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## Female Representation and Implicit Gender Bias at the 2017 American Society of Colon and Rectal Surgeons Annual Scientific and Tripartite Meeting

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## Abstract

**BACKGROUND:** Women surgeons are underrepresented in academic surgery and may be subject to implicit gender bias. In colorectal surgery, women comprise 42% of new graduates, but only 19% of Diplomates in the United States.

**OBJECTIVE:** We evaluated the representation of women at the 2017 American Society of Colon and Rectal Surgeons Scientific and Tripartite Meeting and assessed for implicit gender bias.

**DESIGN:** This was a prospective observational study.

**SETTING:** The study occurred at the 2017 Tripartite Meeting.

**MAIN OUTCOME MEASURES:** The percentage of women in the formal program relative to conference attendees and forms of address.

**METHODS:** Female program representation was quantified by role (moderator or speaker), session type, and topic. Introductions of speakers by moderators were classified as formal (using a professional title) or informal (using name only), and further stratified by gender.

**RESULTS:** Of physicians and medical students, 32% (n=484) of the 1,532 attendees were women. Women comprised 28% of moderators (n=26) and 28% of speakers (n=80). The highest percentage of women moderators and speakers was in education (48%) and the lowest in techniques and technology (17%). In the 4147 sessions evaluated, female moderators were more likely than male moderators to use formal introductions (68.7% vs. 54.0%, p=0.02). There was no difference when female moderators formally introduced female versus male speakers (73.9% vs. 66.7%, p=0.52); however, male moderators were significantly less likely to formally introduce a female versus male speaker (36.4% vs. 59.2%, p=0.003).

**LIMITATIONS:** Yearly program gender composition may fluctuate. Low numbers in certain areas limits interpretability. Other factors potentially influenced speaker introductions.

**CONCLUSIONS:** Overall, program representation of women was similar to meeting demographics, although with low numbers in some topics. An imbalance in the formality of speaker introductions between genders was observed. Awareness of implicit gender bias may improve gender equity and inclusiveness in our specialty. See **Video Abstract** at <http://links.lww.com/DCR/A802>.

## Keywords

Academic surgery; Colorectal surgery; Female surgeons; Gender bias; Implicit bias

## Introduction

The specialty of colon and rectal surgery has witnessed a steady increase in the percentage of women joining the ranks. In 2016, 42% of the Qualifying Exam candidates in colon and rectal surgery were women, which is over twice the current percentage of female Diplomates (19%).<sup>1</sup> This trend mirrors what is seen in general surgery as a whole, with women accounting for 38% of current trainees but only 19% of practicing surgeons.<sup>2,3</sup>

Relative to overall specialty demographics, women are still underrepresented in academic surgery, particularly in senior and leadership roles, although there has been increased representation in recent years. Despite an increase in the number of women chairs of surgery in the United States from four chairs in 2014 to 20 chairs in 2018, only 10% of chairs are women.<sup>4,5</sup> Currently 7.3% of full professors of surgery are women, and it is estimated that gender parity in this regard will not be achieved until 2096.<sup>6</sup> In colon and rectal surgery, only 22% of the faculty in United States fellowship training programs are women.<sup>7</sup> Additionally, there have been two female presidents of the American Society of Colon and Rectal Surgeons (ASCRS) since its inception, and women are underrepresented in leadership of the international colorectal societies as well.<sup>8</sup>

Implicit bias contributes to gender inequity in academic medicine across many different specialties.<sup>9–14</sup> Implicit bias refers to subconscious, unintentional pervasive beliefs or stereotypes that impact an individual's actions toward certain groups.<sup>15,16</sup> A recent study of video-archived internal medicine grand rounds at an academic medical center found that male physicians were significantly more likely to introduce female physician speakers informally (by their name only), compared to male speakers, who were more likely to be introduced by a professional title. This gender difference was not seen with female introducers.<sup>17</sup> Women in surgical specialties may face implicit bias that can subtly create an environment of exclusion, and discourage them from entering and rising in the ranks of academic surgery.

The American Society of Colon and Rectal Surgeons Annual Scientific and Tripartite Meeting (Tripartite Meeting) serves as the largest potential source of data to evaluate female participation and implicit bias on an international scale, given that the formal program contains equal contributions from the American, Australasian, and European societies. In this study, we sought to compare the percentage of women in the formal program to the percentage of female conference attendees, and to assess for evidence of implicit gender bias by determining the frequency with which presenters were introduced formally versus informally by moderators. We hypothesized that women were under-represented in the formal program relative to conference attendees, and more likely than male speakers to be introduced informally by moderators.

## Methods

### Demographics and program analysis

The primary outcome of the study was to compare the percentage of women in the formal program to the percentage of women attending the conference, and to assess for implicit

gender bias using speaker introductions. Secondary outcomes were to compare the percentage of women in the formal program stratified by subject matter, role as speaker or moderator, and session type. Demographic data on meeting attendee registration were obtained with permission from ASCRS. The online program for the Tripartite Meeting in Seattle, Washington from June 10–14, 2017 was accessed and reviewed.<sup>18</sup> The percentage of women on the Program Committee was calculated, as was the percentage of women who were moderators and speakers for workshops, symposia, lectures, and abstracts. The percentage of women moderators and presenters also was calculated across different disease processes and topics. The gender phenotype of those with gender-neutral or unfamiliar names was confirmed by online image search.

Moderators were defined as workshop directors or assistant directors, symposia or debate moderators or co-moderators, moderators of abstract sessions, or introducers of named lectureships. Speakers were defined as workshop or symposia presenters, lecturers, abstract presenters, or debaters. Sessions were defined as symposia, workshops, hands-on labs, lectureships, abstract sessions, or after-hours debates. Non-CME corporate forums, coffees and controversies, resident breakfasts, breakfasts with professors, and e-poster sessions were excluded from the analysis. Speakers who presented more than once within a single session were only counted once. Calculations were performed twice by two different individuals to ensure consistency and accuracy.

### Presenter introductions

The study protocol was kept confidential among the study investigators, to prevent introducing bias to moderators prior to and during the meeting. None of the investigators were moderators or members of the Program Committee or Abstract Selection Committee. Abstract sessions and workshops were excluded. Prior to the meeting, study investigators selected sessions to attend from a secure online sign-up, with a goal of attending all included sessions.

Live meeting sessions were attended by a study investigator who documented the apparent gender phenotype of the moderators and speakers. Introductions of the speaker by the moderator were coded as formal or informal. Formal introductions were defined as inclusion of the speaker's professional academic title (e.g., professor or doctor). Informal introductions were defined by the use of first name +/- last name without formal title, other denotations such as "she" or "he," or any other colloquialisms. Presenters who do not hold advanced degrees (e.g., who would otherwise be presented formally as "Mr." or "Mrs.") were excluded from the analysis.

### Statistical Analysis

Descriptive statistics were performed. Binary variables were analyzed using chi-square test (GraphPad Prism 7.0 software). Categorical data are presented as percentage frequencies. Statistical significance was defined as  $p < 0.05$ .

The study protocol was granted exemption by the Institutional Review Board of Brigham and Women's Hospital.

## Results

### Conference registration demographics

For the 1,534 conference attendees who are ASCRS members, geographic and gender data are shown (Table 1). For the 278 physician attendees who were not ASCRS members (15%), this data was not available, and thus they were excluded from further analysis. Overall, 31% of meeting attendees who are ASCRS members were women, with higher percentages of women as Candidates (44%) and Members (35%) compared to Fellows (24%). Of International Fellows who attended the meeting, only 8% were women (3 of 38). Combining the Fellows (N=661; 24% women) and International Fellows (N=38; 8% women), women accounted for 23% of attending colon and rectal surgeon attendees.

### Program Representation by Gender

The Program Committee leadership consisted of 1 male chair, 2 female vice-chairs, and 1 male international liaison; in addition, the ASCRS President was female. Of the total 119 abstract reviewers, 29 were women (24%); ASCRS abstract reviewers were 36% female (25 out of 70) and Tripartite Member abstract reviewers were 8% female (4 out of 49).

Gender composition within workshops, symposia, named lectures, and abstracts, varied according to the type of session (Table 2). Gender breakdown for both moderators and speakers is shown for workshops, symposia, named lectures, and abstracts (Table 2). Overall, there were 93 moderators, of whom 67 (72%) were male and 26 (28%) were female. Of the total 289 speakers, 209 (72%) were male and 80 (28%) were female. The highest proportion of female moderators was in workshops (n=5, 45%), and the lowest was in lectures (n=1, 10%). The highest proportion of female speakers was in abstracts (N=26, 33%), and the lowest was in workshops (N=15, 25%).

We compared the gender breakdown of attending colon and rectal surgeon conference attendees (Fellows and International Fellows) to the overall gender breakdown of both speakers and moderators, using chi-square analysis, and neither of these comparisons was found to be significantly different ( $p=.29$  for moderators and  $p=.12$  for speakers, respectively). Given that abstract presenters may be more likely to be trainees than in other sessions of the formal program, we repeated the calculation for speakers, omitting abstract presenters, and this comparison remained non-significant ( $p=.54$ ).

We also assessed how women moderators and speakers were represented across different subject matters within the formal program (Table 3). Abstract sessions were excluded from this analysis. The highest overall percentage of women moderators and speakers was in sessions pertaining to education (48.1%) and the lowest in techniques and technology (17.5%). There were some significant variations within major topics. For example, although women presenters and moderators represented 24.6% of sessions on malignancy, there was significant variation based on the type of cancer. For example, women comprised 50.0% of anal cancer/anal intraepithelial neoplasia (AIN), and 14.0% of rectal cancer speakers and moderators. Similarly, within benign disease, women represented 36.8% of pelvic floor moderators and speakers, compared to 16.7% for diverticulitis, with no female inflammatory bowel disease speakers or moderators.

## Speaker Introductions

Of 47 total sessions in the meeting, 41 (87%) were attended by a study investigator. The following 6 sessions were not attended: Rectal Prolapse Advanced Methods Symposium, Advanced endoscopy Symposium and Workshop, Health Care Economics Update, Parvis Jamanger Lectureship, John Goligher Lectureship, Optimizing Pain and Management in Acute and Chronic Disease. Of the 41 sessions attended, there were 322 introductions, of which 186 introductions were formal (58%) and 136 (42%) were informal (Table 4). Female moderators were significantly more likely than male moderators to use formal introductions (68.7% vs. 54.0%,  $p=0.02$ ). No significant difference was observed in female moderators' formal introduction of male speakers vs. female speakers (66.7% vs 73.9%,  $p=0.52$ ). In contrast, male moderators were significantly more likely to formally introduce a male speaker than a female speaker (59.2% vs. 36.4%,  $p=0.003$ ).

## Sensitivity Analysis

We performed a sensitivity analysis to determine whether the potential outcomes of the missed sessions ( $n=6$ ; 13%) would alter the statistical significance of our findings. For the missed sessions, mean imputation was used to estimate the ratio of males to females for moderators and speakers based on findings from available data. Analyses were repeated for both the mean ratio of male and female introduction patterns based on the available data, as well as at a hypothetical extreme, where male moderators introduced female speakers formally with 100% frequency. In both calculations, a statistically significant difference was seen in the primary finding of interest, or the rate at which male moderators formally introduced women compared to men. If hypothetically male moderators had introduced 100% of female speakers formally in the missed sessions, the results remain statistically significant, with male moderators formally introducing male vs. female speakers 59.1% vs. 42.6% ( $p=0.02$ ).

## Discussion

At the 2017 ASCRS-Tripartite Meeting, we found no statistical difference between the proportion of women as moderators and speakers and the proportion of women surgeons in attendance. Women were also well represented in the Program Committee leadership. The highest percentage of women moderators and presenters was in the category of education, and the lowest in techniques and technology. Although the subtopics are in low numbers overall, the highest percentages of women moderators and speakers were in career/mentorship, anal cancer/AIN, and trainee education, and the lowest percentages in inflammatory bowel disease, healthcare economics, and advanced endoscopy. We observed evidence of implicit gender bias, as evidenced by an increased likelihood of male moderators to introduce female speakers in an informal manner, which was not seen with female moderators introducing speakers of either gender.

The balanced representation of women overall in the formal program likely reflects a concerted effort on behalf of the Program Committee, which was led by a female ASCRS President. While the 2017 Program Committee leadership was 50% women, it was noted that women represented only 8% of the 49 Tripartite Member abstract reviewers, compared



to 36% of the 70 ASCRS abstract reviewers. This is unsurprising given that women accounted for only 8% of International Fellow conference attendees, suggesting that there is a smaller proportion of female colon and rectal surgeons outside of the United States, or they may be less likely to attend the meeting.

With regard to the distribution of women in the formal program across different topics, there are some parallels to the ASCRS committees, as some of the areas with the lowest percentages of women moderators and presenters at the meeting also have low numbers of women on related ASCRS committees.<sup>19</sup> For example, the Inflammatory Bowel Disease Committee has only 1 female member out of 17 (6%), Healthcare Economics Committee 5 out of 30 members (17%), and New Technologies Committee 4 of 26 members (15%). The Young Surgeons Committee has the highest proportion of female members, 16 out of 58 (51%), which may reflect the increasing proportion of women graduating from colon and rectal surgery training programs in recent years. Despite variation in the proportion of women among the 27 ASCRS committees, overall women are well-represented in leadership positions, comprising 39% of Committee Chairs and Vice-Chairs (20 of 51). The Executive Council consists of 4 women of 15 members (27%), which is commensurate with current overall specialty demographics.

Existing data suggest that female colon and rectal surgery faculty achieve comparable academic productivity and rank to their male colleagues. A recent study of 55 United States colon and rectal surgery training programs demonstrated that, relative to male faculty (n=281; 78%), female faculty (n=77; 22%) had a significantly shorter median career duration (11 vs. 18 years,  $p<0.001$ ) but had no difference in the median number of publications per year (0.87 vs. 0.89;  $p=0.32$ ).<sup>7</sup> Further, no significant difference was seen in the distribution of women versus men by academic rank, with 63% vs. 47% as assistant professor, 18% vs. 25% as associate professor, and 18% vs. 27% as full professor (overall  $p=0.24$ ). The authors concluded that while female faculty still comprise a minority of the specialty, they are equally academically productive and likely to be promoted. It is possible, however, that the shorter median career length does translate to proportionally fewer female experts in the field. Lastly, our demographic data demonstrates nearly half of Candidate member attendees were women (44%), and that abstract speakers were one-third women, reflecting the changing demographic of our specialty toward gender neutrality.

Although our data demonstrated that women were well-represented overall in the formal program relative to conference demographics, gender disparities do still exist in surgery.<sup>20</sup> A 2010 survey distributed to the ASCRS mailing list demonstrated some important gender disparities in colon and rectal surgery. Specifically, they demonstrated that, compared to male respondents, females were more likely to respond that fewer opportunities existed for female colorectal surgeons to advance their career (19% vs 2%;  $p<0.001$ ). Overall, male respondents were significantly more likely than their female counterparts to report high career satisfaction (79% vs 65%,  $p=0.004$ ).<sup>21</sup> Similar results were obtained in a 2013 multi-center study of senior general surgery residents and junior faculty, which found that one third of female respondents felt that attitudes toward their gender were a barrier to their career advancement, despite no gender-based differences in self-reported confidence,

preparedness, or career satisfaction.<sup>22</sup> Lack of pay parity for women surgeons also remains a significant issue, even when controlling for productivity.<sup>23</sup>

Implicit bias, manifest by language choice, bears important implications for how colleagues interact in a professional setting. The choice to use masculine language to represent a mixed-gender group promotes feelings of exclusion and alienation.<sup>24,25</sup> Accordingly, interventions aimed at using gender-inclusive language have been shown to reduce stereotyping and discrimination.<sup>25,26</sup> In the formal academic setting, implicit gender bias could be minimized by using standard forms of address (such as the use of the highest obtained degree, or “Doctor” for all physicians), or alternatively, speakers could be asked in advance to provide their preferred form of address.

There are some limitations to our study. Overall low numbers of certain disease categories and session types may account for some of the variation in the percentage of female moderators and speakers. Many factors influence choices of moderators and speakers and could have impacted the gender ratios. Further, many factors may contribute to how individuals are presented in a professional setting, including seniority, academic rank, context, culture, and level of familiarity or relationship with the other person.<sup>27</sup> Other types of bias, based on race, nationality, religion or others could have affected the results and were not evaluated in the current study. Study investigators could have introduced bias. Speaker introductions were used methodologically as a proxy for implicit bias and thus may not be representative. Our implicit bias results represent pooled data, and it is possible that the findings are skewed by a few individual moderators. Lastly, it was beyond the scope of this cross-sectional study to compare gender ratios of the 2017 meeting to that of recent non-Tripartite ASCRS meetings, but this is an area that may warrant future research. Although it is possible the findings would have differed at a non-Tripartite ASCRS meeting, gender bias in academic medicine exists worldwide,<sup>12,28</sup> and thus focusing on this international collaborative meeting that only occurs every nine years was an opportunity to obtain results on a global scale.

As subconscious beliefs, implicit biases can be difficult to detect, yet their influences can be pervasive. The first step toward creating a culture of inclusiveness is recognition of the issue. In surgery, social media has recently provided examples of such efforts to raise awareness of these issues through the #ilooklikeasurgeon and #heforshe Twitter campaigns. Additionally, many academic institutions have centers for implicit bias, including the Ohio State University and the University California of San Francisco. Ultimately, such awareness will help to foster a culture of mutual respect and inclusion, to recruit and retain the best talent in our field, and to continue to work collaboratively to further advance the specialty of colon and rectal surgery for the benefits of patients.

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**Table 1.**  
**Conference Demographics**

Data represent meeting online registration demographics. Country is as denoted by the mailing address of the registrant. Missing data points are excluded.

<b>Demographics</b>	<b>Female [N (%)]</b>	<b>Male [N (%)]</b>
<b>Country</b>		
United States (1306)	431 (33)	875 (77)
Other (221)	48 (22)	173 (78)
<b>Total (1527)</b>	<b>479 (31)</b>	<b>1048 (69)</b>
<b>ASCRS Membership Status</b>		
Candidates (429)	189 (44)	240 (56)
Fellow (661)	158 (24)	503 (76)
Honorary fellow (7)	1 (14)	6 (86)
International Fellow (38)	3 (8)	35 (92)
Members (380)	133 (35)	247 (65)
Retired (17)	0 (0)	17 (100)
<b>Total (1532)</b>	<b>484 (32)</b>	<b>1048 (68)</b>

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**Table 2.**  
**Program Moderators and Speakers by Gender**

Workshop included combined symposia and workshops, as well as hands-on sessions.

Session type	Moderators			Speakers		
	Total	Male (%)	Female (%)	Total	Male (%)	Female (%)
<b>Workshop</b>	11	6 (55)	5 (45)	59	44 (75)	15 (25)
<b>Symposium</b>	46	33 (72)	13 (28)	140	104 (74)	36 (26)
<b>Lecture</b>	10	9 (90)	1 (10)	10	7 (70)	3 (30)
<b>Abstracts</b>	26	19 (73)	7 (27)	80	54 (67)	26 (33)
<b>Total</b>	93	67 (72)	26 (28)	289	209 (72)	80 (28)

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**Table 3.**  
**Percentage of Female Presenters and Moderators by Program Topic**

Moderators and presenters are shown in aggregate. All moderators and presenters from workshops, symposia, lectureships, and after hour debates were included. AIN=anal intraepithelial neoplasia; IBD=inflammatory bowel disease; TME=total mesorectal excision; ERAS=enhanced recovery after surgery.

<b>Presenters + Moderators</b>		
<b>Categories</b>	<b>Total (n)</b>	<b>Female (n; %)</b>
<b><u>Malignancy</u></b>	<b>65</b>	<b>16 (24.6%)</b>
Colon Cancer	16	7 (43.8%)
Rectal Cancer	43	6 (14.0%)
Anal Cancer/ AIN	6	3 (50.0%)
<b><u>Benign Disease</u></b>	<b>68</b>	<b>17 (25.0%)</b>
IBD	8	0 (0%)
Anorectal	8	2 (25.0%)
Pelvic floor	19	7 (36.8%)
Diverticulitis	6	1 (16.7%)
Parastomal hernia	8	2 (35.0%)
Pain management	9	2 (22.2%)
Other benign	10	3 (30.0%)
<b><u>Techniques and Technology</u></b>	<b>63</b>	<b>11 (17.5%)</b>
Robotics	8	1 (12.5%)
Transanal TME	21	5(23.8%)
Advanced endoscopy	13	0 (0%)
New Technologies	11	2 (18.2%)
Informatics	10	3 (30.0%)
<b><u>Education</u></b>	<b>27</b>	<b>13 (48.1%)</b>
Trainee education	20	9 (45.0%)
Career/mentorship	7	4 (57.1%)
<b><u>Quality and Economics</u></b>	<b>37</b>	<b>12 (32.4%)</b>
ERAS	14	5 (35.7%)
Quality/outcomes	17	7 (41.2%)
Healthcare Economics	6	0 (0%)

**Table 4.**  
**Formal vs. Informal Speaker Introductions by Gender**

All introductions of speakers by moderators were included in the analysis. Gender phenotype was based on name and general appearance by consensus of at least 2 study investigators.

Moderator gender	Speaker gender	Introduction		
		Formal (%)	Informal (%)	p-value
Either	<b>Either</b>	186 (57.8)	136 (42.2)	n/a
Female	<b>Either</b>	57 (68.7)	26 (31.3)	0.02
Male	<b>Either</b>	129 (54.0)	110 (46.0)	
Female	<b>Female</b>	17 (73.9)	6 (26.0)	0.52
	<b>Male</b>	40 (66.7)	20 (33.3)	
Male	<b>Female</b>	20 (36.4)	35 (63.6)	0.003
	<b>Male</b>	109 (59.2)	75 (40.8)	

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