

Motivations to Pursue Fellowships Are Gender Neutral

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Objective: To determine the importance of factors in decision making by general surgery chief residents to pursue fellowships and to relate factor importance to gender and residency characteristics.

Design: Prospective, voluntary, national survey conducted April through May, 2008, in which finishing chief residents rated the importance of 12 factors in their decision making to pursue fellowships.

Setting: General surgery chief residents who applied for admission to the American Board of Surgery Qualifying Examination process.

Participants: All 1034 first-time applicants.

Main Outcome Measures: χ^2 tests and 1-way analyses of variance were used to correlate gender and residency type, size, and location with summed values and scaled mean scores for ratings of the importance of 12 potential factors in fellowship decision making.

Results: The fellowship rate was 77% and correlated with residency size and location. Women were dispersed asymmetrically across residencies overall but future female fellows were distributed similarly to male ones. Survey item response rates for future fellows were 96% to 98%. Clinical mastery and specialty activities were valued most highly by more than 90% of men and women. Men placed more value on income potential and spousal influence. Lifestyle factors reached only midrange importance for both genders. Program size had more significant relationships to decision-making factors than did gender.

Conclusions: The ability to master an area of clinical practice and the clinical activities of a specialty are the most important factors for chief residents in fellowship decision making, regardless of gender. Lifestyle factors are of midrange importance. Program size is as influential as is gender.

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MOST FINISHING GENERAL surgery (GS) residents opt for advanced surgical education, or fellowship.¹ Information about the fellowship decision-making process is limited. Factors that influence decisions have been inferred from surveys of students about residency selections, and some studies report gender-based differences.²⁻⁷ Career and personal life concerns have been shown to diverge by gender at the resident, fellow, and newly graduated surgeon levels,^{8,9} and women are asymmetrically distributed across fellowship specialties.¹ Determining who selects fellowships and why carries implications for surgical education paradigms and workforce planning. Understanding gender-based motivational differences could be especially cogent, given the rising numbers of female surgical residents. We conducted a prospective survey to examine the relationships between 12 potential factors in fellowship decision making and the

gender and residency program characteristics of general surgery residency graduates.

METHODS

The American Board of Surgery (ABS) administers the General Surgery Qualifying Examination (QE) annually. First-time QE applicants submit demographic information, medical education histories, operative experiences, and postresidency plans. In 2008, applicants who were committed to fellowships were surveyed concerning their decisions to pursue more training. Survey participants rated the importance of 12 potential motivations on a 4-point scale in which 1 indicates not at all important; 2, slightly important; 3, important; or 4, very important (**Table 1**). Survey items were derived from studies of fellowship choices^{1,10} and residency selections.³⁻⁶ Potential decision-making factors were categorized as primarily reflecting a specialty's clinical activities (intellect), typical practice pattern (lifestyle), or fiscal characteristics (economic). Three factors also were hypothesized to reflect respondent perceptions about their residencies: ability to master an area of clinical

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Table 1. Factors in Fellowship Decision-Making^a

Description of Factor ^b	Key Words ^c
Ability to master an area of clinical practice	Mastery
Balance between office- and hospital-based practice	Balance
Enhance my attractiveness to future partners	Market
Frequency and type of on-call cases	Call cases
Increased lifetime earning potential	Income
Increased time for family and personal activities	Time off
Influence of faculty mentor(s)/role model(s)	Mentor
Influence of my spouse/significant other	Spouse
Insufficient exposure to this field during my residency	Gap
Nature of conditions treated/technical challenge	Content
Need more operative experience in this field	More ops
Reduced risk of malpractice suits	Malpractice

^aIn response to the question, "If you are entering a fellowship, rate the importance of each of the following factors in your decision to pursue fellowship training."

^bFull descriptor as appeared on the survey.

^cTerm used in the text to represent this factor.

cal practice (mastery), insufficient exposure to this field during residency (gap), and need for more operative experience in this field (more ops). Survey participation was voluntary and was in no way linked to ABS evaluation of applicant eligibility for QE admission.

Responses were entered prospectively into a longitudinal ABS database. The ABS psychometrician (T.W.B.) linked QE applicant demographics and residency characteristics to survey responses to create the initial study data set. Gender and medical school (United States vs international) were self-reported. Residency program completed was self-reported but was confirmed by each applicant's program director. Residency type was categorized as university or independent. Size was measured by the annual number of chief residents as small, 1 to 3; medium, 4 to 6; or large, more than 6. Residency locations were mapped to regions previously defined by the ABS (Northeast, Southeast, Midwest, Southwest, and West). Respondents' fellowship plans were not verified independently but were collected within 90 days of fellowship commencement and assumed to be reliable.

Military and foreign residency graduates were eliminated from further analysis because their fellowship decisions may be driven by atypical factors. Subjects remaining were subdivided into future fellows and all others. Associations between fellowship rates and demographic and residency variables were sought using χ^2 tests. Survey item ratings from future fellows were evaluated by 2 methods for relationships to gender, medical school, and residency type and size. First, responses of important and very important were combined, and the summed value was termed important. Summed values were examined for linkages to demographic and residency variables by χ^2 testing. Second, a score (range, 1-4) was calculated for each factor as the scaled mean of responses. Scores were tested for associations with demographic and residency variables by a 1-way analysis of variance. To lessen the likelihood of statistically significant but practically irrelevant relationships given the multiple variables tested and comparisons made, significance was set at $P < .01$, and relationships for which $.01 < P < .05$ were termed trends.

Reports provided by the ABS to the authors contained deidentified data in accordance with ABS data-sharing policy. The authors and not the board are solely responsible for analytic accuracy and results interpretation. The ABS does not collect marital status or other relationship information from examination applicants, and we did not seek such information for

Table 2. Gender Distribution by Medical School and Residency Variables

Variable	No (%)			P Value
	Total	Women	Men	
Medical school				
USMG	756 (77)	232 (31)	524 (69)	<.001
IMG	226 (23)	33 (15)	193 (85)	
Program type				
University	657 (67)	196 (30)	461 (70)	.004
Independent	325 (33)	69 (21)	256 (79)	
Program size				
Small	218 (22)	45 (21)	173 (79)	.02
Medium	489 (50)	132 (27)	357 (73)	
Large	275 (28)	88 (32)	187 (68)	
Program location				
Northeast	367 (37)	100 (27)	267 (73)	.03
Southeast	158 (16)	45 (28)	113 (72)	
Midwest	223 (23)	58 (26)	165 (74)	
Southwest	105 (11)	17 (16)	88 (84)	
West	129 (13)	45 (35)	84 (65)	
All	982 (100)	265 (27)	717 (73)	

Abbreviations: IMG, international medical graduate; USMG, United States medical graduate.

the current study. Our results concerning "influence of spouse or significant other" should be viewed in the context of that limitation.

RESULTS

For 2008 there were 1034 first-time QE applicants; all provided their postresidency plans. Most subjects were committed to fellowships (790 of 1034; 76%), including 217 women (28%) and 573 men (72%). Women and men who entered fellowships most often chose mastery as very important (74% overall; 77% women, 73% men) and reduced risk of malpractice suits (malpractice) as not at all important (67%). The pattern of responses differed significantly by gender only for increased lifetime earnings potential (income as very important, men [20%] > women [11%]; $P < .001$). There was a trend for women to value more highly the balance between office-based and hospital-based practice (balance, women [17%] > men [10%]).

After eliminating military and foreign graduates, 982 respondents remained for further study; women comprised 27%. Two-thirds graduated from university programs, one-half finished at medium-sized residencies, and nearly 40% trained in the Northeast. Women were found disproportionately more often within university, large, and Western programs (**Table 2**). More than three-fourths of respondents (756 of 982; 77%) were committed to fellowships and 226 (23%) to enter practice. Fellowship rates differed significantly by program size ($P = .006$) and residency location ($P < .001$) but not by gender, medical school, or program type (**Table 3**). While distributed asymmetrically across residencies, women who pursued fellowships were dispersed similarly to men by residency type, size, and location (**Table 4**).

Responses from 756 future fellows were studied further. Response rates to the survey items ranged from 96% (722 of 756) to 98% (741 of 756). When analyzed by

Table 3. Qualifying Examination Applicant Demographics and Fellowship Rates

Variable	No. (%)			P Value
	Total	Fellowship	No Fellowship	
Gender				
Men	717 (73)	546 (76)	171 (24)	NS
Women	265 (27)	210 (79)	55 (21)	
Medical school				
USMG	756 (77)	572 (76)	184 (24)	NS
IMG	226 (23)	184 (81)	42 (18)	
Program type				
University	657 (67)	516 (78)	141 (21)	NS
Independent	325 (33)	240 (74)	85 (26)	
Program size				
Small	218 (22)	154 (71)	64 (29)	.006
Medium	489 (50)	387 (79)	102 (21)	
Large	275 (28)	215 (78)	60 (22)	
Program location				
Northeast	367 (37)	319 (87)	48 (13)	<.001
Southeast	158 (16)	108 (68)	50 (32)	
Midwest	223 (23)	161 (72)	62 (28)	
Southwest	105 (11)	71 (68)	34 (32)	
West	129 (13)	97 (75)	32 (26)	
All	982 (100)	756 (77)	226 (23)	

Abbreviations: IMG, international medical graduate; USMG, US medical graduate.

summed values, the most influential factor was mastery, rated as important by 98% of respondents, and the least influential was malpractice (15%; **Table 5**). Potential decision-making factors were also ranked in order of scaled mean score. Again, mastery was rated highest and malpractice lowest. Mastery achieved an overall score of 3.71, vs 1.53 for malpractice (**Table 6**). Rank orders by summed values and scaled mean scores were similar across genders.

Survey responses were evaluated for gender and residency characteristics effects. When summed values were compared by gender, only income differed significantly (men > women; $P = .003$). Trends were seen for enhancing attractiveness to future practice partners (market, women > men) and influence of spouse/significant other (spouse, men > women). When summed values were analyzed by residency type, the balance reached significance (independent > university; $P < .001$), while trends were found for increased time for personal and family activities (time off, independent > university) and malpractice (independent > university). Finally, the summed values were assessed for program size effect. Time off differed significantly (small > medium/large; $P = .006$), and a trend was observed for spouse (medium > small/large).

Survey item responses also were examined using scaled mean scores. Scores differed significantly by gender for income (men > women; $P < .001$) and spouse (men > women; $P = .003$). Trends were seen for balance (women > men) and frequency/type of on-call cases (call cases, women > men). When compared by residency type, balance was significant (independent > university; $P < .001$). Trends were found for nature of conditions treated/technical challenge (content, university > independent), need for more op-

Table 4. Gender Distribution of Survey Respondents Who Pursued Fellowships

Variable	No. (%)			P Value
	Total	Women	Men	
Medical school				
USMG	574 (76)	182 (32)	392 (68)	<.001
IMG	182 (24)	28 (15)	154 (85)	
Program type				
University	516 (68)	154 (30)	362 (70)	NS
Independent	240 (32)	56 (23)	184 (77)	
Program size				
Small	154 (20)	37 (24)	117 (76)	NS
Medium	387 (51)	104 (27)	283 (73)	
Large	215 (28)	69 (32)	146 (68)	
Program location				
Northeast	319 (42)	85 (27)	234 (73)	NS
Southeast	108 (14)	34 (32)	74 (68)	
Midwest	161 (21)	45 (28)	116 (72)	
Southwest	71 (9)	12 (17)	59 (71)	
West	97 (13)	34 (35)	63 (65)	
All	756 (100)	210 (28)	546 (72)	

Abbreviations: IMG, international medical graduate; USMG, US medical graduate.

erative experience in the specialty field (more ops, university > independent), time off (independent > university), and malpractice (independent > university). Multiple decision-making factors correlated significantly with program size including influence of faculty mentors/role models (mentor, medium > large > small; $P = .009$), content (large/medium > small; $P = .002$), time off (small > medium > large; $P = .004$), and spouse (medium > large > small; $P = .003$). A trend linking program size to balance also was identified (small > medium > large). **Table 7** displays the results of the summed value and scaled mean score analyses for patterns of fellowship decision-making factors when survey responses were compared by gender, program type, and program size.

When grouped into intellect, lifestyle, and economic categories, response patterns were heterogeneous. Ranges for percentage of very important responses were 8% to 74% for intellect, 8% to 24% for lifestyle, and 4% to 31% for economic. Significance of factors examined by summed values were limited to 1 economic factor for gender, 1 lifestyle factor for residency type, and a separate lifestyle factor for program size. Scaled mean score significance also was variable across categories. Comparisons by gender showed as significant 1 economic and 1 lifestyle factor, by residency type identified 1 lifestyle factor, and by program size found 2 intellect and 2 lifestyle factors. Within categories, directionality of significance was inconsistent, and factor analysis was not performed (Tables 5-7).

Several factors potentially reflect respondents' perceptions about their residencies (**Table 8**). Mastery was the most influential factor in fellowship decision making for both genders and for all program types and sizes, whether measured by summed value or scaled mean score. More than 50% of finishing residents, regardless of gender or residency variables, were motivated by need for more operative experience in their fellowship specialties. Approximately one-fourth of residency graduates

Table 5. Rank Order of Factors by Summed Values for Importance

All		Women		Men	
Factor	Percentage ^a	Factor	Percentage ^a	Factor	Percentage ^a
Mastery	98	Mastery	99	Mastery	97
Content	91	Content	89	Content	92
Mentor	75	Market	79	Mentor	75
Market	74	Mentor	74	Market	70
Time off	63	Call cases	65	Time off	63
Call cases	59	Time off	64	Income	61
More ops	59	More ops	57	More ops	60
Income	57	Balance	48	Call cases	56
Balance	44	Income	48	Balance	43
Spouse	32	Spouse	26	Spouse	35
Gap	24	Gap	23	Gap	25
Malpractice	15	Malpractice	13	Malpractice	16

Abbreviation: ops, operations.

^aPercentage of group who ranked factor as important.

Table 6. Rank Order of Scaled Mean Scores by Gender and Categories

All			Women			Men		
Factor	Score	Category	Factor	Score	Category	Factor	Score	Category
Mastery	3.71	I	Mastery	3.76	I	Mastery	3.69	I
Content	3.40	I	Content	3.33	I	Content	3.42	I
Mentor	2.99	I	Market	3.05	E	Mentor	2.98	I
Market	2.95	E	Mentor	2.99	I	Market	2.91	E
Time off	2.75	L	Time off	2.82	L	Time off	2.72	L
Call cases	2.65	L	Call cases	2.78	L	Income	2.7	E
More ops	2.64	I	More ops	2.61	I	More ops	2.65	I
Income	2.61	E	Balance	2.41	L	Call cases	2.6	L
Balance	2.28	L	Income	2.39	E	Balance	2.23	L
Spouse	1.99	L	Spouse	1.81	L	Spouse	2.06	L
Gap	1.76	I	Gap	1.72	I	Gap	1.77	I
Malpractice	1.53	E	Malpractice	1.50	E	Malpractice	1.54	E

Abbreviations: E, economic; I, intellect; L, lifestyle; ops, operations.

chose fellowships related to insufficient exposure to their specialty field during residency. Roughly 60% of chief residents chose fellowships leading to additional board certification (cardiothoracic, colorectal, critical care, pediatric, plastic, or vascular).

COMMENTS

Fellowship rates for general surgery chief residents have increased steadily, reaching 77% by 2005.¹ General surgery subspecialty programs (eg, breast, minimally invasive surgery) account for much of the most recent rise.¹¹ We found a fellowship rate of 77% for 2008. We cannot escape the reality that most of our residency graduates choose to extend their educational experiences. High fellowship rates have substantial implications for graduate surgical curriculum development and physician workforce planning, including new primary ABS certificates¹² and potential future specialty services shortages.¹³

Relatively little is known about the fellowship decision-making process. A national study of fellowship intentions across all postgraduate year (PGY) levels in 2007

showed that 55% of PGY-1 residents were undecided, 38% identified specific choices, and 7% anticipated no additional training. Specialty plans were correlated with gender and residency program characteristics, and only 22% of PGY-1 residents accurately predicted their PGY-5 fellowship selections.¹⁴ A 2-institution study of residency graduates found inconsistent effects for rotations on dedicated specialty services and for exposure to specialty fellows. Dedicated services appeared to generically promote all fellowships.¹⁵ Fellowship decisions most often are finalized at the PGY-4 level, driven by matching process timetables.

Primary source data about the reasons underlying fellowship decisions are scarce. Most motivations have been imputed from surveys of residency choices by students. Frequently cited influences include intellectual and technical challenges, clinical problems treated, career opportunities, prestige, indebtedness, income, mentors, training duration, controllable lifestyles, clinical mastery, call schedule, family demands, and gender.³⁻⁷ Few studies directly address resident choices. In one national, longitudinal, retrospective study of fellowship selections, female residents in 2005 disproportionately chose colorectal sur-

Table 7. Analyses by Summed Values and Scaled Mean Scores

Category/Factor	P Value ^a					
	Summed Value			Scaled Mean Score		
	Gender	Program Type	Program Size	Gender	Program Type	Program Size
Intellect						
Mastery	NS	NS	NS	NS	NS	NS
Mentor	NS	NS	NS	NS	NS	<.001
Gap	NS	NS	NS	NS	NS	NS
Content	NS	NS	NS	NS	Trend	.002
More ops	NS	NS	NS	NS	Trend	NS
Economic						
Market	Trend	NS	NS	NS	NS	NS
Income	.003	NS	NS	<.001	NS	NS
Malpractice	NS	Trend	NS	NS	Trend	NS
Lifestyle						
Time off	NS	Trend	.006	NS	Trend	.004
Call cases	NS	NS	NS	Trend	NS	NS
Balance	NS	.0001	NS	Trend	<.001	Trend
Spouse	Trend	NS	Trend	.003	NS	.003

Abbreviations: NS, not significant; ops, operations.

^aP values were significant at $P < .01$; trend, $.01 \leq P \leq .05$.

Table 8. Residency Graduate Perceptions of Their Education

Variable	Summed Value Important, %			Scaled Mean Score (1-4)		
	Mastery	More Ops	Gap	Mastery	More Ops	Gap
Women	99	57	23	3.76	2.61	1.72
Men	97	60	25	3.69	2.65	1.77
University	98	60	24	3.73	2.69	1.75
Independent	98	57	24	3.68	2.52	1.76
Small	98	57	23	3.66	2.53	1.70
Medium	97	61	22	3.73	2.70	1.73
Large	96	58	28	3.71	2.62	1.85
All	98	59	24	3.71	2.64	1.76

Abbreviation: ops, operations.

gery, pediatric surgery, and surgical oncology. Potential effects of prestige, income, and mentors were inferred.¹ A single-institution, retrospective survey of residency graduates identified intellectual appeal, clinical opportunities, and mentors as factors in fellowship decisions, regardless of gender. Women were less likely to undertake fellowships and more often considered lifestyle.¹⁰ In a national, prospective investigation of resident attrition conducted in 2008, 55% of respondents spread across all general surgery PGY levels perceived a need for fellowship training to be successful and 64% agreed that additional training was required to be competitive in the job market. Fellowship completion was associated with higher income by 78% and with a better lifestyle by 63%.¹⁶ Internal medicine residents also opt for subspecialization, with fellowship rates burgeoning from 46% in 1998 to 73% in 2003.¹⁷ A 2-institution, prospective, longitudinal study found that US medical graduate status, higher self-reported medical school class rank, lower indebtedness, and higher income expectations predicted fellowship pursuit after core internal medicine residency completion. Leisure time availability, workload demands, and stress were valued similarly by generalists and subspecialists.¹⁸

Our study is the only national, prospective investigation designed to measure the importance of factors used by graduating general surgery residents in making fellowship choices. Our survey items incorporated nearly all of the previously hypothesized motivating factors. We found that the most influential factor was the ability to master an area of clinical practice, chosen as important by 98% of the 756 residents committed to entering fellowships in 2008. Nearly as powerful was the nature of the conditions treated and the technical challenge, rated highly by 91%. The influence of mentors was substantial though less strong at 75%, and was essentially equaled by the marketplace force of enhanced attractiveness to future practice partners at 74%. On a relative rank order basis, lifestyle considerations achieved only midrange importance, as did future income. Reduced risk of malpractice suits was rated as least important (Table 5). Ratings potentially reflecting the adequacy of residency education varied widely (Table 8).

Our study also addresses the effect of gender on fellowship decisions. Women are asymmetrically distributed across residency programs (Table 2) but women who seek fellowships are dispersed similarly to men (Table 4).

Two studies of medical student preferences suggest that lifestyle considerations are similarly important to both genders,^{4,6} and 2 studies of concerns of resident, fellow, and new graduate surgeons show considerable gender consonance.^{8,9} While lifestyle considerations are generally believed to be more important to women, male US medical graduates actually have moved more rapidly to “controllable lifestyle” specialties.¹⁹ Our study confirms that the lifestyle goals of female and male residents are converging; only 1 lifestyle factor varied significantly with gender. Notably, the relative rank of the highest-rated lifestyle factor for both genders was fifth out of 12. Women and men agreed on the 2 most important factors overall, the ability to master an area of clinical practice and nature of conditions treated/technical challenge, as well as the least important reduced risk of malpractice suits (Table 5). Of all of our survey items, only increased lifetime earning potential and influence of spouse or significant other were significantly associated with gender, both being valued more highly by men (Table 7). This difference may reflect the likelihood that a female surgeon’s spouse is more likely to be employed or the reduced earnings anticipated by women planning time off for childbearing and parenting. The impact of spouse or significant other may be underestimated because we did not collect marital status information from survey respondents.

We also examined the relationships of residency type and size on fellowship decision making (Table 7). Independent program type related strongly to balance between office and hospital practice, perhaps reflecting more exposure to community surgeon practice patterns. Residency size correlated significantly with increased time for family and personal activities, being valued highest at medium-sized programs. This result is without obvious explanation. Scaled mean scores but not summed values were significantly related to program size for influence of mentors or role models (medium > large > small), the nature of conditions treated/technical challenge (large and medium > small), and the influence of spouse/significant other (medium > small > large). Mentor availability and accessibility may be optimally balanced at medium-sized programs. The linkage between fellowship specialty content and small program size is unclear. A relationship between program size and spousal influence is puzzling but not fully interpretable without marital status data. The multiple relationships between program size and fellowship decision-making factors are consistent with the overall significant linkage between program size and fellowship rates (Table 3).

Some survey items potentially relate to chief resident perceptions of their residency experiences. Ratings of these factors vary considerably both by summed values and scaled mean scores (Table 8). It is unclear whether graduating residents either should perceive themselves as expert or should be expected by others to have mastered general surgery. Nevertheless, trainee desire for mastery of a well-defined clinical area is strong and is unlikely to be achieved over the broad field of general surgery. Valuing mastery could represent a wish for professional certainty, consistent with a lesser tolerance for ambiguity found in medical students who choose non–primary care specialties. Ambiguity intolerance, however, did not discriminate between

generalist and specialist internal medicine residents.¹⁸ It is potentially concerning that 59% of future fellows sought more operative experience, particularly if this finding maps more to fellowships in general surgery subspecialties such as breast rather than distinctly separate fields leading to second board certifications such as cardiothoracic. We plan to address this question in future study.

Strengths of our study are its prospective nature, extremely high response rates, limited survey administration period, and survey timing that maximizes accuracy of fellowship commitment data while minimizing recall bias of decision-making factors. Concurrent validity of our fellowship rate data are provided by comparison to similar results from the 2005 ABS In-Training Examination.¹ Potential weaknesses are survey brevity and potential failure to include other relevant factors. Our survey items did span nearly all of the previously imputed factors in fellowship decision-making. The summed value analysis may be too blunt and the scaled mean score analysis too sensitive as tools for detecting decision-making effects. Both approaches, however, have been used regularly by others for assessing medical student residency selections. We compared multiple survey factors across multiple residency variables, perhaps increasing the risk of detecting chance associations. To limit irrelevant, chance associations we set our significance level at $<.01$ and labeled $0.1 < P < .05$ merely trends. Data interpretation about the influence of spouse/significant other is limited because we relied on demographic data collected by the ABS that does not include marital status.

In summary, we asked all 2008 finishing chief residents who applied for admission to the ABS QE about their fellowship commitments, and we asked all future fellows to rate 12 potential factors for importance in their decisions for additional training. We compared fellowship rates by gender and residency variables, and we assessed each potential factor for the effect of gender and residency variables using 2 analytic approaches. Key findings are that ability to master an area of clinical practice and the nature of conditions treated/technical challenge dominate fellowship selection processes for women and men and far exceeded the importance given to lifestyle related factors. Gender significantly correlated only with increased lifetime earning potential, income being more highly valued by men. Residency program size appeared to exert a greater effect than gender. We conclude that motivations for pursuing fellowships after general surgery residencies largely are gender neutral. Residency characteristics are as influential as gender. Lifestyle considerations are secondary to mastery of a clinical content area and to the clinical activities of the specialty.

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DISCUSSION

Shirin Towfigh, MD, Los Angeles, California: Drs Borman and Rhodes, with the participation of the American Board of Surgery, have performed gender-based research and, as with much good research, more questions are raised than are answered. The conclusion of the research is represented in the title, that motivations to pursue fellowships are gender neutral. But why are they gender neutral? Is that a good thing? I have a couple of thoughts of my own, which I will share with you, and I'd like to know the author's responses to them.

First, I found it interesting that women were more likely to come from large, university-based programs in the West. Having graduated from a university-based program in the West, I am curious why this trend has been found. Are these programs more likely to attract female candidates? Studies have shown that medical students are more likely to choose surgery if they are exposed to a positive female surgical role model. Do you know whether there are more prominent female surgeon faculty in the West that can serve as mentors, thus making these programs more attractive to female applicants?

Second, we know that as compared to men, women with families devote a greater amount of their daily effort tending to family activities, and this has been shown to be true of women surgeons as well. Also, though the trend is improving, female surgeons are less likely to be married and less likely to have children than male surgeons. In my own study from 2006, which included a sample of residents and practicing surgeons in Southern California, male surgeons were 3 times more likely to be married than female surgeons, and most males had 1 or 2 children, whereas over 80% of female surgeons had no children. With this in mind, I'd like to tackle one of the results in Dr Borman's study. You showed that males were significantly more likely to claim spousal influence as a determinant of their choice to pursue a fellowship. My question is, how much of this response is based on the possibility that the male chief residents are more likely to have a spouse or significant other as compared to their female counterparts, who are more likely to be single? Are the female surgeons' choices of pursuing a specialty fellowship determined less by spousal influence simply because they don't have a spouse? And for those who do have a spouse, is it possible that since they are likely not the only income-earner in the family, that they therefore have the luxury of independently choosing to pursue a specialty fellowship without significant influence from their spouse?

Finally, I would like to applaud Dr Borman for sharing with us the modern data regarding the role of gender in career decision-making in surgery. Over the past several decades, the results of gender-based studies in surgery have been conflicting. What has been consistent is that with time, we have noticed a convergence of values between male and female surgeons. Whereas it may have been true in the past that women surgeons were more likely to work part-time, take time off to raise children, or to choose specialties that require less call, this is no longer a gender-based trend. Older studies had shown that female surgery residents were 4 times more likely to drop out of residency than males, and that their reason for dropping out was more likely to be due to lifestyle choice. Modern studies such as that presented by Dr Rebekah Naylor at the Western Surgical Association meeting 2 years ago, showed that female gender was not an independent risk factor for attrition in surgical residency. I am not claiming that the females are becoming manlier or the males are becoming more feminine, but rather that this generation as a whole, Generation Y, places more importance on lifestyle. Chief residents today choose a fellowship because, among other things, they do not want a general surgery lifestyle. Thus, I am curious to know the authors' thoughts about what some of my male colleagues have termed the "relative feminization" of general surgery residency.

Dr Borman: Answering the question about women from university programs in the West, one could speculate that there was a spirit more open to gender equality earlier in the western part of the country than some other areas. However, I personally favor the mentor hypothesis that you offered. I was disappointed when mentor did not come out on top in our study. I did try to get the AAMC (Association of American Medical Colleges) faculty gender data by medical school with a plan to try to correlate women surgical faculty availability with distribution of women residents. Unfortunately I could not obtain the data, so I cannot comment objectively. I subjectively do believe that, as women

surgical faculty diffuse out into different parts of the country and different subspecialties of surgery, mentor availability will become less of an issue.

Second, to address your question about the relative roles of men and women in marital and family relationships, we did not add any demographic questions to what the Board already collects so we did not ask marital status or about children. It seemed a bit intrusive to add questions about marital status and/or significant others as part of an application to take a Board certification exam, and so we didn't ask that. Dick Bell's study does ask that information of all residents; I don't have that data. I do believe that the possibility of being a second income earner in a family probably does, as you say, give an individual some

freedom to pursue what you love. I note that Dick Bell did show earlier that the attrition rate now for women residents is only about 1½ times that of male residents, as opposed to the previously reported 4 times difference. In terms of the convergence of men and women into Gen-X and Gen-Y concepts about lifestyle, I couldn't agree with you more. I think what we are seeing now is much more a generational effect than a gender effect. I would only point out that lifestyle was rated in the middle third and intellect still predominated for both genders in our study as fellowship motivators, and to me that was an important finding because lifestyle is imputed by many to be the number 1 driver of fellowship plans.

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