Gendered Differences in Letters of Recommendation for Transplant Surgery Fellowship Applicants

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BACKGROUND: No published study has explored gender differences in letters of recommendation for applicants entering surgical subspecialty fellowships.

METHODS: We conducted a retrospective review of letters of recommendation to a transplant surgery fellowship written for residents finishing general surgery residency programs. A dictionary of communal and agentic terms was used to explore differences of the letters based on applicant's gender as well as the academic rank and gender of the author.

RESULTS: Of the 311 reviewed letters, 228 were letters of recommendation written for male applicants. Male surgeons wrote 92.4% of the letters. Male applicant letters were significantly more likely to contain agentic terms such as superb, intelligent, and exceptional ($p = 0.00086$). Additionally, male applicant letters were significantly more likely to contain "future leader" ($p = 0.047$). Letters written by full professors, division chiefs, and program directors were significantly more likely to describe female applicants using communal terms like compassionate, calm, and delightful ($p = 0.0301$, $p = 0.036$, $p = 0.036$, respectively). In letters written by assistant professors, female letters of recommendation had significantly more references to family ($p = 0.036$).

CONCLUSIONS: Gendered differences exist in letters of recommendation for surgical fellowship applicants. This research may provide insight into the inherent gender bias that is revealed in letters supporting candidates entering the field. (J Surg Ed 76:427–432. © 2018 Association of Program Directors in Surgery. Published by Elsevier Inc. All rights reserved.)

KEY WORDS: LOR, Transplant fellowship, Gender bias, Gender disparities in surgery

COMPETENCIES: Professionalism, Interpersonal and Communication Skills, Practice-Based Learning and Improvement

INTRODUCTION

Abdominal transplant surgery fellowship programs participate in the National Residency Match Program and are available to candidates who have completed a general surgery or urology residency.[1] In 2011, the American Society of Transplant Surgeons made it a prioritized effort to attract aspiring academic surgeons and nurture an interest in research during training and the years beyond graduation. Approximately 80% of transplant surgeons practice in an academic setting and an overwhelming majority are male.[2] Over the last decade, the number of women transplant surgeons has steadily increased, yet currently represent only 17% of all transplant surgeons in the United States.

Exploring gender disparities in surgery and academia, have led researchers to investigate unconscious bias in the selection process. Studies have examined linguistics and gender differences in letters of recommendation (LOR) for medical students entering residency programs, faculty applying for positions in medical schools, and medical faculty applying for promotion and tenure.[3,4] However, no such investigation has been performed for surgical residents entering surgical subspecialty fields even though LOR are considered one of the most important factors in when ranking applicants for fellowship. In transplantation, program directors considered LOR to be the most important factor when selecting an applicant to interview.[5]

One example of how LOR have been interrogated for gendered differences is through agency and

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TABLE 1. Dictionary of Agentic and Communal Terms

Agentic Terms	Communal Terms
Superb	Affectionate
Excellent	Sympathetic
Outstanding	Nurturing
Assertive	Warm
Dominant	Thoughtful
Forceful	Delightful
Exemplary	Compassionate
Confident	Friendly
Leader	Kind
Strong	Husband/wife/spouse
Efficient	Children
Problem-solver	Empathetic
Intelligent	Team player
Solid	Easy to work with
Bright	Well-liked
Excel	Communication skills
Exceptional	Conscientious
Rising star	Honest
Superior	Humble
Well-rounded	Calm
Bright future	Congenial

communion. Agency or agentic terms refers to traits of assertiveness, influence and initiation. Often the applicant is described as a problem solver or the author comments on the applicant's abilities. Communion or communal terms have historically been used to describe an individual's concern for the welfare of others or maintaining relationships. When included in LOR, communal terms have been shown to negatively affect hiring and promotion after controlling for objective measures of performance.[4] Thus, the purpose of this study was to examine LOR for residents applying to a transplant surgery fellowship to determine if differences exist between male and female applicants as well as letter writers, based on gender, academic rank, and position.

METHODS

Following institutional review board approval, we conducted a retrospective review of LOR to a single abdominal transplant surgery fellowship program for residents finishing a United States/Canadian general surgery residency program from 2006 to 2017. We excluded applicants from non-US/Canadian residency programs. A dictionary of communal adjectives was created based on previous work in this field. Similarly, a dictionary of agentic adjectives was created in the same manner[6] (Table 1). The letters were then interrogated for length, agentic and communal terms, use of the phrase "future leader," "young man/woman," and reference to an applicant's family life. The analysis was first conducted to determine if differences exist based on gender of the applicant. Analysis was then performed to determine if there were differences in the letters based on author characteristics. Author gender, academic rank, position, and specialty (transplant surgeon/nontransplant surgeon) were recorded. Additional analysis was then performed based on applicant year (2006-2011 and 2012-2017) and geographic location of the applicant. To ensure consistency, the letters were evaluated by 2 blinded and independent investigators. Quantitative analysis was performed using 2 sample t test assuming equal variances. Significance was assessed at $p < 0.05$.

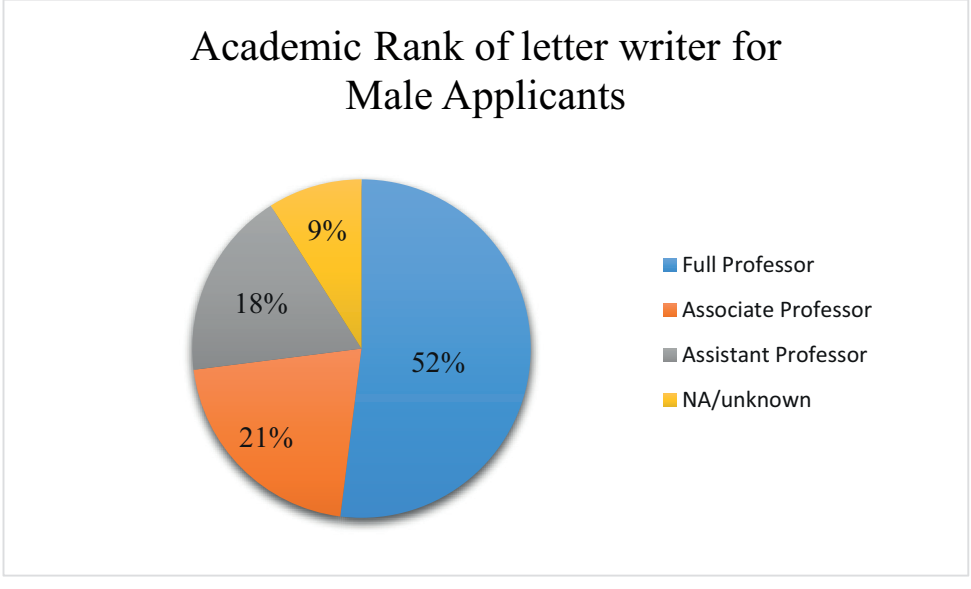

FIGURE.

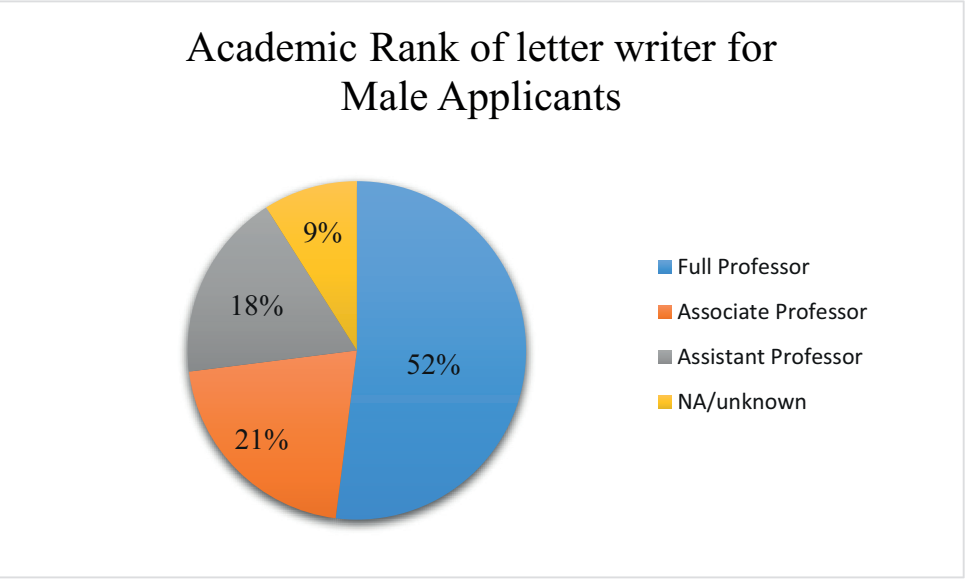

FIGURE. Continued.

RESULTS

Three hundred eleven letters written for 103 applicants, were reviewed and of these 228 recommendations were written for male applicants and 83 were written for female applicants. Male surgeons wrote 91.76% of letters written for female applicants and 93.2% of letters written for male applicants. Of the writers who held academic ranking, full professors made up 59.1%, associate professors 18.1%, and assistant professors 20.8%. Program directors wrote 51.1% of the letters, Division Chiefs wrote 23.9%, and Department Chairs wrote 27.7% of the letters (Fig. a and b).

Twenty-two letters were written by female surgeons; 41.6% were Full Professors, 20.0% were Associate professors, 8.3% were Division Chiefs, 12.5% were Department Chairs. Two hundred ninety-six letters were written by male surgeons in which 55% held a rank of full professor, 16.5% held rank of associate professor, 25% were Division Chiefs, and 28.7% were Department Chairs. Forty-one percent were transplant surgeons.

Male applicant letters were significantly more likely to contain agentic terms than female applicant letters ($p = 0.00086$) (Table 2). For example, male letters were more likely than female letters to include words such as dominant, confident, solid, and exceptional. There were male specific agentic terms, "no doubt he will become an extremely successful academic surgeon," "indestructible machine," "best in show," "franchise player," "unlimited potential," "the complete surgeon and physician," and "game changer." Even though there was no overall difference in communal terms for male and female letters, we did identify female specific communal terms; "lives the girl scout values," "blossomed," "upbeat, fun loving," and "achieves without drama." When the letters were examined based on applicant year, there was no significant difference in the use of agentic terms in female applicant letters or communal

TABLE 2. Gendered Differences in Letters of Recommendation

	Female Applicant Letters	Male Applicant Letters	p =
N =	83	228	
Average Length (lines)	26.72	25.33	p = 0.1554
Communal Terms Average	3.31	2.85	p = 0.5680
Agentic Terms Average	4.43	6.15	p = 0.0008
Use of Term "Young"	18.80%	14.04%	p = 0.2926
Use of phrase "Will be future leader"	7.50%	16.17%	p = 0.047
Mention Applicant Family	7.22%	9.44%	p = 0.5405

terms in either female or male applicant letters. However, male applicant letters were significantly more likely to include agentic terms during the years 2006-2011 when compared with letters from 2012 to 2017 ($p = 0.028$).

Male applicant letters were significantly more likely to contain the term "future leader" than female letters ($p = 0.047$). The term was used in 12% of all letters—16.1% of male applicant letters and 7.5% of female applicant letters. When examining letters containing "future leader" every writer who held an academic rank was a full professor. Letters containing "future leader" also contained more agentic terms ($p < 0.0001$) than those without this phrase. Letters that did not state the applicant will "be a future leader" contained more communal terms than those with this phrase ($p = 0.047$). We found no difference in the overall length, ($p = 0.1554$), use of the term "young man" or "young woman" or mention of applicant's family (Table 2).

When we examined the letters based on writer academic rank or position in the department, significant differences were found. Assistant professors wrote longer letters for female applicants ($p = 0.0054$) and had more family references than male applicants ($p = 0.036$). Associate professors also wrote longer letters for female applicants ($p = 0.038$). Full Professors were significantly more likely to use communal terms to describe female applicants than male applicants ($p = 0.0301$). Program Directors and Division Chiefs were significantly more likely to use communal terms to describe female applicants than male applicants ($p = 0.036$). Additionally, transplant surgeons were also more likely to describe female applicants using communal terms ($p = 0.015$).

One interesting finding discovered during our study was the use of "qualifying statements." These statements were agentic phrases immediately followed by communal phrases, for example, the applicant is "poised, confident, but maintains a pleasant demeanor" or communal phrases immediately followed by agentic phrases "confident ... polite and humble, yet highly skilled," and "he is kind, warm hearted, however do not be fooled... he will go the extra mile." We identified this type of phrasing in 5.2% of applicant letters.

DISCUSSION

We found gendered differences in LOR for transplant surgery fellowship applicants. This study helps explore the implicit bias which manifests in LOR regardless of gender, academic rank, or position of the letter writer. Male applicant letters were significantly more likely to contain agentic terms and contain the phrase "will be a future leader." It is poorly understood why communal terms were not used as often as agentic terms to describe leaders in our study cohort. It is important to note that in 5% of LOR, the writer attempts to alleviate potential bias in the reader by using qualifying statements to excuse the applicant's traits that are historically viewed as undesirable in surgery. For example, "He is invariably polite and humble... yet he is very confident and skilled in clinical surgery." One could argue that collaboration, humility, empathy, and compassion are just as important in a future leader as strength, confidence, and intelligence. In fact, in 2010, the Journal of Graduate Medical Education published a study identifying important characteristics of high quality physician leaders based on focus group responses from both residents and faculty.[7] The study recognizes that both communal and agentic characteristics are vital to be an effective surgical leader. Communal terms have been shown to have negative consequences in promotion and hiring.[7] However, based on the 2010 study, communal and agentic characteristics are neither negative nor positive and should be used to describe applicants regardless of gender.

Examining the academic rank of the letter writer, uncovered an interesting trend. Full professors were more likely to use communal terms in female applicant letters than Assistant professors. Similarly, Division Chiefs were more likely to use communal terms to describe female applicants. If academic rank can serve as a surrogate marker for years of experience and age, it may suggest that older surgeons view female general surgery residents under a lens of both descriptive and prescriptive gender stereotypes.[8]

The letter writers from our study were made up of geographically diverse faculty from institutions across the United States, however not 1 female letter writer wrote that a female applicant would be "a future leader." Since, every writer who used this phrase and held an academic rank was a Full Professor, this uncovers a likely unconscious and unintentional bias based on gender stereotypes held in academic surgical settings. Furthermore, this may partially explains why gender gaps in the highest-level faculty positions remain difficult to close.

Acknowledging gender bias exist and has been shown to affect hiring and promotion decisions in academia and scientific fields is a first step to gender equity.

We have identified potential avenues to help alleviate gender bias in LOR.

1. The use of standardized or structured LOR

Standardized LOR (SLOR) have been used in Emergency medicine residency applications since the 1990s and have been shown to more accurately predict future performance than unstandardized or narrative LOR. Recently Otolaryngology residencies have examined the use of SLOR vs. narrative LOR have found that SLOR reduced, but not eliminated gender bias in LOR.[3]

Furthermore, gender bias was introduced in the narrative portion of the recommendation. In SLOR, female applicants were less likely to have their physical appearance included as part of the narrative portion of the LOR and more likely to be described as intelligent.

2. Implementation of training workshops

A single center cluster randomized trial including 92 departments, implemented a workshop to change gender bias habits. The workshop was 2.5 hours and 31% of the faculty attended. Their study showed that actions to promote gender equity significantly increased at 3 months. Although, the workshop was not intended for writers of LOR, portions are relevant to stereotype based gender bias in writing. For example, occupational role congruity, which is the acknowledgement that men have an advantage when being evaluated for a role in which traits are strongly linked to male stereotypes, i.e.,: leader, scientist, or this case surgeon.[8,9] Additionally, workshops may help letter readers and writers develop awareness of the language commonly used in gender stereotyped situations.

We have also identified several counterproductive measures of reducing gender bias.

1. Prescriptive gender norms

Prescriptive gender norms are assumptions made about how men and woman are inherently different and should behave in certain ways. Prescriptive gender norms suggest that LOR reflect this difference. It is easy to apply these assumptions to explain differences in LOR. For example, assuming female applicants are described "communally" because women are inherently sympathetic, congenial, and nurturing, where men are not.[8] This manifestation of stereotyped based gender bias is found commonly in academic settings.[8,10]

Multiple studies have shown that male and female applicants with similar objective qualifications are described differently in LOR and judged differently as job applicants.[4,5,8,10,11]

In 2012, a randomized double-blind study revealed that faculty in biological and physical sciences were significantly more likely to rate the male applicant as competent and hirable even when shown the exact same application. The male applicant was also offered a higher salary and more career mentoring than the female applicant.[10]

2. Gender blindness

Eliminating gender references in applications was only minimally successful at reducing gender bias in academia.[9,12] One possible explanation for this finding was that LOR written for male applicants had a greater proportion of agentic terms which influenced ranking and hiring.

3. Self-proclaimed objectivity

Studies have shown that the more people feel they are strongly objective, the more likely they are to show gender discrimination. In fact, 1 study in particular revealed that participants with greater self-perceived objectivity were more likely to see overt differences in male and female applicants even though the 2 applicants were identical.[12,13] Implicit bias testing is easily accessible and can help identify one's own biases.[14]

In summary, we recommend both LOR writers and readers explore their own implicit biases, recognize the use of prescriptive gender norms, and examine whether SLOR or gender bias-habit changing workshops can be integrated in their department.

There are several limitations in our study. This study is limited to applicants applying to a single transplant surgery fellowship program. Findings may differ in other disciplines and surgical subspecialties however, LOR are rarely individualized to specific programs so one can assume these findings would hold true for other transplant surgery fellowship programs. The letters were reviewed by 2 independent researchers; however, it is possible communal and agentic terms were overlooked. Additionally, we cannot draw conclusions as to whether the LOR influenced ranking or matching into the fellowship program. The small number of female letter writers makes drawing conclusions about differences in the LOR based on the gender of the author difficult. Further study is needed to determine if gendered differences in LOR influence ranking of applicants in postsurgical training. Our study approached gender bias from the perspective of the letter writer and applicant. We are fully aware that bias can exist on the part of the reader.

The gendered differences found in this study may provide insight into the inherent gender bias that is revealed in letters supporting candidates entering a surgical subspecialty. This is the largest published study to identify differences in terms, length, and family references in a cohort of residents applying for a surgical fellowship.

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