Academic Couples: Implications for Medical School Faculty Recruitment and Retention

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BACKGROUND: Academic couples constitute 36% of the US professoriate. Universities are in the midst of a major transition in hiring practices to support these and other faculty with working partners. However, less is known about academic couples among medical school faculty and surgical specialties specifically. This study was designed to address this gap.

STUDY DESIGN: In 2006–2007, the Michelle R Clayman Institute for Gender Research at Stanford University designed and administered the "Managing Academic Careers Survey" to nearly 30,000 full-time faculty across all academic fields at leading research universities nationwide. This study included 2,475 medical school faculty survey respondents at 12 participating institutions. Main outcomes measures were academic partner status; number of journal articles/chapters during career; and applications to other academic position(s) in last 5 years.

RESULTS: A total of 73.3% of medical school faculty respondents were in dual-career partnerships (where both partners actively pursue employment) and 32.2% had an academic partner. Sixty-nine percent of academic partners were also in medical schools. Women faculty were more likely than men to have an academic partner. Among surgery faculty, 40% of women had an academic partner, as compared with 29.3% of men. In fully adjusted regression models, faculty with academic partners had higher publication counts than other faculty, and had higher odds of applying to other academic positions.

CONCLUSIONS: Academic couples constitute one-third of all medical school faculty. They represent a productive and potentially mobile component of the medical faculty workforce. Because women had a higher rate of academic partnering, dual-career academic hiring policies are especially important for recruitment and retention of female faculty in surgical specialties. (J Am Coll Surg 2011; 212:310–319. © 2011 by the American College of Surgeons)

In 1993, Robert and Suzanne Fletcher, then editors of *Annals of Internal Medicine*, announced "here come the couples," referring to the increasing numbers of two-physician marriages (physicians marrying other physicians) as more women entered the workforce.[1] The implications for the profession were uncertain at the time, but the authors warned that the effects could be "powerful"—perhaps less noticeable than the impact of new technologies and health care reform, but no less important.

A decade and a half later, couples have indeed arrived. Dual-career academic couples, in which both partners are academics, now constitute 36% of the US professoriate—representing a deep pool of talent. Seventy-two percent of US professors overall have employed partners whose careers need to be taken into consideration when recruiting.[2] These new patterns signal one of the largest shifts in the US academic workforce since equal opportunity legislation more than 40 years ago.

Like their peers in the arts and sciences, business, and law, medical schools and surgery departments are in the process of developing new hiring practices to respond to this shift and attract top talent.[3] Couple hiring, or "dual-career academic hiring," where both academic partners are hired as part of a negotiation, is one such practice. In the United States, dual-career academic hiring has increased from 3% in the 1970s to 13% since 2000. Ten percent of all faculty are "dual hires."[2] Although the majority of US uni-

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versities consider couple hiring to be important, only 24% report having the infrastructure for these types of hires.[4]

Data on coupling in medical schools are still relatively sparse. In a 1998−1999 study of 317 academic surgeons, the majority of married women surgeons were in dual-career partnerships, and 28% were partnered with another surgeon; dual-career partnership rates were lower among men.[5] Similarly, Sobecks and colleagues[6] found that 44% of women physicians in their sample were married to other physicians, versus 22% of their male peers, but their research was not specific to medical school faculty and does not show the impact of these trends on recruitment and retention policies at the departmental or institutional level. This study was designed to build on previous literature and address these gaps. We drew from faculty data at 12 leading US medical schools to examine partnering within the profession and the implications for both faculty careers and institutional practice. We examined trends among all medical school faculty, and those among surgeons specifically—a specialty with exceptionally low numbers of women, but high rates of academic coupling among the few who are there. We considered how couple hiring can advance surgery departments' strategic plans, as well as those of medical institutions as a whole. We close with recommendations for medical faculty hiring practices that are also relevant to other large health care−providing organizations.

METHODS

Design

In 2006−2007, the Michelle R Clayman Institute for Gender Research at Stanford University designed and administered the "Managing Academic Careers Survey" online to nearly 30,000 full-time faculty at 13 leading research universities in the United States. Participating institutions were geographically diverse and included 5 private and 8 public institutions (institutions were assured of anonymity as part of their participation). The survey was piloted during several months with Stanford faculty and included a wide range of questions about academic and family life (eg, demographics, partner employment status, career mobility, scholarly productivity, and, for academic couples, dual-hiring experiences). A total of 9,043 faculty responded to the survey, constituting a 30.4% response rate. See Schiebinger and colleagues[2] for additional details about sampling design and survey administration.

Sample characteristics

This study included 2,475 medical school faculty survey respondents at 12 of 13 participating institutions (1 institution did not have a medical school). "Medical school respondents" were those who marked on the survey that their primary appointment was in the "school of medicine"; and that their rank was "medical school faculty". Nearly 30% (29.2%) were endowed or full professors, 23.8% were associate professors, and 30.9% were assistant professors (remaining faculty were distributed across other ranks and positions, including 11.35% who marked "medical school faculty"). Women constituted 43.5% of respondents (women, n = 1,077; men, n = 1,397) (1 respondent did not mark their "sex" on the survey).

Response rate at the majority of these 12 medical schools was consistent with the response rate for the overall study (~30%) (a small number of institutions did not provide department affiliation of their full-time faculty members, meaning we cannot calculate a school-by-school or department-by-department rate of response at these campuses). We compared the gender ratio and rank distribution of our medical school respondents with those characteristics among medical faculty nationally to determine the broad representativeness of the sample. Data indicate that women and full professors were over-represented and assistant professors were under-represented.[7] Methods of analysis to address these patterns are described here later. Notably, women constituted a greater proportion of assistant and associate professors as compared with full professors in our sample, and men were more likely than women to hold senior-ranking positions—this is consistent with national trends.[7]

Statistical analysis

Several descriptive analyses were conducted to draw a portrait of medical school faculty with academic partners. Table 1 summarizes demographic and partner data for all medical school respondents and Table 2 summarizes medical faculty with academic partners and compares them with all other medical faculty on select career characteristics stratified by gender and rank. To account for patterns of over- and under-representation in our sample and minimize the possibility of biased aggregate estimates, we disaggregated our descriptive estimates by gender among all faculty (all ranks and positions) and by "ladder rank" (assistant, associate, and full professor). We then tested for the statistical significance of gender differences at each rank. Reporting descriptive estimates for women and men separately serves the additional purpose of helping us to address our research objectives, given that previous literature suggest gender differences in partnering patterns.

Means were compared using independent sample *t*-tests. Mann-Whitney U tests were used for non-normal continuous data. Pearson's chi-square was used for contingency tables (when expected frequencies were <5 for any cell, 2-tailed Fisher's exact test was used). We note that select

Table 1. Medical Faculty Characteristics by Rank and Gender (n = 2,475 Medical School Faculty; Survey 2006–2007)

	All faculty*			Assistant professors			Associate professors			Full professors		
	Men (n = 1,397)	Women (n = 1,077)	p Value†	Men (n = 379)	Women (n = 383)	p Value	Men (n = 322)	Women (n = 265)	p Value	Men (n = 524)	Women (n = 194)	p Value
Age (y), mean (SD)	49.9 (9.8)	47.2 (9.0)	<0.001	41.1 (6.4)	41.7 (6.6)	0.24	48.3 (6.4)	49.6 (6.6)	0.01	57.5 (6.9)	56.8 (6.3)	0.20
Years since degree, mean (SD)	21.3 (10.8)	16.8 (9.1)	<0.001	11.5 (6.3)	10.9 (5.7)	0.18	19.3 (6.8)	18.6 (6.4)	0.19	30.0 (8.0)	27.6 (7.0)	<0.001
Under-represented racial/ethnic minority, %	3.4	7.1	<0.001	4.2	7.8	0.04	3.4	6.4	0.09	2.1	7.2	0.001
Subfield/department, %			<0.001			0.15			<0.001			0.07
Basic sciences	9.3	6.9		8.3	5.7		9.7	5.4		10.5	11.2	
Clinical sciences	79.5	74.5		81.4	80.2		78.5	70.7		77.1	69.4	
Other	11.2	18.6		10.2	14.1		11.7	24.0		12.3	19.4	
Partner status, %‡			<0.001			<0.001			<0.001			
Single	6.6	18.5		9.3	15.9		6.5	14.7		5.0	22.3	
Stay-at-home partner	22.5	5.1		19.1	3.9		23.7	7.9		25.3	5.2	
Employed (nonacademic) partner	41.3	40.7		43.4	46.2		41.4	38.5		39.8	35.2	
Academic partner	29.6	35.6		28.2	33.9		28.3	38.9		29.9	37.3	<0.001

Means are compared using independent sample *t*-tests.

*Includes all ranks and positions (other, assistant professor, associate professor, full professor).

†p Values refer to the significance of the gender difference among all faculty, assistant professors, associate professors, and full professors.

‡Stay-at-home partners are those who are currently not employed in the paid workforce. Employed (nonacademic) partners are those who are currently employed in the paid workforce and who are not academics. Academic partners are those for whom the faculty respondent marked "My partner is an academic." Dual-career partnerships include faculty who have employed (nonacademic) partners and academic partners.

Table 2. Characteristics of Medical Faculty in Academic Partnerships and Other Partner Categories, by Rank and Gender

	All faculty			Assistant professors			Associate professors			Full professors		
	Men (n = 410)	Women (n = 383)	p Value	Men (n = 106)	Women (n = 130)	p Value	Men (n = 91)	Women (n = 103)	p Value	Men (n = 155)	Women (n = 72)	p Value
Top quartile of grants awarded,* %												
Faculty in other partner categories	30.7	20.8	<0.001	23.2	21.8	0.71	30.0	27.1	0.56	22.3	25.4	0.48
Faculty with academic partners	30.6	23.8	0.04	33.3	33.1	0.97	22.5	24.5	0.75	28.5	32.9	0.51
Applied for other academic positions in last 5 y, %												
Faculty in other partner categories	32.1	29.5	0.27	34.8	32.8	0.63	33.5	26.1	0.12	30.8	22.0	0.07
Faculty with academic partners	40.8	33.8	0.04	37.7	36.9	0.90	46.7	34.0	0.07	40.0	23.6	0.02
Published articles during career												
Faculty in other partner categories, mean (SD)	61.4 (75.3)	31.5 (40.9)	<0.001	19.8 (23.8)	13.9 (12.6)	0.003	40.1 (30.9)	32.5 (27.7)	0.007	107.5 (87.8)	81.8 (60.9)	0.002
Median	40.0	19.0		14.0	11.0		36.0	29.0		85.0	64.0	
Faculty with academic partners, mean (SD)	68.7 (79.0)	40.8 (56.3)	<0.001	20.4 (15.2)	17.5 (12.3)	0.22	53.9 (83.9)	36.61 (25.2)	0.02	121.2 (83.1)	104.1 (96.6)	0.02
Median	45.0	25.0		18.0	15.0		41.0	35.0		100.0	78.0	

Total number of faculty with academic partners (across all ranks/positions) = 793. Total number of faculty in other partner categories (across all ranks/positions) = 1,668.
Mann-Whitney nonparametric tests are used to analyze gender differences in total publication count due to its skewed distribution.
*Quartiles are customized for each rank when analyses are split by rank (ie, top quartile for assistant professors is calculated using the distribution of grant awards for assistant professors only).

Table 3. Regression Results: Coefficients for "Have Academic Partner" in Unadjusted and Fully Adjusted Models of Productivity

	b	SE	CI: Low	CI: High	p Value
Unadjusted model					
Have academic partner	0.20	0.06	0.08	0.32	0.001
Constant	3.21	0.03	3.14	3.28	<0.001
Adjusted model					
Have academic partner	0.18	0.05	0.09	0.28	<0.001
Constant	2.08	0.10	1.88	2.27	<0.001
Adjusted R^2 for fully adjusted model	0.41				

Natural log; listwise n = 2,032; ordinary least squares regression.
Covariates in adjusted model: Gender: woman; years since degree; subfield: basic science (reference group = clinical science); subfield: other science (reference group = clinical science); under-represented racial/ethnic minority; top quartile of grants awarded; h/wk working: 51+; salary; rank: assistant professor (reference group = nonladder-rank faculty); rank: associate professor (reference group = nonladder-rank faculty); rank: full professor (reference group = nonladder-rank faculty).

estimates and statistical tests for these estimates are not presented in Tables 1 or 2 (eg, percentages among faculty with academic partners versus all other faculty, men and women in the aggregate); in these instances, estimates and p values are provided in text. Because our survey collected information on medical specialty, we were able to pull out data for surgery faculty specifically to show how major trends in the data play out in this specialist group.

Regression analyses were conducted to examine the relationship between having an academic partner and 2 key career outcomes holding other faculty characteristics constant. The first of the outcomes was productivity, which is defined as the (self-reported) total number of published journal articles and chapters in edited volumes during one's career (hereafter simply "articles" or "publication count") (Table 3). For the purpose of regression, we log-transformed total publication count (using the natural log) because of its skewed distribution. We then used ordinary least squares regression techniques to address the following questions: Among faculty with comparable career characteristics, are those with academic partners more or less productive than other faculty? Does the relationship between productivity and having an academic partner depend on gender and rank? We recognize the limitations to a singular measure of productivity, but also maintain that this is an appropriate measure for full-time medical faculty at highly selective US research universities.

The second of the key career outcomes was faculty response to the survey question "In the last 5 years, have you applied for other academic positions?" (Table 4). Applying for outside positions is one measure of how likely an institution is to lose this faculty member. This is a binary variable, coded 0 = no, 1 = yes. Here we used logistic regression techniques to address the following questions: Among faculty with comparable career characteristics, are the odds of applying for other positions higher or lower among faculty with academic partners? Do these odds depend on gender and rank?

Having an academic partner was coded as 0 = no, 1 = yes, ie, faculty with academic partners were compared with all other medical faculty across all other partner categories. Our explanatory variables included gender; years since degree; subfield: basic science and subfield: other science (reference category was clinical science); under-represented racial/ethnic minority (URM) status; top quartile of total grant dollars awarded; hours worked per week: 51+; salary; rank: assistant professor, rank: associate professor, and rank: full professor (reference category was nonladder-rank faculty); and for the analysis of applying to other positions, productivity, ie, total number of published articles (natural log).

For both regression analyses, the coefficient for having an academic partner was examined in an unadjusted model and a fully adjusted model (ie, controlling for all covariates). A series of 2- and 3-way interactions between having

Table 4. Regression Results: Coefficients for "Have Academic Partner" in Unadjusted and Fully Adjusted Models Applying to New Positions

	Odds ratio	SE	CI: Low	CI: High	p Value
Unadjusted model					
Have academic partner	1.36	0.10	1.12	1.65	0.002
Constant	0.45	0.06			<0.001
Adjusted model					
Have academic partner	1.38	0.10	1.13	1.70	0.002
Constant	0.54	0.24			0.009
−2 Log likelihood	2447.08				
p Value of Hosmer and Lemeshow test	0.71				

Listwise n = 2,021; logistic regression.
Results of fully adjusted models are available from the first author on request. In general, b coefficients summarize the relationship between the independent variable and the dependent variable as follows: the average change in the dependent variable for every unit increase in the independent variable (holding other variables in the model constant). When the dependent measure is natural-logged, as in the model in Table 3, "b", when multiplied by 100, can be interpreted the percentage change in the dependent variable with a 1-U increase in the independent variable. In logistic regression, b coefficients represent the change in the log odds of the dependent variable for every unit increase in the independent variable. Table 4 presents odds ratios or exp (b).
Covariates in adjusted model: gender: woman; years since degree; subfield: basic science (reference group = clinical science); subfield: other science (reference group = clinical science); under-represented racial/ethnic minority; top quartile of grants awarded; h/wk working: 51+; salary; rank: assistant professor (reference group = nonladder-rank faculty); rank: associate professor (reference group = nonladder-rank faculty); rank: full professor (reference group = nonladder-rank faculty); total number of published articles (natural log).

an academic partner, gender, and rank were subsequently tested, holding all variables constant. For all data, findings that reached statistical significance at $p < 0.05$ were considered significant. We emphasized the magnitude and direction of differences in addition to significance. Statistical analysis was performed using SPSS version 17.0.

RESULTS

Medical school faculty demographics and partnering patterns

Table 1 describes all medical school faculty respondents. The majority of faculty across all ranks and positions were located in clinical academic tracks. Women were more likely than men to come from URM backgrounds (African American/Black, Latino/a, and Native American/Alaskan), particularly at senior ranks.

Partnering patterns among medical school respondents indicate that the majority (73.3%) of faculty are in dual-career partnerships, representing a major shift in the academic medical workforce in recent decades. This breaks down to 41.1% with an employed (but nonacademic) partner, 32.2% with an academic partner, 14.9% with a stay-at-home partner, and 11.8% who are currently single. Importantly, men and women medical faculty had different partnering patterns (Table 1): women were more likely to be single than men (18.5% versus 6.6%); by contrast, many more men than women had stay-at-home partners (22.5% versus 5.1%). Similar proportions of women and men had employed (nonacademic) partners. Women faculty were more likely than men to have academic partners (35.6% versus 29.6%). In surgery, the difference was even wider (but did not reach statistical significance, $p = .31$): 40% of the women surgeons in our sample ($n = 25$) had an academic partner as compared with 29.3% of male surgeons ($n = 82$).

These partnering patterns generally hold by rank. Men were more likely to have stay-at-home partners and women were more likely to be single among assistant, associate, and full professors in medical schools (Table 1). Proportionately more women than men had academic partners at each rank, but the difference was smallest among assistant professors—the newest generation of medical faculty (and the rank at which women and men were equally represented).

Partnering patterns can vary between URMs ($n = 124$) and non-URMs, particularly in the single and stay-at-home categories (19.5% of URMs are single versus 11.4% of non-URMs; 8.1% of URMs have stay-at-home partners, versus 15.2% of non-URMs; chi-square $p = 0.01$). Respondents in same-sex partnerships constitute 6.0% ($n = 130$) of all partnered respondents (the survey did not ask single respondents about their sexual orientation). Partner's employment/academic status did not differ by same-sex status.

Academic Couples: Career Characteristics

At 32.2%, faculty with academic partners constitute a large segment of the medical school faculty workforce. How do these faculty compare with other medical faculty (faculty without academic partners) on key career measures, eg, grants, publications, and applying to new jobs? Descriptive analyses of these measures by gender and rank are summarized in Table 2. We noted at the outset that there were no differences between faculty with academic partners and other faculty in terms of rank.

Medical faculty with academic partners fell into the "top quartile" of grant dollars at the same rate as other faculty. Notably, however, women assistant professors with academic partners were more likely to have achieved "top quartile status" than other women assistant professors (chi-square $p = 0.02$; see estimates in Table 2). We also noted that salary ranges were similar for faculty with academic partners and other faculty (data not shown in Table 2). They worked the same hours per week (63.1% and 64.6%, respectively, work 51+ hours).

Productivity

Medical faculty with academic partners have published significantly more articles than have other medical faculty (mean 55.2, SD 70.4, median 32 versus mean 48.9, SD 65.1, median 28; Mann-Whitney U test $p = 0.001$). This holds for both women and men ($p < 0.001$ and $p = 0.02$, respectively; see estimates in "all faculty" columns in Table 2).

We conducted an ordinary least squares regression analysis to explore the relationship between having an academic partner and total number of articles published (natural log) after controlling for career and background measures. In the fully adjusted model (see Table 3), having an academic partner was a positive and significant predictor of productivity; that is, even among faculty with comparable career characteristics and similar positions, the average published article count among faculty with academic partners was 18% higher than among their peers ($b = .18$; 95% CI, $.09-.28$; $p < 0.001$).

In an ancillary analysis, we explored differences in total publications by specific partner type (eg, academic partner, employed but nonacademic partner). In a regression controlling only for partner type (using our largest group, faculty with employed, nonacademic partners, as the reference group), "academic partner" and "stay-at-home partner" were both positive predictors of publication count (and "single" was not significant, meaning that single faculty do not publish considerably more or less than do faculty with

employed, nonacademic partners). However, "stay-at-home partner" was reduced to nonsignificance once other variables were controlled (using the same set of covariates for models in Table 3; b = .13, p = 0.06), although "academic partner" remained significant (b = .22, p < 0.001). Unlike other partner categories, being in an academic partnership had a unique and positive relationship with total number of published articles, even after controlling for other key factors that might explain higher or lower levels of productivity.

Two- and three-way interaction terms showed that this relationship was independent of gender and/or rank, much as the descriptive data in Table 2 suggest. (Small sample sizes for some of our 3-way gender*rank*academic partner groups [<100] should be kept in mind when interpreting the results of our analyses.)

Applying to new positions

Faculty with academic partners were also more likely to have applied for other academic positions in the past 5 years than were other faculty (37.4% versus 31.1%, chi-square p = 0.002). The difference was greater among men than women (chi-square p = 0.002 and p = 0.15, respectively; see estimates in Table 2).

Table 4 summarizes the results of the logistic regression analysis to examine the relationship between having an academic partner and the odds of applying for other academic positions after controlling for career and background characteristics. As the fully adjusted model shows, having an academic partner increased the odds of applying by nearly 40% (odds ratio [OR] = 1.38, 95% CI, 1.13−1.70; p = 0.002). Two- and three-way interactions again indicate that, controlling for other explanatory variables, this relationship was independent of gender and rank.

Although other results of the full model do not directly bear on the objectives of this study, we note one finding of relevance for discussion of hiring practice: although men and women assistant professors had the same odds of applying for other positions, gender differences in odds of applying emerged at senior ranks. Women associate professors had a 24% lower odds of applying to new positions than do men associate professors, and women full professors had a 43% lower odds of applying than do men full professors (gender b = .46; 95% OR CI, .93−2.69; p = 0.09; gender*associate professor b = −.74; 95% OR CI, .25−.91; p = 0.03; gender*full professor b = −1.02; 95% OR CI, .19−.70; p = 0.003).

Academic couples' departmental location and hiring histories

We examined additional survey data on academic couples' fields and hiring histories to explore factors that might inform their career choices and decisions. First, the majority of couples were both medical school faculty (69%), and a little more than one-quarter were in the same department. The rate of partnering with another medical school faculty member was even higher among surgeons in academic partnerships (82.6%), but the rate of coupling in the same department (2 surgeons partnered together) was lower (13%) (see Schiebinger and colleagues[2] for within-department coupling rates in >80 academic departments).

Nineteen percent of academic couples had been dual-hired to their current institution. As a proportion of all 2,475 medical faculty, these dual-career academic hires constituted 6.1%. The rate of dual-hiring among URMs in medical schools was not statistically different from the rate of dual-hiring among non-URMs in medical schools. Rates of dual hiring also did not differ by same-sex status.

Women were more likely than men to be employed at their current institutions as part of a dual-hire, especially at senior ranks (13.4% of women versus 6.3% of men at the full professor level; chi-square p = 0.002). However, in this sample, 27 women were first hires (ie, the partner first to the deal who negotiates for the second partner) versus 48 men. By contrast, 40 women were second hires, compared with only 4 men. A total of 32 faculty were "joint hires," where both partners in a couple were recruited together; men and women respondents were equally likely to fall into this joint hire category.

Among faculty with academic partners who applied to a new position in the last 5 years and then refused the offer, gender differences emerged for 2 reasons (a total of 11 were listed on the survey): "partner was not offered a satisfactory position in the area" (35.5% of women versus 18.8% of men; chi-square p = 0.01) and "offer was not attractive due to research support" (31.6% of women versus 17.8% of men; chi-square p = 0.03). These differences were contingent on rank—39.3% of male assistant professors with academic partners (and 22.6% of women in this new generation) refused a position because their partner was not offered a satisfactory position.

DISCUSSION

These data bring to light 3 important sets of findings: the number of academic couples among medical faculty, the career characteristics of these couples, and the implications of academic coupling for both women's advancement in medical schools, especially in surgery, and hiring policies as a whole. Each set of findings will be discussed.

Faculty with academic partners constitute fully one-third of all medical faculty. Both partners tend to be in clinical departments; surgeons have a particularly high rate of coupling with other medical school faculty members.

Clearly, academic couples are prevalent in the medical school workforce, as they are across all academic fields (eg, among women scientists with academic partners, 83% are partnered with another scientist[2]). These numbers point to the importance of dual-career academic hiring for faculty recruitment and retention.

Medical school faculty with academic partners are also prolific scholars who are on the move. Academic partners share intellectual interests and discuss their work with each other[2,8,9]; fully 58% of academic couples across all fields share mentors and contacts, versus a quarter or less of other partnered faculty.[2] These shared networks can contribute to the increased productivity of women and men in academic partnerships. Overall, women faculty had lower average article counts than did men faculty (although differences were narrow at junior ranks), which stands in contrast to their commensurate grant records (Table 2); a large body of sociological work examines career factors and related mechanisms that explain differences in women's and men's number of journal publications.[10,11]

The greater propensity of dual-career couples to seek new positions might reflect the difficulty of finding 2 competitive academic jobs rather than 1 (see Costa and Kahn[12] for broader discussion of dual-career mobility). Academic couples must be savvy and adaptable to make their careers work. However, our findings also suggest that women overall might be less likely than men to seek out new positions at senior ranks; one factor that might help to explain this finding is that women more than men place equal value on both partners' careers, regardless of whether a partner is an academic or nonacademic, and that women full professors are particularly likely to emphasize career equality in partnerships.[2]

Finally, women were more likely to have an academic partner than men, with even wider gender gaps emerging in surgical specialties, where women have long been underrepresented.[13] And there was some variation by rank; although rates of academic partnering were comparable among new-generation women and men who are currently at the assistant professor level, the gender gap widens at senior ranks—almost 40% of women associate and full professors were partnered with another academic (versus 30% of men). Interestingly, we note another key difference "within gender": women assistant professors with academic partners were more likely than were other women assistant professors to be in the top quartile of total grant dollars awarded to all assistant professors in medical schools.

These data suggest that academic couples have not simply arrived—they constitute a substantial segment of the workforce, with direct consequences for departments' strategic plans. For example, 40% of women surgeons in this survey sample were partnered with another academic, many of whom were medical school faculty members, if not surgeons themselves (see also Schroen and colleagues[5]). This means that building up a strong and diverse surgery faculty base—tapping into the pool of women surgeons—will require clear policies and practices surrounding couple hiring.

In addition, medical faculty with academic partners had strong publication records and applied to new positions more often than other faculty, and refused new positions if partners were not accommodated. In response, medical schools need to develop a working infrastructure for couple hiring and retention to anchor top talent to their institutions. Although often expensive up front, addressing the challenges of dual careers helps universities avoid steep turnover costs.[14]

Institutionalizing support for dual-career academic couples is not without caveats, however.[2,15] A little more than one-quarter of couples in academic medicine were in the same department. This adds complexity to the dual-hiring process, as budgets and positions are limited.

Fewer women enter a dual hire as the first hire in a couple, despite being more likely to have an academic partner. Why this is so is unclear—it is possible that dynamics within couples and traditional recruitment processes are simultaneously at work.[16] Because our findings show narrower gender differences among the newest generation of medical faculty, it will be important to follow gender ratios of first and second hires over time and consider how dual-hire policies might be refined to help institutions achieve greater gender equality.

Recommendations

Academic couples constitute one-third of all medical faculty and both partners tend to be in medical schools. These faculty represent a productive and potentially mobile component of the medical workforce. Medical schools and surgery departments that strengthen their dual-career policies will achieve a hiring advantage.

How do institutions and departments accomplish this? A critical step is to establish clear practices and policies surrounding academic couple hiring and retention. Dual-career academic hiring is on the rise, increasing from 3% in the 1970s to 13% in the 2000s. More and more universities are developing agreed-on, written protocols or guidelines for the procedures whereby requests for partner hires can flow efficiently through their institution. As a result of our larger study, a number of universities have put such guidelines into effect. Well-developed guidelines increase the transparency and fairness as well as the speed with which departments can vet potential candidates. Like all hiring,

partner hiring must be done with extreme care to ensure the quality of the overall faculty.

The findings from our larger study and the practices at one of our participating universities also suggest that recruiting women and under-represented minorities as first (rather than second) hires can help surgery departments with historically low proportions of diverse faculty to increase their diversity and capitalize on a broader range of talent in the medical pipeline. In looking at academic couples across all fields, it is worth noting that women more than men tend to request positions for partners of equal academic rank.[2]

It is important to remember that "academic partnerships" might be more fluid in academic medicine than in other fields, as partners who also have medical degrees might be able to move between private practice, other larger health care institutions, and clinical academic appointments during the course of their relationships and careers (and depending on the opportunities available to them). That is, dual-hiring is relevant not only to the one-third of medical school faculty in "active" academic partnerships, but also faculty with physician partners who are currently in private practice and who could take clinical appointments as part of a hire package. This is not a small number—a subanalysis of our data (not reported here) showed that among medical faculty partnered with non-academics, men assistant professors were nearly twice as likely as women assistant professors to have a partner with a medical degree (31.1% versus 16.9%; $p = 0.001$). More than one-third of senior-ranking faculty who had nonacademic partners were partnered with a fellow physician.

Our analyses are limited because we cannot study academic coupling's impact on the course of faculty careers and specific measures of departmental competitiveness longitudinally—these are cross-sectional data that allowed us to draw only a current portrait of couples in academic medicine. Our response rate to the study was lower than what large survey projects aim for, although it was consistent with other medical faculty surveys; future research might explore different forms of incentives for faculty respondents to participate in research such as this, to increase both sample size and generalizability. Future research also might study the impact of related measures (eg, regional location of medical schools, possible distinctions between public and private institutions), examine different measures of career productivity and mobility, and use broader sampling frames (eg, surveying part-time and adjunct or consulting faculty). These findings do make clear, however, that support for dual careers opens another avenue by which surgery departments can compete for the brightest and best; such support is essential to meet both emergent and long-standing challenges to academic medicine.[17-19] As one professor of medicine in our study remarked, talented academics are often partnered, and "if you want the most talented, you find innovative ways of going after them."

Author Contributions

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