Evaluating Unconscious Bias: Speaker Introductions at an International Oncology Conference

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PURPOSE In a professional setting, the introduction of female speakers without their professional title may have an impact on the public's perception of the female speaker. We examined how professional titles were used during speakers' introductions at the ASCO Annual Meeting.

METHODS We conducted a retrospective, observational study of video-archived speaker introductions at the 2017 and 2018 ASCO Annual Meetings. A "professional address" was defined as the professional title followed by the speaker's full name or last name. Multivariable logistic regressions were used to identify factors associated with the form of address.

RESULTS Of 2,511 videos reviewed, 781 met inclusion criteria. Female speakers were addressed less often by their professional title compared with male speakers (62% v 81%; $P < .001$). Males were less likely to use a professional address when introducing female speakers compared with females when introducing male speakers (53% v 80%; $P < .01$). When women performed speaker introductions, no gender differences in professional address were observed (75% v 82%; $P = .13$). Female speakers were more likely to be introduced by first name only (17% v 3%; $P < .001$). Male introducers were more likely to address female speakers by first name only compared with female introducers (24% v 7%; $P < .01$). In a multivariable regression including gender, degree, academic rank, and geographic location of the speaker's institution, male speakers were more likely to receive a professional address compared with female speakers (odds ratio, 2.43; 95% CI, 1.71 to 3.47; $P < .01$).

CONCLUSION When introduced by men, female speakers were less likely to receive a professional address and more likely to be introduced by first name only compared with their male peers.

INTRODUCTION

The number and percentage of women who choose medicine as a career continue to grow. In 1960, women made up 6% of all practicing physicians; in 2000, they comprised approximately 30% of the practicing physician population. In 2017, the number of women enrolling in US medical schools exceeded the number of men, representing 50.7% of the 21,338 medical school matriculants.[1,2] Despite this robust pipeline, women make up only 42% of all US medical school faculty, 25% of full professors, and only 19% of department or division chairs.[3,4] In the 2018 Association of American Medical Colleges report, the average rate of promotion of women to associate professor was significantly lower compared with their male peers (41% v 59%).[4] The factors and biases influencing the gender gap in medical leadership are not fully understood.

Gender bias drives gender disparity in academic advancement and therefore remains a significant challenge for women in the workplace.[5-7] Gender bias can be subtle and unconscious and may be further reinforced through the use of gender-subordinating language, including variability in the level of formality in form of address (ie, formal title, first name, and nickname).[8-10] Word choice and selective use of forms of address may reflect conscious or unconscious assumptions about gender roles.[8,11,12] An analysis of speaker introductions at internal medicine grand rounds at the Mayo Clinic found that male introducers of female speakers used professional titles only 49% of the time, whereas female introducers of male speakers used professional titles 95% of the time.[12]

In a professional setting, the introduction of female speakers without their occupational/professional title may have a direct impact on the public's perception of the female speaker.[12] These differences in formality in speakers' introductions may amplify isolation, marginalization, and professional discomfiture expressed by women faculty in medicine.[12]

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As one of the major subspecialties within internal medicine, medical oncology represents a large workforce with multiple annual conferences geared toward advancement of the field. One of the largest of these types of meetings is the ASCO Annual Meeting, with 40,000 attendees in 2018.[13] The ASCO Annual Meeting is the venue of choice to discuss state-of-the-art treatment modalities, new therapies, and ongoing controversies in the cancer field.[14] Speakers at the ASCO Annual Meeting are often considered experts in their field; the role of a speaker represents a formal setting of acknowledgment among one's professional peers. In this formal setting, the standard expectation for any speaker is a formal introduction by their professional title and/or credentials.

We hypothesized that female speakers in this professional setting were more likely to be addressed informally than their male counterparts during speaker introductions.

METHODS

We conducted a retrospective, observational study of forms of address used during presentations at the ASCO Annual Meeting. We reviewed the video archive of all oral presentations at the 2017 and 2018 ASCO Annual Meetings. Data collection followed methods described by Files et al,[12] with adaptations for the unique characteristics of our study. Mixed-gender coders (four female coders and four male coders [N.D., U.D., C.B.W., L.A.K.F., J.M.C., C.W., H.E.F., and M.G-V.) from diverse ethnic and racial backgrounds extracted data from the official ASCO Annual Meeting videos and transcripts. The use of diverse mixed-gender coders was intentional to decrease the effect of any unconscious bias on the part of the coders. To ensure uniformity in coding strategy, coders were trained by author N.D. (Data Supplement). Coders were part of the investigational team and did not receive monetary incentives. A chronologic list of all presentations was created, and presentations were evenly distributed among coders following alphabetical order. Each coder was assigned a list of presentations to watch. To validate the coding process, randomization software was used. Twenty percent of files were reviewed and recoded by the principal investigator; these were later matched with the original files to confirm accuracy.

Presentation participants were identified as "introducers" or "speakers," depending on their role in the verbal interaction observed in the video file and the official transcript of the session. An "introducer" was defined as an individual who made the introduction. A "speaker" was defined as an individual referred to during the introduction, who subsequently gave a presentation. Events were coded per type of session and presentation within the meeting. Events were classified by type, per ASCO's published category for each event (ie, plenary session, educational session, scientific session, and oral abstract presentation), and disease category, including hematology or oncology subspecialties (ie, medical oncology, health care delivery, and so on).

Degree, academic rank (if practicing in an academic setting), and leadership roles were extracted for speakers; data were obtained from the ASCO Web site and the speaker's institutional Web site. Binary gender was determined by first name, data from the video files, and pronouns used to refer to the individual. For cases in which the gender of a speaker or introducer was not certain, we identified their gender by visiting their institutional Web site. The geographic location of the primary institution of speakers and introducers was also collected as a separate variable.

In the analysis, an occurrence was defined as a unique event with one introducer and one speaker. Introductions were recorded as Dr. Full name, Dr. Last name, Dr. first name only, first and last name, and first name only. These variables were grouped into professional address (Dr. Full name and Dr. Last name) and nonprofessional address (all other options). Data were recorded in a de-identified manner. In Europe and Asia, academic ranking (ie, Professor) is often used in lieu of the title "Doctor"; therefore, "Professor" was coded as a professional address. In addition, if the speaker was introduced by their name followed by their professional title (ie, Name, MD), this was also coded as a professional form of address.

Statistical Analysis

Data were descriptively summarized for all introductions included in the analysis and divided by gender of both speakers and introducers in frequencies and percentages. We reported the frequency and counts of the types of introductions by the genders of speakers and introducers. χ^2 tests of proportion were used to estimate differences in categorical data when comparing female and male speakers (covariable distribution). Multivariable logistic regressions, including characteristics of speakers and introducers, were used to identify factors associated with a professional or unprofessional form of address. Data were analyzed using STATA statistical software (StataCorp 2017. Stata Statistical Software: Release 15. College Station, TX: StataCorp). A two-sided P value $< .05$ was considered statistically significant.

RESULTS

A total of 2,511 unique video presentations were listed in the ASCO video archive library for the 2017 and 2018 ASCO Annual Meetings. All archived video files were individually reviewed; 1,730 videos were excluded from the analysis (Fig 1). The final analysis included 781 presentations/introductions. Presentations included in the analysis covered 89% and 91% of all sessions at the 2017 and 2018 meetings, respectively (Fig 2). For both years, the median number of introductions per session was two. Table 1 lists characteristics of the speakers; 322 (41%) were female, and 459 (59%) were male. Seventy-five percent of
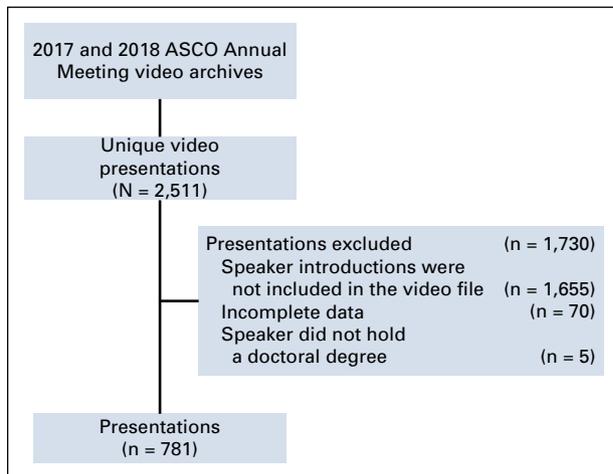
FIG 1. Consort diagram depicting the selection of video files from the 2017 and 2018 ASCO Annual Meetings.

speakers were from institutions in the United States. Twenty percent of presentations were randomly selected and reviewed a second time by the principal investigator to confirm the accuracy of data; 98% concordance was observed in the speakers' form of address. For the 2% of presentations in which discordance was reported, introductions were reviewed by a second investigator and classified on the basis of the majority.

The introducer/speaker dyad proportions were as follows: female introducing female speaker = 125 (16%), female introducing male speaker = 197 (25%), male introducing female speaker = 197 (25%), and male introducing male speaker = 262 (34%). No difference in the distribution of introducer and speaker dyad proportions was observed between 2017 and 2018 ($P = .20$). Regarding speaker

introductions, 62% (198 of 322) of female speakers received a professional form of address ("Dr. Full name" or "Dr. Last name") compared with 81% (371 of 459) of male speakers ($P < .001$). More female speakers were introduced by their first name only compared with their male counterparts (17% [56 of 322 female speakers] v 3% [14 of 459 male speakers]; $P < .001$). When comparing data between the meetings, 63% of female speakers received a professional address in 2017 compared with 60% in 2018 ($P = .5$). Seventy-nine percent of male speakers received a professional address in 2017 compared with 83% in 2018 ($P = .2$).

Male introducers used a professional address 53% of the time when introducing female speakers compared with 80% of the time when introducing male speakers ($P < .01$). Twenty-four percent of male introducers addressed female speakers by first name only compared with 7% of female introducers ($P < .01$). Female introducers used a professional address at high rates independent of the speaker's gender (75% of the time when introducing female speakers and 82% of the time when introducing male speakers; $P = .13$).

In a multivariable regression that included gender, year of the ASCO meeting, type of session, academic rank of the speaker, and geographic location of the speaker's institution (Table 2), male speakers were more likely to receive a professional form of address compared with female speakers (odds ratio [OR], 2.43; 95% CI, 1.71 to 3.47; $P < .01$).

In a second multivariable regression, female speakers were found to have higher odds of being introduced by first name only compared with male speakers (OR, 5.91; 95% CI, 3.08 to 11.31; $P < .01$; Table 3). We included the gender of the introducer in the multivariable regression and observed that male introducers were three times more likely to introduce
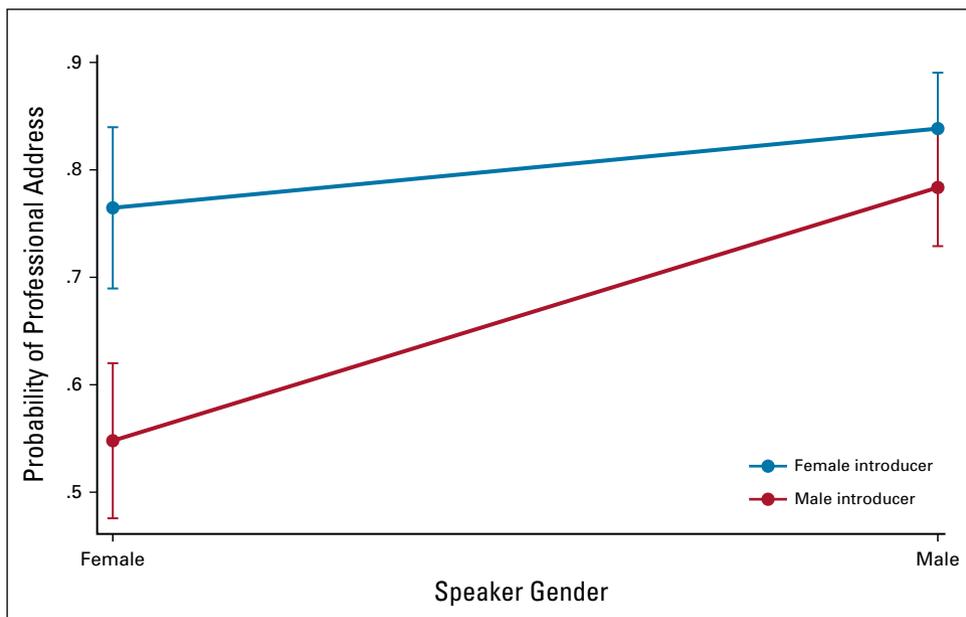
FIG 2. Interaction of speaker gender with introducer gender.

TABLE 1. Characteristics of Speakers at the 2017 and 2018 ASCO Annual Meeting

Characteristic	Female Speaker, n = 322 No. (%)	Male Speaker, n = 459 No. (%)	P
Year			.80
2017	176 (55)	255 (56)	
2018	146 (45)	204 (44)	
Session area			< .01
Hematology	34 (11)	48 (10)	
Oncology	161 (50)	250 (55)	
Care delivery/medical education/survivorship	99 (31)	87 (19)	
Basic sciences/early drug development	27 (8)	66 (14)	
Missing/unknown	1 (< 1)	8 (2)	
Academic degree			< .01
MD	232 (72)	291 (63)	
MD/PhD	56 (17)	137 (30)	
PhD	25 (8)	25 (5)	
Other	9 (2)	6 (1)	
Academic rank of speaker			.03
Instructor	4 (1)	7 (2)	
Assistant professor	51 (16)	55 (12)	
Associate professor	83 (26)	98 (21)	
Professor/emeritus	99 (31)	192 (42)	
Nonacademic	11 (3)	13 (3)	
Other/unknown	55 (17)	65 (14)	
Missing	19 (6)	27 (6)	
Geographic region of speaker's institution			.06
United States	249 (77)	339 (74)	
Europe	48 (15)	80 (17)	
Canada	15 (5)	14 (3)	
Australia	5 (2)	3 (1)	
Asia	3 (1)	19 (4)	
Africa	2 (1)	1 (< 1)	
Central America/South America/Caribbean	0 (0)	3 (1)	
Medical trainee	10 (3)	10 (2)	.42

Abbreviations: MD, Doctor of Medicine; PhD, Doctor of Philosophy.

a speaker by first name only (OR, 3.16; 95% CI, 1.40 to 6.01; *P* < .01).

In both multivariable regressions (for a professional form of address and introductions by first name only), the genders of the speaker and the introducer were the only variables that were statistically significant and affected the speaker's form of address after accounting for the speaker's academic ranking, degree, and geographic location.

We identified an interaction between the speaker's gender and the introducer's gender in a univariate analysis, but this was not statistically significant in the multivariable

model (OR, 1.91; 95% CI, 0.98 to 2.68; *P* = .08; Data Supplement).

DISCUSSION

In our study, female speakers were less likely to receive a professional form of address and more likely to be introduced by first name only compared with male speakers. Female introducers were more likely to use a professional address regardless of the speaker's gender, and male introducers were more likely to introduce female speakers by first name only. Gender was the only variable

TABLE 2. Logistic Regression of Predictors of Speaker's Professional Form of Address

Characteristic	Odds Ratio	P	95% CI
Speaker's gender			
Female	Ref.		
Male	2.43	< .01	1.71 to 3.47
Year			
2017	Ref.		
2018	1.02	.92	0.72 to 1.45
Session area			
Hematology	Ref.		
Oncology	0.80	.44	0.45 to 1.43
Health care delivery/survivorship	1.20	.59	0.62 to 2.30
Basic sciences/drug development	1.83	.13	0.83 to 4.05
Academic rank of speaker			
Instructor	Ref.		
Assistant professor	0.39	.26	0.08 to 2.00
Associate professor	0.57	.50	0.11 to 2.91
Full professor/emeritus	0.71	.68	0.14 to 3.56
Nonacademic	0.35	.25	0.06 to 2.13
Other/unknown	0.50	.41	0.10 to 2.57
Academic degree			
MD/PhD	Ref.		
MD	0.76	.24	0.48 to 1.20
PhD	0.59	.19	0.27 to 1.29
Non-MD/PhD	0.47	.22	0.14 to 1.59
Location of speaker's institution			
United States	Ref.		
Outside of the United States	1.26	.33	0.80 to 1.98
Male introducer	0.50	< .01	0.34 to 0.72

Abbreviations: MD, Doctor of Medicine; PhD, Doctor of Philosophy.

associated with a particular form of address in multivariable regressions.

Forms of address signify credibility and respect. This significantly applies to the professional address received by speakers at a large medical conference such as the ASCO Annual Meeting. Gender bias can be unconscious and subtle. The use of subordinating language or a different level of formality (ie, professional title, first name, or nickname) when addressing female versus male speakers may influence how the audience perceives the expertise and competency of a female speaker.[9,15]

Our findings correlate with the work of Files et al.[12] In their study, investigators evaluated gender differences in the form of address at the internal medicine grand rounds at the Mayo Clinic's locations in Rochester, MN and Scottsdale, Arizona from 2012 to 2014. They reported that women were less likely to be introduced by their

professional titles, and female introducers were more likely to use a professional form of address for any speaker. Similar differences were observed at the 2017 American Society of Colon and Rectal Surgeons Annual Meeting; the authors reported that female moderators were more likely than male moderators to use formal introductions (68.7% v 54.0%; $P < .02$), and male moderators were less likely to formally introduce a female versus a male speaker (36.4% v 59.2%; $P < .003$).[16]

In 2017, the #MeToo movement brought awareness to the issue of sexual harassment in the workplace; our data included meetings that occurred before and after this social movement. However, female speakers were still less likely to be introduced by their professional title at the 2018 ASCO Annual Meeting.[17,18]

Our findings are in line with other subtle, yet significant differences reported in how female versus male applicants are described in recommendation letters,[10,19-21] grant applications,[8] and evaluations.[22] Female applicants are more likely to be described with the adjectives "caring" and "delightful" whereas male applicants are described as "leaders" and "exceptional."[20] These patterns in word selection follow gender stereotypes that associate ability and achievement with men versus effort and nurturing with women.[10,19,23] These gender stereotypes reinforce implicit and unconscious hypotheses about gender differences. They play a central role in how women and men are perceived, evaluated, and, in the case of our study, introduced at an international conference.[23,24]

The demographics in medicine[3] and oncology have changed,[25] with more female oncologists entering the field every year. However, advancement to decanal roles or leadership positions has come at a much slower rate for women.[4,23,26] Gender bias remains a significant challenge for women in the workplace and contributes significantly to job dissatisfaction and career decisions. In a study conducted by Banerjee et al,[27] female respondents were more likely to consider that their gender had a significant impact on their career than men (35.9% v 20.9%). Lacking to acknowledge women's professional titles and accomplishments can further the feeling of marginalization perceived by many women in medicine.[28] As our workforce in oncology continues to diversify, we should evolve to a more inclusive community. Men and women can work on mitigating the existing bias, which will bring the community closer together. After all, both genders have the same goal—to improve cancer care.

One factor that is difficult to account for in our study is the level of familiarity of the introducer with the speaker. When a close professional relationship exists, the introducer may be more likely to address the speaker by first name only. However, considering the effect that these forms of introduction have on the audience and that a presentation at the largest oncology conference is a significant career

TABLE 3. Logistic Regression of Predictors of Speaker's "First Name Only" Form of Address

Characteristic	Odds Ratio	P	95% CI
Speaker's gender			
Male	Ref.		
Female	5.91	< .01	3.08 to 11.31
Year			
2017	Ref.		
2018	1.12	.69	0.64 to 1.94
Type of session			
Hematology	Ref.		
Oncology	1.05	.91	0.44 to 2.50
Health care delivery/survivorship	0.87	.78	0.33 to 2.28
Basic sciences/drug development	0.63	.46	0.18 to 2.14
Academic rank of speaker			
Instructor	Ref.		
Assistant professor	1.18	.88	0.12 to 11.38
Associate professor	1.04	.97	0.11 to 9.71
Full professor/emeritus	0.86	.89	0.09 to 7.92
Nonacademic	0.65	.75	0.05 to 9.27
Other/unknown	0.63	.69	0.06 to 6.30
Academic degree			
MD/PhD	Ref.		
MD	1.28	.54	0.59 to 2.78
PhD	1.17	.80	0.34 to 4.05
Non-MD/PhD	1.16	.89	0.13 to 10.72
Location of speaker's institution			
United States	Ref.		
Outside of the United States	0.88	.74	0.42 to 1.84
Male introducer	3.16	< .01	1.40 to 6.01

Abbreviations: MD, Doctor of Medicine; PhD, Doctor of Philosophy.

milestone, professional address should be prioritized independent of the level of familiarity between the introducer and speaker. In counterpoint, female introducers at national or international meetings are likely as familiar with male speakers; given the differences identified in our work, that familiarity did not have an impact on the use of professional address by female introducers.

This study suffers from the limitations of all retrospective analyses. Because we studied only one international medical conference within oncology, it is conceivable that our findings may be unique. However, given how widely attended the ASCO Annual Meeting is by oncologists from all over the world, it is likely that our results are generalizable. Another limitation to our study is that the assignment of gender dichotomously as male or female on the basis of a speaker or introducer's name, pronouns used, and video recording could have potentially misclassified speakers and introducers from gender minorities (ie, nonbinary genders).

Because of the retrospective nature of our study, we did not use self-identification to categorize gender. Another potential confounder was the age of speakers, because this variable was not publicly available. The academic rankings of introducers were not collected in our study but should be included in future studies to understand its effect on the type of introduction.

Further studies could also include the interactions and forms of address between speakers and discussants during the sessions because this could directly affect the audience's interpretation of data that have been presented. Last, we could not account for within-introducer correlation (ie, examining forms of address by the same introducer and determining the variability of introductions by the gender of the speaker). Nonetheless, the median number of introductions per session was two. With the low likelihood of one introducer chairing more than one session at the meeting, within-introducer correlation is less likely to affect the results of the study.

Our team intended to collect the race and ethnicity of speakers from the information available at the ASCO Annual Meeting video archives and the speaker's institutional Web site. Self-identification is one of the cobblestones of race and ethnicity, limiting the accuracy of data and making it subjective to bias. After taking all of those factors into account, the investigational team decided not to include the race and ethnicity of speakers in the final analysis. Further research is needed in this area, including better methods for the collection of racial and ethnic background data of speakers and introducers, and the association of gender, race, and ethnicity with the forms of address.

Failure to address female speakers by their professional title is a subtle form of reinforcement of gender disparities in medicine. These differences should not be overlooked because they represent the basis of more significant issues, eg, women in medicine are less likely to be appointed to leadership positions,[29] are paid less than their male counterparts,[30,31] and are expected to hold more responsibilities outside of work while being evaluated with the same standards as men.[32]

Acknowledging the existing bias in speakers' introductions is the first step in reducing its potential downstream, negative effects. Educational resources have been shown to successfully change faculty members' perceptions of bias.[33] We propose the implementation of training tools for faculty at conferences to help eliminate unconscious gender bias. Importantly, these programs should be implemented on a system-wide level for both women and men. We encourage all societies, institutions, and conference organizers to create and implement guidelines for speakers' introductions at their meetings. Providing instructions to session chairs and discussants and requiring a professional form of address for all speakers can make

a significant difference in reducing the disparities observed in our study. We also hope that our findings will further the conversation about unconscious bias in medicine and its effect on minority groups.

In conclusion, we found disparity in how male versus female speakers were introduced at the ASCO Annual Meetings in 2017 and 2018. More research is needed to elucidate both the cause and the downstream effects of this disparity. We propose that meeting organizers adopt educational tools and guidelines to raise consciousness of the issue and combat the unintended consequences of this unconscious bias.

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PRIOR PRESENTATION

Presented at the 2019 ASCO Annual Meeting, Chicago, IL, June 3, 2019.

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AUTHORS' DISCLOSURES OF POTENTIAL CONFLICTS OF INTEREST

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Consulting or Advisory Role: Pfizer

Shikha Jain
Honoraria: Tempus

Stephanie L. Graff
Speakers' Bureau: OncLive
Research Funding: Boehringer Ingelheim (Inst), Eli Lilly (Inst), Genentech (Inst), Immunomedics (Inst), Novartis (Inst), Celldex (Inst), Dana-Farber Cancer Institute (Inst), TapImmune (Inst), Merus (Inst), Odonate Therapeutics (Inst), Innocrin Pharma (Inst), GRAIL (Inst)

No other potential conflicts of interest were reported.