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Editorial (Spring)Board? Gender Composition in High-Impact General Surgery Journals over 20 years.

Chelsea A. Harris, MD[1], **Tanima Banerjee, MS**[2], **Monica Cramer**[3], **Shannon Manz**[4], **Sarah Ward, MD**[5], **Justin Dimick, MD MPH**[6], **Dana A. Telem, MD MPH**[6,7]

[1]Section of Plastic Surgery, Department of Surgery, The University of Michigan Medical School, Ann Arbor, MI

[2]Institute of Health Policy and Innovation, University of Michigan, Ann Arbor, MI

[3]Cornell University, Ithaca, NY

[4]University of Michigan, Ann Arbor, MI

[5]Section of Cardiac Surgery, Department of Surgery, The University of Michigan Medical School, Ann Arbor MI

[6]Department of Surgery, University of Michigan, Ann Arbor, MI

[7]Michigan Women's Surgical Collaborative, University of Michigan, Ann Arbor, MI

Abstract

Objective: To quantify gender composition of ten high-impact general surgery journals, delineate how board composition has changed over time, and evaluate qualification metrics by gender.

Background: Underrepresentation of women on editorial boards may contribute to the gender-based achievement gap in surgery.

Methods: We performed a cross-sectional analysis of the editorial board gender composition among 10 high-impact general surgery journals in 1997, 2007, and 2017. Univariate and regression analyses were used to assess differences in editors' H-indices, academic rank, and number of advanced degrees. Differences in editor turnover and multiple board positions were evaluated for each time interval.

Results: Over 20 years, the proportion of women on editorial boards increased from 5% to 19%. After controlling for time since board certification, no differences between men and women's number of advanced degrees, H-indices, or academic rank remained significant. Women and men were equally likely to hold multiple board positions (1997 p = 0.74; 2007 p= 0.42; 2017 p=0.69), but men's editorial board tenure was longer across each time interval (1997–2007 p=0.003; 2007–2017 p=<0.001; 1997–2017 p=0.01).

Conclusion: Women surgeons have a small but growing presence on surgical editorial boards, and gender-based qualification differences are likely attributable to practice length. Men's longer

Corresponding author and reprint requests sent to: Chelsea A. Harris , Section of Plastic Surgery, The University of Michigan Health System, 2800 Plymouth Road, Building 1400 G200-07, Ann Arbor, MI 48105, Phone: 734-763-1829, canneh@med.umich.edu.

tenure on editorial boards may drive some of the observed disparity by limiting new appointment opportunities. Strategies such as imposing term limits or instituting merit-based performance reviews may help editorial boards capture the field's changing demographics.

Abstract

Poor representation on editorial boards may contribute to one aspect of gender-based academic achievement gaps observed in surgery. This study seeks to quantify the proportion of women editorial board members in ten prominent surgery journals, describe demographic changes from 1997–2017, and compare empiric metrics of academic success across editors.

Keywords

gender bias; women; surgery; editor; women in medicine; editorial board; gender equity; academic surgery

Introduction:

Achievement gaps between men and women physicians exist across virtually every performance metric in academic medicine. Compared to men, women physicians command lower salaries, are promoted later and less often, and hold substantially fewer leadership positions[1–9]. For women in surgical specialties, the contrast is even starker. As of 2014, women comprised only 19% of Associate Professors, 10% of Full Professors, and chaired just 5% of the 294 academic surgery departments in the United states[10]. Such disparity has long been characterized as a "pipeline problem", where women's poor representation in surgery's upper echelons is the result of a small candidate pool[11,12]. However, achievement gaps persist even as women make up higher and higher proportions of the surgical workforce, indicating that female presence may be only part of the problem[13,14].

Many observers blame gender-based differences on diverging career goals. In this construct, women trade academic prestige for gains in work-life balance, specialty selection, and teaching opportunities[15–20]. Yet recent case-match studies demonstrate that achievement gaps exist even between a highly-selected group of academic men and women physicians (e.g. K08 and K23 NIH grant awardees), suggesting that women's success is impacted not just by choice, but by opportunity[21–23]. Journal editorial board composition may offer key insight into 1 such differential opportunity. Owing to editorial board membership's prestigious nature and its inherent gatekeeper functions, equitable access to editorial positions is important for both individual women surgeons and for their collective advancement[24]. Multiple analyses report that although women's representation in medical journals is improving, in absolute terms, women editors remain vastly outnumbered[25–29]. The extent to which similar trends exists in general surgery journals has not been examined. Furthermore, few studies address whether women candidates face different qualification thresholds for appointment, or whether highly senior women are oversampled across journals as kind of superficial diversity. Given that surgery often performs below other fields in measures of gender-equity, close examination of editorial board composition is warranted.

To address these questions, this study seeks to quantify the proportion of women editors in 10 prominent surgery journals, compare empiric metrics of academic success across editors, and describe demographic changes over time. We hypothesize that similar to the patterns seen in other fields, the number of women editors will increase over time, but the overall proportion of women editors will remain low compared to men. We further hypothesize that a small pool highly qualified women will hold multiple board positions, which will drive differences in editors' average qualification-level.

Methods:

We selected the editorial boards of 10 broadly representative general surgery journals for analysis based on impact factor and 2 senior authors' (DT, JD) judgment that journal content, and therefore board members' necessary expertise, would be similar enough to make appointment to multiple boards most likely. Journals included *Journal of American College of Surgeons, Journal of the American Medical Association (JAMA) Surgery, Annals of Surgery, Surgical Endoscopy, Annals of Surgical Oncology, Surgery, Diseases of Colon and Rectum, Surgery of Obesity and Related Diseases, Journal of Gastrointestinal Surgery, and Journal of Surgical Education*. Current editorial board members were identified from each journal's publically available website through July 20, 2017. To assess editorial board composition in 1997 and 2007, we obtained copies of the journal masthead or publisher-supplied editor lists (excepting *Surgery of Obesity and Related Diseases*, which was first published in 1999). For each time period, two investigators (CH with SW, SM, or MC) independently generated a unique dataset which they then compared lined-by-line. All discrepancies were jointly researched, and no persistent disagreements emerged.

To create the 2017 dataset, the research team primarily used faculty webpages to determine gender, academic rank, and graduate degree number. Gender was ascribed based on name, posted photographs, and gendered pronouns. Academic rank was usually clearly stated; however, if a subject had multiple current appointments, the highest rank was chosen. Editors listed as 'Professor Emeritus' were treated as full professors. Adjunct professors or those currently in private practice were grouped together, and their previous academic rank was not considered. Because of their high degree of heterogeneity, additional appointments such as 'division head' or 'research director' did not factor in to academic rank. Degree number was first assessed based on degrees listed after faculty members' names and was further verified using the 'education' section of faculty webpages. When available, editors' *curriculum vitae* were also reviewed to corroborate rank and graduate degrees obtained. In order to ensure accurate comparisons, editors practicing abroad, nonphysicians, and nonstandard editors (emeritus, creative director, managing) were excluded from the sample.

For all subjects who completed general surgery residency in the United States, time since board certification was used as a proxy for practice length, and was determined using the American Board of Surgery 'Check Certification' function to identify initial board certification year. Editors in other specialties, such as radiation oncology, which do not make certification dates public, were excluded from those portions of the analysis, as were editors currently practicing in the U.S. who had trained abroad. Editors' H-indices were obtained by searching the Scopus Author Index (https://www.scopus.com/freelookup/form/author.uri).

Identification of the correct author was confirmed by verifying the associated institution, affiliation with surgery departments specifically, and comparison of the listed articles with editors' known specialties or those listed on their faculty Website.

Finally, to determine editor retention, we compared editorial boards across 3 periods: 1997–2007 (10 years), 2007–2017(10 years), and 1997–2007 (20 years). We excluded emeritus editors and all known deceased persons as verified by a publically available obituary that confirmed employment in their known specialty and location. No attempt was made to determine or exclude editors who had retired from clinical practice.

Statistical Analysis

Composite data was recorded and stored in excel spreadsheets (Microsoft Corporation, Redmond, Washington) and analyzed using SAS (Version 9.3, SAS Institute Inc., Cary, NC, USA). The proportion of women editors in individual journals and in aggregate was tabulated and compared over time. To evaluate differences in editors' qualifications, we began with univariate analysis. We compared men and women editors' H-indices, academic rank, and rank using two sample t-tests, Fisher exact tests, and Chi square tests as appropriate, both in aggregate, and for editors in the three highest impact journals.

Based on our supposition that qualification metrics were likely to be associated with career length, we further evaluated the mean length of time since board certification (a proxy for length of time in practice) for each group using two-sample t-tests. As the difference between men and women's practice length was significant, we adjusted mean H-index by number of years since board certification for each editor. Because the equality of variance test was significant, we then compared men and women's mean adjusted H-indices using two sample t-tests with unequal variance. Logistic regression was performed to test the relationship between length of time since certification and both academic rank and number of additional degrees. After identifying a significant positive and negative correlation respectively, subsequent logistic regression was performed for each qualification metric controlling for length of time since certification. All analyses were then repeated examining only editors in the three highest impact journals.

At each time point, the number of editors who appeared on more than one journal's board (editor repetition) was computed for men and women editors. The gender differences in the degree of editor repetition was compared using Fisher Exact tests for both the total population, and specifically among editors in the three highest impact journals. Turnover was assessed using descriptive statistics.

Results

Editorial Board Member Representation by Gender

After excluding all international, nonphysician, and Emeritus editors, gender was successfully identified in 1171 out of 1174 cases (99.7%). Figure 1 presents the total percentage of women editors and the percentage of women in individual journals in 1997, 2007, and 2007 respectively. Overall, the aggregate percentage of women increased from 5% in 1997 to 19% in 2017. As shown in Figure 2, in the period from 2007 to 2017 the

percentage increase in women editors slightly outpaced the increase in editorial board size for most journals.

Editorial Board Members' Academic Qualification by Gender

Initially, univariate analysis found significant differences between men and women's qualifications across all academic metrics (Table 1). Editorial board members who were men had higher mean H-indices (39.3 vs 27.8; p<0.001) and more men had achieved a rank of full professor (71.1% vs. 56.7% p=0.039), whereas a higher percentage of women had additional degrees (36.1% vs 21.9% p=0.004).

Assessment for differences in practice length demonstrated that the length of time since board certification was 23 years (SD 11.2) for men and 17 years (SD 8.2) for women ($P < 0.001$). Based on this significant association, repeated adjusted analyses were performed for each qualification metric. After adjusting H-indices by practice length (H-index/years since certification) no significant difference remained between men and women (men: 1.81, SD 1.0; women 1.7, SD 0.8; p= 0.276). Multivariable analysis using logistic regression demonstrated a significant positive association between time since board certification and higher academic rank ($P < 0.001$) and a significant negative association between length of time and additional degrees ($P < 0.001$). Adjusted analyses controlling for practice length revealed no significant differences in the probability of men versus women attaining full professor rank ($P = 0.654$) or in the probability of having additional degrees ($P = 0.051$).

Editorial Board Member Characteristics by Gender: Highest-Impact Journals

Examining only editors in the top 3 highest impact journals produced similar results (Table 2). Univariate analysis again indicated the men editor group had a higher mean H-index (51.0, SD=21.4 vs 36.4 SD= 16.7 $P = <0.001$); lower proportion of editors with additional degrees (22.7 vs. 44.7 $P = 0.0063$), but no difference in proportion of full professors (90.3% vs 89.5% $P = 0.88$). No significant difference in H-index between men and women persisted after adjusting for length of time since board certification (2.0 score/years SD: 1.1 vs 1.8 score/years SD: 0.8 $P = 0.217$). Logistic regression showed a similar positive association between length of time since certification and higher academic rank ($P < 0.001$) and a negative association with additional degrees ($P = 0.081$). Final logistic regression controlling for time since certification revealed no differences in rank ($P = 0.183$) or additional degrees ($P = 0.081$) by gender.

Editorial Board Member Repetition and Retention

As demonstrated in Figure 2, the number of editorial board members appearing on a least 1 other journal board (editor repetition) appears to be increasing over time (1997 total: 13% men, 15% women; 2007: 21% men, 14% women; 2017: 21% men, 23% women). Editorial board member repetition was even more pronounced when considering only editors in the 3 highest-impact journals (1997 total: 33% men, 29% women; 2007: 47% men 38% women; 2017: 41% men 54% women). However, across all journals, women editorial board members were not more likely to repeat (1997 p = 0.74; 2007 p= 0.42; 2017 p=0.69), nor were they more likely to repeat in the highest impact journals (1997 p=1.0; 2007 p=0.60; 2017 p=0.15) (Fig 3). Editorial retention (i.e. the proportion of a journal's editors that stayed the same over

a given period) also increased between the 1997 and 2007 and the 2007 and 2017 intervals (Fig 4). Across all intervals, men were significantly more likely to be retained (1997–2007 $P = 0.003$; 2007–2017 $P < 0.001$; 1997–2017 $P = 0.01$).

Discussion

In this study, we found that the total number of women editorial board members lagged far below the number of men. However, the overall picture of women's editorial opportunity is encouraging. First, the proportion of women editorial board members has been steadily increasing over the last 20 years, and at 19% closely matches the Association of American Medical Colleges 2015 report that women constitute 23% of academic surgical faculty[30]. Our results also indicate that women editors do not have significantly different academic credentials and are no more likely to hold multiple board positions than their men colleagues in either the highest impact journals, or in aggregate. This parity is in direct contrast to our original hypothesis that journals tend to select women board members from a small pool of highly elite candidates. Thus, it does not appear that surgery journals are oversampling a small number of elite women surgeons as a form of superficial diversity, but are appointing new and different women to their boards.

This study also finds little evidence for the conclusion that women editorial board members must clear higher appointment thresholds than men. Although unadjusted analysis demonstrated that a higher portion of women obtained advanced degrees, this relationship disappeared after controlling for length of time in practice. Differences in degree numbers therefore likely reflect an overall trend among younger physicians to obtain multiple degrees, rather than systemic biases that force women to obtain more training prior to board appointment. Similarly, gender-based differences in rank (where women actually scored lower in unadjusted analysis) also attenuated after controlling for length of time since board certification. Although there is considerable evidence that women face slower promotion in academia, our results indicate that women may be joining editorial boards slightly earlier in their careers.[6,31,32]

Proactive appointment, coupled with women's modest but growing presence overall, is particularly encouraging because it suggests that in the decade since Jagsi et al first called attention to this issue, editors-in-chief have responded.[26–28,33] Given that there does not appear to be stage-matched differences in editors' qualifications, editors-in-chief appear to be capitalizing on a growing pipeline to appoint more women and remedy historic disparity. The fact that women's editorial board representation is growing faster than their presence in academic positions (in 2015 women constituted only 10% of full professors) and faster than increases in board size, further strengthens this conclusion. [30]

Our finding that adjusting editors' H-indices by practice length eliminates any significant difference between genders also adds important nuance to broader discussions of publication bias in medicine. Studies demonstrating that there are far fewer women first and senior authors in both high-impact general interest journals and subspecialty publications have helped strengthen narratives that women's choices (eg, their purported preference for teaching over research roles) and systemic biases (eg, unequal access to resources, poor

mentorship) lead to academic achievement gaps.[34–40] Our findings suggest that time may be an even more important factor, and that it is important to examine women at different career stages separately. Although the women in this study reflect an elite cohort, a recent study by Mueller *et al*[35] examining a more generalized population found that gender-based differences in author's H-indices were more pronounced at the associate-professor level than at other ranks. Taken together, these finding may suggest publication bias has a timing component that impacts early-, mid-, and late-career physicians differently. More work is needed to establish when and how publication barriers arise, and to identify the factors that facilitate women's success in this context.

The duration of men and women's editorial board tenure emerged as one of the few differences between genders, with men more likely than women to remain on boards across each time period. The exact mechanism driving this trend remains unclear, but the very low absolute number of women on editorial boards, particularly in 1997, may make retaining high percentages of women particularly difficult. Our study also demonstrated that while journals varied widely in their tendency to keep board members (some turned over completely in 10 years, whereas other retained over half of their men), on average, tenure length is increasing. Slow turnover has important implications for surgeons regardless of gender. Although trends toward increased board size over time suggest that 1 editor's appointment is not necessarily contingent upon another's exit, ostensibly each journal maintains an upper limit that caps the positions available to next-generation surgeons. Board members who stay on indefinitely may clog the opportunity pipeline, preventing journals from realizing the full potential of more equitable appointment practices. In order to overcome these barriers, editors-in-chief should consider proactive strategies to diversify their boards. Options highlighted by our findings include imposing term limits or merit-based performance reviews to ensure all board members meet standardized benchmarks.

Our study has several limitations. Our primary aim was to assess whether journals were oversampling a small cohort of highly qualified women; thus, we needed to select a subset of journals where overlap was possible. Given that the content expertise necessary to contribute to a trauma surgery journal may be much different than that needed for, say, a transplant surgery journal, we elected to examine mainly gastrointestinal subspecialty journals. This lessened our chance of making a type II error in assessing oversampling, but this decision may have introduced a broader selection bias. It is therefore possible that our results may not be generalizable across all surgical subspecialty journals. However, even if different gender parity trends exist in some surgical fields, the recommendations made in this article should remain broadly applicable, as instituting term limits will afford continued opportunities to adjust editorial boards as the workforce evolves.

Because we relied on institution-maintained websites, it is possible that some of our data, particularly academic rank, is not perfectly up-to-date. In addition, we had to use current academic rank as a proxy for the academic stage at which individuals were appointed because we did not have any data specifying exactly when editors joined the board. It is therefore possible that more subtle forms of discrimination persist in how board membership impacts career advancement between genders. For example, if men are appointed at earlier career stages, board membership may act as a vehicle for promotion them whereas it

remains the result of promotion for women. More work is needed to establish whether this is the case.

We also had no way to assess editorial board members' contributions to each journal, so we could not standardize the demands of their roles. Given the substantial variance in editorial board size, it is reasonable to intuit that individuals at certain journals may retain primarily ceremonial positions while other members are more active in the journal's day-to-day functions. These "holdover" positions may skew board demographics to look more like those of 2007 or 1997 despite improved equality in recent appointments, and may therefore partially confound our results. Finally, it is difficult to define empirically what constitutes appropriate representation. One may argue that women's editorial board presentation is proportional to their presence in the academic workforce and may even exceed expectations considering that women surgeons in clinical or educational tracks may not desire board positions. Conversely, others may believe that equal male:female ratios are needed to improve and sustain women's presence in the field. Regardless, a continued focus on equity is warranted.

Conclusions

Ultimately, our study fits into the ongoing narrative that conditions are improving for women in medicine, but more work needs to be done before we can achieve true equity. As surgery demographics continue to shift, editors-in-chief should make deliberate efforts to appoint board members that reflect the field's growing diversity, not just along gender lines, but among multiple identity parameters. Potential reforms, such as term limits, can be implemented to help achieve this goal. Determining what should constitute adequate representation will be a matter of ongoing philosophical debate and will require thoughtful consideration of how to balance diverse perspectives with appropriate qualifications, but it is an important conversation to continue.

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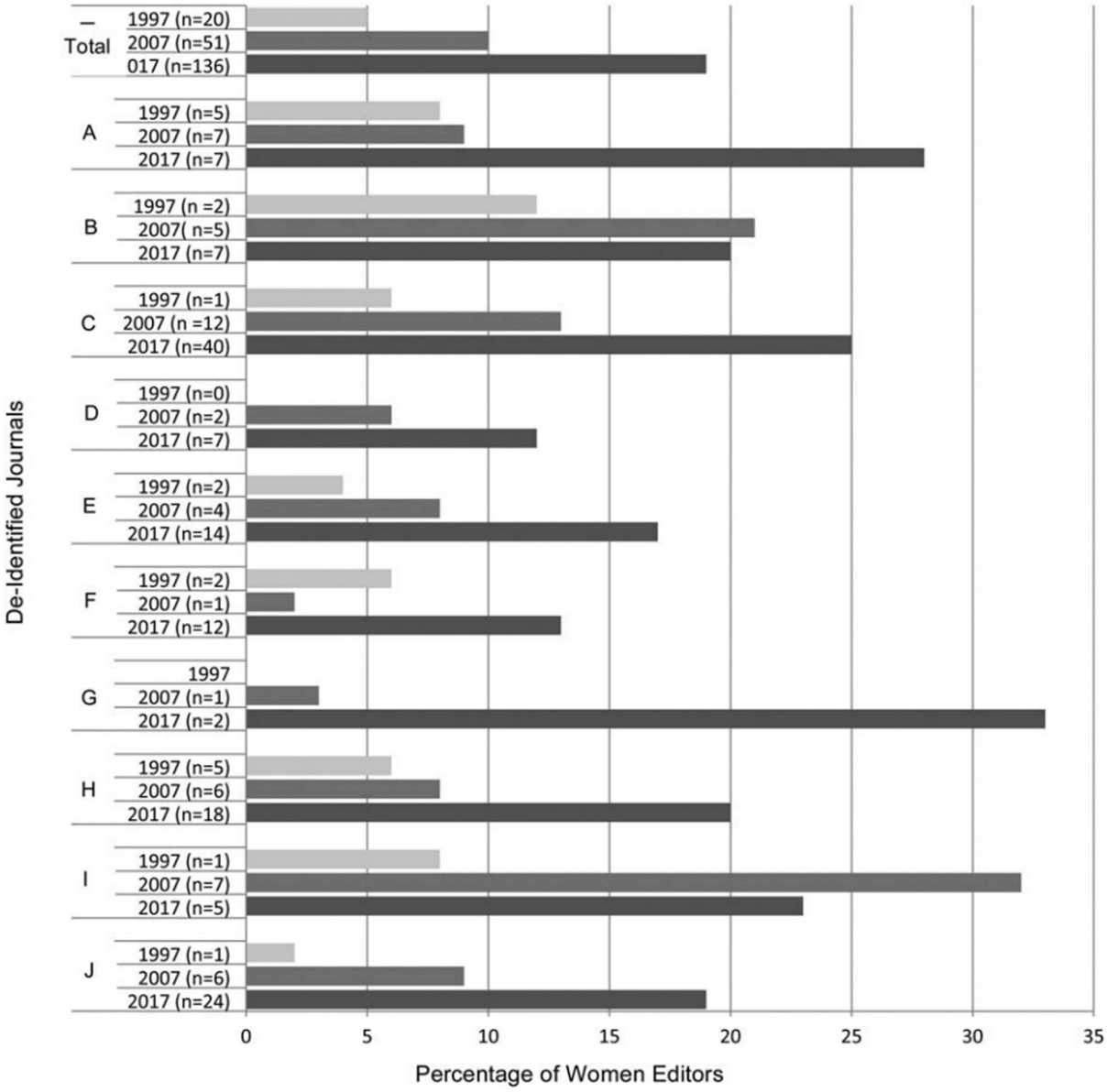

Figure 1.

Editorial board composition by percent women in 1997, 2007, and 2017 by journal (A-J) and in aggregate. Absolute number of women editors listed in parentheses.

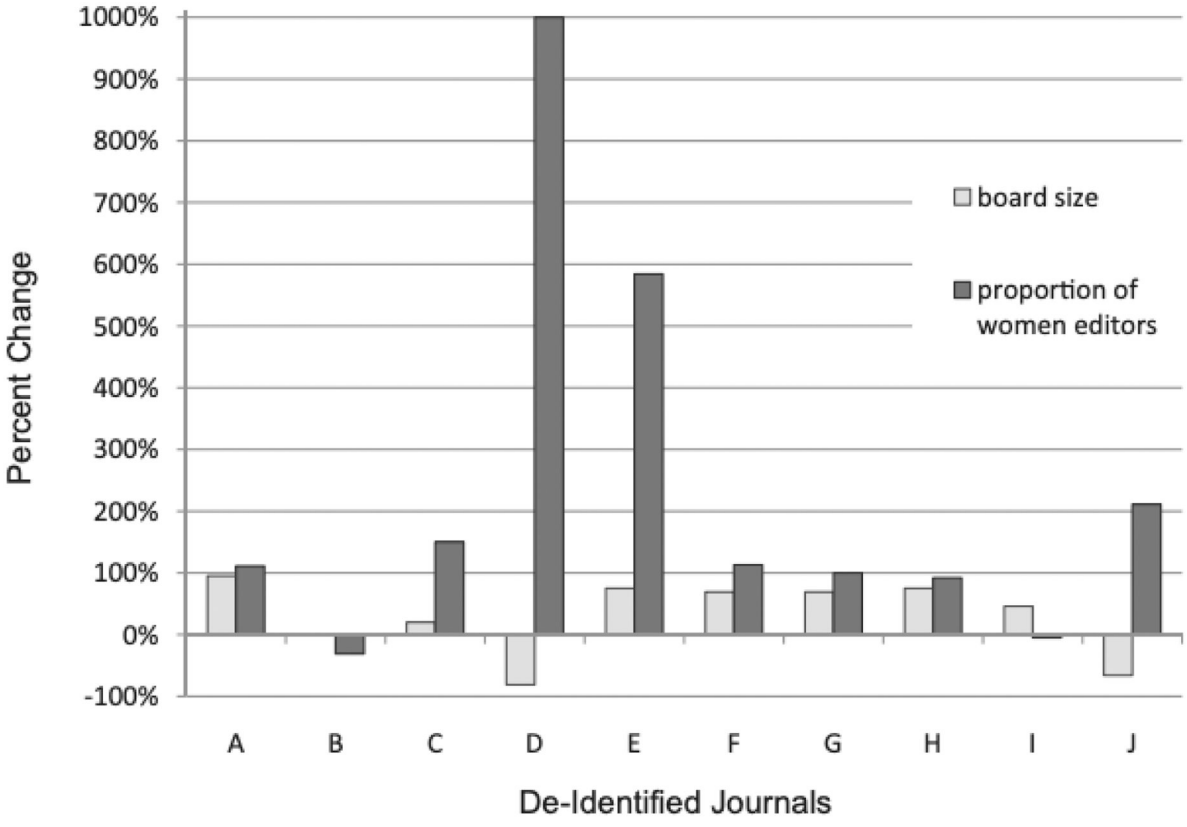

Figure 2.
Percentage change in board size and gender composition 2007 to 2017.

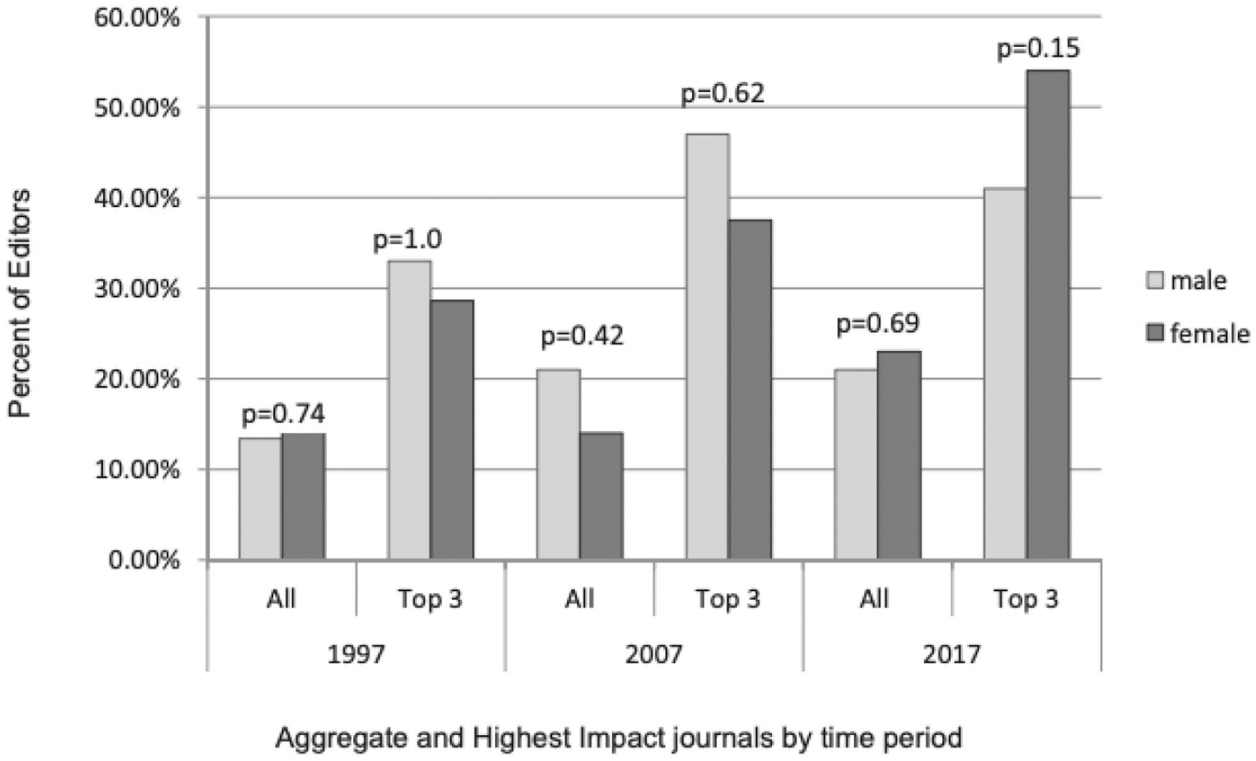

Figure 3.

Percentage of men versus women editors who appear on multiple editorial boards both in aggregate and in the top 3 highest-impact journals in 1997, 2007, and 2017.

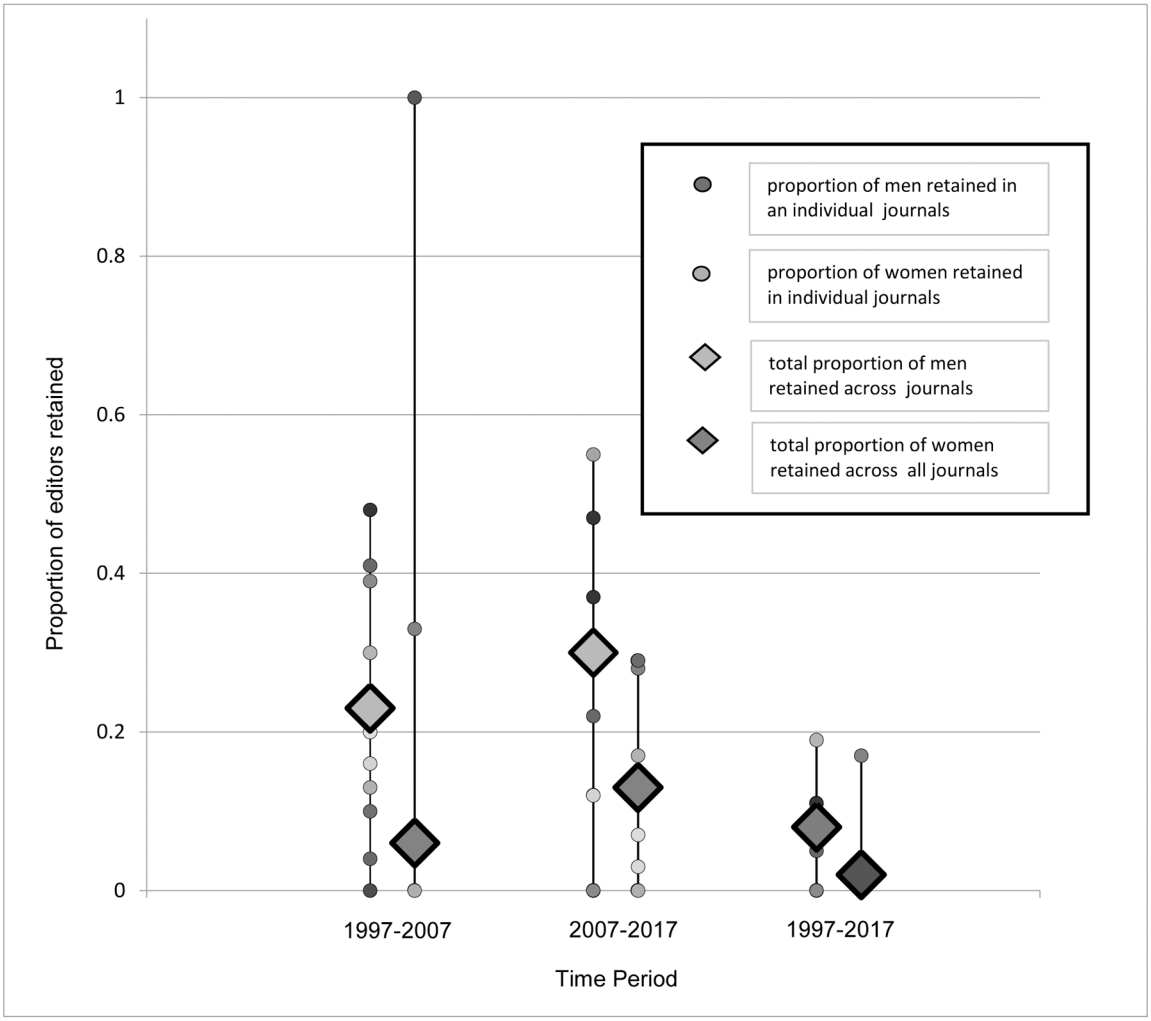

Figure 4.
Proportion of editors retained by gender from 1997 to 2007, 2007 to 2017, and 1997 to 2017

Table 1.

Univariate analysis of editor qualification metrics by gender across all journals and in three highest-impact

	All Journals			Top 3		
	Men n = 426	**Women n =102**	**p value**	**Men n =154**	**Women n = 38**	**p value**
H-index			<0.0001			<0.0001
N	390	97		154	38	
Mean (SD)	27.8 (16.5)	39.3 (22.2)		51.0 (21.4)	36.4 (16.7)	
Range	3.0–137.0	4.0–100.0		(3.0–137.0)	(10.0–100.0)	
Rank			0.0391			0.8845
Missing	3	0		0	0	
Professor	275 (71.1%)	55 (56.7%)		139 (90.3%)	34 (89.5%)	
Associate professor	86 (22.2%)	31 (32.0%)		15 (9.7%)	4 (10.5%)	
Assistant professor	18 (4.7%)	9 (9.3%)				
Adjunct/Private	8 (2.1%)	2 (2.1%)				
Additional Degrees			0.0036			0.0063
N	389	97		154	38	
% additional degree	85(21.9%)	35(36.1%)		17 (44.7%)	35 (22.7%)	
Years in Practice	23 (SD11.2)	17 (SD 8.2)	<0.001	29 (SD 11.2)	22 (SD 8.7)	<0.001

Table 2.

Adjusted analysis of editor qualification metrics by gender across all journals and in three highest-impact

	All Journals			Top 3		
	Men n = 426	**Women n =102**	**p value**	**Men n =154**	**Women n = 38**	**p value**
Adjusted H-index			0.276			0.217
N	390	97		154	38	
H-index/year (SD)	1.8 (1.0)	1.7 (0.8)		2.0 (1.1)	1.8 (0.8)	
Range	(0.1–8.3)	(0.2–5.0)		0.1–8.3	(0.7–5.0)	
Adjusted Rank			0.654			0.183
aOR (95% CI)		0.88 (0.50–1.55)			0.41 (0.11–1.53)	
Adjusted degree			0.051			0.081
aOR (95% CI)		1.64 (1.00–2.68)			2.00 (0.92–4.37)	