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# INCREASING REPRESENTATION, MAINTAINING HIERARCHY: AN ASSESSMENT OF GENDER AND MEDICAL SPECIALIZATION

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## **Abstract**

*Despite increases in the number of women entering the medical profession during the past four decades, female medical students remain more likely than their male colleagues to enter less prestigious medical specialties. Data from the Association of American Medical College's 2004 Graduation Questionnaire are used to test both supply- and demand-side explanations for this pattern among a recent cohort of graduating medical students. Controlling for educational debt, type of medical school attended, and race/ethnicity, women are less likely to enter the prestigious fields of surgery and anesthesiology, radiology, and pathology. Although none of this study's hypotheses account entirely for the effect of gender on medical specialization, results reveal that concerns about*

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*work and family balance and experiences of mistreatment in medical school affect all medical students' career decision making, albeit in somewhat unanticipated ways.*

## **Introduction**

Although women are increasingly gaining access to occupations historically dominated by men, processes of internal segregation often occur within occupations following the entry of significant numbers of women (Reskin and Roos 1990). The medical profession is no exception, as women are disproportionately represented within less prestigious specialties such as pediatrics, psychiatry, and obstetrics and gynecology (Colquitt 1994; Hinze 1999, 2004). Gender segregation in the medical profession also has consequences outside the workplace. Research shows patients prefer to be seen by physicians of similar backgrounds; thus, a diverse physician pool serves patient interests (Laveist and Nuru-Jeter 2002; Menees et al. 2005; Saha et al. 2000). For example, women's reluctance to be screened for colon cancer has been attributed to the low number of women gastroenterologists (Menees et al. 2005). Women are willing to delay colon screenings in order to see a female gastroenterologist, as they feel more comfortable with a woman performing the exam (Menees et al. 2005). Because women may delay medical care to see physicians who are demographically similar to them, a lack of diversity across medical specialties has implications for women and women's health throughout society.

In this paper, we examine the gendered hierarchy of the contemporary medical profession. Why, we ask, are women disproportionately located in less prestigious medical specialties?<sup>1</sup> What factors contribute to the gendered hierarchy of the medical profession? We explore two possible explanations for this gendered pattern offered by recent literature. What we refer to as the supply-side explanation argues for the importance of individual preferences

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<sup>1</sup>As with other occupations and professions, specialty prestige is often rewarded economically as well as culturally. A particular occupation or profession is usually defined as prestigious given a number of factors, notably educational requirements and/or perceived skill or talent. For example, in the field of medicine, surgery is considered the most prestigious because it requires the longest time commitment beyond medical school. Surgery residency programs are typically five to seven years, while a family practice residency, for example, is usually three years.

and goals. Here, women's location within less prestigious medical specializations relates primarily with their unique goals and desires. This gendered goal development is thought to result largely from the differential socialization of men and women, and women's resulting concerns about balancing work and family life. In contrast, what we term the demand-side explanation holds that experiences during medical school shape male and female students' career trajectories in very different ways. This perspective locates the source of men and women's divergent medical pathways firmly within medical and educational institutions.

These two explanations are not mutually exclusive, as students bring a priori intentions and goals to their medical training, which affects future career plans. Although we discuss these two explanations separately given debates in the literature about the relative merits of each, they are tested concomitantly in our analysis.

### ***The Gender Hierarchy of the Medical Profession***

Mirroring the success of the women's movement by opening up opportunities for women in previously male-dominated fields, the 1970s marked the first entrance of significant numbers of women into medicine (Boulis and Jacobs 2008). As of 2005, women comprised close to half of medical students, an increase from 11 percent in 1970 (Boulis and Jacobs 2008:2). These gains have continued in more recent timespans; from 1999 to 2003 there was a 10.8 percent increase in female medical residents (Brotherton, Rockey, and Etzel 2004). Despite the near equal representation of men and women within medical schools today, previous research has shed light on processes of internal segregation in the field. Specifically, women have been found more likely than their male colleagues to enter and practice in less prestigious medical specializations. For example, in 2003, 70.8 percent of medical doctors training in obstetrics and gynecology were women, while 76.2 percent of medical doctors training in general surgery were men (Brotherton et al. 2004). Boulis and Jacobs (2008) describe gendered patterns of medical specialization as being less a pattern of female "ghettos," and more a function of persistent "male bastions" (112). That is, certain specializations, such as surgery, have consistently remained male-dominated, while others have experienced increased gender integration since the 1970s.

### ***Why is Specialty Choice Gendered?***

Both supply- and demand-side explanations provide insight into the origins of workplace gender inequality (Reskin 1993; Tomaskovic-Devey 1993). Supply-side explanations, in short, are grounded in human capital and socialization theories that claim gender inequality in the workplace is the result of variation in occupational choices between men and women. Sociologists who mark supply-side arguments cite gender socialization to explain variation in occupational choices (Bem 1993; Lips 1993; Martin and Ruble 2004). Beginning from the differential socialization of men and women, economists argue that women invest less in the paid labor market because their primary commitment is to the family (Polachek 1976, 1981; Tam 1997).

In contrast, demand-side explanations maintain that structural barriers and interactional expectations converge within institutional settings to limit women's advancement in occupations dominated by men. Although desegregation provides women with more opportunities to enter higher-paid positions than were provided to early generations of women, demand-side explanations suggest discriminatory factors emerge as barriers within workplaces to keep women from achieving full equality. These barriers take on different forms. At the interactional level, they operate through mechanisms such as in-group and out-group exclusionary practices, sexual harassment, being asked inappropriate questions during employment interviews, and cognitive bias rooted in culturally hegemonic beliefs about women and gender (Correll 2004; Ridgeway 1997; Ridgeway and Correll 2004; Reskin 1993, 2000; Reskin and Hartmann 1986; Reskin, McBrier, and Kmec 1999). At the institutional level, women and minorities are tracked into less prestigious positions because of institutional discrimination (Bielby and Baron 1986; Reskin 1993, 2000; Reskin and Hartmann 1986; Reskin et al. 1999). Both interactional and institutional barriers converge within gendered organizations as social closure mechanisms fueling unequal outcomes.

### ***Supply-side Explanations***

Empirical studies have attributed the intra-occupational sex segregation of the medical profession to supply-side explanations. Some research suggests that the lack of gender equality within

specialties is because of self-selection caused by early gender socialization. For instance, in a longitudinal study of medical doctors before, during, and after graduation between 1970 and 1990, Hojat et al. (1994) report that women chose to specialize in pediatrics because of the “maternal and nurturing attitudes” developed during primary gender socialization (299). Additionally, Hojat et al. (1994) argue that women are more comfortable specializing in obstetrics and gynecology because they are more familiar with the female body than the male body.

Colquitt (1994) similarly contends that specialization is the result of gender socialization based on quantitative data from medical school graduates between 1980 and 1989. She argues that gender socialization contributes to choice of medical specialization because men and women in medicine have internalized traditional gender expectations that they carry into medical school. Colquitt claims this is evident because both men and women have an early preference for a specific specialty. These early preferences are due to a variety of personal predilections and lifestyle indicators—most notably anticipated working hours—that result, Colquitt argues, in women avoiding specialties such as surgery and internal medicine because of the demands they place on physicians’ family relations.

In July of 2003, the Accreditation Council for Graduate Medical Education restricted the workweek for medical residents to 80 hours (Arnold, Patterson, and Tang 2005). In an experimental study assessing perceptions of the surgical field, Arnold et al. (2005) surveyed third-year medical students the years before and after the 80-hour restriction was instituted. They found that the new hour restriction had significant, positive effects on students’ views of surgery, but that this effect was more pronounced among female medical students.

### ***Demand-side Explanations***

Research has also shown that the medical institution as a whole may foster inequality and that femininity within the profession is devalued (Hinze 1995). Based on 18 qualitative interviews conducted between 1991 and 1992 with respondents who were part of a larger survey of medical specialization, Hinze argues that until men no longer see women as inferior, the existence of gender inequality within the medical profession will continue. One of

Hinze's informants, a female obstetrician-gynecologist, perhaps best illustrates this gendered hierarchy. When asked to describe surgeons, the obstetrician-gynecologist stated, "Surgeons are kings. They're the real men. They have the biggest testicles" (Hinze 1999:228). When questioned further about what she meant by "the biggest testicles," the informant described "people who work harder" (Hinze 1999:228). Thus, Hinze concluded that observed differences in the proportion of women across medical specialties can more clearly be understood when accounting for the ways in which various specializations are "typed," or laden with gendered meanings that may variously encourage or discourage women from entering them.

Based on a survey administered in 1996 to all Norwegian physicians licensed to practice medicine in the years 1980 to 1983, Gjerberg (2002) found that almost the same number of women as men initially entered surgery and internal medicine. However, many of the women left their initial specialty for obstetrics and gynecology because of group closure carried out through "male exclusionary strategies" (Gjerberg 2002:603).

Colquitt (1994) also found differences in the degree of bias experienced during residency interviews for those training in general surgery as compared with residents who were not training in general surgery. Men and women were less likely to specialize in general surgery if they reported that they were asked inappropriate questions during their residency interviews. More recently, Stratton et al. (2005) found that female medical students who reported exposure to gender discrimination or harassment were more likely to say that these experiences influenced their specialty choice and residency rankings. In fact, the gendered meanings attached to certain specialties may breed the mistreatment of women; female medical students who choose to enter surgery are most at-risk for experiencing harassment and discrimination (Stratton et al. 2005).

Female medical residents often resist the temptation to report mistreatment to avoid the label associated with being a victim or whistleblower in a masculine profession (Hinze 2004). To quote Hinze, "Women who admit discomfort with sexual harassment, women who name the problem and women who protest, fear being viewed as 'weak' in a masculine culture in which toughness is valued" (2004:120).

### ***Control Variables***

Research also supports a relationship between type of medical school and specialization, as well as educational debt and specialization. Fein and Weber (1971) found that private schools produced fewer general practitioners than public schools. They suggest this is caused by a variety of factors, such as the financial background of medical school students, research status of the medical school, and variation in admissions criteria. Fein and Weber's findings were supported in 1994, when Colquitt also found that type of medical school had an effect on specialization. Specifically, Colquitt reported that men from private medical schools were 44 percent more likely to specialize in surgery than men from public medical schools (1994).

Medical school indebtedness is also important in understanding variation in medical specialization, as research has shown that medical school graduates with higher educational debts are more likely to enter higher paying medical specialties than graduates with lower educational debts (Dial and Elliott 1987). At the same time, literature has shown that women incur more debt during medical school than men (Spar, Pryor, and Simon 1993). Nevertheless, Spar et al. did not control for type of medical school when examining the variation in educational debt. Their research focused on describing the current state of medical students' indebtedness rather than offering an explanation for their observations. However, Jolly (2005) did separately examine type of medical school and educational debt and found that private medical school graduates have greater educational debt than public medical school graduates. Jolly also noted that men and women were equally represented across private and public medical schools. Still, we do not know if debt affects female and male doctors differently.

Not all racial or ethnic minorities are equally represented in the medical profession. In 2004, African Americans and Hispanics combined accounted for less than 7 percent of U.S. physicians, 3.3 percent and 2.8 percent, respectively.<sup>2</sup> In addition to this underrepresentation in medicine, Keith, Bell, and Williams (1987) report that minorities are more likely to occupy less prestigious

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<sup>2</sup> <https://www.aamc.org/download/87306/data/physiciandiversityfacts.pdf>.

specialties such as pediatrics and family practice than white medical school graduates.<sup>3</sup>

### **Hypotheses**

Three hypotheses that emerge from supply- and demand-side explanations of gendered patterns in medical specialization will be explored in this analysis:

*Hypothesis 1:* Women are less likely than men to enter high-prestige medical specializations, such as surgery.

*Hypothesis 2:* Women are less likely than men to specialize in high-prestige areas because of family and work concerns.

*Hypothesis 3:* Women are less likely than men to specialize in high-prestige areas because of gender discrimination experienced during medical school.

### **Methods**

Using a variety of data sources, several recent studies have suggested that the medical profession may experience decreasingly gendered patterns in specialization, as well as other areas (Borman, Biester, and Rhodes 2010; Newton and Grayson 2003; Newton, Grayson, and Thompson 2010). In light of ongoing debate as to whether specialization differs by gender, as well as how specialization looks by gender, it is important to use multiple data sources throughout time to explore the nature of male and female medical students' residency choices.

We use data from the Association of American Medical College's (AAMC) 2004 Graduation Questionnaire (GQ) to examine our hypotheses. These data are not publicly available; it was only after a great deal of time and energy in communication with the American Medical Association that we were able to gain access to this information. While other scholars have gained access to previous GQ's, no study that we are aware of has used the 2004 GQ to look at the question of medical specialization. This is a unique dataset of all graduating medical students in the United States in 2004, which contains an array of standard demographic, medical

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<sup>3</sup> Keith, Bell, and Williams (1987) examined minorities as a group and did not assess variation across different racial and ethnic categories.

school experience, and career intent variables for 10,893 respondents.<sup>4</sup> According to the AAMC, the response rate for the 2004 web-based GQ was approximately 70 percent.<sup>5</sup>

New medical school graduates enter resident training programs, which vary in duration, based on their areas of specialty. In determining specialization for the GQ, each medical doctor was asked to identify his or her intended area of specialization from 30 areas of medicine. The AAMC provided respondents an exhaustive list of areas of medicine the medical students could select when indicating his or her intended area of specialization. At the point at which students take this survey, they have not only decided on their area of specialization, but have also been matched with a residency program in their area. Thus, survey respondents are reporting on the specialty area they will train in following graduation.

### ***Dependent Variable***

#### *Medical Specialization/Prestige*

Given our access to the medical specialization plans in this unique dataset, we are able to examine how women fare in comparison to men in the same profession. While women may be entering the medical profession at greater rates now than in earlier generations (Boulis and Jacobs 2008), an examination of which specialties they are more likely to enter is useful in examining the gendered state of the medical profession because medical specialties are not viewed as equivalent by medical professionals themselves (Hinze 1999; Colquitt 1994).

Previous research by Hinze (1999) offers a reliable hierarchical model of specialty prestige, as it was constructed through qualitative interviews with medical residents. Beginning with the most prestigious, the six levels of specialty prestige in this model are: (6) surgeons, (5) internal medicine physicians, (4) anesthesiologists,

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<sup>4</sup> Although there were a total of 10,893 respondents for the 2004 GQ survey, only 8,772 are included in our analysis given missing data on either the outcome or predictor variables.

<sup>5</sup> The response rate was provided through e-mail correspondence with a representative from the AAMC. According to the *Statistical Abstracts of the United States*, in 2005 there were 15,461 medical degrees conferred. This data is available at <http://www.census.gov/compendia/statab/2011/tables/11s0300.pdf>.

radiologists, and pathologists, (3) obstetricians-gynecologists, (2) pediatricians and dermatologists<sup>6</sup>, and (1) psychiatrists.

The degree to which Hinze's specialty prestige model is out-of-date is a particularly difficult question to answer. Evidence suggests that the prestige hierarchy of the medical profession may be obdurate and lasting (Boulis and Jacobs 2008), however, some research indicates that the reputation of certain specializations has shifted throughout time (Newton, Grayson, and Thompson 2005).

What is certain is that prestige hierarchies have not undergone a radical shift since the late 1990s, which would make Hinze's model entirely unsuitable. In fact, others have relied on this model as well (Creed, Searle, and Rogers 2010). The prestige of medical specialties has largely remained stable since the rise and development of medical specialization with the implementation of Medicare and the growth of employer-financed health insurance in the 1970s and beyond (Creed et al. 2010; Freidson 2001). Therefore, we do not hesitate to rely on Hinze's model in our examination of the gender composition of medical specializations.

We treat each level dichotomously in order to assess women's likelihood of entering each level of the hierarchy relative to men's. Special attention is placed on the levels and specialties that women seem to be disproportionately more likely to enter than men. The dependent variable is then a series of dichotomous specialization variables coded "1" for reporting placement in such specialty and "0" for placement in another specialty.

### ***Independent Variables***

#### ***Family and Work Conflict***

Because women are traditionally socialized to believe that they should be the primary caregivers in the home, Colquitt (1994) argues that women avoid prestigious specialties, such as surgery, because of the stringent demands they place on physicians. She maintains that less prestigious specialties, such as psychiatry, attract female physicians because they have fewer demands on time and energy. Colquitt found that this was especially true for female physicians

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<sup>6</sup> Hinze's 1999 hierarchical prestige model does not present a place for dermatologists. However, in her 1995 dissertation, she presents a similar model, which includes dermatologists in level 2. Therefore, when discussing prestige in this paper, dermatologists will be placed within level 2.

who had children and were married. In order to measure the effect of family responsibilities on specialty choices, a variable assessing perceived work/family conflict within the profession will be used. The GQ asked, "Based on your experiences, indicate whether you agree or disagree with the following statements about medicine and the profession: The demands of a physician's work interfere too much with family relations." Respondents were offered a five-point Likert scale ranging from 1 = Strongly Agree to 5 = Strongly Disagree. For the analyses, the response categories were collapsed into "yes," "no," and "undecided."

#### *Gender Discrimination*

Reskin (2000) argues that gender discrimination operates within the workplace through in-group and out-group exclusionary practices. Using Reskin's research as a framework, a variable that assesses whether medical school graduates felt they were denied opportunities because of their gender will be added to analyses to account for the possibility of institutional discrimination. This discrimination variable is the respondent's perception of whether or not he or she was discriminated against in the medical profession because of his or her gender. It is based on the question, "Have you been denied opportunities for training or rewards because of your gender?" Response options included "never," "once," "occasionally," and "frequently." Very few medical doctors reported that they were denied opportunities because of their gender. Thus, the variable will be dichotomized, and the responses once, occasionally, and frequently will be collapsed into "yes."

We also add to our analysis a variable indicating reported mistreatment, as research has shown that doctors who report mistreatment are more likely than doctors who do not report mistreatment to specialize in less prestigious, and less "masculine," specialties (Hinze 2004). The variable is based on the question, "Did you report the incident(s) to a designated faculty member or a member of the medical school administration empowered to handle such complaints?" Response categories were limited to "yes" or "no." This was a follow up question to the question "Have you personally been mistreated during medical school?"

## ***Control Variables***

### *Medical School*

Literature has shown that less prestigious specialists are more likely to have matriculated at public medical schools rather than private medical schools (Colquitt 1994; Fein and Weber 1971). It is therefore necessary when examining medical specialization to control for the type of medical school that the physician graduated from. The type of medical school was added to the dataset by the AAMC based on the medical school the doctor reported he or she was set to graduate from.

### *Educational Debt*

To control for the influence of educational debt on medical specialization (Dial and Elliot 1987; Spar et al. 1993), a variable based on the question “To what degree did your level of educational debt influence your specialty choice?” will be included. The response categories were “no influence,” “minor influence,” “moderate influence,” and “strong influence.” Few medical school graduates reported that their level of educational debt strongly influenced their specialization. Therefore, in order to avoid complications when conducting statistical analyses, the response options “moderate influence” and “strong influence” have been collapsed together, as have the categories “no influence” and “minor influence.”

### *Underrepresented Minorities in Medicine*

The term “underrepresented minorities in medicine” (URM) has historically distinguished underrepresented minorities from minorities who are not underrepresented in medicine. Prior to June of 2003, minorities underrepresented in medicine included U.S. citizens or permanent residents who identified as black, American Indian, Alaska Native, Native Hawaiian, Mexican American, and Puerto Rican. Hispanics who did not identify as Mexican American or Puerto Rican were not considered underrepresented minorities by the AAMC. In 2004, however, the AAMC adopted a new definition of “underrepresented minorities in medicine” that does not focus on specific racial and ethnic groups. The new definition includes any “racial and ethnic populations that are underrepresented in the medical profession relative to their numbers in the general

population.”<sup>7</sup> The new definition allows for “including and removing underrepresented groups on the basis of changing demographics of society and the profession, a shift in focus from a national perspective to a regional or local perspective on underrepresentation, [and] stimulate data collection and reporting on the broad range of racial and ethnic self-descriptions.”<sup>8</sup> In this study, we control for URM status by incorporating a variable compiled by the AAMC based on individual race and ethnicity responses.<sup>9</sup>

### **Findings**

Almost 44 percent of our sample of medical school graduates in the year 2004 identify as women. Approximately 6 percent of medical school graduates in 1973 were women (Ernst and Yett 1985), so it is evident the gender inclusivity of the medical profession has improved dramatically. However, a relationship between gender and specialization exists.<sup>10</sup> Figure 1<sup>11</sup> illustrates that women have not overcome the barriers that keep them from prestigious specialties (Hinze 1995). Women are still less likely than men to enter more prestigious specialties. The relationship between gender and medical specialization is perhaps most clear when examining the field of surgery. We see that 21.3 percent of male medical school graduates intend to specialize in surgery, while only 8.7 percent of female graduates have the same professional intentions. Almost 40 percent of women are clustered into areas of medicine that serve families, women, or children.

While a description of the data is not presented here in table form, the averages of each independent and control variable add to our understanding of the gendered hierarchy of the medical profession. The data suggest that medical school graduates have thought about how the demands of the profession interfere with

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<sup>7</sup> <https://www.aamc.org/initiatives/54266/urm/>

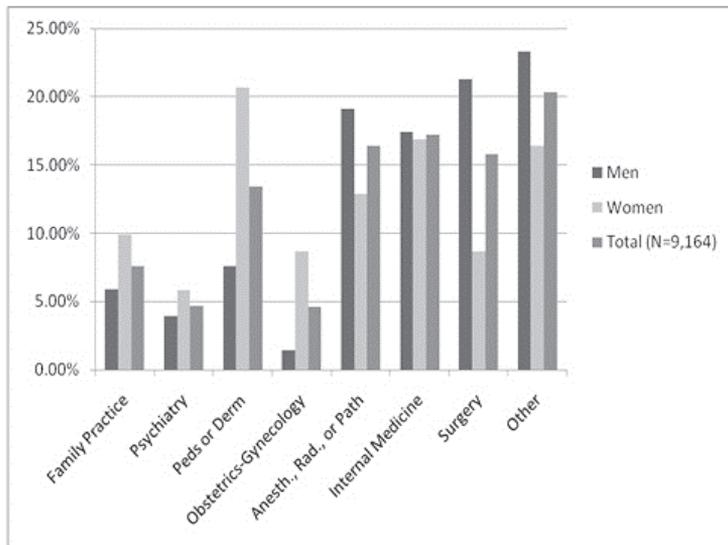
<sup>8</sup> <https://www.aamc.org/initiatives/54266/urm/>

<sup>9</sup> The first author explores the affect of race and ethnicity on medical specialization in a separate paper.

<sup>10</sup> A significant  $\chi^2$  value associated with the relationship between gender and medical specialization is displayed in Figure 1 ( $\chi^2 = 907.85$ ;  $p < .001$ ).

<sup>11</sup> Figure 1 graphically presents the distribution of gender by specialties included in Hinze’s (1999) hierarchical specialty prestige model. Family practice and “other” specialties are included for descriptive purposes only.

Figure 1. Distribution of Medical Specialization by Gender for Selected Specialties



Source: 2004 Association of American Medical College's Graduation Questionnaire.

family relations. Specifically, 53 percent of graduates surveyed felt that the demand of the profession interferes with family relations. With respect to variation among women and men, almost 51 percent of women either strongly agreed or agreed that the demands of a physician's work interfere with family relations, compared with about 55 percent of men.

Very few graduates (2.3 percent) felt they were denied opportunities because of their gender; this statistic suggests that either discrimination is decidedly rare, or that discrimination in the medical profession occurs in ways that are not perceived as such. However, slightly more women (3 percent) reported being denied opportunities than men (1.7 percent). Similarly, very few graduates (4 percent) reported mistreatment to school administration, yet more women (5.4 percent) reported mistreatment than men (2.9 percent). Even so, the percentage of respondents reporting discriminatory factors is low overall. With respect to control variables, 86.1 percent of graduates surveyed reported that their educational debt had little influence on specialization. Most graduated from a public medical school (61.6 percent), and 9.5 percent of respondents were underrepresented minorities. There was, however, a slightly greater

percentage of underrepresented minority women (5.4 percent) than underrepresented minority men (4.1 percent).

### ***Multivariate Analyses***

To test hypotheses derived from the medical specialization literature, we rely on Hinze's (1999) specialty prestige model to run distinct logistic regression models predicting placement in each specialty ("1") in comparison to reporting placement in some other specialty ("0"). A total of six logistic regression models were computed in the initial logistic regression series, with gender as the sole predictor of medical specialization (Table 1). Given that we find women are less likely than men to enter surgery and anesthesiology, radiology, or pathology, we look more closely into these fields by including additional measures motivated by existing literature into our models predicting medical specialization (Table 2). This focus allows us to assess how supply- and demand-side variables, after controls, shape and possibly explain gender-specific specialization patterns (Hypotheses 2 and 3).

In a final logistic regression series, we split the models presented in Table 2 for men and women, treating gender not as an independent variable, but as the central variable of interest (Tables 3, 4). Splitting models here allows not only that specialization choice may differ by gender, but also that the motivations behind specialization choice may develop differently for men and women.

We present both the expected odds associated with the logistic regression models and the odds ratios in Tables 1–4. However, for interpretation purposes, we discuss expected odds rather than odds ratios throughout the analysis. Odds ratios are exponentiated logistic regression coefficients, or  $(\text{Exp}(B))$ , otherwise known as  $e^{(\text{coefficient})}$ . An odds ratio less than a value of 1 indicates the presence of the predictor in question, and controlling for other variables in the model, decreases the likelihood of the dependent variable. An odds ratio value greater than 1 indicates the predictor in question, and controlling for other variables in the model, increases the likelihood of the dependent variable. An exponentiated value reveals the percentage change in the expected odds of the dependent variable for a one-unit change in a continuous independent variable, or for

*Table 1. Logistic Regression Odds Ratios and Expected Odds Predicting Medical Specialization: The Effects of Gender*

Predictors	Psychiatry (R <sup>2</sup> = .005 <sup>a</sup> )	Pediatrics or Dermatology (R <sup>2</sup> = .05 <sup>a</sup> )	Obstetrics and Gynecology (R <sup>2</sup> = .08 <sup>a</sup> )	Anesthesiology, Radiology, or Pathology (R <sup>2</sup> = .000 <sup>a</sup> )	Internal Medicine (R <sup>2</sup> = .000 <sup>a</sup> )	Surgery (R <sup>2</sup> = .04 <sup>a</sup> )
Constant	.041***	.082***	.014***	.236***	.211***	.271***
Gender:						
Women	1.502*** (50.2%)	3.171*** (217.1%)	6.616*** (561.6%)	.627*** (-37.3%)	.967 (-3.3%)	.353*** (-64.7%)

Source: 2004 Association of American Medical College's Graduation Questionnaire

Note: N = 8,772

<sup>a</sup> Hosmer-Lemeshow's R<sup>2</sup>

\*\*\*p < .001

presence of a given categorical independent variable. The generic formula used to obtain an exponentiated value is:

$$(\text{Exp}(B) - 1) * 100$$

The product obtained from this formula is commonly referred to as an “expected odd” and reported as a percentage.

Initial logistic regression results indicate a clear relationship between gender and medical specialization offering support for Hypothesis 1. Table 1 shows conclusively that women are less likely than men to enter more prestigious medical specialties and more likely than men to enter less prestigious specialties. Specifically, women are less likely than men to enter surgery (-65 percent) and anesthesiology, radiology, or pathology (-37 percent), but more likely than men to enter psychiatry (50 percent), pediatrics or dermatology (217 percent), and obstetrics and gynecology (562 percent). The only exception is internal medicine; women do not significantly differ from men in their likelihood of entering this specialization.

An in-depth look into surgery and anesthesiology, radiology, and pathology presents a unique story about the determinants of medical specialization. Surgery and anesthesiology, radiology, and pathology have long been highly prestigious specialty areas in the field of medicine, and accordingly are some of the highest paid. However, as documented in Table 1 and discussed above, women are significantly less likely to specialize in these areas than men. Previous literature offers evidence that supply- and demand-side

*Table 2. Logistic Regression Odds Ratios and Expected Odds Predicting Medical Specialization*

Predictors	Anesthesiology, Radiology, Pathology (R <sup>2</sup> = .03 <sup>a</sup> )	Surgery (R <sup>2</sup> = .04 <sup>a</sup> )
Constant	.128***	.353***
Gender:	.678***	.353***
Women	(-32%)	(-65%)
Demands of Profession Interfere with Family <sup>b</sup>		
Yes	1.829*** (83%)	.763*** (-24%)
No Opinion	1.369** (37%)	.925 (-8%)
Experienced and Reported Mistreatment	1.052 (5%)	.656* (-34%)
Denied Opportunities because of Gender	1.505* (51%)	1.44 (44%)
High Influence of Education Debt	1.768*** (77%)	.743** (-26%)
Medical School: Public	1.135* (14%)	.862* (-14%)
Underrepresented Minority	.882 (-12%)	1.624*** (63%)
Underrepresented Minority Women	.754 (-25%)	.672 (-33%)

Source: 2004 Association of American Medical College's Graduation Questionnaire

Note: N = 8,772

<sup>a</sup> Hosmer-Lemeshow's R<sup>2</sup>

<sup>b</sup> Reference category is "no"

\**p* < .05; \*\**p* < .01; \*\*\**p* < .001

factors as well as the influence of educational debt, type of medical school, and race/ethnicity might explain this finding.

Table 2 explores whether supply- or demand-side explanations help account for the effect of gender on likelihood of entering surgery and anesthesiology, radiology, and pathology. In both models presented, neither the inclusion of work/family concerns (supply-side explanation) nor experienced mistreatment or the denial of opportunities based on gender (demand-side explanation) reduce the significance of gender; after the inclusion of all variables and controls, women remain less likely than men to enter into these two specialty areas. Thus, we cannot confirm Hypotheses 2 or 3. However, results do show that work/family concerns, experienced mistreatment, and the denial of opportunities based on gender are

*Table 3. Logistic Regression Odds Ratios and Expected Odds Predicting Medical Specialization for Women*

Predictors	Anesthesiology, Radiology, Pathology (R <sup>2</sup> = .023 <sup>a</sup> )	Surgery (R <sup>2</sup> = .008 <sup>a</sup> )
Constant	-2.465***	.123***
Demands of Profession Interfere with Family <sup>b</sup>		
Yes	1.867*** (86.7%)	.715* (-28.5%)
No Opinion	1.463* (46.3%)	.786 (-21.4%)
Experienced and Reported Mistreatment	1.027 (2.7%)	1.03 (3%)
Denied Opportunities because of Gender	1.446 (44.6%)	2.243** (124.3%)
High Influence of Education Debt	2.086*** (108.6%)	.685 (-31.5%)
Medical School: Public	1.077 (7.7%)	.942 (-5.8%)
Underrepresented Minority	.655* (-34.5%)	1.076 (7.6%)

Source: 2004 Association of American Medical College's Graduation Questionnaire

Note: N = 3,847

<sup>a</sup> Hosmer-Lemeshow's R<sup>2</sup>

<sup>b</sup> Reference category is "no "

\*p < .05; \*\*p < .01; \*\*\*p < .001

significantly related to the likelihood of entering either of these two areas. Students who answered that the medical profession interferes too much with family relations were significantly less likely to go into surgery, but significantly more likely to go into anesthesiology, radiology, and pathology than other specializations. In addition, students who had experienced and reported mistreatment were 34 percent less likely to enter surgery, while students who report being denied opportunities because of their gender were 51 percent more likely to enter anesthesiology, radiology, and pathology.

We visit these two fields of medicine separately for women and men in Tables 3 and 4, respectively. Data reveal concern about work/family balance was significantly related to specialty choice for both men and women, but in opposite ways between the two areas of medical specialization. Those who reported that the profession interferes too much with family relations are less likely to go into surgery, but more likely to go into anesthesiology, radiology, and pathology. Interestingly, the magnitude of these relationships is

*Table 4. Logistic Regression Odds Ratios and Expected Odds Predicting Medical Specialization for Men*

Predictors	Anesthesiology, Radiology, Pathology (R <sup>2</sup> = .017 <sup>a</sup> )	Surgery (R <sup>2</sup> = .011 <sup>a</sup> )
Constant	-2.045***	.354***
Demands of Profession Interfere with Family <sup>b</sup>		
Yes	1.802*** (80.2%)	.783** (-21.7%)
No Opinion	1.316* (31.6%)	.984 (-1.6%)
Experienced and Reported Mistreatment	1.093 (9.3%)	.411** (-58.9%)
Denied Opportunities because of Gender	1.561 (56.1%)	.913 (-8.7%)
High Influence of Education Debt	1.636*** (63.6%)	.762** (-23.8%)
Medical School: Public	1.171* (17.1%)	.834* (-16.6%)
Underrepresented Minority	.886 (-11.4%)	1.63*** (63%)

Source: 2004 Association of American Medical College's Graduation Questionnaire

Note: N = 4,925

<sup>a</sup> Hosmer-Lemeshow's R<sup>2</sup>

<sup>b</sup> Reference category is "no "

\**p* < .05; \*\**p* < .01; \*\*\**p* < .001

approximately equal among men and women; both men's and women's odds of entering surgery given concern about work/family balance are reduced about 20 percent. Therefore, we still cannot confirm Hypothesis 2, which states that women are less likely than men to enter surgery because of family and work concerns. Both women and men are less likely to specialize in surgery because of the perceived time demands surgeons encounter in their field.

Perceived discriminatory barriers present an equally interesting story. Neither of our variables measuring discriminatory barriers in medicine was statistically associated with choosing to specialize in anesthesiology, radiology, and pathology. We previously hypothesized that women would be less likely to specialize in prestigious fields of medicine because of gender discrimination (Hypothesis 3). However, given that women who felt they were denied opportunities because of their gender were just more than 124 percent more likely to enter surgery than those who did not feel they were denied opportunities, we still cannot confirm Hypothesis 3.

Interestingly, women who experienced and reported mistreatment were no more or less likely to enter surgery than those who did not experience and report mistreatment. In contrast, men who did experience and report mistreatment were just less than 59 percent less likely to enter surgery than men who did not experience and report mistreatment. Men who felt they were discriminated against because of their gender were no more or less likely to enter surgery than those who did not feel they were discriminated against because of their gender.

While controls are not the primary focus of analysis here, results also speak to a need for future research that would investigate the relationships among medical specialization, school type, school indebtedness, and race/ethnicity. Models here suggest that these variables matter, perhaps somewhat more so for men; public versus private school type, for instance, only mattered to men's choice of specialization.

### **Discussion**

Findings from this study advance our understanding of hierarchy within the medical profession. Consistent with existing empirical literature (Colquitt 1994; Gjerberg 2002; Hinze 1999, 1995; Hojat et al. 1994), we find that women are entering the medical profession in greater numbers, but find themselves at the bottom of organizational prestige hierarchies. Female medical students are more likely than male medical students to enter less prestigious specialties such as psychiatry, pediatrics or dermatology, and obstetrics and gynecology. At the same time, women are less likely than men to enter more prestigious specialties such as surgery and anesthesiology, radiology, or pathology.

In explaining why gendered patterns of specialty choice exist, none of our hypotheses motivated by existing literature can be entirely confirmed. Women were not the only ones self-selecting out of more prestigious specialties because of anticipated interference with family responsibilities. Results show men were also concerned about work interfering with family, and were less likely to enter the most prestigious specialty area of surgery when they had this concern. Neither was discrimination in medical school able to account for women's predominate position within less prestigious

specialties. In fact, in some cases women were more likely to enter prestigious fields when they had faced barriers within the profession.

In contrast, it may be that women who enter prestigious specializations are notably gender nontraditional. Perhaps women in medical school, particularly those who select the specializations under study here, have a very nontraditional outlook on women's positions in society and the family compared with women who do not pursue these areas. There is growing evidence, however, that the perceived "family friendliness" of various specializations significantly affects all students' chosen career paths (Dorsey, Jarjoura, and Rutecki 2003; Drinkwater, Tully, and Dornan 2008; Lambert and Holmboe 2005; Newton, Grayson, and Thompson 2005). Perhaps results here provide evidence of increased "gender convergence" in men and women's family and work responsibilities. It may be that both male and female medical students are increasingly concerned about the stringent demands of certain specialty areas as they leave fulltime schooling and shape their professional and personal lives. If so, the implications for the future of the medical profession are clear: the occupation itself must find ways to accommodate the need of all students to balance both paid work and outside caretaking responsibilities.

Results also suggest that in light of concerns among all students about work demands, various specialty areas may become more or less attractive given their reputation as more or less demanding of time and energy. Hinze's (1999) prestige model places surgery and anesthesiology, radiology, and pathology high on the scale, indicating a confluence of high time and energy demands and high levels of compensation. However, both the realities and reputations of specializations may change throughout time, whether due to shifts in policy from above or pushes from below (Arnold et al. 2005). New evidence suggests that radiology in particular has developed a "family-friendly" reputation (Newton, Grayson, and Thompson 2005). It is unsurprising, then, to see that medical students who express concern about work/family balance may be more likely to choose this path than others.

Women who felt they were denied opportunities because of their gender were actually more likely to enter surgery than women who did not feel they were denied opportunities because of their gender. Although the data does not allow us to test the following assumption,

nor the trajectories of causality between barriers and specialization, this finding may suggest that female surgeons possess an increased awareness of gendered barriers in the field of medicine. Women in surgery may be more consciously aware of the gendered nature of medicine, and by default, are uniquely courageous in our gendered world for pursuing such a career. As noted earlier, it might be that female surgeons are particularly gender nontraditional. Regardless, what we hope to make clear is that it would be both misleading and inaccurate to conclude that demand-side factors, for example gender discrimination, do not matter for women in medicine. Such a conclusion would be short-sighted and far too simplistic. Instead, we encourage a conceptualization that frames women in medicine, especially female surgeons, as a unique group of gendered actors, outliers on the forefront of the “undoing gender” battle (Deutsch 2007).

Whether medical institutions, gender socialization, or a complex combination of these and other factors perpetuates the gender hierarchy of the medical profession remains something of an open question. However, results of this study reveal factors that affect every medical student’s specialty choice. These results suggest that specialization choice stems from a number of factors both internal (mistreatment, harassment, educational debt, private/public school) and external (race/ethnicity, gender, work/family concerns) to the medical profession. One interesting gender finding that emerges from the data is that the effect of concerns about work/life balance on specialization exists among both male and female medical students.

Specifically, students who report that the demands of a medical career conflict with family responsibilities are less likely than those who do not to enter the highest prestige medical specialty, surgery, which is perceived to demand the most time and energy from young doctors. While medical students’ perceptions of the surgical field may be increasingly positive given legislated weekly hour maximums for surgical residents (Arnold et al. 2005), results here show men and women are both concerned about balancing work and family life.

### **Limitations**

There are four limitations to this study that should be highlighted. First, the number of available variables in the GQ dataset limits our models. It is possible that results would have differed if the data included more supply- and demand-side factors and additional controls. Second, we do not have information on the academic background of the doctors. Without having access to undergraduate grade point average and the Medical College Admission Test scores of the medical doctors represented in the dataset, it is impossible to control for academic background. Third, the data used in these analyses derived from a questionnaire distributed to all graduating U.S. medical school students. Previous literature has shown that some medical doctors transfer specialties even after they are established in their residency program (Gjerberg 2002; Zanten et al. 2002). Gjerberg (2002) found women who enter surgery are less likely to continue in the specialty than men. Specifically, Gjerberg found the probability of leaving surgery for a different specialty was 0.31 for men and 0.60 for women. This means that if anything, results in this paper underestimate gender inequality. Lastly, our analysis neglects the role of patients in molding medical students' choices of specialization. While scarce, the literature on this point suggests that the types of patients budding doctors will encounter vary demographically and in illness severity across specializations, and that medical students and residents select specialty areas because they desire specific types of doctor-patient relationships (Behrend et al. 2008; Kravitz et al. 1992; McMurray et al. 1993; Van Der Horst et al. 2010). Again, the lack of relevant variables in the GQ dataset on this point do not allow for an exploration of the role of patients and doctor-patient interactions in shaping doctors' career decision making.

### **Conclusion**

Future quantitative research should incorporate more variables that might help explain why women are less likely than men to enter more prestigious medical specializations. We need more indicators of institutional discrimination, individual agency, citizenship status, social class, and academic background, as well as information on the role of patients and patient-doctor interaction on specialization choice. In particular, a longitudinal study assessing the career plans

of physicians at different stages of their careers would be beneficial. For instance, one could measure future doctors' specialization plans at the start of their medical school career, during their last year of medical school, during residency, upon completion of residency, and after years of practicing medicine. The focus of such research should be on the determinants of transferring medical specialties, as there is research that suggests new medical doctors transfer medical specialties during their first residency year (Gjerberg 2002; Zanten et al. 2002). The literature on medical specialization also needs a more recent qualitative project that would allow physicians to openly and freely discuss the reasons for their choice of medical specialization.

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