

The Relationship between Specialty Choice and Gender of U.S. Medical Students, 1990–2003

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Abstract

Purpose

Women have been postulated to be more responsible than men for the recent trend of lifestyle factors influencing the specialty choices of graduating U.S. medical students. The authors looked at the specialty choices of U.S. medical students between 1990 and 2003 to determine whether and to what degree women were responsible for the trends toward controllable lifestyle specialties.

Method

Specialty preference was based on analysis of results from the American Association of Medical Colleges' Medical School Graduation Questionnaire.

Specialty lifestyle (controllable vs. uncontrollable) was classified using a standard definition from prior research. A random effects regression model was used to assess differences between men and women in specialty choice over time and the proportion of variability in specialty preference from 1990 to 2003 explained by women.

Results

Overall, a greater proportion of women planned to pursue uncontrollable specialties compared with men in every year analyzed. Both women and men demonstrated a decreasing interest in uncontrollable lifestyle specialties by almost 20%. However, regression

analysis found that women were more slightly more likely to choose an uncontrollable lifestyle specialty compared to men over time ($p < .01$).

Conclusion

Among U.S. medical graduates, women were not more responsible than were men for the trend away from uncontrollable lifestyle specialties over the time period studied. Men and women expressed similar and significant rates of declining interest in specialties with uncontrollable lifestyles.

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The percentage of women graduating from U.S. medical schools rose from 7.7% in 1964 to 45.1% in 2003. Concurrently, there were dramatic shifts in the career choices of U.S. medical students (USMSs). Interest in primary care careers like internal medicine, pediatrics, and family practice declined dramatically from 1987 to 1993, rose to record high popularity in the mid-1990s, and has been decreasing since. The popularity of controllable lifestyle fields has been inversely related to the popularity of primary care among USMSs.¹ Controllable lifestyle specialties have been defined as those that allow

more personal time free of practice requirements for leisure, family, and avocational pursuits, and control of total weekly hours spent on professional responsibilities.² With the influx of women into medicine has come the concern that women are disproportionately responsible for a growing interest in medical specialties with more manageable lifestyles like radiology, anesthesiology, and dermatology,³ and decreased interest in primary care fields and general surgery, which are perceived to have uncontrollable lifestyles.⁴ Despite the increasing representation of women in medicine, little is known about how the changing gender composition of medical school graduates has affected specialty selection.

Specialty selection has traditionally been believed to be influenced by many factors including intellectual content of the specialty, role models, and altruism. Both men and women have been shown to choose careers based on some common factors like self-fulfillment and positive clerkship experiences, while men place greater emphasis on financial advantages and manual dexterity skills and women on type of patient encountered and patient education.^{5,6} Recent studies have

suggested that the perceived “controllable” lifestyle of a specialty may be the factor that most explains current medical students' preferences.⁷ Dorsey et al.⁷ found that controllable lifestyle explained 55% of the variability in specialty preference from 1996 to 2002 after controlling for income, work hours, and years of graduate medical education required. These priorities are different from those of medical students in the 1980s who indicated that personal factors and lifestyle were the least important influences on their selections.⁸ Although women have traditionally gravitated toward fields like pediatrics and obstetrics–gynecology,⁹ it has been speculated that the attributes of a specialty with a controllable lifestyle are more appealing to women who may be trying to balance family and career responsibilities.¹⁰ In this study, we analyzed the specialty preferences of men and women who were U.S. medical school graduates between 1990 and 2003 to determine if women were more responsible for the recent migration toward specialties with more controllable lifestyles.

Method

We used the Association of American Medical Colleges' (AAMC) Medical

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School Graduation Questionnaire (GQ) to analyze specialty preference from 1990 to 2003 (<http://www.aamc.org/data/gq/allschoolsreports/start.htm>). The GQ has been administered in the spring to all students graduating from medical school since 1978. In this questionnaire, students report their specialty choice or their first three choices if they are undecided about their career. The term “specialty preference” refers to the definite choices of those who said they had definite specialty plans and to the first choices of those who said they were undecided. In this article, we refer to a USMS as a man or woman who finished medical school in the indicated year and completed the AAMC GQ. We excluded GQ respondents who did not answer the specialty choice question from this analysis. We classified specialties as having either a controllable lifestyle (anesthesiology, dermatology, emergency medicine, neurology, ophthalmology, otolaryngology, pathology, psychiatry, and radiology) or uncontrollable lifestyle (family practice, internal medicine, obstetrics–gynecology, orthopedic surgery, pediatrics, general surgery, and urology), as defined by Schwartz et al.² In 1990 and from 1999 to 2003, the AAMC GQ asked respondents to indicate subspecialty as well as specialty preference. From 1991 to 1998, the GQ asked only for specialty preference. For the overall trend analysis, subspecialty preferences were included within specialty preference. We used 1990, 1996, and 2003 as representative years for comparison. Pathology was not listed as a

specialty preference options for all years between 1990 and 2003 and was therefore not included in the analysis of the trends of uncontrollable versus controllable specialties. However, between 1997 and 2003, pathology showed a trend of increased interest similar to that of the other controllable specialties.

We used a random effects regression model to assess for differences in specialty choice by gender over time. We first calculated the difference between men and women for each year, then used a regression model with the year as the independent variable and the difference as a dependent variable, weighted for the number of students each year, using men as the reference (STATA, version 8; StataCorp LP, College Station, Texas).

Results

Overall trends

The percentage of female GQ respondents mirrored very closely the percentage of women graduating from U.S. medical schools each year (see Table 1 and Figure 1). There has been marked variation in specialty preference since 1990. The popularity of specialties with an uncontrollable lifestyle declined in the early 1990s, increased until 1996, and has been decreasing every since (see Table 2). The specialty preferences of women and men have changed at similar rates.

Uncontrollable lifestyle specialties

The declining interest in primary care accounts for the majority of the

downward trend of uncontrollable lifestyle specialties. In 1996, nearly three-quarters of women expressed a preference for internal medicine, family practice, obstetrics–gynecology or pediatrics. By 2003, these specialties interested only 53.0% of graduating women. Interest in obstetrics was more constant than was interest in the other primary care specialties. Of the other uncontrollable specialties, general surgery has attracted a small but relatively consistent pool of women while urology and orthopedics have the interest of a very little, but increasing percentage, of women (see Table 3).

The percentage of graduating male USMSs interested in family practice decreased from 15.4% to 6.1% and in internal medicine from 22.6% to 18.5% between 1996 and 2003. Pediatrics’ popularity among men has also diminished in recent years; attracting 7.5% of men in 1996 but only 5.5% in 2003. Interest in general surgery among men declined from 10.0% of men in 1996 to 6.7% in 2002, but rebounded slightly to 8.4% in 2003. Obstetrics–gynecology attracted a smaller portion of men in almost every year between 1990 and 2003. Orthopedics and urology have attracted a relatively stable portion of men since 1990 (see Table 3).

Controllable lifestyle specialties

Specialties with controllable lifestyles all experienced increased popularity among women between 1996 and 2003. For example, 2% of women expressed an

Table 1
Characteristics of U.S. Medical Students Who Responded to the Association of American Medical Colleges’ Medical School Graduation Questionnaire and Characteristics of Nonrespondents, 1990–2003

Characteristic	Year of graduation													
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Respondents														
No. (%) respondents	11,617 (75.4)	11,433 (74.1)	12,096 (78.7)	12,131 (78.4)	12,892 (82.9)	13,336 (83.9)	13,168 (82.7)	14,189 (89.1)	14,040 (88)	12,734 (79.6)	14,416 (91.7)	14,206 (90)	14,240 (91)	13,764 (87.5)
% Women	34.6	36.5	36.7	38.5	38.4	38.5	41.4	42.2	41.9	43	43.1	43.5	44.6	45.7
% Men	64.5	62.7	62.3	61.5	59.8	58.4	58	57.8	58.1	57	56.9	56.5	55.4	54.3
Nonrespondents														
% Nonrespondents	15.3	7.9	9	11	13.4	8.1	7	4.4	5.1	9.9	11.4	11.1	11.4	14.2
% Women	15.4	8.2	9.8	11.9	14.6	8.6	6.9	4.2	4.7	11.7	12.7	13.5	14.5	16.7
% Men	15.2	7.6	8.6	10.5	12.5	7.8	7.1	4.6	5.4	8.5	10.4	9.3	9	12.1
Total class														
% Women	34	36	36.1	38.1	38.2	39.1	40.9	41.6	41.5	42.4	42.6	43.6	44.1	45.1

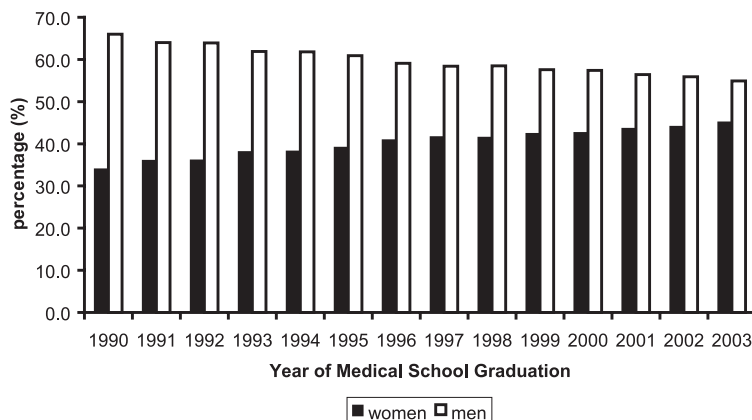


Figure 1 Percentage of U.S. medical school graduates who were men and women, 1990–2003.

interest in radiology in 1996. In 2003, 4.4% of women indicated that radiology was their first choice. In dermatology, 1.8% of graduating women USMSs were interested in 1995 versus 3.9% in 2003. Only three of the eight controllable specialties experienced increased interest among men. Emergency medicine has been attracting a growing portion of men since 1990 when it appealed to 4.3% of men to a peak of 9.6% in 2002. Radiology and anesthesiology have demonstrated increased popularity. In 1998, 5.6% of men were interested in radiology and 3.4% in anesthesiology; in 2003, 9.6% of men were interested in radiology and 8.5% in anesthesiology. However, in aggregate, all of the controllable lifestyle specialties attracted larger proportions of men than women with the exceptions of psychiatry, dermatology, and more recently neurology (see Table 3).

While the percentage of women (6.1%) interested in controllable fields increased at a rate similar to the percentage of men

(5.7%) between 1990 and 2003, the percentage of U.S. medical graduates who are women has risen substantially. Since the graduating class of 2003 contained 11.1% more women than did the class in 1990, the 6.1% increased interest translated into 958 more women pursuing controllable lifestyle specialties while even a 5.7% increased interest among men translated into 44 fewer men pursuing controllable lifestyle specialties. The random effects regression analysis found a trend for slightly more women than men choosing uncontrollable lifestyle specialties, but the model coefficient was only .003 ($p < .01$).

The trend away from generalist specialties was dramatic, but was actually an underestimation of the declining interest of USMSs in generalist careers. In 2003, graduates were 1.5 times more likely than were graduates in 1999 to express a desire to pursue internal medicine, surgery, pediatric, obstetrics, or gynecology subspecialty fellowships. When analyzed

by gender, women were 1.7 times more likely and men 1.3 times more likely to express an interest in fellowship training. Not only were USMSs less likely to choose a primary care residency, but if they did, they were more likely to subspecialize.

Discussion

In this study, we used specialty preference data from the AAMC GQ to analyze how specialty preference changed by gender between 1990 and 2003. We found that women and men demonstrated similar rates of migration away from careers with uncontrollable lifestyles at the beginning of the 1990s and again from 1996 to 2003. In 1996, nearly 75% of women chose internal medicine, family practice, obstetrics–gynecology, or pediatrics. By 2003, these specialties had the interest of only 53.0% of graduating women. The percentage of graduating male USMSs interested in family practice decreased from 15.4% to 6.1% and in internal medicine from 22.6% to 18.5% between 1996 and 2003. Almost 20% fewer USMSs of both genders in 2003 were interested in pursuing a career with an uncontrollable lifestyle when compared with their peers in 1996. Although interest by gender declined at a similar rate, a greater proportion of women than men were still attracted to uncontrollable specialties. Men demonstrated a greater interest in the controllable lifestyle specialties in every year analyzed. Although internal medicine attracted almost a fifth of graduating men, radiology, anesthesiology, emergency medicine, and otolaryngology were the next most popular choices in 2003.

Table 2
Percentage of U.S. Medical Students Who Chose Controllable or Uncontrollable
Specialties, from the Association of American Medical Colleges’ Medical School
Graduation Questionnaire, by Gender, 1990, 1996, and 2003*

	% Who chose specialty					
	1990		1996		2003	
	Uncontrollable specialties	Controllable specialties	Uncontrollable specialties	Controllable specialties	Uncontrollable specialties	Controllable specialties
Total	63.0	32.6	73.8	22.7	55.7	37.9
Women	67.7	28.3	80.2	17.8	60.7	34.4
Men	60.5	35.0	69.2	26.2	51.8	40.7

* Controllable specialties are defined as those that allow more personal time free of practice requirements for leisure, family, and avocational pursuits, and control of total weekly hours spent on professional responsibilities. Controllable lifestyle specialties are anesthesiology, dermatology, emergency medicine, neurology, ophthalmology, otolaryngology, pathology, psychiatry, and radiology. Uncontrollable lifestyle specialties are family practice, internal medicine, obstetrics–gynecology, orthopedic surgery, pediatrics, general surgery, and urology.

Table 3

Specialty Choices of U.S. Medical Students, by Gender, from the Association of American Medical Colleges' Medical School Graduation Questionnaire, 1990–2003

Specialty	% Who chose specialty											
	1990		1991		1992		1993		1994		1995	
	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men
Family practice	12.6	10.2	11.7	9.7	11.2	9.5	14.9	11.7	16.1	12.9	18.9	15.2
Internal medicine	19.3	19.3	18.0	19.2	18.7	18.9	18.5	19.0	19.5	19.7	20.4	22.0
Obstetrics–gynecology	13.7	6.4	12.9	5.7	13.7	5.8	15.0	5.7	14.6	5.3	13.0	5.1
Pediatrics	17.1	6.0	17.2	5.6	17.0	5.2	16.4	5.9	16.7	5.9	18.8	6.2
Surgery	5.7	11.8	3.6	6.7	4.4	7.5	4.6	7.7	4.6	9.3	4.5	9.3
Urology	0.3	1.8	0.5	2.3	0.5	2.5	0.6	2.4	0.5	2.2	0.4	2.1
Orthopedics	0.8	7.1	0.8	7.1	1.1	8.5	1.3	7.9	1.1	8.1	0.9	7.3
Anesthesiology	5.2	8.9	5.2	8.6	5.0	8.5	4.4	7.4	3.6	6.4	2.1	3.7
Dermatology	2.5	1.5	2.9	1.4	2.9	1.5	3.1	1.5	2.5	1.5	1.8	1.1
Emergency medicine	3.1	4.3	3.4	5.0	3.6	5.5	3.7	6.3	4.0	6.4	4.7	6.9
Neurology	1.7	1.9	1.7	2.0	1.9	1.9	1.7	2.1	2.0	1.6	1.2	1.5
Ophthalmology	2.2	3.7	2.3	3.6	1.8	3.6	2.2	3.5	2.3	3.5	2.3	3.1
Otolaryngology	0.6	2.6	1.0	2.8	1.5	2.7	0.8	2.6	0.9	2.7	0.8	2.4
Psychiatry	7.7	4.9	7.0	4.1	5.4	3.5	5.3	3.3	4.5	2.6	4.7	3.1
Radiology	5.2	7.1	5.2	6.9	4.5	6.5	4.5	7.0	3.6	6.2	3.4	6.1
Pathology*	N/A	N/A	2.8	2.1	2.8	1.8	N/A	N/A	N/A	N/A	N/A	N/A

* Pathology was not listed as a specialty preference option on the Association of American Medical Colleges' Medical School Graduation Questionnaire for all years between 1990 and 2003.

Interestingly, Table 3 shows that in 2003 there was a slight convergence of the proportions of men and women choosing the controllable lifestyle specialties, perhaps the first indication of more similar preferences.

The controllable lifestyle specialties are a fraction of the size (i.e., dermatology trains 0.9% of all residents) of the uncontrollable lifestyle specialties (i.e., family practice trains 9.8% of residents), so a similar change in interest may be perceived to be more dramatic.¹¹ The small size and increased popularity of controllable lifestyle specialties has made admission to their residencies extremely competitive. U.S. medical school applicants submitted an average of almost 43 applications to dermatology residencies versus an average of approximately 12.5 applications submitted to family practice residencies in 2003.¹² The declining interest in choosing primary care residencies was compounded by the fact that the USMSs who did choose a primary care residency in 2003 were 50% more likely than were their peers in 1996 to express an interest in subspecialty training. Although more women than men were interested in primary care in 2003, more women than

men had plans to pursue fellowship training. This is a change from 1994 when 31% of women and 18% of men planned to be generalists in family practice, internal medicine, or pediatrics.⁶ It is important to recall that in the early to mid-1990s, there was substantial pressure to increase primary care capacity as part of health care reform that evaporated quickly in the late 1990s with the public backlash against governmental health care reform and managed care.

Tardiff et al.⁸ tracked the predominantly male graduates of a medical college from 1971 to 1982 and found that 13% of graduates switched fields. Those who changed careers were significantly more likely to leave primary care specialties to go to hospital service specialties like radiology and pathology. The physicians who changed careers placed greater importance on financial rewards and flexibility of hours and less emphasis on length of residency and seeing a wide variety of disease. Men and women had the same reasons for choosing and changing specialties. This study found that lifestyle and financial factors were not important in the original choice of a specialty but were important for the graduates who changed fields. Schwartz

et al.,² who defined the criteria for controllable lifestyle specialties, found that students were most inclined to select specialties that had fewer number of practice work hours per week, allowed adequate time for the pursuit of avocational activities, and seemed to have a decreased number of call nights.

The dearth of primary care providers in the United States has resulted in a lack of basic care in rural and inner-city areas and increasing health care costs.¹³ With fewer physicians choosing primary care, these residency programs are forced to accept physicians less selectively and to enroll more international medical students. Jarecky et al.¹⁴ found that significantly higher percentages of medical students in the bottom 10% versus members of Alpha Omega Alpha Honor Medical Society of the University of Kentucky medical class selected primary care specialties and that the percentage increased over time. U.S. senior medical students filled 73% of the family practice residency spots in 1996 but only 47% in 2002.¹⁵ Low match numbers in general surgical residencies were compounded by attrition rates of almost 20% in 2000.¹⁶ Bland and Isaacs¹⁷ found that between 38.8% and 57.8% of

Table 3
(Continued)

% Who chose specialty															
1996		1997		1998		1999		2000		2001		2002		2003	
Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men
20.7	15.4	19.2	16.5	17.5	14.9	16.0	11.3	14.7	10.9	12.1	8.2	11.4	7.4	10.0	6.1
21.4	22.6	22.6	23.4	22.2	23.6	19.7	21.8	18.8	20.3	17.4	19.2	17.1	18.6	16.5	18.5
12.8	4.6	13.4	4.4	12.3	3.6	12.4	3.1	12.1	2.3	11.9	2.4	12.2	2.3	10.5	2.1
19.3	7.5	19.4	7.5	21.5	8.1	19.5	7.4	18.5	7.0	18.2	6.8	16.4	5.6	16.0	5.5
4.6	10.0	4.5	8.8	3.8	7.0	4.0	7.4	4.6	7.8	4.3	7.0	4.1	6.7	5.2	8.4
0.5	2.2	0.4	2.3	0.5	2.1	0.5	2.8	0.6	2.4	0.7	2.5	0.8	2.3	1.1	2.5
0.9	6.9	1.0	6.4	0.9	7.2	1.2	7.2	1.1	7.1	1.4	7.4	1.2	7.6	1.3	7.8
0.9	1.4	1.0	2.1	1.6	3.4	2.2	4.3	2.9	5.0	3.3	7.2	4.6	8.8	5.2	8.5
2.4	1.1	2.2	1.3	2.9	1.8	3.1	1.4	3.3	1.8	3.6	1.6	3.9	1.5	3.9	1.7
4.9	9.0	3.7	8.1	3.7	8.0	4.7	8.1	4.8	8.8	5.3	9.3	6.1	9.6	6.4	8.3
1.1	1.2	1.2	1.6	1.2	1.5	1.3	1.8	2.0	2.1	1.8	1.9	2.1	2.5	2.6	2.2
1.7	2.9	1.6	2.8	1.6	2.9	2.4	2.9	2.4	3.5	2.5	3.3	2.5	3.7	2.4	3.4
0.7	2.6	0.8	2.2	0.7	2.2	0.8	2.6	0.8	2.7	1.0	2.4	1.2	2.3	1.1	2.5
4.0	3.1	4.3	3.2	4.1	2.7	4.2	3.1	4.6	3.2	5.5	3.5	5.6	3.8	5.9	3.4
2.2	4.8	1.9	4.5	2.3	5.6	3.0	7.1	4.3	8.1	4.9	8.8	3.9	8.7	4.4	9.6
N/A	N/A	1.0	1.3	1.1	1.0	1.3	1.2	1.1	1.1	1.7	1.4	1.8	1.3	2.6	1.9

students who were initially attracted to general surgery changed their minds for lifestyle reasons. Although their survey did not analyze decision factors by gender they concluded practicing surgeons were failing to model a balance between professional and personal life, an issue they regarded as particularly important because “half of medical students today are women, and surgical lifestyle is viewed as one especially difficult to reconcile with family life”^{17, p.268}.

However, neither our study nor the literature supports the hypothesis that women are more likely to pick careers based on lifestyle factors. Wendel et al.⁴ assessed the factors that contributed to career choice for men and women and found that women were less likely than were men to cite practice lifestyle as a contributing factor to their career choice and equally likely to feel residency lifestyle, practice lifestyle, and length of training were reasons not to choose general surgery. Another study found that men were more concerned than women were about medicine interfering with “other” interests, and that men and women were equally concerned about medicine conflicting with family.⁷ Gabram et al.¹⁸ surveyed surgical residents to identify issues of concern for

men and women. The study found that both genders’ top five concerns were work hours, personal finances, quantity and quality of formal education, and postponement of family plans.

In our study, the percentage of women preferring general surgery was low, but its downward trend mirrored the interest of men. The inability of general surgery residencies to attract a larger portion of the increasing number of graduating women physicians combined with declining interest among male medical students resulted in U.S. senior medical students filling only 75% of the general surgery residency spots in 2002, down from 89% in 1996.¹⁵ On the other hand, surgical subspecialties (e.g., urology, orthopedics, and otolaryngology) have become more appealing to women while attracting a relatively constant percentage of men. The increased interest for women and constant interest for men in surgical subspecialties with both controllable and uncontrollable lifestyles suggest that general surgery is not attracting both men and women for reasons that cannot be explained by lifestyle factors alone.

When women first entered medicine in large numbers they were concentrated in fields like pediatrics and family practice.

Researchers hypothesized that as the portions of women physicians increased, women would be distributed more evenly across specialties.¹⁹ While women can now be found in a much broader range of specialties, their patterns of specialty choice are still markedly different from those of men. Paines et al.²⁰ demonstrated that women were more influenced by faculty evaluations than were men and that some professors “pigeonholed” women into fields traditionally considered feminine. In one study, although only 8% of women entering medical school intended to specialize in pediatrics, a third entered the field.²⁰ Role models have been shown to have a greater impact for women than for men.⁴ Women’s attraction for fields that contain women may explain the continued scarcity of women surgeons and cardiologists and popularity of fields like psychiatry and obstetrics.

Our study demonstrates that both men and women have been migrating away from primary care careers. Contrary to common perception, however, a greater percentage of women than men still favors careers with uncontrollable lifestyles. If the increased number of women is not responsible for the rising popularity of controllable lifestyle

careers, what is? Today's medical students are more likely to have majored in a nonscience field and may be less myopic about medicine than were previous generations of students. Many of today's incoming students have often have taken time off after college and enter medical school with previous careers and families²¹ and may be interested in the regular hours and more focused knowledge required by lifestyle fields. The Women Physicians' Health Study found that physicians in controllable lifestyle fields reported higher career satisfaction than did those in primary care fields, especially general internal medicine and general practice,²² testimony which will surely attract the interest of the next generation of physicians. The United States cultural values have shifted to less emphasis on professional success; for example, a 2003 article noted that many highly educated women and men were "opting out" of careers entirely for full-time child rearing.²³

Our study had several limitations. First, we used a database that provided career preferences and not career choice. However, recent results from the National Matching Residency Program shows that the specialties chosen closely mirror the preferences demonstrated on the AAMC GQ.¹⁵ Second, we only examined the influence of gender on medical students' recent shifts in specialty selection and other factors are clearly important. However, in this article we demonstrate that women were not disproportionately responsible for the increased interest in controllable lifestyle. It is beyond the scope of this article to analyze all the factors that contribute to specialty selection.

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