




# Status of Women in Academic Ophthalmology

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## Abstract

**Objective** The purpose of this study was to evaluate the status of women in academic ophthalmology in the United States and compare this to academic clinical departments in other clinical specialties.

**Methods** The study reviewed data from the American Association of Medical Colleges for the years 2003 to 2017. The number and percentage of women at different ranks, as well as number of women Chairs of clinical academic departments, were collected by specialty. The number of women residents from 2007 to 2017 was obtained from datasets published by the Accreditation Council for Graduate Medical Education. Trends of the percentage of women at different ranks were compared.

**Results** The percentage of women residents in ophthalmology has remained constant at around 42%, although it has declined slightly over the last 3 years. On the other hand, the number of women faculty in academic ophthalmology has gradually increased from 24 to 34% over 15 years. This increase has largely been at the Assistant Professor rank, with only a modest increase at the Professor rank.

**Discussion** The percentage of women in ophthalmology continues to lag behind the average for all clinical departments at every level. While this gender disparity is rapidly closing for Assistant Professors and slowly closing for Associate Professors and Chairs, it is widening for Professors. This demonstrates that women in ophthalmology are making some strides but are not being promoted to Professor at the same rate as other specialties. This may be the result of explicit and implicit biases, as well as phenomena such as imposter syndrome that are more common in women.

## Keywords

- ▶ gender disparity
- ▶ women
- ▶ academic ophthalmology
- ▶ rank

During 2017 to 2018, for the first time, the number of women entering medical school exceeded men comprising 50.7% of the accepted pool.<sup>1</sup> This number is still slightly lower than the first-time applicants to medical school where women made up 51.6% of the candidates. Prior to that, for the past 10 years, between 47 and 49% of matriculants to medical school were women. However, the percentage of women faculty on academic tracks (Assistant Professor, Associate Professor, and Professor) in clinical departments at medical schools is less than 40%. This ranges from ~46% for Assistant Professors to 37% for Associate Professors and only 24% for Professors.<sup>2</sup> In leadership positions, this gender gap widens, with women representing only 17% of Department Chairs and 16% of Deans of Academic Medical Centers.

Not unexpectedly, the extent of this gap varies by specialty, and women continue to be severely underrepresented in traditionally male dominated specialties such as orthopaedics, surgery, and otolaryngology. On the other hand, specialties such as obstetrics and gynecology, pediatrics, and family practice have relatively more total women than men. This is especially evident at the Assistant Professor rank, where there are close to twice as many women as men in obstetrics and gynecology at this time.

Ophthalmology, as one of the E-ROAD (Emergency Medicine, Radiology, Ophthalmology, Anesthesiology, Dermatology) specialties, is attractive to medical students as it is perceived to have a favorable lifestyle profile.<sup>3</sup> A study of graduating medical students revealed that, on average,

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career choices were equally guided by lifestyle and future income potential. In the same study, ophthalmology was considered one of the top specialties in terms of lifestyle and medical students who chose ophthalmology considered lifestyle much more attractive than income potential.<sup>4</sup> Another study of factors important to residents by gender revealed that, in women, lifestyle was a much more important factor than income.<sup>5</sup> The 2018 Medscape survey on lifestyle and burnout revealed that ophthalmologists are one of the happiest specialties at or outside work, with one of the lowest rates of burnout and depression.<sup>6</sup> This should make ophthalmology an attractive specialty for women physicians and the expectation is that higher numbers of women would enter this specialty. The goal of this study was to evaluate the trends in the status of women ophthalmologists in academic medicine and compare these to the rest of clinical academic medicine.

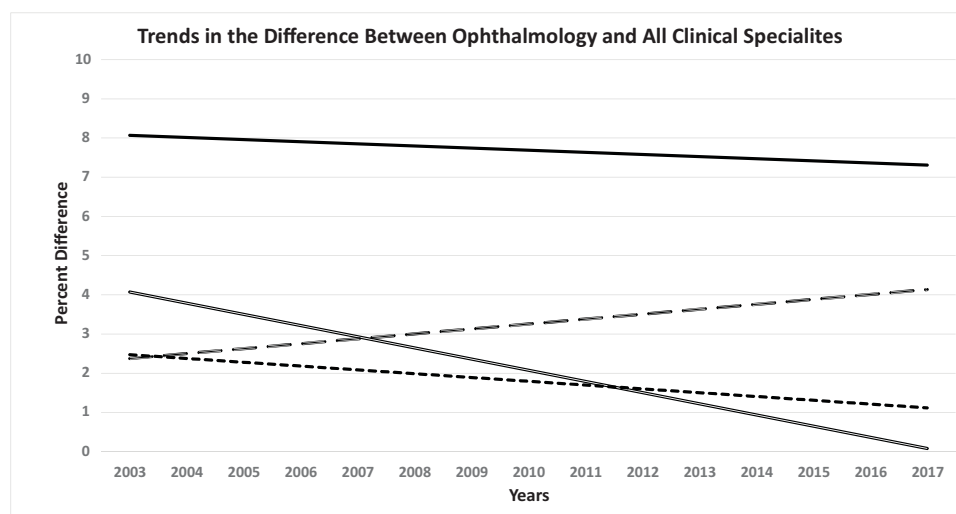
## Data Collection

The workforce data tables of academic medical centers published by the American Association of Medical Colleges (AAMC) were reviewed for the years 2003 to 2017. The data for ophthalmology was then stratified by gender and compared with data from all academic clinical departments. These included anesthesiology, dermatology, emergency medicine, family practice, internal medicine, neurology, OBGYN, orthopaedics, otolaryngology, pathology, pediatrics, PM&R, psychiatry, public health, radiology, and surgery. The ranks evaluated were Assistant Professor, Associate Professor, Professor, and Chair. Trends were evaluated for each rank, as well as overall for all ranks over the 15 years. Data on residents in ophthalmology as well as the same other clinical specialties was collected from the Accreditation Council for Graduate Medical Education Data Resource Book that was available from 2007 to 2017. All statistical analyses and graphs were prepared on Microsoft Excel.

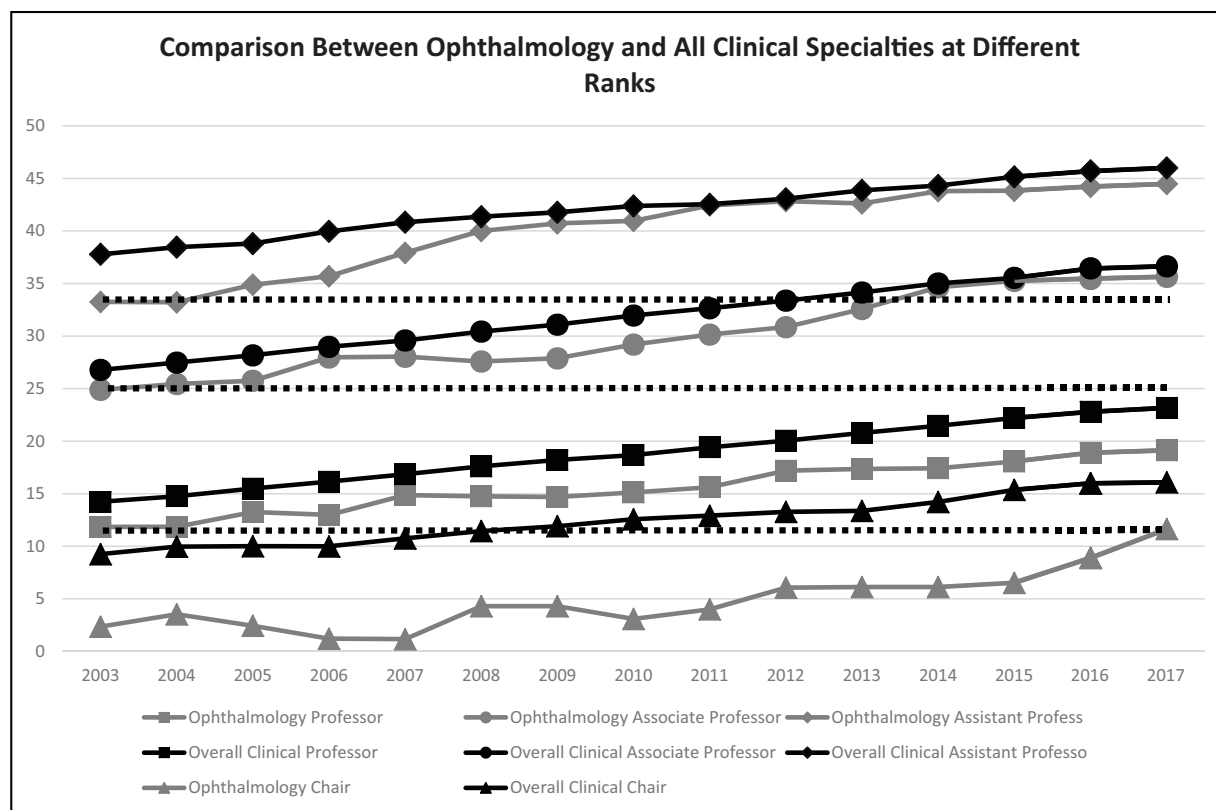
## Data Analysis

The percentage of women ophthalmology residents between 2007 and 2017 has averaged around 42%. The percentage gradually increased from 41% in 2007 to a high of 44% in 2013, after which it steadily declined back to 41% in 2017. The percentage of women entering clinical residencies overall increased from 41% to 44% from 2007 to 2012, and then stayed stable at 44% until 2017. Unfortunately, SFMatch ([www.sfmach.org](http://www.sfmach.org)), the matching service for ophthalmology did not document the gender of applicants to ophthalmology residency for the majority of these years. Therefore, the percentage of female medical students applying for ophthalmology residency compared with the percentage actually matching into ophthalmology cannot be determined for most of these years.

Among academic ophthalmology faculty, the percentage of women in all professorial tracks combined has gradually increased from 24% in 2003 to 34% in 2017. Over the same period, the total women in all academic clinical departments increased from 29 to 39%, indicating that the overall trend in ophthalmology was mirroring that in the rest of the clinical departments, although the gap was not closing. However, when the different ranks were evaluated separately, there were some significant differences between ophthalmology and clinical specialties overall for chairs ( $p = 0.000$ ) and Professors ( $p = 0.002$ ) by two sample Z-test for proportions. The trends over the 15 years from 2003 to 2017 for the different ranks in ophthalmology and other clinical specialties showed some dissimilarities (► Fig. 1). At the Assistant Professor rank, the difference between ophthalmology and overall clinical specialties rapidly closed, decreasing from ~5% in 2003 to less than 2% in 2017. Currently, 44% of Assistant Professors in ophthalmology are women. The difference at the Associate Professor rank was low to begin with and did not change much, decreasing slightly from ~2% to ~1%. In addition, the percentage of women at Associate Professor rank in ophthalmology in 2013 reached that of Assistant Professors in 2003 (after 10 years). However, at the Professor



**Fig. 1** Trends in the difference in the percentage of women at different ranks between ophthalmology and all clinical specialties.



**Fig. 2** Percentage of women at different ranks between ophthalmology and all clinical specialties from 2003 to 2017. The dotted lines show the percentage of women at each rank in ophthalmology in 2003 extended out to 2017 to compare with the percentage of women at the next rank. For example, the percentage of Associate Professors in 2017 is higher than that of Assistant Professors in 2003. On the other hand, the percentage of Professors in 2017 is much lower than that of Associate Professors in 2003.

rank, the difference gradually widened from 2% in 2003 to 4% in 2017. Only 19% of Professors in ophthalmology are women currently. The percentage of women Professors in 2017 is still significantly lower than the percentage of Associate Professors 15 years ago (► **Fig. 2**). Women Chairs comprised only 2% of the total Chairs in ophthalmology in 2003 but rapidly increased in the past 5 years to comprise nearly 12% and nearly reached the level of Professors in 2003 (15 years ago). The difference between the percentage of women ophthalmology Chairs and women Chairs in all clinical specialties remained relatively steady at ~7% until 2017 when it dropped to ~4.5%.

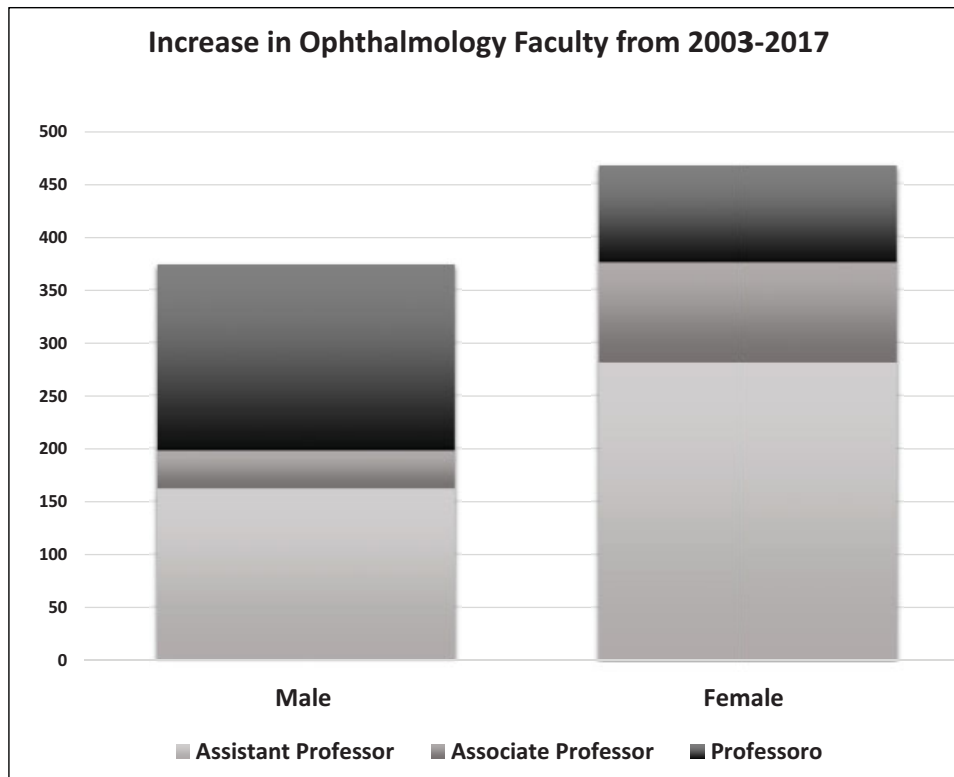
There was a statistically significant difference between the percentage of women at the Assistant, Associate, and Professor ranks for both ophthalmology ( $p=0.000$ ) and clinical specialties overall ( $p=0.000$ ) using analysis of variance Single Factor Analysis. This difference was highly statistically significant when comparing Assistant to Associate, Associate to Professor, and Professor to Chair (all  $p=0.000$ ) using the two-sample  $t$ -test for both ophthalmology and clinical specialties overall.

## Discussion

Despite ophthalmology being a relatively attractive specialty for women, there are more men accepted into ophthalmology residency than women. Whether this is due to less women applying to ophthalmology, or whether the accep-

tance rate of women is lower than men is not known at this point, as SFMatch did not collect this data until very recently.

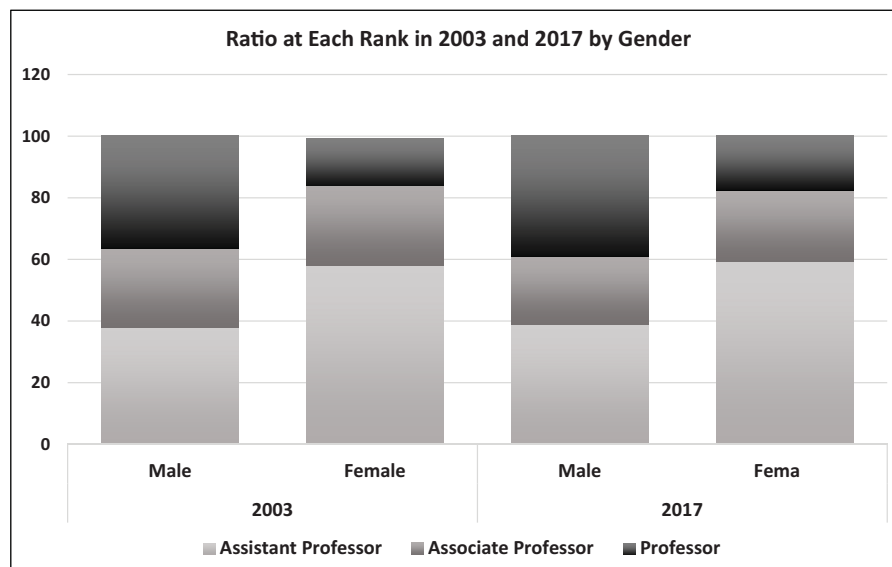
It also appears that more women than men are entering academic ophthalmology at the Assistant Professor level where the percentage of women is now 44%, even though only 41% of graduating residents are women, and that the gap between ophthalmology and clinical specialties overall is narrowing at this rank. However, what is disappointing is that women are not progressing as rapidly as men. Taking into account that, at most academic institutions, the time period for promotion between ranks is ~7 years, it would be anticipated that the percent of women Associate Professors would equal that of Assistant Professors after about 7 years. This is because the group of Associate Professors would have been promoted to Professor rank, and the group of Assistant Professors would have graduated to Associate rank during that time period. In fact, the percent women Associate Professors in 2017 approximately equaled that of Assistant Professors 11 years earlier (2006) demonstrating that they were progressing slower than their male colleagues. At the Professor rank the discrepancy was much greater. The percent of women Professors in ophthalmology in 2017 was not even close to that of Associate Professors 15 years prior (19 vs. 25%) and the gap between the percentage of women at Professor rank in ophthalmology and clinical specialties overall is widening (► **Fig. 2**).



**Fig. 3** Change in the number of ophthalmology academic faculty between 2003 and 2017 by gender and rank shows that, while the number of women has increased more than men, this has primarily been at the Assistant Professor rank.

The total number of women in academic ophthalmology increased by ~450 over the past 15 years, whereas the total number of men increased by ~350 indicating that more women entered ophthalmology than men. When we break down these numbers by rank, the situation is very different for men and women (→**Fig. 3**). For women, the number of Assistant Professors increased by 280, while the Associates and Professors increased by ~90 each. In contrast, for men,

Assistant Professors increased by 150, Associates by 50, and Professors by nearly 200. What is even more concerning is that the ratio at each rank has not changed from 2003 to 2017. In 2017, 17% of all women in ophthalmology were Professors while ~40% of men were at that rank, compared with 37 and 15%, respectively, in 2003 (→**Fig. 4**). At the Chair level, there was a huge disparity between the percentage of men and women until 2016 with the percentage of women in



**Fig. 4** Ratio of faculty at each rank in 2003 and 2017 by gender shows that the relative proportion of women at the different ranks has been essentially unchanged over the past 15 years and is very different from that for men.

the single digits. In 2017, however, there was a large increase in the number of women Chairs in ophthalmology, and the percentage is currently ~12%, although it still lags the average for all clinical specialties. The advancement structure for women continues to be pyramidal with a significantly lower percentage of women at each advanced rank compared with the previous rank. These data indicate that there is a significant discrepancy between the advancement of men and women through the ranks in academic ophthalmology. This mirrors a recent study that followed over 1,200 faculty at 24 academic medical centers for 17 years and found that women were much less likely than men to achieve the rank of Professor or leadership positions. This difference persisted even after adjusting for productivity.<sup>7</sup> So what are the potential reasons for this discrepancy between women and men advancing and achieving leadership roles? Studies suggest that these reasons may be those that are intrinsic to women themselves, as well as those that are extrinsic, due to the traditional perceived roles of women, and lack of supportive work environments.

Extrinsic reasons include explicit and implicit bias that can lead to differential treatment of women, providing them with less institutional support and mentorship that could negatively impact their career trajectory.<sup>8</sup> Explicit bias is synonymous with stereotyping and usually involves a belief that certain groups have certain characteristics. Overtly negative gender biases in academic medical centers have reduced in recent years in the United States due to the Education Amendment to the Civil Rights Act (Title IX). Therefore, people are less likely to overtly discriminate (or, at least admit to discriminating) against women for reasons such as pregnancy and child-rearing. However, people more readily admit to seemingly positive stereotypes such as the belief that women are more nurturing. Although positive on the surface, these beliefs may also lead to the perception that women would be less committed to their job due to household responsibilities and child rearing. It can also lead to disproportionately considering women for less prestigious positions such as clerkship directors (requiring a nurturing disposition) while considering male faculty members for the more prestigious (and career-advancing) positions such as center director. It is possible, however, with education, to mitigate the effects of explicit bias as these are easier to recognize and control for.

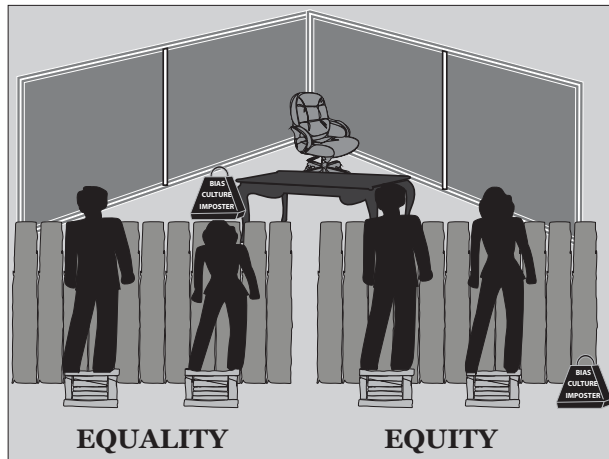
Implicit bias has garnered much attention recently and is a trickier problem to solve. As opposed to explicit biases such as “women are more likely to take time off for childbearing,” implicit biases are those that a person is not consciously aware of, unintentional, and therefore cannot be controlled. Thus, these biases are much more likely to impact women’s advancement as studies have found that people are implicitly biased to consider women to be communal and deficient in the traits that are sought after in strong leaders such as logic, independence, and strength.<sup>9</sup> The effects of this implicit bias are seen as early as the writing of recommendation letters for resident applicants; letters for male applicants were found to have higher word counts, more standout adjectives, and achievement words. In contrast, female applicant letters

were shorter, more likely to have general terms, and have doubt-raising comments.<sup>10</sup> Implicit gender bias was very well illustrated in a randomized double-blind study by Moss-Racusin et al where they sent applications differing only in name (John vs. Jennifer), but identical otherwise, to research faculty at academic universities. The faculty not only rated the male applicant significantly more competent and hireable than the identical female applicant but also offered him a higher salary and more career mentoring.<sup>11</sup>

In addition to the explicit and implicit biases that hamper women’s advancement (or, perhaps, because of it), there are differences between the approaches of women and men to their academic careers themselves. Women are often not as strategic as men, often volunteering to assume tasks that are less likely to impact promotion such as participation in committees, volunteering, and education.<sup>12</sup> They are also more likely to be in clinical and educational tracks rather than research or tenure tracks. This can create a Catch-22 situation whereby they are provided less resources and support for research and scholarly activity, which results in further lowering of their opportunity for advancement.

Another phenomenon that plays a role in the differential advancement of men and women in academia is known as the imposter phenomenon.<sup>13</sup> The imposter phenomenon is characterized by chronic feelings of self-doubt and fear of being discovered as an intellectual fraud. Despite evidence to the contrary and significant achievements, people suffering from imposter phenomenon are unable to feel a sense of accomplishment and feel like they do not deserve their success. While most people experience self-doubt about their accomplishments on occasion, studies have found that women suffer from imposter syndrome significantly more than men.<sup>14</sup> This occurs at the level of medical students, residents, and faculty, and can be a serious barrier to advancement.<sup>15</sup> Individuals with imposter syndrome tend to either overprepare or procrastinate that can perpetuate the cycle of self-doubt.

One of the consequences of this imposter phenomenon is that since women feel that they have achieved their status fraudulently, they lack confidence in their abilities and do not pursue competence related advancements.<sup>16</sup> An internal survey at Hewlett-Packard frequently quoted in popular media evaluated their workforce and compared them by gender. The survey revealed that men applied for advancement opportunities when they met 60% of the requirements for the position, whereas women did not apply until they met 100%.<sup>17</sup> Other studies have disputed this as the cause for the disparity between genders and suggest that the reason women do not apply for positions is because they follow the rules (and hence requirements for the position) more literally than men. Regardless of the cause, however, equally accomplished women are much less likely to apply for advancement than their male counterparts. Another consequence of imposter syndrome that is less apparent is that people suffering from it also tends to fear success as they believe that being successful would cause others to resent them. Therefore, they tend to deny their success and do not strive for further advancement readily as they fear the loss of



**Fig. 5** An active women's leadership program is needed in academic ophthalmology, not to give women an unfair advantage, but to decrease their barriers to advancement (Adapted from Interaction Institute for Social Change | Artist: Angus Maguire).

their social support if they are promoted over their colleagues.

Thus, we see that women face significant internal and external barriers to advancement in academic ophthalmology. Mitigating these barriers would require a recognition of the challenges faced by women, and then necessitate a concerted effort by these institutions to hire and promote more women.<sup>18</sup> Educational programs, especially for search committees and promotion and tenure committees, on explicit and implicit bias, as well as imposter syndrome, would increase awareness. Leadership programs targeting women in particular, such as the AAMC's Early and Mid-Career Women Faculty Leadership Development Seminars, are useful but are limited in how many women they can reach. Similar programs are needed in the individual institutions so that greater numbers of women can benefit from them. Analogous to programs for underrepresented minorities, the goal of these programs is not to give an unfair advantage to women at academic institutions, but to decrease the barriers to their advancement so that they can compete on an even footing with their male colleagues and close the gender disparity in academic medicine (→ Fig. 5).

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#### Conflict of Interest

None declared.

#### References

- 2017 Applicant and Matriculant Data Tables. Association of American Medical Colleges; 2017. [https://aamc-black.global.ssl.fastly.net/production/media/filer\\_public/5c/26/5c262575-52f9-4608-96d6-a78cdaa4b203/2017\\_applicant\\_and\\_matriculant\\_data\\_tables.pdf](https://aamc-black.global.ssl.fastly.net/production/media/filer_public/5c/26/5c262575-52f9-4608-96d6-a78cdaa4b203/2017_applicant_and_matriculant_data_tables.pdf). Accessed 04/24/2019
- U.S. Medical School Faculty by Sex and Rank. 2017. Association of American Medical Colleges; 2019. <https://www.aamc.org/download/486130/data/17table9.pdf>. Accessed 04/24/2019
- DeZee KJ, Byars LA, Magee CD, Rickards G, Durning SJ, Maurer D. The R.O.A.D. confirmed: ratings of specialties' lifestyles by fourth-year US medical students with a military service obligation. *Fam Med* 2013;45(04):240–246
- Newton DA, Grayson MS, Thompson LF. The variable influence of lifestyle and income on medical students' career specialty choices: data from two U.S. medical schools, 1998-2004. *Acad Med* 2005;80(09):809–814
- West CP, Drefahl MM, Popkave C, Kolars JC. Internal medicine resident self-report of factors associated with career decisions. *J Gen Intern Med* 2009;24(08):946–949
- Grisham S. Personal Happiness vs Work Burnout. *Medscape Ophthalmologist Lifestyle Report*. 2018. <https://www.medscape.com/slideshow/2018-lifestyle-ophthalmologist-6009233#1>. Accessed 04/24/2019
- Carr PL, Raj A, Kaplan SE, Terrin N, Breeze JL, Freund KM. Gender differences in academic medicine: retention, rank, and leadership comparisons from the national faculty survey. *Acad Med* 2018;93(11):1694–1699
- Jena AB, Khullar D, Ho O, Olenski AR, Blumenthal DM. Sex differences in academic rank in US medical schools in 2014. *JAMA* 2015;314(11):1149–1158
- Carnes M, Bartels CM, Kaatz A, Kolehmainen C. Why is John more likely to become department chair than Jennifer? *Trans Am Clin Climatol Assoc* 2015;126:197–214
- Turrentine FE, Dreisbach CN, St Ivany AR, Hanks JB, Schroen AT. Influence of gender on surgical residency applicants' recommendation letters. *J Am Coll Surg* 2019;228(04):356–365.e3
- Moss-Racusin CA, Dovidio JF, Brescoll VL, Graham MJ, Handelsman J. Science faculty's subtle gender biases favor male students. *Proc Natl Acad Sci U S A* 2012;109(41):16474–16479
- Babcock L, Vesterlund MP, Weingart L. Gender differences in accepting and receiving requests for tasks with low promotability. *Am Econ Rev* 2017;107(03):714–747
- Rose Clance PI. A. The imposter phenomenon in high achieving women: dynamics and therapeutic intervention. *Psychotherapy (Chic)* 1978;15:241–247
- Villwock JA, Sobin LB, Koester LA, Harris TM. Impostor syndrome and burnout among American medical students: a pilot study. *Int J Med Educ* 2016;7:364–369
- Oriel K, Plane MB, Mundt M. Family medicine residents and the impostor phenomenon. *Fam Med* 2004;36(04):248–252
- Armstrong MJ, Shulman LM. Tackling the imposter phenomenon to advance women in neurology. *Neurol Clin Pract* 2019;9(02):155–159
- Sandberg S. *Lean In: Women, Work, and the Will to Lead*. First ed. Knopf; 2013
- Butkus R, Serchen J, Moyer DV, Bornstein SS, Hingle ST; Health and Public Policy Committee of the American College of Physicians. Achieving gender equity in physician compensation and career advancement: a position paper of the American College of Physicians. *Ann Intern Med* 2018;168(10):721–723