

# Opportunity Costs of Internal Promotions in Plastic Surgery: Are Women Given a Fair Shot?

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**Background:** Academic advancement in plastic surgery necessitates creation of opportunities for rising faculty, which are pivotal for women in their efforts to close prominent gender gaps in higher ranks. We study positions of academic prestige that benefit from internal nomination as surrogates for opportunities afforded to men and women seeking leadership roles.

**Methods:** We collected the following datapoints: authors of invited discussions published in *Plastic and Reconstructive Surgery* from 2010 to 2019; current editorial board members of representative plastic surgery journals; recipients of society-sponsored traveling fellowships; and directors of the American Board of Plastic Surgery. Public profiles for all authors and surgeons were referenced to confirm gender identification.

**Results:** Seven-hundred ninety-seven plastic and reconstructive surgery discussions were included, 18% of which included female first or senior authorship. Seventy-one (9%) discussions listed a female senior author. Male and female senior authors were equally as likely to collaborate with a female first co-author (25% and 26%, respectively). Only 17% of invited authors contributed to 55% of discussion articles. Women occupied 19% of journal editorial board positions, though none were editors-in-chief. American Society of Reconstructive Microsurgery, American Society of Maxillofacial Surgeons, American Society for Surgery of the Hand, and Plastic Surgery Foundation traveling fellowships were awarded to one (3%), four (7%), five (13%), and 141 (15%) female plastic surgeons, respectively. Women comprise 26% of directors of American Board of Plastic Surgery.

**Conclusions:** Female representation in plastic surgery is rising, but it is not mirrored across appointed positions in academia. We should strive to support advancements that allow selected prestigious positions to more accurately reflect the gender distribution within the plastic surgery community. (*Plast Reconstr Surg Glob Open* 2022;10:e4302; doi: [10.1097/GOX.0000000000004302](https://doi.org/10.1097/GOX.0000000000004302); Published online 6 May 2022.)

## INTRODUCTION

Relative to other surgical subspecialties, plastic surgery has the highest percentage of women and is closest to approaching gender parity.<sup>1,2</sup> There has been a steady increase in both female faculty members and residents.<sup>3</sup> From 2007 to 2017, representation increased from 14.6% to 22% for female faculty, and from 30% to 40% for female residents.<sup>4</sup>

Female presence and opportunities for women in plastic surgery are continuously improving, yet leadership

within the field does not reflect this trend with the most notable gender inequalities at the most senior academic and leadership positions.<sup>5</sup> At present, 9% of plastic surgery program chiefs/chairs and 12% of plastic surgery program directors are women.<sup>6</sup> Representation among national plastic surgery associations remains low, with women constituting 10% of the American Council of Academic Plastic Surgeons leadership, and 14% of the American Society for Aesthetic Plastic Surgery governance.<sup>2</sup> These findings suggest that the phenomenon of the “leaky pipeline” is at work, which describes a decline in the number of women compared with men at each rung up the academic ladder.

Numeric disparities, however, are only part of the problem. Although many positions are awarded through blinded applications following equal opportunity guidelines, some roles are granted through personal connections and networking, which can result in an opportunity

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cost of diversity and inclusion especially at the higher ranks. Without access to a robust network of academic colleagues, advancement becomes more difficult. However, networking at this higher academic level can require that an individual already has some level of establishment and connection within the field.<sup>7,8</sup> Sponsorship from academic peers and leverage of these networks can provide additional professional opportunities for further promotion. As female trainees and junior academicians advance through their careers, it is important to consider how these opportunities can function to promote diversity and inclusion in all arenas of plastic surgery. This study evaluates gender balance across various positions within plastic surgery that often benefit from internal nomination and can be propelling factors for academic promotion.

## METHODS

A list of all invited discussions in *Plastic and Reconstructive Surgery (PRs)* published between 2010 and 2019 was curated, inclusive of complete author listings. Only written discussions published in the journal were included; video discussions were not studied. In the event of multiple authors for a single publication, analyses were performed on the assumption that invitation was extended to the senior author listed. Two discussions were excluded from data analysis due to inaccessible author information.

A roster of editorial board members of select plastic surgery journals as of 2020 was developed. Editors-in-chief and associate editors were included. The following journals were searched: *PRs*, *Annals of Plastic Surgery*, *Cleft Palate Craniofacial Journal*, *Journal of Craniofacial Surgery*, *Hand*, *Journal of Hand Surgery*, *Microsurgery*, *Journal of Plastic and Reconstructive and Aesthetic Surgery*, and the *Aesthetic Surgery Journal*.

Society-sponsored traveling fellowships awarded to notable faculty in their respective fields were searched. All recipients, from the time of the program's inception, were recorded for the following societies/fellowships: American Society of Maxillofacial Surgeons CRANIO fellowship, American Society of Reconstructive Microsurgery Godina fellowship, American Society for Surgery of the Hand Bunnell fellowship, and Plastic Surgery Foundation fellowship. In addition, a list of active American Board of Plastic Surgery Board of Directors as of July 2021 was compiled. Lastly, a list was developed of all divisional/departmental chief/chairpersons and residency program directors of Accreditation Council for Graduate Medical Education (ACGME)-accredited plastic surgery training programs throughout the 2020–2021 academic year.

Gender, academic appointment, academic rank, and endowment status of all authors and/or surgeons were recorded. Gender was assigned by referencing publically-available profiles and professional images, including institutional webpages, and LinkedIn or Doximity profiles. Academic appointment was defined as maintaining a part-time or full-time faculty position at a currently active ACGME-accredited plastic surgery training program. Academic standing and years in practice (determined by

## Takeaways

**Question:** This study evaluated gender balance across various leadership positions within academic plastic and reconstructive surgery (PRs) that often benefit from internal nomination and can be propelling factors for academic promotion.

**Findings:** Our results identified various professional opportunities that exist for plastic surgery academicians that were significantly deficient of female faculty representation. Female representation in plastic surgery is rising, but it is not mirrored across appointed positions in academia.

**Meaning:** This study provides further evidence that our field should strive to ensure selected prestigious PRs positions more accurately reflect the gender distribution within the greater plastic surgery community.

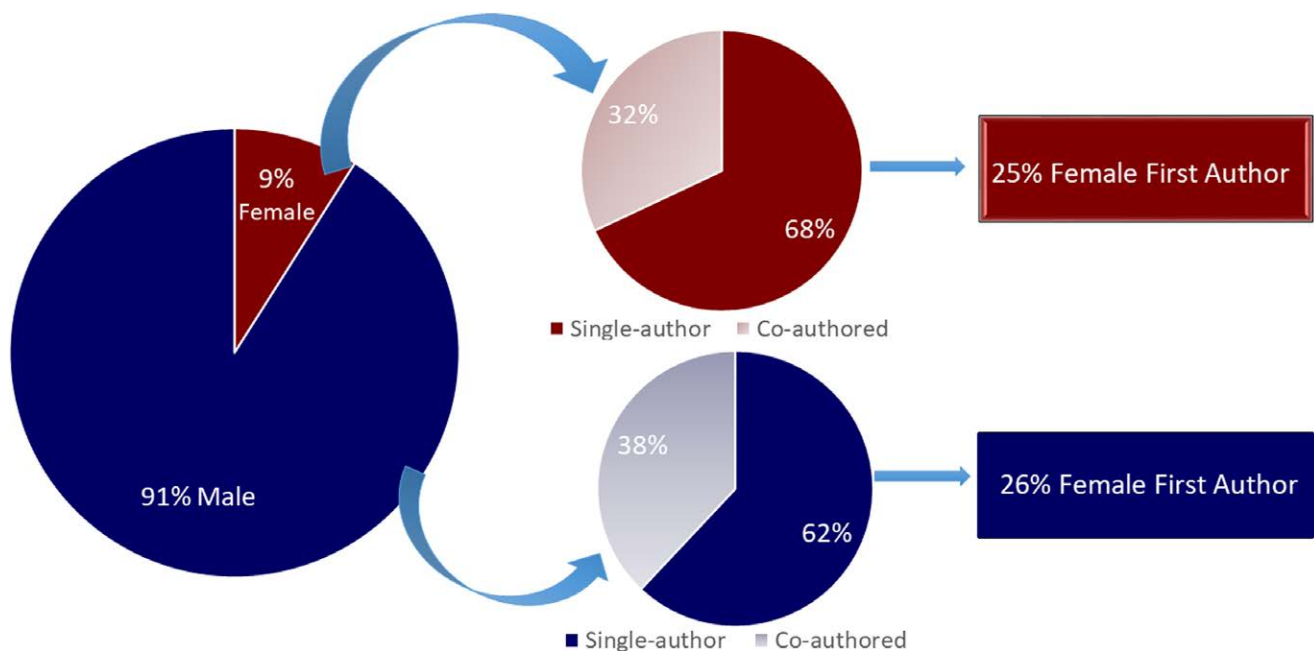
completion of all residency and fellowship training) were also determined through institutional websites.

## RESULTS

Seven-hundred ninety-seven invited discussions were published in *PRs* during the study period. Women served as the sole or senior author in 9% ( $n = 72$ ) of all discussions and appeared as the first author in 10% ( $n = 76$ ). Male and female discussants were equally as likely to credit additional collaborators in their articles, serving as the sole author in 62% ( $n = 451$ ) versus 67% ( $n = 48$ ) ( $P = 0.354$ ) of their respective discussions. Moreover, male and female senior authors were equally inclusive of female first-authors: 26% ( $n = 71$ ) versus 26% ( $n = 6$ ) (Fig. 1).

A total of 322 unique sole or senior authors were identified, with a median number of 2.5 discussions per author. Invitation was largely skewed preferentially toward men, with 86% male ( $n = 276$ ) and 14% female ( $n = 46$ ) unique authors. Thirty male authors were invited to publish more than five discussions, compared with two female authors. Thirty-one percent of invited discussants held an academic appointment in an ACGME-accredited plastic surgery program; 10% maintained an endowed professor status, and 14% were members of an editorial board (Table 1). Endowed professors and members of an editorial board were significantly more likely to be invited to author for a discussion ( $P < 0.01$  and  $P < 0.001$ , respectively). Seventeen percent of authors (17%,  $n = 55$ ) contributed to 55% of the discussant literature ( $n = 438$ ) (Fig. 2).

On average, women accounted for 19% of editorial board membership of the peer-reviewed plastic surgery journals included for analysis. *PRs* and *Journal of Hand Surgery* possessed the highest cohort of women, with 21% of editorial positions held by women (Table 2). Two journals had no female editors. No journals had a female editor-in-chief. A total of 48 editorial board members were invited to author discussions in *PRs* and contributed to 34% ( $n = 268$ ) of overall *PRs* discussions during the study period. Twenty-one percent of these editorial-member



**Fig. 1.** Gender breakdown of discussants. Far left: percentage of female versus male senior-authored discussants. Center: percentage of single-authored versus co-authored discussions per senior-author gender. Far right: percentage of female first authors for each senior-author gender group.

discussants were women. Editorial board members averaged 5.58 discussions per editor; however, female editors averaged 3.7 discussions per editor.

Society-sponsored traveling fellowships maintained greater variability across subspecialties (Table 3). The Plastic Surgery Foundation fellowship was awarded to 15% female recipients, whereas the Godina fellowship has been awarded to one female microsurgeon in its 30-year history (3%). The current American Board of Plastic Surgery Board of Directors is composed of 74% men and 26% women. Academic plastic surgery programs are led

by 9% female chief/chairwomen, and 19% of programs directors are women.

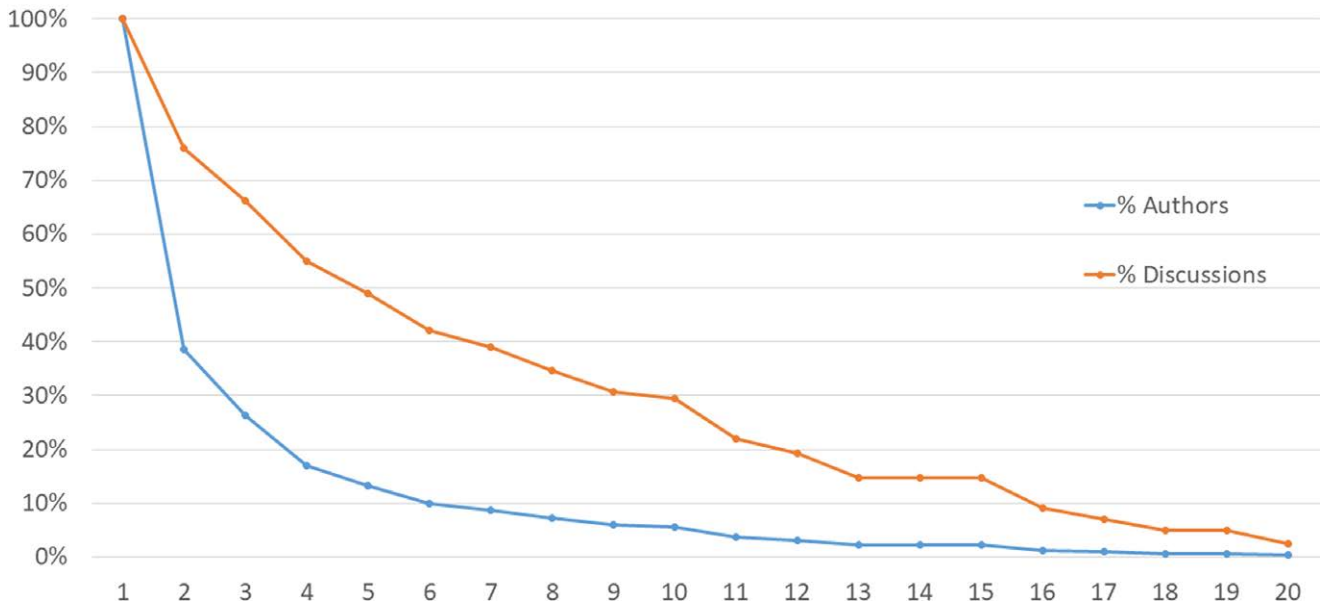
### DISCUSSION

Female underrepresentation in academic plastic surgery has been repeatedly described, with only modest recent improvements.<sup>2,5,6</sup> Despite growing female inclusion at entry levels in medical schools and surgical training, systemic inequalities continue to halt recruitment, and more critically, progression of female faculty.<sup>9</sup> The

**Table 1. Author Gender, Endowment Status, and Editorial Board Membership Status per Maximum Number of Discussions Invited to Publish**

No. Discussions (Max Invited)	No. Authors (Total)	(%)	Male Authors	(%)	Female Authors	(%)	No. Endowed Professors	No. Editorial Board Members	No. Editorial Board (PRS)
1	198	61%	166	60%	32	71%	10	8	1
2	39	12%	34	12%	5	11%	4	6	5
3	30	9%	27	10%	3	7%	4	6	4
4	12	4%	11	4%	1	2%	5	7	6
5	11	3%	9	3%	2	4%	1	3	2
6	4	1%	3	1%	1	2%	2	4	4
7	5	2%	4	1%	1	2%	1	2	2
8	4	1%	4	1%	0	0%	0	1	1
9	1	0%	1	0%	0	0%	0	1	1
10	6	2%	6	2%	0	0%	2	2	2
11	2	1%	2	1%	0	0%	1	2	2
12	3	1%	3	1%	0	0%	0	2	2
13	0	0%	0	0%	0	0%	0	0	0
14	0	0%	0	0%	0	0%	0	0	0
15	3	1%	3	1%	0	0%	1	1	0
16	1	0%	1	0%	0	0%	0	0	0
17	1	0%	1	0%	0	0%	0	1	1
18	0	0%	0	0%	0	0%	0	0	0
19	1	0%	1	0%	0	0%	0	0	0
20	1	0%	1	0%	0	0%	0	0	0
Totals	322	100%	277	86%	45	14%	31	46	33

## Authors Contributing to Overall Discussions



**Fig. 2.** Authors contributing to discussions. Curvilinear plot of percentage of authors (orange) invited to publish a minimum number of discussions (x-axis). Plot of percentage of discussions (blue) authored by faculty who were invited a minimum number of times (x-axis). The area between these curves represents the gap in percentage of authors contributing to the overall percentage of discussions.

present study highlights glaring discrepancies in nomination of women to positions that are often viewed as benchmarks of academic contribution. By assessing rates of invitation to author journal discussions, appointment to scholastic editorial boards, endowment of professor status, receipt of traveling fellowships, and selection to the certifying board’s leadership positions, we demonstrate that women are not afforded the same academic capital as men, thereby leading to increased difficulty in professional advancement in American plastic surgery.

By deeming publications, lectureships, and research funding as the primary forms of academic currency, one can appreciate that one of the fundamental drivers of female and ethnic minority scarcity is limited access to the “inner circle” that other demographics can more easily default into. The variables studied in this work were chosen as surrogates of the potential outcomes to be gained from fruitful networking, given the subjectivity of nomination predominating over an objective selection process.

Discussion publications, for instance, are reserved for expert opinion on a nuanced topic, but expert selection can be biased and unregulated. Although women comprise 15%–24% of the authorship cohort in the plastic surgery literature,<sup>10</sup> less than 10% of discussions are offered to these individuals by invitation. Preferences for private over academic practices among female plastic surgeons have been suggested to explain academic attrition and disparate productivity between men and women,<sup>11</sup> yet our results demonstrate that greater than one-third of invited discussants in fact do not hold academic appointments at ACGME training programs. While this definition of an academician is debatable, journals demonstrate experience in inviting expertise from the broader community, which theoretically should also yield a commensurate increase in female discussants from the private sector. We also found that a small minority of discussants contributed to more than half of the discussion literature. Certainly some areas of research are deemed hot topics that can ignite plentiful debate, which may be salient to a select few individuals to rightfully defend or contend. Nevertheless, it seems that such discussions are enriched when various perspectives are presented. Thus, broader inclusion of a wider variety of authors of these discussions is not only beneficial to the academician but heightens the substance of the discussion itself.

Encouragingly, male and female authors follow similar practices in engaging female first authors, which can prove beneficial to those they bring on. Co-authorship with a broad network of collaborators has been directly tied to greater productivity and promotional gains.<sup>12</sup> Moreover, the rate of collaboration with female authors is much more reflective of the overall makeup of female plastic

**Table 2. Percentage of Female Editors at Plastic Surgery Journals**

Journal	No. (%) Female Editors
<i>Journal of Craniofacial Surgery</i>	2 (33%)
<i>Plastic and Reconstructive Surgery</i>	8 (21%)
<i>Journal of Hand Surgery</i>	12 (21%)
<i>Cleft Palate Craniofacial Journal</i>	2 (20%)
<i>Aesthetic Surgery Journal</i>	2 (20%)
<i>Annals of Plastic Surgery</i>	2 (10%)
<i>Hand</i>	4 (11%)
<i>Microsurgery</i>	0 (0%)
<i>Journal of Plastic Reconstructive and Aesthetic Surgery</i>	0 (0%)
Average	19%

**Table 3. Characteristics of Plastic Surgery Traveling Fellowships**

Fellowship	No. Women	Recipients per Year	% Women
American Society of Reconstructive Microsurgery – Godina Fellowship	1	1	3%
American Society of Maxillofacial Surgeons – CRANIO Fellowship	4	2	7%
American Society for Surgery of the Hand – Bunnell Fellowship	5	1	13%
Plastic Surgery Foundation Fellowship	21	Variable	15%

surgeons and, unlike other specialties, remains equivalent regardless of senior author gender.<sup>12</sup> This signals promise for the more junior authors, typically trainees and students, but leaves a void for recognition of female authors at the senior “expert” level.

Among faculty who have earned discussion requests, a common series of academic accolades was observed. Endowed professorship at an academic program was significantly associated with greater publication of *PRS* discussions. The process of procuring funding for endowment and rewarding faculty with this prestige is entirely unstandardized, but the academic perks to that individual are undeniable and deserved. It affords them financial freedom to act on their research interests, the ability to leverage promotional consideration at other institutions, and additional clout for their academic reputation. Gender was not found to be significantly associated with endowment status, though this may be the result of underpowered analysis, as only eight female faculty in this study have an endowed position. Similarly, editorial board members were also significantly more likely to be invited to author discussions. Arguably, those surgeons display a strong commitment to the plastic surgery literature and are naturally suited to lead the conversation on topics of interest. Fortunately, women’s position in this space is improving<sup>13</sup>; though once again, opportunities are opening at the foundational level with gaps most notably up top and parity still far from reach. Some journals lack any female representation among their editorial board, and our specialty has yet to appoint a female editor-in-chief (of the journals studied). Whether these factors of endowment and board membership are predictive of invitation or consequent of prolific authorship that results from invitation is difficult to discern. Regardless, these historical metrics feed into a perpetual cycle that can signal academic value and place talented female faculty on the radar for success. Expanding eligibility of entry into this cycle is a clear solution to diversifying the pool and capturing deserving faculty with a clear path toward upward mobility.

Ultimately, one postulates that a critical but challenging avenue of opportunity for female advancement is access to influential social and professional networks that can foster interpersonal relationships within the relatively small plastic surgery community, such as the “old boys club.”<sup>14</sup> Exclusion from network exposure and power circles can be professionally isolating for individuals, leading them to feel unheard in their own groups, frustrated by stalled advancement, and ultimately contribute to high attrition rates.<sup>15–17</sup> Innerworkings of these social interactions can in turn yield fruitful research collaborations,

sharing of funding pathways otherwise overlooked, or most effectively sponsorship.<sup>18</sup> Unlike mentorship that exists inherently between the mentor and mentee, sponsorship extends out into the community, promoting the individual through exercising reputation and advocacy. Sponsorship may be the most fruitful solution to diversity and inclusivity. Recommendation to sit as a panelist at national meetings, invitation to exclusive societal gatherings, nomination to a visiting professorship, amongst the several positions investigated in this study, are all methods by which junior faculty can be supported in academia, which at present are opportunities generally afforded more frequently to men compared with women. In its current state, unfortunately, when women are tasked with academic responsibilities, they disproportionately absorb underrecognized and less-awarding responsibilities such as higher teaching loads,<sup>19</sup> which often require a significant time commitment associated with a lower dividend on their academic portfolio. This inherently results in a greater investment in time and resources that is critical for overall progression of the field but can displace the energy demanded to accelerate personal progress. This is not to say teaching is not important, but it cannot be the primary load for female faculty looking to push the field forward.

The results presented are not without limitations. Most notably, the variables investigated serve as mere surrogates of academic inclusion because networking is not an objective metric that can be studied easily. Moreover, our results are reflective of authors who accepted and fully completed invitation to a discussion, without fully capturing all invitations disseminated and to whom those invitations were initially directed. In addition, gender assignments and classification of practice type were performed as objectively as was feasible; however, there exists some subjectivity that may or may not mirror the self-designation of authors and surgeons. More granularly, senior authorship of a discussion piece may not accurately reflect invitation to that individual, perhaps omitting some invited authors whose collaborators are listed secondarily to them.

## CONCLUSIONS

Our results describe the various professional opportunities that exist for plastic surgery academicians which are too frequently closed off to female faculty. As the community invests further into narrowing the gender gap, it is worthwhile to consider rehabilitation of the biased prerequisites for entry into the “academic club.” Active sponsorship and inclusivity of women is a low-effort change that can undoubtedly allow them to maximize

their potential and pay it forward for generations to come to even the playing field and close the gender gap.

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