shown in Figure 1). Parity in lead authorships, assuming realistically that increases in women faculty representation will decelerate over time, is reached by 2021–2023 regardless of two, three or four coauthors per article. In fact, improvements in gender publication parity are occurring more strongly in terms of lead authorships compared to the total number of publications.

A third empirical contribution is that findings build upon but also go beyond past results, particularly in light of our methodological innovations (cf. Aguinis, 2025). When examining the presence of a gender publication or citation gap from a *cross-sectional perspective*, prior studies have shown that the gap is pervasive across many disciplines, including social sciences, biology and others (e.g. Symonds *et al.*, 2006; West *et al.*, 2013). The fact that we examined changes in GPG and parity over time—from a *longitudinal perspective*—means our results extend past conclusions. Specifically, we found that there is currently a considerable GPG, which is consistent with past research. As shown in Table 2, in 2021 and 2023, women's estimated share of publications (i.e. authorships) is much lower than men's across all journals (with the potential exception of GOM, where women's share is nearly equal to men's). At the same time, we found that the GPG is narrowing, and parity is being achieved, especially concerning lead authorships, when viewed in terms of gender-based differential growth over time through the lens of allometric and time series analysis rather than a snapshot. So, these longitudinal results do not deny the premise from past research that gender publication inequity remains. However, they show clear and strong signs of improvement, given the faster publication growth for women than men. This conclusion is not possible by considering cross-sectional data only. In other words, innovative methods resulted in unique value-added insights.

Finally, another empirical contribution is that we focused on the number of publications rather than citations to measure research output. The fact that many past studies have found considerable gender gaps in citations is not necessarily inconsistent with our conclusion that the publication gap is narrowing and parity in publications is improving over time (especially in the micro journals). Compared to citations, publications act as a precursor to citations and thus serve as a leading indicator. There can be a multi-year or even decade lag between publication and the number of cumulative citations. Thus, another extension of our results is that we expect women's citations to improve over time, and future research focusing on gender parity in terms of citations may find significant improvements, much like we did by examining publications over time.

Contributions to theory: plausible why
Given that we did not use the traditional hypothetico-deductive method of theorizing, how can we understand and explain these empirical results? We use the conceptual framework of situational constraints (Bear *et al.*, in press; Peters and O'Connor, 1980; Villanova and Roman, 1993) to make sense of our findings. In doing so, we make four contributions toward theoretical progress.

First, using the performance situational constraints conceptual model allows us to synthesize multiple explanations for the gender gaps, which originated in several fields, including social psychology, human resource management and economics. These different fields and research streams rely on many theoretical explanations for the gaps. For example, the social psychology and social cognition literature rely on implicit biases and discrimination (e.g. Villamor and Aguinis, 2024). Specifically, one explanation is that women hit a performance ceiling because they are not perceived to have the necessary attributes and characteristics of top performers, particularly in male-dominated occupations (Villamor and Aguinis, 2024). Additionally, sociological theories refer to norms and standards (e.g. Biernat and Fuegen, 2001) and differential resource allocation (e.g. Castilla, 2008) that disadvantage

women. Specifically, norms and standards, combined with stereotypes, create disadvantages for women by setting lower minimum standards but higher confirmatory standards for them compared to men. This means that while women may initially meet basic screening criteria more easily, they must provide more evidence of competence to be perceived as equally capable, making it harder for them to achieve success in settings like hiring or promotions where rigorous confirmation is required. As another example of additional explanations, the literature in economics also refers to differential norms and standards and the "translation loss" from representation to performance output (e.g. Card *et al.*, 2020).

Rather than proposing yet another new theory, we believe that the performance situational constraints conceptual model initially proposed by Peters and O'Connor (1980) and subsequently tested empirically (e.g. Villanova and Roman, 1993) offers a parsimonious way to synthesize the vast body of existing explanations. The situational constraints conceptual framework suggests that multiple factors combine to inhibit women's performance compared to men. And when these performance-inhibiting factors are removed, the gap can be narrowed.

Second, although situational constraints have been used to describe performance ceilings generally, we expand this theorizing to the particular domain of gender. Moreover, before Peters and O'Connor (1980) proposed their conceptualization, situational factors had been proposed as causing performance ceilings, such as Campbell *et al.*'s (1970) discussion of "situational constraint" variables that interact with individual characteristics in determining performance. Similarly, Campbell and Pritchard (1976) referred to situational characteristics not under the control of the individual serving as "facilitating" or "inhibiting" conditions for performance. Aguinis *et al.* (2016) examined "conductors" and "insulators" of performance by focusing on factors such as job autonomy and job complexity. More recently, this literature has focused on situational constraints and their potential to help us understand gender gaps (Bear *et al.*, in press). Accordingly, we use the situational constraints conceptual model to include gender explicitly.

Third, we also expand the situational constraints framework by considering the potential impact of not only tangible but also intangible constraints. To date, the focus of this conceptual framework has been on tangible job-related characteristics. For example, Peters and O'Connor included (1) insufficient job-related information, (2) tools and equipment, (3) materials and supplies, (4) budgetary support, required services and help from others, (5) task preparation, (6) time availability and (7) work environment. Similarly, Mathieu *et al.* (1992) and Klein and Kim (1998) focused on tangible situational constraints such as the extent to which employees (1) receive adequate information from sources other than the training, (2) have adequate equipment and supplies, (3) have sufficient authority to complete tasks and (4) have enough time to complete their jobs successfully. For example, women are more likely to be assigned non-promotable tasks and "invisible work," resulting in less research time (cf. Babcock *et al.*, 2017).

Empirical research on the situational constraints framework has been silent about the existence of intangible ones. For example, the literature has uncovered implicit biases that result in women being held to higher standards compared to men (e.g. Hengel, 2017), discrimination during the journal review process (e.g. Chesler *et al.*, 2010), differential gender-based incremental differentiation that prevents parity despite similar abilities and skills (e.g. Aguinis *et al.*, 2018), and women perceived as "not having what it takes" to be star performers (Villamor and Aguinis, 2024). Our expanded conceptualization and analyses based on situational constraints advance current theorizing by including intangible ones. Specifically, we uncovered the possible effects of differential mentoring programs and representation in leadership positions.

Finally, the evidence gathered so far has demonstrated that performance situational constraints not only hurt performance but also cause adverse affective reactions such as stress, frustration and job dissatisfaction (e.g. O'Connor *et al.*, 1982), which result in further performance loss as well as turnover (e.g. O'Connor *et al.*, 1984). In fact, a meta-analysis by Villanova and Roman (1993) found a strong negative relation between situational constraints

and job satisfaction ($\overline{r} = -0.32$) and a strong positive relation with frustration ($\overline{r} = 0.39$, meaning that more situational constraints are associated with higher frustration). Thus, the situational constraints conceptual model could also explain why women leave academia at higher rates than men at every career age (Spoon *et al.*, 2023). Consistent with our explanation and use of the situational constraints conceptual model, Spoon *et al.* (2023) reported that greater fractions of women reported feeling more stressed and pushed out due to stressors and leaving academia as a response. Specifically, women's odds of feeling pushed out were 44% higher than men's (Spoon *et al.*, 2023).

In sum, parsimony is a hallmark of good theory (Cronin *et al.*, 2021) and in phenomenon-based theorizing, the situational constraints framework seems to allow us to make theoretical progress and understand, explain and predict the gender gaps by subsuming previously provided explanations. As is true of many management domains (Aguinis, 2025, Chapter 3), the multiple explanations provided to date seem very complex and can also be contradictory. However, using a situational constraints framework in the specific domain of gender and also expanding it to include intangible constraints turns what seems very complex into a simple and plausible explanation: Compared to men, women's performance seems to be constrained by the simultaneous effects of multiple tangible (e.g. fewer resources, less time) and intangible (e.g. less mentorship and fewer leadership role models) inhibitors.

Implications for practice

We believe that our findings that the GPG is narrowing should be a point of pride for management and related fields—and particularly for microdomains. This positive outcome can lead to a chain of consequences that positively affect our field and others. For example, an increased number of articles in high-impact journals, and lead-authorship articles in particular, may mitigate situational constraints caused by old stereotypes regarding women's abilities (Eagly *et al.*, 2020), their potential to become star performers (Villamor and Aguinis, 2024), alleviate performance inhibitors for women (e.g. collaboration opportunities; Bear *et al.*, in press) and attract more women prospective researchers to the field.

In addition, our results on already-achieved parity on lead authorships suggest that universities should consider explicit criteria about authorship order for hiring and promotion decisions. Given that gender parity has been reached regarding lead authorships, using this particular metric in making hiring, promotion and tenure decisions could be another way to create equitable environments where women can thrive (Gooty *et al.*, 2023).

Our results regarding mentoring sessions for women across conferences, with significantly more support for women in micro than macro domains, suggest an actionable recommendation for fields interested in decreasing their GPG. This straightforward action to decrease barriers for women could also be implemented for members of other underrepresented groups, much like The PhD Project has done so successfully [3].

Finally, business schools must continue identifying and removing performance situational constraints for women. Spoon *et al.* (2023) provided evidence regarding the higher attrition of women in academia and pointed to the need to understand the "gendered reasons for attrition." So, based on our study, to understand the *gendered reasons for performance situational constraints*, we recommend using the critical incidents technique, which has been used effectively in the performance management literature for decades (Flanagan, 1954). This approach would consist of collecting self-reported information about incidents of poor research performance (e.g. insufficient number of research projects, insufficient number of publications). In collecting critical incidents, it is particularly important to include information on what led up to the poor-performance incident and the context in which it occurred. Then, respondents work backward to identify particular situational conditions that they believed explained their poor performance in those situations. The critical incidents are then collected and sorted into intro groups, akin to a "qualitative factor analysis." As illustrated by O'Connor *et al.* (1984), the performance constraints are grouped based on situational factors, not agents

(e.g. department chair, journal editor) who may be identified as culprits for poor performance. As an illustration, although not specific to gender gaps, O'Connor *et al.* (1984) identified situational constraints, including shortage of assistance; frequent, long and inappropriate meetings; insufficient financial support; and work overload. Identifying the specific situational constraints inhibiting women's research performance in a specific context (e.g. research team, department) would be a necessary and valuable first step to designing interventions to reduce these constraints (Gooty *et al.*, 2023).

Limitations and additional future research directions

First, given the paucity of women in management and related fields before 2002 (i.e. there were even fewer women in the 1990s and earlier; Gardner *et al.*, 2018), widening the time window for our database would not provide additional meaningful and informative data. Similarly, while we acknowledge our use of eight journals and our chosen period as a potential limitation in terms of external validity, past research examining additional journals did not yield substantially different results across top management journals (e.g. Treviño *et al.*, 2018). Nonetheless, future studies could investigate other journals and different time windows.

Second, we made assumptions about future representation to calculate parity targets. We first assumed that the proportion of women in management grows proportionately to that of full-time faculty in business schools. Then, we projected the proportion of women in the field in the future using three different scenarios. As such, although 2021 AACSB data show that the proportion of tenured and tenure-track women combined is virtually identical to that of full-time women faculty, there is uncertainty regarding how accurately these figures predict future representation and parity targets. Nonetheless, we aimed to address these uncertainties by making separate predictions based on three scenarios regarding women's proportions. We also made our assumptions explicit and open and reported detailed numerical results based on each assumption—in addition to conducting both allometric and time series analyses with a single ratio variable and finding convergence.

Third, studies published as early as the 2000s observed that pay and promotion differences by gender have narrowed over time and expected such narrowing to continue (Blau and Kahn, 2000; Ginther and Hayes, 2003). These results contradict recent research that shows that the within-job gender pay gap still exists across countries (Penner *et al.*, 2022). Our results motivate future research to explain changes in gender differences in pay and promotion because recent evidence indicates that the gender gap in pay mostly disappears after controlling for the quality of publications (Harris and Maté-Sánchez-Val, 2022). This suggests that further narrowing of the GPG and increased parity would, in turn, promote gender equity in terms of promotion and pay. Our study showed that the GPG is narrowing (based on allometric and time series analysis) and parity (based on time series analysis) is within reach at least in microdomains. We thus provide evidence to hypothesize that greater gender equity in pay and promotions should be seen in the next several years and decades—a topic of potential interest for future research to explore.

Fourth, based on our results that improvements in gender publication parity were even greater in terms of lead authorship publications (particularly among articles with three or four coauthors), a follow-up research question is whether women in lead-author roles are more or less likely to bring in additional coauthors. Although prior research conducted outside of the management field shows that female authors tend to have more coauthors compared to male authors (Larivière *et al.*, 2013), empirical work is needed to know whether this is the case in management and related fields as well. If so, does that reflect women's more or less relational orientation toward one's job?

Finally, we acknowledge that we are using the situational constraints conceptual model as a plausible explanation for our results. Future research is needed to empirically investigate this issue systematically.

Conclusions

Our phenomenon-based study adopting a "movie" rather than a "still shot" approach revealed that the GPG is narrowing (i.e. women's publication growth rate is higher than men's). In addition, our results showed that gender publication parity (i.e. the point at which women's share of publications matches the proportion of women in the field) is already achieved or is within reach in microdomains. Based on allometric and time-series analysis, women are now publishing at greater rates than men, which is even more noticeable for articles with multiple coauthors and women as lead authors. Taken together, results offer strong and triangulated empirical evidence that the GPG is narrowing due to the higher publication growth rate for women compared to men. Also, results based on scenario-based analyses showed that parity is already achieved or within reach for most micro journals, although the picture is not as favorable for macro journals. Moreover, analyses revealed that for articles with two, three and four coauthors, women publish significantly more lead-authored papers compared to their relative representation in the field. We used and expanded situational constraints as a plausible conceptual framework, which allows us to synthesize the several disparate research streams across multiple fields relying on different theories (e.g. discrimination and implicit biases in social psychology, differential incremental differentiation in human resource management and translational loss from representation to performance in economics). Although situational constraints have been used to describe performance ceilings generally, we expanded this theorizing to the particular domain of gender, and we also expanded it by including intangible constraints. Using a situational constraints framework turns what seems complex into the following plausible explanation: Compared to men, women's performance seems to be constrained by the simultaneous effects of multiple tangible (e.g. fewer resources, less time) and intangible (e.g. less mentorship and fewer leadership role models) inhibitors. From a practical perspective, future efforts to narrow gender performance gaps should focus on identifying differential tangible and intangible situational constraints using the critical incidents technique and then attempt to reduce them.

Notes

1. Although AMP's mission is to publish papers with policy implications based on management research in general, most editors have had a macro background since its inception (when it was called *Academy of Management Executive*), and a recent review provided evidence that policy implications are mainly absent from organizational behavior and human resource management research (Aguinis *et al.*, 2022), suggesting that AMP is mostly a macro journal.

2. The number of articles published by a single author was insufficient to estimate parameters and capture trends accurately.

3. The PhD Project, founded 30 years ago, encourages and supports historically underrepresented candidates on their journey to acquiring a Ph.D. in business fields. It provides connections and opportunities to high-potential recruits through conferences, mentoring and networking.

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AQ: 11 **Further reading**

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Appendix
Allometric modeling used to examine the gender publication gap
A faster growth rate for women than men would indicate that the GPG is narrowing. More precisely, let Equations A1 and A2 describe the publications of women (P_f) and men (P_m), each growing exponentially in time (t):

$$P_f = P_f(0)\, e^{at} \qquad\qquad (A1)$$

$$P_m = P_m(0)\, e^{bt}, \qquad\qquad (A2)$$

where t represents time; $P_f(0)$ and $P_m(0)$ represent P_f and P_m, respectively, when $t = 0$; and a and b represent the growth constants associated with P_f and P_m. Parameters a and b represent the non-linear

growth rate in publications for women and men, respectively. As such, the finding of a larger parameter value associated with one gender group (over the other) would indicate a comparatively greater non-linear growth rate for that group.

By solving for time (t) in Equations A1 and A2 (i.e. creating one expression for t as a function of P_f and another as a function of P_m and then setting them to be equal), we can create a new equation where the variable time (t) is eliminated. This results in the power-law (i.e. allometric) Equation A3:

$$P_m = CP_f{}^\alpha \tag{A3}$$

where the scaling exponent alpha (α) is the ratio of exponential parameters b to a in Equations A1 and 2 (i.e. $\alpha = b/a$). Accordingly, the magnitude of α reflects whether publications grow disproportionately faster for one gender group than the other. Specifically, an α value greater than 1 indicates an allometric scaling relationship where publications grow faster for men than women (i.e. the GPG is *not* narrowing). In contrast, an α value less than 1 indicates that publications are growing faster for women than men (i.e. the GPG *is* narrowing). If $\alpha = 1$, then there is an isometric or linear scaling relationship in which publications grow proportionately the same across genders. Further, the constant C in Equation A3 is a function of women and men publications at $t = 0$, i.e. $P_f(0)$ and $P_m(0)$ and their growth constants, a and b, as shown in Equation A4:

$$C = \frac{P_f(0)^a}{P_m(0)^b} \tag{A4}$$

Next, we can solve for the exponent α by performing a log-log transformation of Equation A3. To wit, an allometric relationship between two variables (i.e. $Y = kX^\alpha$) is equivalent to a linear relationship between the logarithms of those same variables; namely, $\log(Y) = \log(k) + \alpha\log(X)$. Thus, by performing a linear regression on the logarithms of those variables, we can estimate the size of exponent α, which becomes the slope of the regression line. Hence, we estimated the size of exponent α by fitting a linear regression line to the logarithmic transformation of the allometric equation (i.e. Equation A3), as shown in Equation A5:

$$\log(P_m) = \log(k) + \alpha \log(P_f) \tag{A5}$$

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