Title IX and Female Occupational Choice: Removing Barriers to Graduate Higher Education

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Abstract

This paper explores the determinants of occupational sorting by focusing on an important mechanism: barriers to human capital. I exploit the 1972 passage of Title IX, which banned gender discrimination in graduate school admissions, to get causal estimates on female occupational choice. I accomplish this in two steps. First, I use a difference-in-differences methodology to test whether barriers to higher education influenced female educational choice. I find that females who were affected by Title IX were 3.4-6.5 percent more likely to study business, health, and law compared to females who were not affected by Title IX. Moreover, Title IX had differential effects by gender parity. Second, I use a novel metric to measure the change in the distribution of an unordered categorical variable. With this, I am able to estimate the effect of the female-male convergence in graduate field on the female-male convergence in occupation. I find that a 1 percent convergence in graduate field leads to a 1.25 percent convergence in occupation. This effect is driven by convergence in specialized fields, which are closely related to a specific occupation. The results also suggest that females are more likely than males to pursue generalized fields.

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1 Introduction

A phenomenon that has been extensively documented is the convergence in the U.S. occupational distribution between men and women over the past 50 years. Between 1960 and 2000, the share of male lawyers has decreased by nearly 30 percent from 96 percent to 68 percent. The share of male doctors decreased from 94 percent to 72 percent. Similar changes have occurred amongly other high-skilled occupations.[1] Of particular interest to economists is the reason behind this convergence. There is a long and exhaustive literature examining the growth in female labor force participation. Much of this literature focuses on the demand factors, specifically the decreasing gender wage gap (Heckman and Sedlacek, 1985; Smith and Ward, 1985, 1989; Blau and Kahn, 1997, 2000, 2006; Black and Juhn, 2000; Mulligan and Rubinstein, 2008). Less work has been done on the supply factors with most of them focusing on the fertility consequences of labor force participation (Goldin 1988, 1990; Angrist and Evans, 1998; Goldin and Katz, 2002; Bailey 2006). This paper provides evidence that another supply factor, barriers to graduate higher education, played a significant role in females' occupational choices. My research differs from previous supply-factor research in that it focuses on graduate higher education, specifically graduate field of study. Moreover, I am interested in the intensive margin of occupational choice rather than the extensive margin of entering the labor force.

If innate ability for highly-skilled professions does not differ between gender (not an implausible assumption), then the occupational convergence suggests that females were not pursuing their comparative advantage back in 1960. There are several explanations for this, the most commonly known being the existence of barriers that prevented females from pursuing their comparative advantage. These barriers can be classified into two broad categories. The first are those that exist in the workplace and deter females from entering certain occupations. Goldin (1988) talks about "marriage bars", a tactic employed by firms and school boards to not hire married women and fire any single women who marry. The second category consists of ones that prevent females from obtaining the necessary human capital in order to enter certain occupations. For example, there may be fewer female lawyers because law schools favor male applicants over female applicants regardless of their qualifications. This paper explores the second type of barrier.

At first blush, there appears to merit to the hypothesis that occupational convergence stemmed in part from female educational choices. Figures 1A and 1B plot the distributions of occupations for males and females in 1970 and 2000. The occupations are roughly ordered by decreasing level of skill. There is convergence across all occupations, but more so among highly-skilled occupations. Figures 2A and 2B plot the distributions of graduate fields of study for men and women during the same time period. Here, the convergence is much clearer, especially in business, health, and legal professions.

[1] These statistics are based off the Census IPUMS 5 percent samples for years 1960 and 2000. See also Figures 1A and 1B.

To test this hypothesis, I use the exogenous passage of Title IX as a proxy for the removal of barriers to obtaining human capital. Title IX was passed in 1972 and banned gender discrimination in graduate school admissions, as well as other areas of education. The scarcity of empirical evidence on the impact of Title IX attests to the difficulty of identification. First, Title IX is a national policy, making it difficult to find useful variation to estimate a causal impact. Second, the 1972 passage of Title IX corresponded with the women's movement, the introduction of the birth control pill, and the legalization of abortion. These events may have had comparable effects on female's educational and labor market decisions. Perhaps for this reason, most of the work on Title IX look at its impact on high school athletics; Stevenson (2010) finds that Title IX had a significant and positive impact on female college attendance and labor force participation through participation in high school sports. This paper examines the impact of Title IX on occupational choice, a previously under-studied area in the literature. I do this in two parts. The first part is the educational choice analysis that looks at how the removal of barriers to graduate education affected female's graduate field of study. The second part of my analysis is the occupation distributional analysis that looks at how the removal of barrers affected the distribution of female occupational choice.

For the educational choice analysis, I use difference-in-differences (DID) methodology to test whether barriers to higher education influenced female educational choices, an important mechanism in occupational sorting. I find that Title IX reduced the female-male gap in legal, health, and business degrees by 3.4 to 6.5 percentage-points, accounting for 16 to 23 percent of the female share growth in these fields of study. These results hold even after controlling for the introduction of the birth control pill and the legalization of abortion. Second, I show that there are differential effects of Title IX by gender parity in the field. If there indeed were barriers-to-entry to specific fields, then the removal of these barriers would have larger effects in fields where females faced high barriers relative to those where females were already well-represented. I find that low female share in particular fields was due to barriers-to-entry and also female preferences. Third, my placebo test on foreign graduate students shows that my results are not spurious.

The occupation distributional analysis examines the extent to which the female-male convergence in occupation is due to the female-male convergence in graduate fields of study. Using the earth mover's distance (EMD) algorithm, a metric used in computer science for image retrieval, I am able to obtain a measure of the convergence in occupation and graduate fields. This is an important application as unordered categorical variables make distributional analysis very difficult. Using Title IX as an exogenous shock to the female graduate field distribution (as validated by the first part of my analysis), I find that a 1 percent convergence in graduate field leads to a 1.25 percent convergence in occupation. This is driven by convergence in "specialized" fields, which are closely tied to a particular occupation. The results also suggest that females are more likely than males to enter "generalized" fields.

It is important to stress that my explanation is not the only one in explaining the growth in female labor force participation. But on the whole, I do believe my results are strongly suggestive of the important role that human capital access plays in occupational sorting. The rest of my paper is organized as follows: Section 2 details a short history of Title IX, and Section 3 sets up the theoretical framework of this paper. Section 4 describes the data and trends in graduate fields of study by gender. Section 5 outlines the empirical strategy and results of the first half of my analysis: the effect of Title IX on educational choice. Section 6 describes the earth mover's distance metric and the results of distributional analysis. Section 7 concludes.

2 A History of Title IX

2.1 Title IX

The 1965 Presidential Executive Order 11246 (prohibiting federal contractors from discrimination in employment based on race, color, religion, or national origina) was the impetus of Title IX. It was amended in 1968 to include sex and was used by Bernice R. Sandler, then a part-time lecturer at the University of Maryland, to argue that sex discrimination in employment at universities and colleges still existed. This spurred action by Congress, and on June 23, 1972, Title IX of the Education Amendments of 1972 was signed into law.

Title IX mandated that:

> No person in the United States shall, on the basis of sex, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any education program or activity receiving Federal financial assistance.

The law covered many aspects of education discrimination, but in regards to admissions, Title IX applied specifically to "institutions of vocational education, professional education, and graduate higher education, and to public institutions of undergraduate higher education." This law came at a time when women faced substantial inequality in education. Elite colleges and universities had quotas for the admission of women, and women often needed higher test scores and grades than their male peers to be admitted. Once admitted, females were excluded from fields of study that were stereotypically "male", such as medicine (Valentin 1997).

Although Title IX was aimed at explicitly increasing gender equality in education, whether it had any real impact is still an open question. Table 1 presents *prima facie* evidence of Title IX's impact on medical school applications. Although the number of female applicants increased each year, the largest increase is in the academic year 1972-1973, the year after Title IX was passed. More importantly, male applications dropped drastically from 6-7 percent to a stagnant 1 percent, on average, after Title IX.

More generally, Figure 3 shows that there indeed was an increase in female graduate degrees, relative to male's. The dashed, red line indicates the year that Title IX was passed. Before the treatment period, 1971-1973, males were differentially more likely than females to have a graduate degree, all else equal. But after Title IX, the sign flips and now females are differentially more likely to have a graduate degree. This result accounts for demographic factors and time-related changes and is statistically significant at the 1 percent level.

It is important to note that Title IX came at a time when women's rights were greatly expanding. This is evidenced by a noticable time trend in Figure 3. Indeed, the birth control pill was introduced in 1960, giving women a lot more freedom in their career choices. The 1964 Civil Rights Act outlawed discrimination in sex as well as race, religion, and national origin. *Roe v. Wade*, the 1973 Supreme Court case, gave women the right to have an abortion. To complement Title IX, which used sanctions for non-compliance with gender-equity legislation, the Women's Equity Education Act (WEEA) was passed in 1974 and provided incentives and guidance to schools and community groups to achieve gender equality.[2] I need to control for these other events in order to obtain an estimate of the sole impact of Title IX on female educational choices. In the remaining sections of this paper, I seek to provide compelling evidence that there was indeed a causal impact.

3 Theoretical Framework and Empirical Implications

The theoretical framework is a simple model of educational choice in which an individual's decision to pursue a particular graduate degree is conditional on her acceptance to the program and her preferences, among other factors. Preferences has a positive relationship with an individual's likelihood to obtain a graduate degree, whereas barriers-to-entry has a negative relationship. My main research question in the educational choice analysis focuses on the comparative static with respect to barriers-to-entry: how does an exogenous shock to female acceptance rates affect female graduate degrees? Also of interest is the cross-partial between these two factors, which I assume to be zero. If a person has a strong distaste for studying medicine, then high discrimination in medical school admissions will not have an effect on her decision to attend medical school. This assumption implies the following empirical observations:

Hypothesis 1. *If there is low female representation in a field due to preferences, then a removal of barriers to graduate school admissions will not affect female share of graduate degrees in that field.*

Hypothesis 2. *If there is low female representation in a field due to barriers, then a removal of barriers to graduate school admissions will increase female share of graduate degrees in that field.*

[2] A timeline of relevant historic events is summarized in Appendix A.

Corollary 1. *The increase in female share will be larger in fields with higher barriers to entry, where females are severely under-represented.*

An individual's decision to enter a particular occupation is also a complex one driven by many factors, of which I focus on the graduate degree. The importance of a graduate degree is better understood when looking at "specialized" fields that prepare individuals for a specific career. Examples of specialized fields are medical and law degrees. The mapping from degree to occupation can be categorized into two broad theories: at one extreme is a specialization theory that states that each field has a unique, 1:1 mapping to an occupation. At the other end is a generalization theory that states that a field can lead to any occupation. The empirical implications are as follows:

Hypothesis 3. *Convergence among specialized fields will see greater effect on occupations.*

Hypothesis 4. *Convergence among generalized fields will see smaller (or no) effect on occupations.*

Hypothesis 5. *Convergence among graduate fields will see greater effect on high-skilled occupations.*

Hypothesis 6. *Convergence among graduate fields will see smaller (or no) effect on low-skilled occupations.*

My occupation distributional analysis builds upon the educational choice analysis. If Title IX had a significant impact on female field of study, then it is plausible that the convergence in graduate field resulted in occupational convergence. Although the main focus of my occupation distributional analysis is to estimate this causal effect, I also test the empirical implications of the theoretical framework.

4 Data Summary

One of the challenges of studying the impact of Title IX on academic outcomes is the dearth of large-scale datasets that record detailed education data from the 1960s. The National Survey of College Graduates (NSCG) is a longitudinal, biennial survey of U.S. college graduates that began in the 1970s. I use data from the 1993 survey, which surveyed all non-institutionalized, U.S. individuals under the age of 73 with at least a bachelor's degree as of 1993. The individuals who lived through Title IX would have been roughly 40-50 years old in 1993 and, therefore, in this dataset. Most importantly, the 1993 survey is the first of its kind to ask about field of study.

The survey asks respondents to report their field of study and year of degree for their (1) bachelor's degree, (2) highest degree, and (3) most recent degree. I classify graduate school as any degree other than a bachelor's degree. This includes master's degrees, professional degrees, and doctoral degrees. All results reported in this paper use data on the most recent degree. There are 255 reported fields of study in the

NSCG data. I consolidate these into 28 main fields, as categorized by the 2010 Classification of Instructional Programs (CIP).[3]

Table 2 provides a sense of the status of education before Title IX. In 1961, there were about 1.5 more male BAs than female BAs. Similarly, in 1965, there were twice as many males obtaining graduate degrees, relative to females. In 1990, however, there is a shift and females attended graduate school in higher numbers than males. Second, education is the most popular graduate field of study for both males and females in 1965. But whereas nearly half of all females in graduate school are in education, only 20 percent of males chose that field. In other words, males were more evenly distributed across fields in graduate school whereas females were clumped in education.

The next two most popular graduate fields for men are health, at 13.5 percent, and legal professions, at 12.7 percent. By contrast, only 8.6 percent of females are in medical school and one percent are in law school in 1965. The disparity between male and female educational choices becomes starker when we consider undergraduate majors. In 1961, back when these graduate students were in college, 9.3 percent of female BAs studied health but only 4 percent of males did so. However, males made up 78 percent of medical degrees in 1965. Men were severely over-represented in medical school.

Figure 4 plots the growth rate from 1972 to 1980 for all 28 graduate fields of study. There are majors that were popular (Architecture) or unpopular (English) for both males and females. But some fields became differentially more appealing to females. Female engineering degrees grew by over 1000 percent compared to a 21 percent *decrease* for males. Female business degrees grew by nearly 1200 percent compared to a 12 percent growth for males. More interesting, however, is that the fields that experienced the greatest growth between 1972-1980 are mainly fields that were unpopular with females. The black dot indicates a field with less than 1 percent of all female graduate degrees in 1960 or 1965.[4] The fields with the largest female growth rates are mainly these fields: Agriculture, Business, Engineering, Legal Professions, Natural Resources, and Physical Sciences. If there indeed were barriers-to-entry for certain fields, I would expect the largest growth in female degrees to be in these fields, after the removal of these barriers.

I use the 1965-2014 Current Population Survey (CPS) March Supplement for occupation data. The CPS March Supplement, an annual supplement to the monthly CPS, is jointly collected by the Bureau of Labor Statistics and the Census Bureau. The main CPS uses a probability selected sample of about 60,000 occupied households and surveys non-institutionalized individuals not in the Armed Forces above the age of 15. It is the primary source of labor force statistics for the United States, whereas the March Supplement asks

[3]CIP was originally developed in 1980 by the U.S. Department of Education's National Center for Education Statistics for the purpose of accurate tracking, assessment, and reporting of fields of study. Please see the online appendix for the crosswalk between NSC 1993 reported field of study and the 2010 CIP major code.

[4]Of all the female graduate degrees in 1960 or 1965, less than 1 percent of them are in these fields.

detailed on education attainment, work experience, and specific labor market outcomes over the previous calendar year. I reclassify reported occupations from the March Supplement into a balanced panel using Dorn's crosswalk (2009). This is important because occupations have changed greatly since the 1960s. Then, I consolidate the balanced occupations into 56 major occupation categories.

5 Title IX and Female Educational Choice

5.1 Empirical Strategy

I use a standard DID for my educational choice analysis, using the passage of Title IX as a proxy for the dissolution of barriers to obtaining human capital for females. Title IX applied to both public undergraduate schools and all graduate schools, but my analysis focuses on graduate school admissions. The reason for this is two-fold. First, my data are, unfortunately, unable to differentiate between private and public undergraduate universities. Second, I am interested in the determinants of the female-male occupational convergence that was mainly concentrated in highly-skilled occupations. I am also interested in the mapping from education to occupation, wihch is tighter for graduate degrees than it is for undergraduate degrees.

My DID strategy compares the female-male difference in specific graduate degrees between birth cohorts. The DID by birth cohort takes into consideration that individuals make education-related decisions at particular points in their life-cycle, and is, therefore, a cleaner comparison of similarly-aged individuals than a DID by time. Furthermore, I only consider graduate degrees obtained between the ages of 18 and 30 for both cohorts.[5]

Specifically, I compare individuals who were too old to be affected by Title IX to those who were affected by Title IX. I define those affected by Title IX as those who were born between the years 1956-1961 ("post-cohort") and those who were not affected by Title IX as those who were born between the years 1944-1948 ("pre-cohort"). Those in the post-cohort were 11-16 years old in 1972 when Title IX passed, whereas those in the pre-cohort were 24-28. The reason I choose cohorts slightly apart is to allow time for Title IX to have an impact on graduate degrees. Most graduate decisions are not randomly determined; the field is very closely related to the undergraduate major. For example, it is unusual for an art history major to pursue a medical degree. Therefore, by opening up choices in graduate school, Title IX also affected female educational choices at the undergraduate level. To account for this change, my post-cohort is eight years older than my pre-cohort.

Individuals in the pre-cohort would have graduated from college and made their graduate school choices

[5] I chose age 30 as an arbitrary cutoff age as most graduate degrees are obtained by then.

by the time Title IX was passed. But it is possible that pre-cohort females attended graduate school after Title IX was passed. If this occurred, the female share of graduate degrees in my pre-cohort would be higher than otherwise, making it difficult to see a positive effect since I am comparing female degrees in the post-cohort to female degrees in the pre-cohort. Therefore, the fact that I find a positive, significant result only makes my findings stronger.

The regression model is as follows:

$$Y_{isct} = \alpha_{isct} + \delta_i F_i + \eta_i P_i + \beta_i F_i P_i + \gamma_{is} X_{is} + \mu_c C_{isct} + \tau_t T_{isct} + \varepsilon_{isct} \tag{1}$$

where i indexes individuals, s indexes state of birth, c indexes the year of birth, and t indexes year of the degree. Dummy variable Y_{isct} denotes graduate degree in a particular field. For example, Y_{ist} is equal to 1 if individual i received a graduate degree in Business Management in year t. F_i is a dummy variable equal to 1 if individual i is female; P_i is a dummy variable equal to 1 if the individual is in the post-cohort and equal to 0 if the individual is in the pre-cohort; X_{ic} are demographic controls; μ_c are the coefficients on the year-of-birth dummies; τ_t are coefficients on the year-of-degree dummies. The coefficient of interest is β_i. This is the average female-male difference in educational outcomes between birth cohorts affected by Title IX and those not affected by Title IX. In other words, if Title IX had a positive impact on female decisions to get an MBA, then β_i will be positive and statisically significant.

5.2 Results

5.2.1 The Pill

Because the 1970s was a time of great social change, it is difficult to ascertain whether the sign flip we see in Figure 3 is due purely to Title IX or some other event that was happening around the same time. One major event that may cause issues is the birth control pill. The introduction of the birth control pill in 1960 was a very important milestone in advancing female rights and civil liberties. The pill not only gave women sexual freedom, but it also lowered the cost of making long-term career investments. With greater certainty over the pregnancy consequences of sex, women no longer needed to worry about an unintended pregnancy interrupting their education or career.

Although the pill came out long before Title IX was passed (12 years prior, to be exact), it was first available only to married women at or above the age of majority. Therefore, young, single women still in school or wanting to attend graduate school did not have access to the pill if they were under the age of majority (Goldin and Katz 2002). The concern is that females in my pre-cohort would not have access to the pill whereas females in my post-cohort would, thereby convoluting the impact of Title IX with the impact of

the pill. To address this concern, I restrict my analysis to states where age of majority was younger than 20 years old in 1971.[6] During the late 1960s, several states lowered their age of majority. If these changes were related to fertility concerns or educational equity, then I would not be able to use this variation across states to address the problem caused by the birth control pill. Luckily, the legal changes came about mainly in response to the discrepancy in minor's rights highlighted by the ongoing Vietnam War. Specifically, 18-year old men were being drafted but were not allowed to vote until they were 21 (Paul, Pilpel, and Wechsler 1974).

There are 18 states where single females below 20 were able to obtain the birth control pill in 1971, before Title IX was passed. By restricting my data sample to these states, I am allowing for all females in my analysis sample to have access to the pill. Now, the DID estimate will be the sole effect of Title IX. More importantly, females in these 18 states had access to the pill while they were in college. If access to the birth control pill were to affect females' decisions on graduate field of study, it would have an impact at both the undergraduate and graduate level. A college-aged woman who wants to attend medical school not only cannot get pregnant during medical school, but also during undergraduate so that she can actually attend medical school.

One question is whether access to the pill equates to usage of the pill; just because females were able to obtain the pill does not mean that they actually took it. Goldin and Katz (2002) find that states with less restrictive laws had greater pill use by young unmarried women, which is what would be expected if females were taking the pill. Moreover, they argue that the pill diffused rapidly among single women after they were able to obtain it. Therefore, there should be no delayed effect that could potentially confound my results by overlapping with the timing of Title IX.

Table 3 lists the results for selected fields of study, specifically the four fields whose pre-treatment trends satisfy the common trends assumption.[7] Figures 5ABC graph the pre-trends for these four fields. Table 3 reports regression results. After controlling for the pill, demographic factors, and time fixed effects, I find that Title IX increased female MBAs by nearly 7 percentage points. Compared to the pre-cohort's mean female share in business school, 6.8 percent, this is an effect size of 103 percent. Health and legal professions also experienced large effects. Title IX led to a statistically significant 6 percent increase in female MDs and a statistically significant 4 percent increase in female JDs. In education, where nearly half of the graduate students were female, Title IX resulted in a 1 percent increase in female graduates.

To understand the magnitude of these effects, consider the overall increase in female share in these fields. The share of female MBAs increased by 25 percentage-points between the pre-cohort and the post-cohort,

[6] Appendix B lists the age of majority from 1969 to 1974 for all 50 states and DC.

[7] The full set of results are in Appendix Table 3. Results for the base analysis, not controlling for the pill or *Roe v. Wade*, are in Appendix Table 2.

from 7 percent to 31.9 percent, respectively. Title IX explains 28 (= 7/25) percent of the 25 percentage-point growth in female MBAs. The share of female doctors increased by 25.6 percentage-points between the two cohorts, from 17.9 percent to 43.5 percent. Title IX explains 24 percent of that increase in female MDs. Female lawyers increased from 9.7 percent in the pre-cohort to 30.6 percent in the post-cohort,nearly a 21 percentage point increase. Title IX explains 19 percent of the increase. In education, Title IX explains only 3.8 percent of the increase in female graduate degrees.

5.2.2 *Roe v. Wade*

Another potential confounding event is the 1973 landmark U.S. Supreme Court case *Roe v. Wade* that legalized abortions. Just as the birth control pill lowered the cost of long-term investments for women, *Roe v. Wade* gave women more choice and control over their lives. If a woman became pregnant while in college or graduate school, she would have had no choice but to drop out of her program. Therefore, by allowing females to terminate their pregnancies, we would expect *Roe v. Wade* to increase the number of female graduates. Any positive, significant effects I see in my analysis, therefore, would be due to both *Roe v. Wade* and Title IX, assuming I am already controlling for the pill. I would need to properly control for *Roe v. Wade* to get a causal estimate of the sole impact of Title IX on female graduate degrees.

Although abortions were legal in the United States, it was still not easy for a pregnant female to obtain one. This is because of the prevailing social attitude at the time. Prior to *Roe v. Wade*, only four states had legalized abortion. It was illegal in 30 states with no exceptions and legal in 16 states only in the case of rape, damage to the mother's health, or a likely damaged fetus.[8] After *Roe v. Wade* was passed, states passed laws with physician and hospital requirements, gestational limits, counseling requirements, mandatory waiting periods, and even restrictions on public funding (Guttmatcher Institute 2014). Generally, most or all medically necessary abortions for Medicaid enrollees are paid by the state's own funds. Some states, however, can refuse to use their own funds. In the 1960s, 32 states had restrictive funding.[9] To address the concern raised by *Roe v. Wade*, I restrict my data sample to these 32 states. I also continue to keep only states with age of majority under 20 in 1971 in order to control for the birth control pill. Luckily, there are enough states that fall into both of these categories so as not to create a small sample size problem.[10]

By restricting my data to states with restrictive public funding, I expect to see smaller effects of Title IX on female graduate degrees, compared to my results from the previous section. I am now running my analysis on females who would have had to pay for the abortion out-of-pocket but still had access to the pill.

[8]The four states that had legalized abortions were New York, Washington, Hawaii, and Alaska.

[9]These states currently have restrictive public funding for abortions indicating that they also had restrictive public funding in the 1960s. Appendix C lists the states and their public funding status for abortions.

[10]There are 16 states in my final analysis sample: Alaska, Arizona, Arkansas, Idaho, Illinois, Kentucky, Maine, Montana, Nevada, New Mexico, North Carolina, North Dakota, Oklahoma, Tennessee, Utah, and Wisconsin.

If they become pregnant, they would have to quit their schooling. The even-numbered columns in Table 3 show estimates for business degrees, education, health, and legal, respectively.[11] The effect sizes are pretty similar to their counterparts when controlling only for the pill. Again, to put these magnitudes in terms that are easily understandable, Title IX accounts for 26 percent of the growth in female MBAs, 22 percent of the growth in female doctors, 18 percent of the growth in female lawyers, and 6 percent of the increase in female graduate students in education.

It is possible that controlling for *Roe v. Wade* is unnecessary as I already control for the pill. In this regression sample, females have access to the pill before the age of 20. If they are on birth control then it is likely that they will not get pregnant; controlling for legal abortions should not have a huge effect, which is what we see.

5.3 Differential Effects by Gender Parity

In this section, I test whether there are any differential effects of Title IX by gender parity in the field. The previous section found differential effects across fields; females were differentially more likely to pursue business degrees than education degrees. As Title IX is a federal policy that applied equally to all graduate fields, heterogeneous treatment effects suggest that there may be heterogeneity in barriers and/or preferences across fields. This is summarized by Hypotheses 1-1.

To test these hypotheses empirically, I categorize graduate fields of study into three groups: (1) "low gender parity": the average female share of graduates is less than 10 percent between 1962-1970, (2) "mid gender parity": average female share of graduates is between 11-48 percent between 1962-1970, and (3) "high gender parity": average female share of graduates is 49 percent or higher between 1962-1970. Appendix D lists the fields that are in these three groups. Comparing the low-parity group to the high-parity group, we see that the latter contains those considered stereotypically "female", such as Education, English, Family Science, and Library Science, and those in the former, stereotypically "male", such as Architecture, Business, Computer Science, Engineering, and Legal Professions.

I run the same DID regression model as specified in equation (1) for the three different levels of gender parity. I plot the pre-treatment trends in Figures 6ABC to test the validity of the common trends assumption. For all three categories, the pre-treatment trends are similar. Table 4 lists the results. The smallest effect is in low-parity fields, which goes against the barriers hypothesis. But the largest effect is in mid-parity fields, not high-parity fields, which suggests barriers did exist. The results suggest that though Title IX successfully reduced barriers-to-entry to certain fields, preferences still played a role. These results control for both the birth control pill and *Roe v. Wade*.

[11] The full set of results are in Appendix Table 4.

A closer look at the table reveals heterogeneity in barriers by degree type. Title IX would have easily addressed barriers at the MA level, typically the first graduate degree after a BA, and would be less effective at the PhD level, the most advanced graduate degree. Table 5 reports the results. Among the low-parity fields, the largest effect is among master's degrees and the smallest effect is among doctoral degrees. Moreover, among PhDs, the largest effect is in mid-parity fields. Professional degrees saw the largest impact on mid-parity fields. This is because health and law degrees, both of which are classified as professional degrees in the data, are in the mid-parity group.

5.4 Placebo Regression on Foreign Graduate Students

A robustness check is to run a placebo regression on foreign graduate students. Title IX is a federal policy in the United States, so it should have had no influence abroad. In other words, I expect to see no significant effects of the treatment year, 1971-1973, on female graduate field choices in other countries. The 1993 NSCG survey asked all respondents whether they were born in the U.S. and the country of their graduate degree. Thus, I am able to identify foreigners who obtained their graduate degree abroad: individuals who would not have been exposed to Title IX. Remember that the NSCG surveyed all individuals with at least a BA who are *currently living in the United States*. Therefore, the sample of foreigners may be very different than that of the U.S. population. Panel A of Table 6 breaks out my data by birth country and degree country. My main analysis considers the 122,966 individuals born in the United States. For the placebo regression, I am interested in the 9,573 foreigners who were born abroad *and* who obtained their degree abroad.

I also look at a few demographic characteristics in Panel B. Gender composition, what I am most concerned about, is very similar between the two data samples. The racial composition is quite different, but this is not surprising. Racial make-up for foreigners is more an indicator of country of origin.

Table 7 lists the placebo regression results of Title IX on female graduate field of study in foreign schools. There is no clear pattern like we saw in Figure 3 with the U.S. sample. Column 1 shows the results for all foreign graduate degrees; Columns 2-28 list results for all graduate fields.[12] The pattern we would expect to see, if Title IX had an impact, is significant, negative coefficients before the treatment year and significant, positive coefficients after. However, for all of the regressions in Table 7, there is no clear pattern.

[12]There are 28 total fields of study, but Homeland Security is omitted because it had no observations.

6 Title IX and Female Occupational Choice

6.1 Limitations of Distributional Analysis

Distributional analyses are mainly limited to those using continuous variables or ordinal variables because there is no way to measure change in the distribution of an unordered, categorical variable. Many measures of distributional change like the Kolmogorov-Smirnov test are for continuous variables. There are statistical models for unordered variables, like the multinomial logit or random utility models, but these are generally considered too restrictive. The main issues are the Inclusion of Irrelevant Alternatives assumption and degrees of freedom. I have 56 different occupations and 28 different fields of study in my data. A major contribution of this paper is the application of a metric used in computer science to the economics literature. As this metric is used for image retrieval, it applies easily to measure change in the distribution of unordered variables, specifically graduate field of study and occupation.

6.2 The Earth Mover's Distance (EMD)

The Earth Mover's Distance is a metric that measures the differences between two distributions. In a nutshell, it is the minimal cost that must be paid to transform one distribution into the other. Computation of EMD is borne from the transportation problem. Suppose that several suppliers, each with a given amount of goods, are required to supply several consumers, each with a given limited capacity. For each supplier-consumer pair, the cost of transporting a single unit of goods is given. The transportation problem is then to find a least-expensive flow of goods from the suppliers to the consumers that satisfies the consumers' demand. The following formalization of EMD is adapted from Rubner, Tomasi, and Guibas (2000) to apply to the context of occupational convergence.

The computation of EMD can be formalized by the following linear programming problem:

Let

$$M = \{(m_1, w_{m_1}), \cdots, (m_m, w_{m_m})\}$$

be the male occupation distribution with m occupation categories, where m_i is occupation i and w_{m_i} is the share of males in occupation i.

Analogously, let

$$W = \{(w_1, w_{w_1}), \cdots, (w_m, w_{w_m})\}$$

be the female occupation distribution with n occupation categories (notice that $m = n$); and let

$$\mathbf{D} = [d_{ij}]$$

be the difference matrix where d_{ij} is the difference between occupations m_i and w_j, that minimizes the overall cost

$$WORK(M, W, \mathbf{F}) = \sum_{i=1}^{m} \sum_{j=1}^{n} d_{ij} f_{ij},$$

subject to the following constraints:

$$\begin{aligned}
f_{ij} &\geq 0, \quad 1 \leq i \leq m, \quad 1 \leq j \leq n && (2)\\
\sum_{j=1}^{n} f_{ij} &\leq w_{m_i}, \quad 1 \leq i \leq m && (3)\\
\sum_{j=1}^{m} f_{ij} &\leq w_{w_i}, \quad 1 \leq j \leq n && (4)\\
\sum_{i=1}^{m} \sum_{j=1}^{n} f_{ij} &= \min\left(\sum_{i=1}^{m} w_{m_i}, \sum_{i=1}^{n} w_{w_i}\right) && (5)
\end{aligned}$$

Constraint (2) allows moving people from M to W and not vice versa. Constraint (3) limits the number of males who can be moved in an occupation to their share (i.e., if 30 percent of males are doctors, the number of male doctors who can be moved to another occupation is limited to that 30 percent). Constraint (4) is analog for occupation categories in F; and constraint (5) forces to move the maximum number of people possible. This number is called the total flow. Once the transportation problem is solved, and the optimal flow F is found, the earth mover's distance is defined as the resulting work normalized by the total flow:

$$EMD(M, F) = \frac{\sum_{i=1}^{m} \sum_{j=1}^{n} d_{ij} f_{ij}}{\sum_{i=1}^{m} \sum_{j=1}^{n} f_{ij}}$$

The normalization factor is the total weight of the smaller distribution, because of constraint (5). Thus, the EMD naturally extends the notion of the dissimilarity between two distributions. To give a visual example, Figure 6 shows two female-male distributions of graduate field of study. The distributions from 1962 on the top has an EMD value of 0.0136. In 1990, where the convergence is visually clearer, the distributions are assigned an EMD value of 0.00805. As EMD is a measure of cost, smaller values correspond to more similar distributions. I use EMD to measure the similarity between the female and male distributions in each year, separately for occupations and graduate fields of study.

Figure 7 presents *prima facie* evidence of the causal impact of Title IX on the female-male convergence in occupation. The two graphs plot the EMD values over time. They tell us that the female-male distributions were converging over time for both occupations and graduate fields. To see whether Title IX had an impact, I also estimate a lowess smoother allowing for a break in 1975, the year that Title IX regulations were stipulated. We see that there is a marked jump towards convergence after 1975 for graduate fields and a smaller one for occupations.

6.3 Empirical Strategy and Results

My empirical strategy is very straightfoward:

$$\text{LOccConv}_t = \beta_0 + \beta_1 \text{LFieldConv}_t + \beta_2 \text{Post1975}_t + \beta_3 \Big(\text{Post1975}_t \times \text{LFieldConv}_t \Big) + \varepsilon_t, \tag{6}$$

where t indexes the year. LOccConv_t is the logged difference between the male occupation distribution and female distribution in year t; LFieldConv_t is the logged difference between the male graduate field distribution and female distribution in year t; Post1975_t is a dummy equal to 1 if year t is after 1975. The coefficient of interest is β_3, the interaction between Post1975 and the log measure of convergence in graduate field distribution.

Table 9 presents regression results for different specifications. My preferred specification is in column 3, which has the highest adjusted R-squared. I find that a 1-percent convergence in graduate field leads to a 1.3 percent convergence in occupation. I also estimate a three-spline model to account for the transition to Title IX; the results for this specification are reported in columns 4 and 5. The interaction term is no longer significant, but this is likely due to the small sample size.

6.4 Graduate Field Specialization

Having found a causal link between graduate field convergence and occupation convergence, a natural next step is to understand the mechanism. In this section, I test the empirical implications of Hypotheses 3 and 4. To classify a field as specialized or generalized, I calculate the Herfindahl-Hirschman Index (HHI) for each graduate field using the field as the industry and each occupation as a firm:

$$H_F = \sum_{i=1}^{N} s_{i,F}^2,$$

where $s_{i,F}$ is the share of respondents in occupation i with degree F and N is the total number of occupations. I classify fields with $H_F > 0.15$ as specialized. This threshold was chosen as it indicates moderate

concentration according to the merger guidelines.[13]

Figure 8 plots the EMD values over time by field specialization. Again, the solid lines are lowess smoothers allowing for a break in 1975. There is a marked, discrete jump in specialized fields, similar to the one observed in the occupation distribution (Figure 7). Generalized fields do see dramatic convergence, but there is no discrete jump like the one seen in specialized fields.

Table 9 lists regression results. My preferred specifications are in columns 3 and 8. As expected, a 1 percent convergence in specialized fields leads to a 0.9 percent convergence in occupations, whereas there is no statisticaly significant effect for generalized fields. Although it is insignificant, the negative sign on the coefficient Post1975 and log convergence in graduate fields indicates that females are more likely to pursue generalized fields. Figure 8 shows that there is great convergence between males and females in generalized fields. The negative sign, however, implies that this convergence led to a *divergence* in occupation. Therefore, females are differentially pursuing generalized fields.

6.5 High-skilled vs. Low-skilled Occupations

In this section, I conduct a robustness check by exploiting the fact that Title IX affected higher education. As such, one would expect greater effects of graduate field convergence on high-skilled occupations and little or no effect on low-skilled occupations.

To classify occupations by skill-level, I use Occupational Information Network (O*NET) data to obtain education requirements for each occupation. O*NET is the Department of Labor's successor to the Dictionary of Occupational Titles that contains data on tasks, activities, knowledge, and abilities used in each occupation and began in 2001. O*NET randomly selects workers in a random sample of businesses expected to employ workers in targeted occupations. These workers are asked about various aspects of their occupation. One specific question is the level of education required to perform the job.

There are 12 different categories: Less than high school, High school degree (or GED equivalent), Post-secondary diploma, Some college courses, Associate's degree, Bachelor's degree, Post-baccalaureate certificate, Master's degree, Post-master's certificate, First professional degree, Doctoral degree, Post-doctoral training. Any occupation that requires at least a bachelor's degree is classified as high-skilled. As my analysis is at the aggregate occupation level, I aggregate education requirements using the following rule: if more than half of the occupation codes in a major occupation category requires at least a BA, then I classify the major occupation category as a high-skilled occupation. Figures 9AB plot the share of BA-degree holders in each occupation between 1950-2000 to get a sense of the validity of this measure over time. The dots

[13] I also calculate an alternate measure of specialization that uses the maximum correlation value across all graduate field-occupation pairs. If the standardized correlation value is in the top 40 percent, then the field is classifed as specialized. I obtain similar results using this alternate measure.

indicate the average share of BA-degree holders. The vertical line represents the range of shares from 1950 to 2000. The low-skilled occupation shares are very stable, with a modal range of 10 percentage-points and most under 10 percent. The share of BA-holders in high-skilled occupations is more variable, but this is not surprising as only XX percent of the population had a BA in 1960.

Figure 11 shows *prima facie* evidence that high-skilled occupations were affected by Title IX. There is a steep move towards convergence in high-skilled occupations post-1975. Low-skilled occupations, meanwhile, are hardly disturbed. It is also important to notice the scale of the two graphs. Although both high-skilled and low-skilled occupations converge over time, the dissimilarity among low-skilled occupations remains greater at all times. This is not surprising as most of the low-skilled occupations are those where men have a comparative advantage.

Table 10 lists the results from the empirical analysis. My preferred specification finds that high-skilled occupations have an elasticity of 1.1. When I account for the transition to Title IX, I find that a 1 percent convergence in graduate field leads to a 1.5 percent convergence in occupation. Panel B shows results among low-skilled occupations. A 1 percent convergence among graduate fields leads to a 0.3 percent occupational convergence. The significant result is likely due to leakage of BAs into low-skilled occupations. Although the analysis focuses on generalized fields, it is important to remember that these are still graduate degrees. So it is not surprising to see some convergence in occupations. When accounting for the transition to Title IX, the interaction is no longer significant.

7 Conclusion

This paper explores the determinants of occupational sorting by focusing on an important mechanism: barriers to human capital. The convergence in the U.S. occupational distribution between men and women has been extensively documented, but to my knowledge no previous paper has looked at this supply factor. I establish a causal link between the graduate field convergence and occupation convergence by exploiting the 1972 passage of Title IX, which banned gender discrimination in graduate school admissions. A 2013 working paper by Hsieh and co-authors estimates that 15 to 20 pecent of the growth in aggregate output per worker can be explained by the removal of frictions, in general, and the resulting improvement in allocation of talent. I attempt to add to the literature by distinguishing between labor market discriminiation and barriers to human capital acquisition.

I examine whether an exogenous shock to graduate school admissions, through Title IX, affects females' decisions to pursue graduate degrees that are closely correlated with an occupation. My DID analysis finds that Title IX did increase female degrees, but also that there were differential effects by gender parity. This

is due to both barriers and preferences. Moreover, the convergence in graduate field distribution, through Title IX, led to a convergence in occupations that was mainly driven by specialized fields. Last, my results suggest that females are more likely than males to pursue generalized fields.

Although I believe the empirical evidence presented in this paper is strongly suggestive of the important role of graduate higher education in occupational sorting, it is important to stress that this is not the only explanation. As mentioned before, there is a rich literature on both the demand and supply factors determining female labor force participation. But on the whole, I believe my results are broadly suggestive of the significant impact of increased female human capital on occupational sorting.

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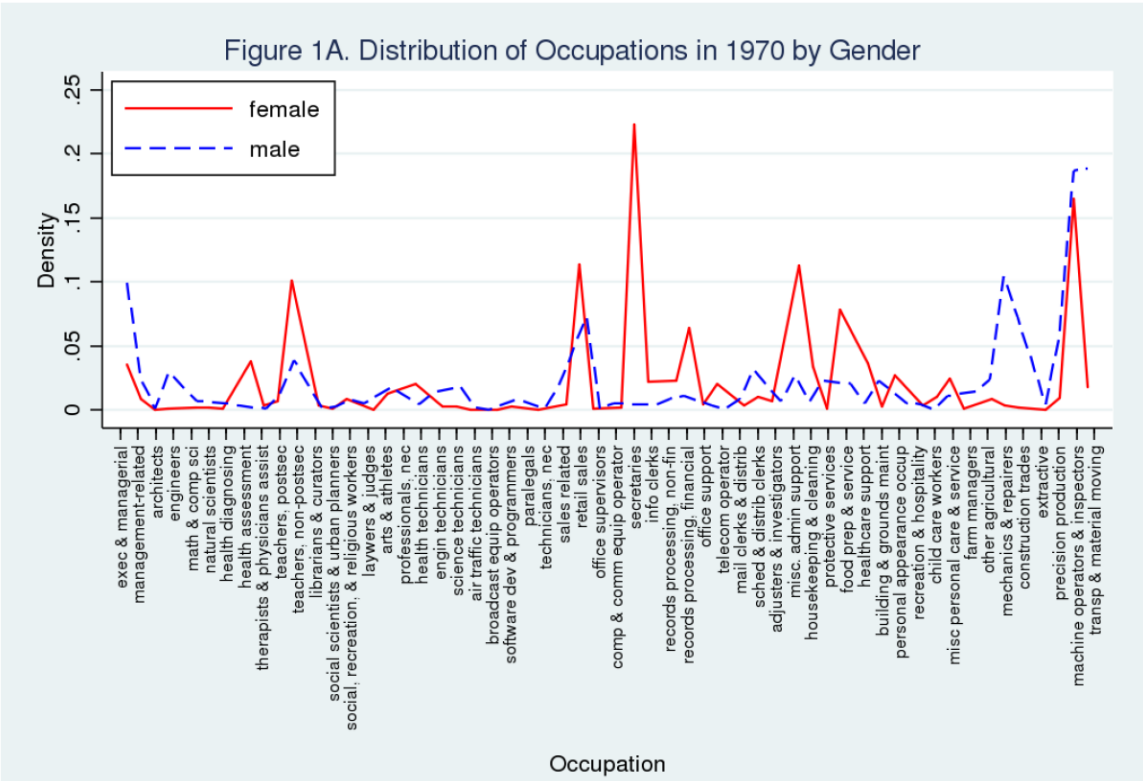
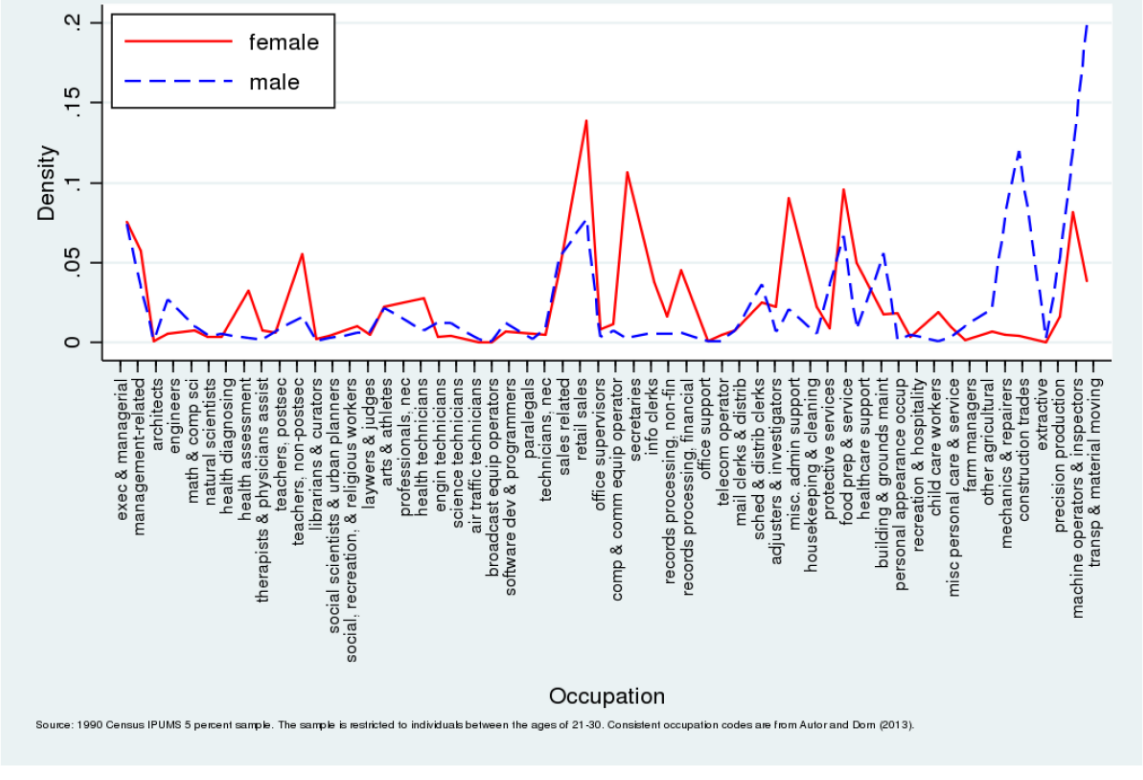


Source: 1970 Census IPUMS 5 percent sample. The sample is restricted individuals between the ages of 21-30. Consistent occupation codes are from Autor and Dorn (2013).



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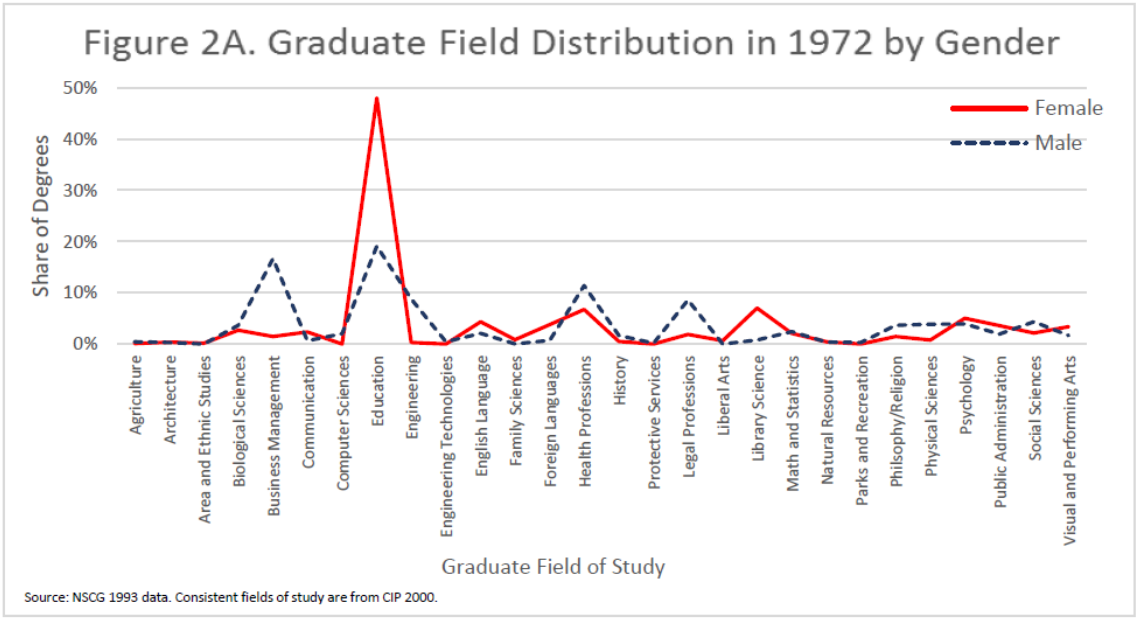
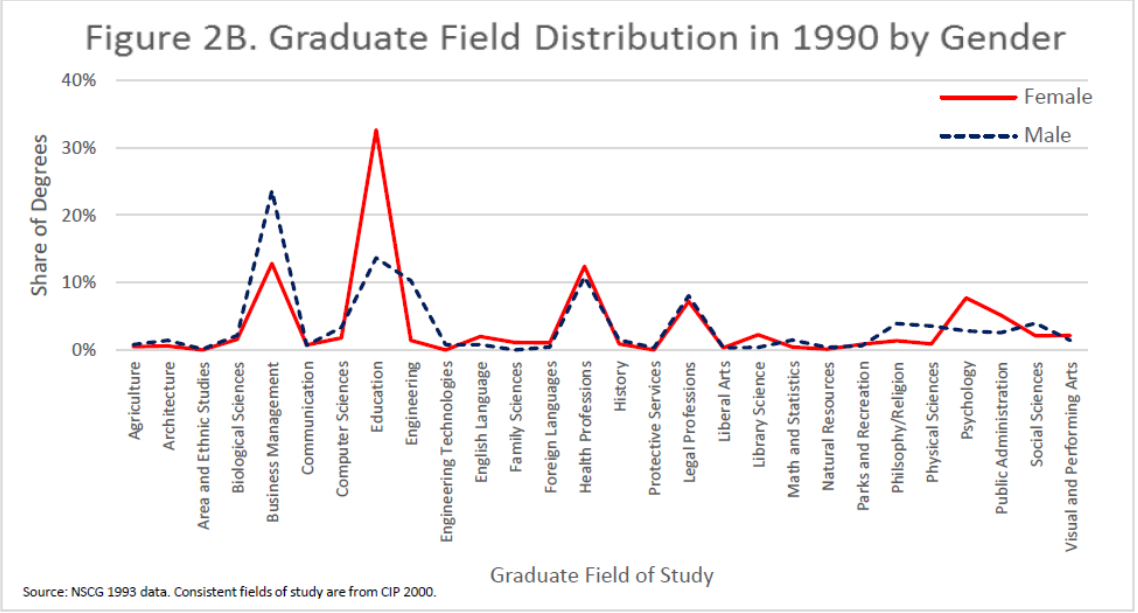


Source: NSCG 1993 data. Consistent fields of study are from CIP 2000.



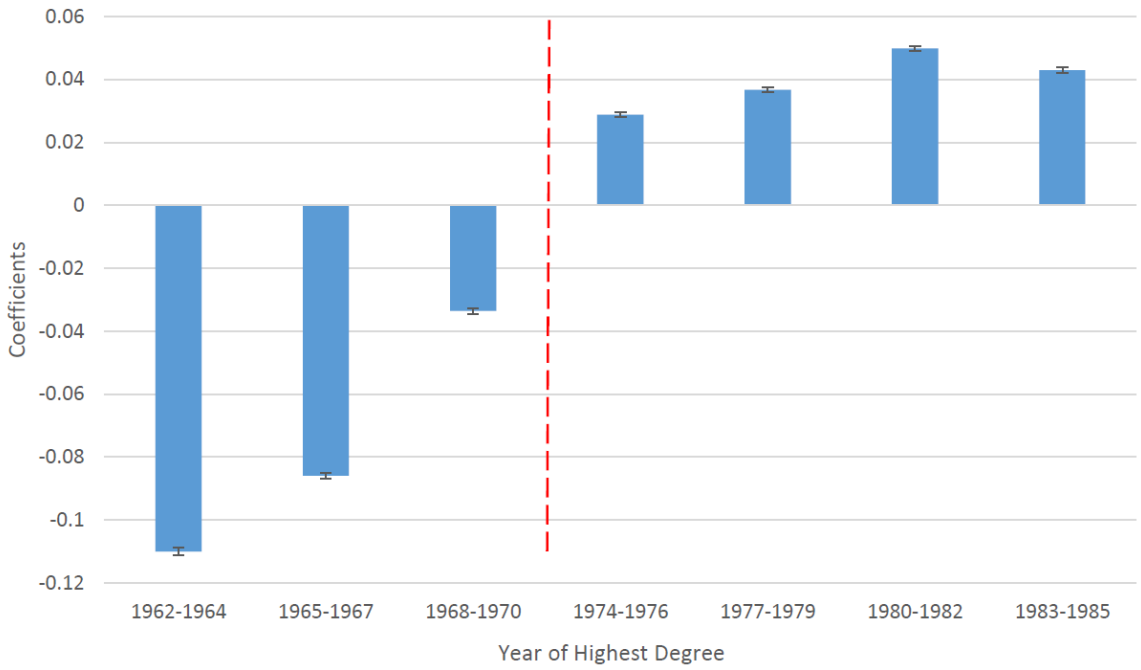
Source: NSCG 1993 data. Consistent fields of study are from CIP 2000.

Table 1. U.S. Medical School Applications by Sex
Academic years 1968-69 through 1983-84

	Number of Applicants			Growth Rate		
Academic Year	Total	Male	Female	Total	Male	Female
1968-69	9863	8976	887			
1969-70	10422	9474	948	6%	6%	7%
1970-71	11348	10092	1256	9%	7%	32%
1971-72	12361	10668	1693	9%	6%	35%
1972-73	13677	11377	2300	11%	7%	36%
1973-74	14159	11369	2790	4%	0%	21%
1974-75	14763	11488	3275	4%	1%	17%
1975-76	15295	11648	3647	4%	1%	11%
1977-78	16136	12006	4130	5%	3%	13%
1978-79	16501	12339	4162	2%	3%	1%
1979-80	16930	12217	4713	3%	-1%	13%
1980-81	17186	12220	4966	2%	0%	5%
1981-82	17286	11951	5317	1%	-2%	7%
1982-83	17254	11792	5462	0%	-1%	3%
1983-84	17150	11497	5653	-1%	-3%	3%

Source: U.S. Department of Health & Human Services (1984), p. 112 (Table 48).

Figure 3. Female-Male Difference in Graduate Degrees Relative to 1971-1973



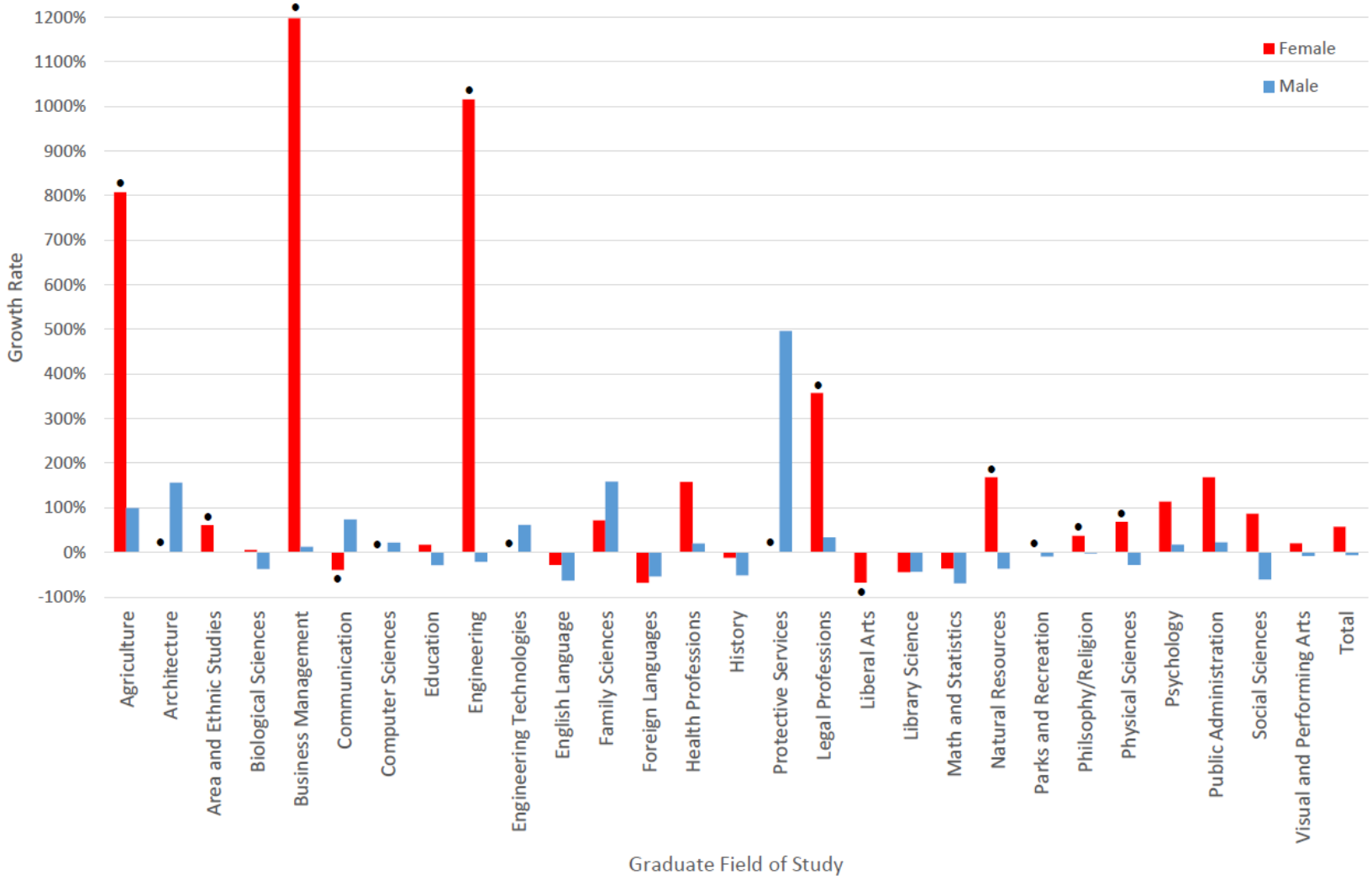
Source: NSCG 1993 data.
Note: The dashed red line indicates the year that Title IX was passed. The wings on the bars indicate standard errors. The graph plots β_t from the following regression: $Y_{ist} = \alpha_{ist} + F_i\delta_i + F_iT_{ist}\beta_t + X_{is}\gamma_{is} + T_{ist}\tau_t + \varepsilon_{ist}$, where i indexes individuals, s indexes birth state, and t indexes year of the most recent degree. The education outcome of interest, graduate degree holder, is denoted by dummy variable Y_{ist}. A graduate degree is defined as either a master's degree, a professional degree, or a doctorate. F_i is a dummy variable equal to 1 if individual i is female; X_{is} are demographic controls (race and birth-state dummies); τ_t are the coefficients on year of most recent degree dummies. The coefficients of interest are β_t. These are the year-specific, female-male differences in educational outcomes. Regression results are in Appendix Table 1.

Table 2. Summary Statistics of Major Fields of Study in 1961, 1965, and 1990

	BA Degrees in 1961		Graduate Degrees in 1965				Graduate Degrees in 1990			
Major Fields of Study	**Females**	**Males**	**Females**		**Males**		**Females**		**Males**	
Agriculture, Agriculture Operations, and Related Sciences	0.1%	3.6%	140	0.4%	1,771	2.0%	892	0.5%	1,357	0.8%
Architecture and Related Services	0.0%	1.1%	0	0.0%	0	0.0%	1,134	0.6%	2,405	1.4%
Area, Ethnic, Cultural, Gender, and Group Studies	0.0%	0.0%	0	0.0%	0	0.0%	0	0.0%	220	0.1%
Biological and Biomedical Sciences	0.8%	1.3%	956	2.5%	3,474	3.9%	3,007	1.6%	3,616	2.1%
Business, Management, Marketing, and Related Support Services	3.9%	34.0%	53	0.1%	10,458	11.9%	24,677	12.8%	40,014	23.6%
Communication, Journalism, and Related Programs	0.8%	2.1%	176	0.5%	554	0.6%	1,457	0.8%	1,185	0.7%
Computer and Information Sciences and Support Services	0.0%	0.1%	0	0.0%	0	0.0%	3,382	1.8%	5,651	3.3%
Education	42.5%	7.6%	19,005	48.8%	17,260	19.6%	62,820	32.6%	23,087	13.6%
Engineering	0.1%	18.5%	0	0.0%	8,783	10.0%	2,743	1.4%	17,355	10.2%
Engineering Technologies and Engineering-Related Fields	0.0%	1.1%	0	0.0%	360	0.4%	0	0.0%	1,337	0.8%
English Language and Literature/Letters	8.6%	2.1%	1,749	4.5%	752	0.9%	3,844	2.0%	1,302	0.8%
Family and Consumer Sciences/Human Sciences	8.2%	0.0%	858	2.2%	0	0.0%	2,102	1.1%	0	0.0%
Foreign Languages, Literatures, and Linguistics	2.4%	0.8%	592	1.5%	354	0.4%	1,976	1.0%	730	0.4%
Health Professions and Related Programs	9.3%	4.0%	3,335	8.6%	11,836	13.5%	23,904	12.4%	18,322	10.8%
History	3.9%	1.7%	406	1.0%	1,567	1.8%	1,706	0.9%	2,504	1.5%
Homeland Security, Law Enforcement, Firefighting and Related Protective Services	0.0%	0.0%	0	0.0%	285	0.3%	65	0.0%	582	0.3%
Legal Professions and Studies	0.7%	0.1%	382	1.0%	11,189	12.7%	13,804	7.2%	13,611	8.0%
Liberal Arts and Sciences, General Studies and Humanities	2.4%	0.4%	0	0.0%	0	0.0%	665	0.3%	556	0.3%
Library Science	0.2%	0.0%	1,129	2.9%	304	0.3%	4,341	2.3%	670	0.4%
Mathematics and Statistics	1.3%	3.3%	720	1.8%	1,752	2.0%	794	0.4%	2,499	1.5%
Natural Resources and Conservation	0.0%	1.8%	0	0.0%	455	0.5%	229	0.1%	617	0.4%
Parks, Recreation, Leisure, and Fitness Studies	0.1%	0.1%	0	0.0%	282	0.3%	1,621	0.8%	1,054	0.6%
Philsophy and Religious Studies; Theology and Religious Vocations	1.2%	1.7%	403	1.0%	5,104	5.8%	2,611	1.4%	6,604	3.9%
Physical Sciences	2.3%	4.2%	554	1.4%	3,806	4.3%	1,677	0.9%	6,005	3.5%
Psychology	1.7%	1.2%	1,226	3.1%	1,811	2.1%	14,894	7.7%	4,784	2.8%
Public Administration and Social Service Professions	0.7%	0.6%	2,107	5.4%	1,977	2.2%	9,963	5.2%	4,341	2.6%
Social Sciences	4.4%	6.7%	1,513	3.9%	2,710	3.1%	4,028	2.1%	6,677	3.9%
Visual and Performing Arts	4.3%	1.7%	3,660	9.4%	1,120	1.3%	4,109	2.1%	2,373	1.4%
Number of graduates	82,511	126,556	38,962		87,964		192,443		169,456	

Source: NSCG 1993 data. Graduate degrees are defined as any degree that is not a BA. Consistent fields of study are from CIP 2000.

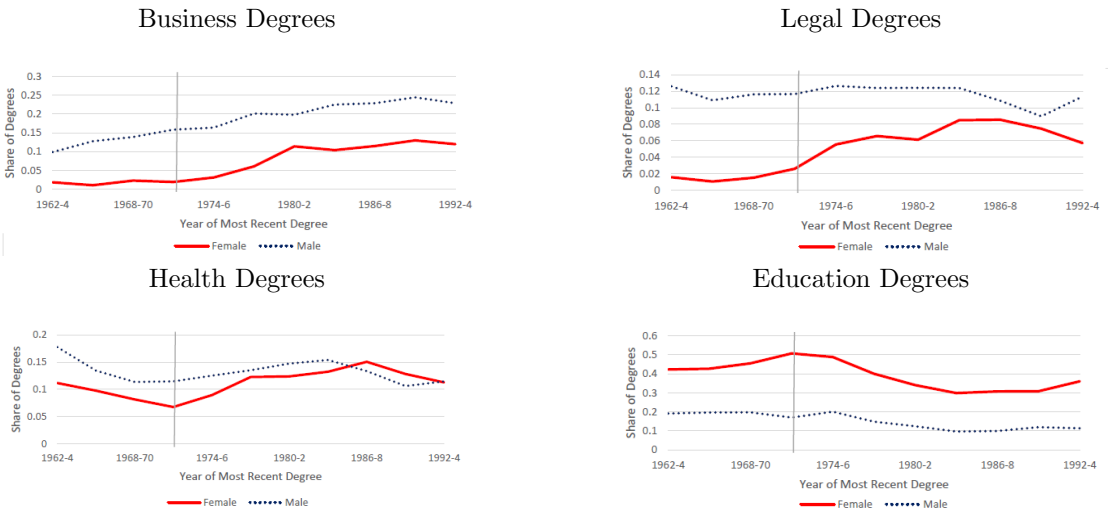
Figure 4. Growth Rates for Graduate School Fields of Study from 1972 to 1980



• Least popular fields for females (<1% of all female graduate degrees in 1960 or 1965)

Source: NSCG 1993 data. Consistent fields of study are from CIP 2000.

Figure 5. Graduate Degree Trends by Gender



Source: NSCG 1993 data.

Table 3. Female-Male Cohort Difference in Select Graduate Fields of Study

	Outcome Variable: Graduate Field of Study							
	Business		Health		Legal		Education	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Pre-Cohort Mean Female Share	0.068	0.071	0.179	0.183	0.097	0.101	0.486	0.475
Female*Post-Title IX cohort	0.0698***	0.0653***	0.0617***	0.0584***	0.0409***	0.0344***	0.0102***	0.0173***
	(0.00224)	(0.00236)	(0.00214)	(0.00223)	(0.00200)	(0.00204)	(0.00240)	(0.00248)
Post-Title IX cohort	-0.0787***	-0.0622***	-0.228***	-0.235***	-0.0525***	-0.0692***	0.490***	0.479***
	(0.0169)	(0.0172)	(0.0162)	(0.0163)	(0.0151)	(0.0149)	(0.0182)	(0.0181)
Female	-0.159***	-0.163***	-0.0654***	-0.0584***	-0.116***	-0.110***	0.194***	0.185***
	(0.00170)	(0.00180)	(0.00163)	(0.00170)	(0.00152)	(0.00155)	(0.00183)	(0.00189)
Constant	0.335***	0.338***	0.0557***	0.0631***	0.0820***	0.0933***	-0.0774***	-0.0605***
	(0.00656)	(0.00671)	(0.00628)	(0.00634)	(0.00586)	(0.00580)	(0.00704)	(0.00705)
Time Fixed Effects	X	X	X	X	X	X	X	X
Demographic Controls	X	X	X	X	X	X	X	X
Control for Birth Control Pill	X	X	X	X	X	X	X	X
Control for Roe vs. Wade		X		X		X		X
N	2,312	2,142	2,312	2,142	2,312	2,142	2,312	2,142

Source: NSCG 1993 data.

Note: Pre-Title IX birth cohorts are people born between 1944-48. Post-Title IX birth cohorts are 1956-61. Both cohorts are restricted to ages 18-30. Time fixed effects include year and birth cohort dummies. Demographic controls include race and state of birth dummies. I control for access to the pill by restricting the data to birth states where the age of majority was ¡20 in 1971. See Appendix B for the list of states. I control for Roe vs. Wade by restricting my data to birth states that had restrictive abortion funding in 1983. See Appendix C for the list of these states. * p< 0.05, ** p< 0.01, *** p< 0.001

Figure 6A. Trends for Graduate Fields with Low Gender Parity in 1962-1970

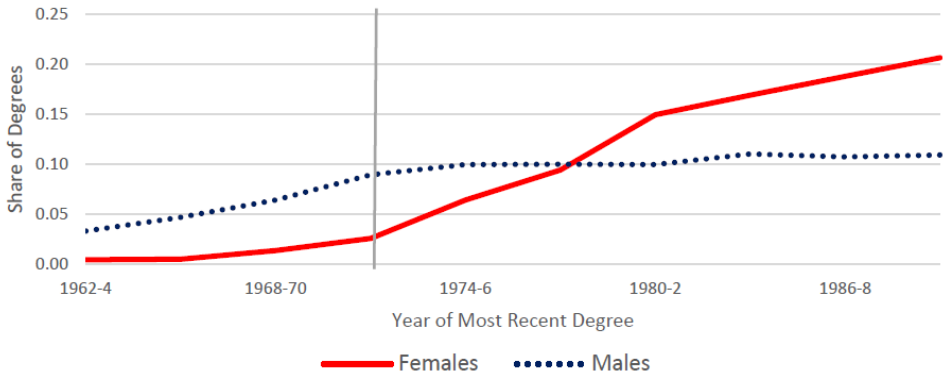


Figure 6B. Trends for Graduate Fields with Mid Gender Parity in 1962-1970

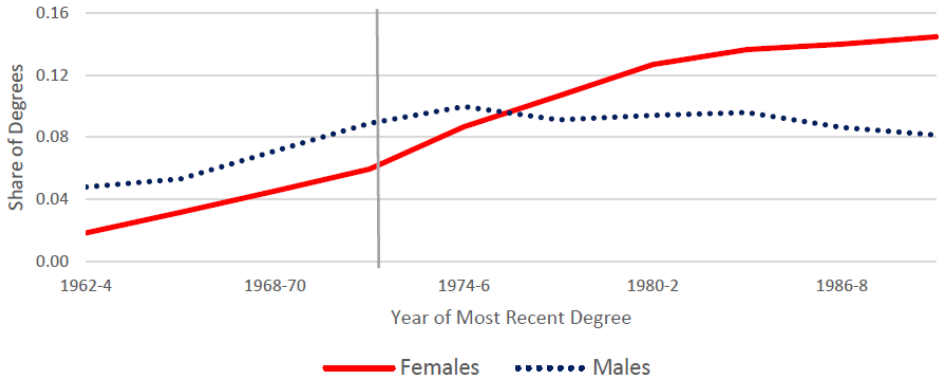
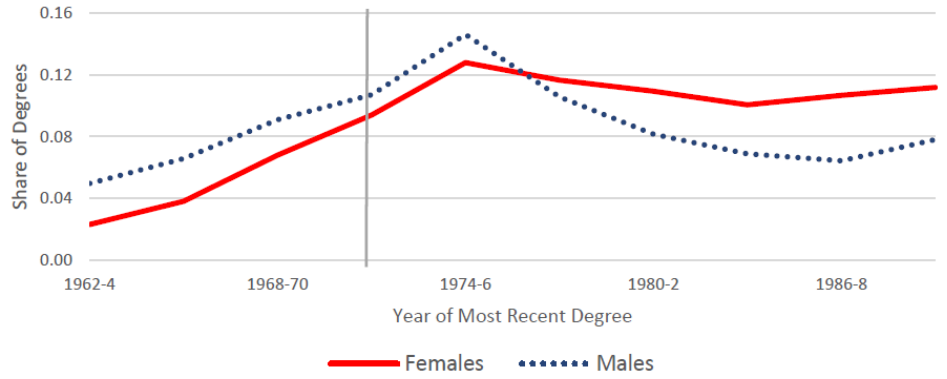


Figure 6C. Trends for Graduate Fields with High Gender Parity in 1962-1970



Source: NSCG 1993 data.
Note: Low gender parity is defined as females with a less than 10% female share of all degrees. Mid gender parity are fields with 11-48% female share. High gender parity are fields with at least 49% female share of all degrees.

Table 4. Female-Male Cohort Difference in Graduate Degrees by Gender Parity

	Field's 1962-70 Gender Parity:		
	Low (1)	**Mid (2)**	**High (3)**
Pre-Cohort Mean Female Share	0.145	0.320	0.586
Female*Post-Title IX cohort	0.00716*	0.0332***	0.0292***
	(0.00287)	(0.00211)	(0.00272)
Post-Title IX cohort	-0.561***	-0.414***	-0.459***
	(0.00291)	(0.00312)	(0.00389)
Female	-0.0270***	-0.0695***	-0.0370***
	(0.00254)	(0.00160)	(0.00166)
Constant	1.468***	1.159***	1.022***
	(0.00894)	(0.00731)	(0.0106)
Time Fixed Effects	X	X	X
Demographic Controls	X	X	X
Control for Birth Control Pill	X	X	X
Control for *Roe v. Wade*	X	X	X
N	7,526	7,318	5,290

Source: NSCG 1993 data.
Note: Pre-Title IX birth cohort contains people born between 1944-48 and were 24-28 years old in 1972. Post-Title IX birth cohort contains people born between 1956-61, who were 11-16 in 1972. Time fixed effects include year and birth cohort dummies. Demographic controls include race and state of birth dummies. Low gender parity is defined as fields with a less than 10% female share of all degrees. Mid gender parity is defined as fields with 11-48% female share of all degrees. High gender parity is defined as fields with at least 49% female share of all degrees. For a list of specific fields in each category, see Appendix D. * $p< 0.05$, ** $p< 0.01$, *** $p< 0.001$

Table 5. Female-Male Cohort Difference in Graduate Degree Types by Gender Parity

	Master's degree			Professional degree			PhD degree		
	Low (1)	Mid (2)	High (3)	Low (4)	Mid (5)	High (6)	Low (7)	Mid (8)	High (9)
Pre-Cohort Mean Female Share	0.147	0.439	0.603	0.153	0.081	0.341	0.096	0.171	0.358
Female*Post-Title IX cohort	0.0249***	-0.0351***	0.0211***	-0.0245***	0.0252***	-0.0104***	0.00621***	0.0435***	0.0185***
	(0.00262)	(0.00192)	(0.00280)	(0.00204)	(0.00139)	(0.000498)	(0.000839)	(0.00112)	(0.000888)
Post-Title IX cohort	-0.364***	-0.256***	-0.394***	-0.169***	-0.0581***	0.0123***	-0.0292***	-0.100***	-0.0775***
	(0.00265)	(0.00283)	(0.00401)	(0.00207)	(0.00205)	(0.000713)	(0.000850)	(0.00165)	(0.00127)
Female	-0.0357***	0.0805***	-0.000702	0.0219***	-0.0918***	-0.00573***	-0.0117***	-0.0581***	-0.0306***
	(0.00232)	(0.00146)	(0.00171)	(0.00181)	(0.00105)	(0.000305)	(0.000744)	(0.000851)	(0.000543)
Constant	1.318***	0.653***	0.930***	0.0976***	0.120***	0.000327	0.0451***	0.387***	0.0912***
	(0.00816)	(0.00664)	(0.0110)	(0.00637)	(0.00480)	(0.00195)	(0.00262)	(0.00388)	(0.00348)
Time Fixed Effects	X	X	X	X	X	X	X	X	X
Demographic Controls	X	X	X	X	X	X	X	X	X
Control for Birth Control Pill	X	X	X	X	X	X	X	X	X
Control for *Roe v. Wade*	X	X	X	X	X	X	X	X	X
N	7,526	7,318	5,290	7,526	7,318	5,290	7,526	7,318	5,290

Source: NSCG 1993 data.

Note: Pre-Title IX birth cohort contains people born between 1944-48 and were 24-28 years old in 1972. Post-Title IX birth cohort contains people born between 1956-61, who were 11-16 in 1972. Time fixed effects include year and birth cohort dummies. Demographic controls include race and state of birth dummies. Low gender parity is defined as fields with a less than 10% female share of all degrees. Mid gender parity is defined as fields with 11-48% female share of all degrees. High gender parity is defined as fields with at least 49% female share of all degrees. For a list of specific fields in each category, see Appendix D. * $p< 0.05$, ** $p< 0.01$, *** $p< 0.001$

Table 6. Summary Statistics of the NSCG 1993 data

Panel A

	Attended U.S. Graduate school:				
	No		**Yes**		**Total**
Born Abroad	9,573	6.4%	16,348	11.0%	25,921
Born in the U.S.	526	0.4%	122,440	82.2%	122,966
Total	10,099	6.8%	138,788	93.2%	148,887

Panel B

	U.S. sample		**Foreign sample**		
	Number	**Perc**	**Number**	**Perc**	**Total**
Gender					
Female	12,079,076	45.9%	498,443	46.7%	12,577,519
Male	14,256,236	54.1%	568,065	53.3%	14,824,301
Race					
Hispanic	511,153	1.9%	120,568	11.3%	631,721
White	24,051,763	91.3%	343,967	32.3%	24,395,731
Black	1,427,277	5.4%	17,555	1.6%	1,444,832
Asian	271,275	1.0%	580,983	54.5%	852,258
Other	73,843	0.3%	3,435	0.3%	77,278
Total	26,335,311	100.0%	1,066,508	100.0%	27,401,820

Source: NSCG 1993 data.
Note: U.S. sample is defined as individuals who were born in the U.S. Foreign sample is defined as any individual who was born outside the U.S. and received a graduate degree outside the U.S. Panel B numbers are weighted.

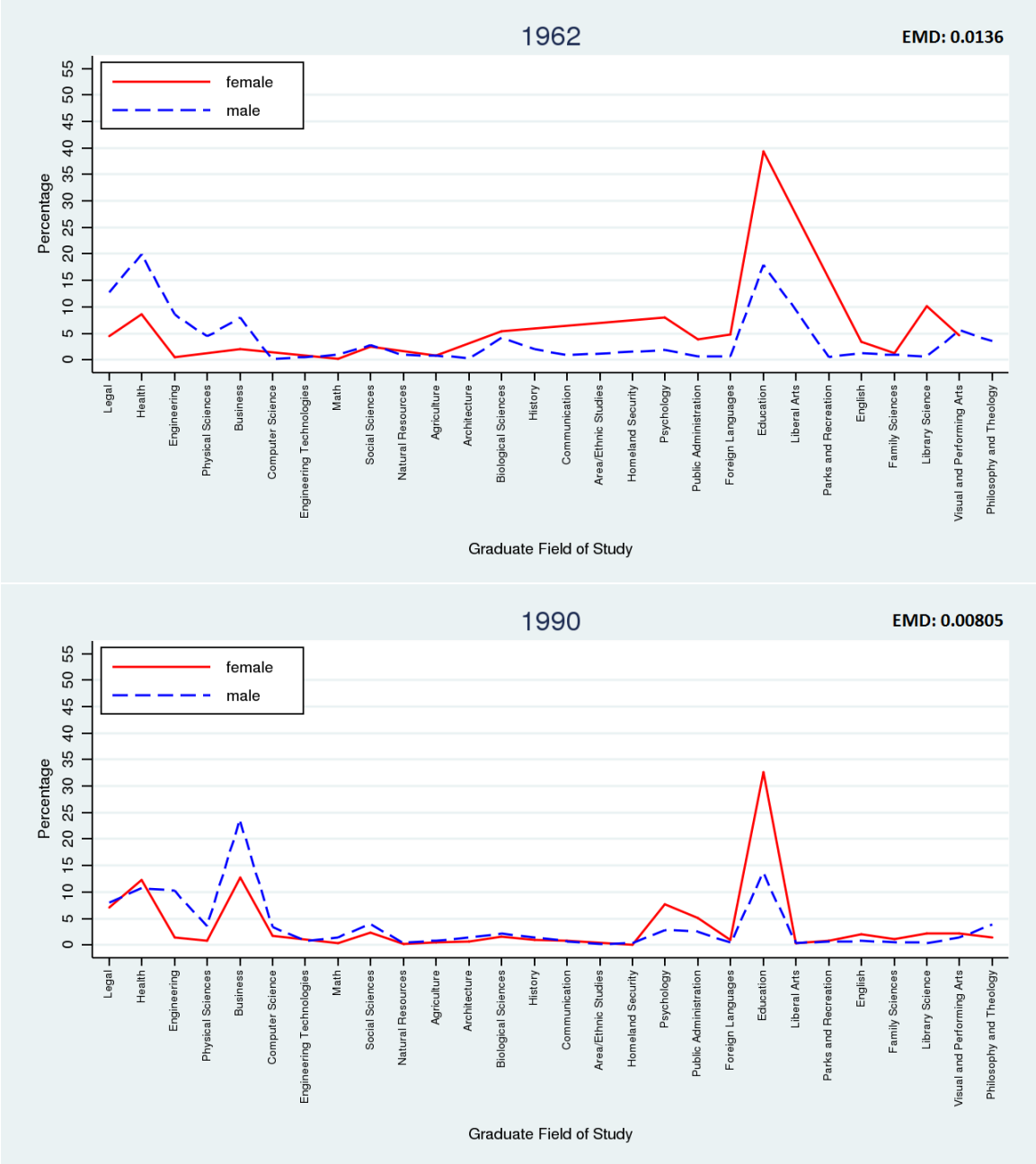
Table 7. Female-Male Difference in Foreign Graduate Fields of Study, Relative to 1971-73

	Outcome Variable: Graduate Field of Study													
	(1) Grad. Degree	(2) Agriculture	(3) Architecture	(4) Area/Ethnic	(5) Biology	(6) Business	(7) Commun.	(8) Computer Sci.	(9) Education	(10) Engineering	(11) Engineer. Tech.	(12) English	(13) Family Sci.	(14) Foreign Lang.
1962-70 Mean Female Share	0.00	0.00	0.26	0.00	0.45	0.22	0.00	0.32	0.48	0.09	0.00	0.44	1.00	0.63
Female	-0.149***	0.00956***	0.00967***	0.000107	0.0230***	-0.0885***	0.0000474	-0.0201***	0.0698***	-0.116***	-0.0187***	0.0173***	-0.000846	0.0251***
	(0.00249)	(0.00101)	(0.00117)	(0.000440)	(0.00260)	(0.00308)	(0.000788)	(0.00143)	(0.00214)	(0.00358)	(0.00126)	(0.00174)	(0.000565)	(0.00162)
Selected Interactions between Female dummy and 3Year dummy														
1962-1964	-0.000148	-0.00846***	-0.0224***	0.00125	-0.00921*	0.112***	-0.000429	0.0189***	-0.0441***	0.0628***	0.00261	-0.0390***	0.0201***	-0.0219***
	(0.00399)	(0.00176)	(0.00205)	(0.000769)	(0.00454)	(0.00539)	(0.00138)	(0.00249)	(0.00374)	(0.00627)	(0.00221)	(0.00304)	(0.000989)	(0.00284)
1965-1967	-0.0295***	-0.0116***	-0.00704***	0.000548	0.0525***	0.103***	0.00136	0.0295***	-0.0460***	0.00833	0.0181***	-0.0111***	0.00102	-0.0267***
	(0.00380)	(0.00161)	(0.00187)	(0.000703)	(0.00415)	(0.00493)	(0.00126)	(0.00228)	(0.00342)	(0.00573)	(0.00202)	(0.00278)	(0.000904)	(0.00260)
1968-1970	-0.0136***	-0.00720***	-0.00908***	-0.000249	0.0176***	0.0335***	-0.00307**	0.0104***	-0.0510***	-0.0432***	-0.000867	0.0341***	0.000913	0.0587***
	(0.00358)	(0.00146)	(0.00169)	(0.000636)	(0.00376)	(0.00446)	(0.00114)	(0.00206)	(0.00309)	(0.00519)	(0.00183)	(0.00252)	(0.000818)	(0.00235)
1974-1976	0.0358***	-0.0386***	-0.00102	0.000479	0.0113**	0.0226***	0.0106***	0.0190***	-0.0174***	0.0504***	-0.0147***	0.0611***	0.00436***	-0.0148***
	(0.00353)	(0.00142)	(0.00165)	(0.000621)	(0.00367)	(0.00436)	(0.00111)	(0.00201)	(0.00302)	(0.00507)	(0.00179)	(0.00246)	(0.000799)	(0.00230)
1977-1979	-0.0104**	-0.0158***	-0.0218***	-0.000185	-0.00746*	0.0706***	0.0230***	-0.0145***	-0.0226***	0.0656***	-0.00988***	0.0364***	0.00701***	-0.00501*
	(0.00361)	(0.00145)	(0.00168)	(0.000631)	(0.00373)	(0.00443)	(0.00113)	(0.00205)	(0.00307)	(0.00514)	(0.00181)	(0.00250)	(0.000812)	(0.00233)
1980-1982	0.00189	-0.0152***	0.00488**	0.00833***	0.00118	0.0276***	0.00346**	-0.0311***	-0.0610***	-0.0400***	0.000731	0.0237***	0.0103***	0.0131***
	(0.00359)	(0.00138)	(0.00160)	(0.000601)	(0.00355)	(0.00421)	(0.00108)	(0.00195)	(0.00292)	(0.00490)	(0.00173)	(0.00238)	(0.000773)	(0.00222)
1983-1985	0.0788***	0.0199***	0.0113***	-0.0127***	-0.0112**	0.0956***	0.000398	-0.00814***	-0.00703*	-0.0268***	0.00509**	-0.0198***	0.0207***	-0.0141***
	(0.00383)	(0.00142)	(0.00165)	(0.000619)	(0.00366)	(0.00434)	(0.00111)	(0.00201)	(0.00301)	(0.00505)	(0.00178)	(0.00245)	(0.000797)	(0.00229)
Constant	1.048***	0.00702	-0.00802	0.0123**	0.0186	0.0591	0.00283	0.0241	-0.0163	0.0581	-0.00156	-0.0151	-0.00110	-0.00305
	(0.0506)	(0.0103)	(0.0119)	(0.00449)	(0.0265)	(0.0315)	(0.00805)	(0.0146)	(0.0218)	(0.0366)	(0.0129)	(0.0178)	(0.00577)	(0.0166)
Year Fixed Effects	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Demographic Controls	X	X	X	X	X	X	X	X	X	X	X	X	X	X
N	2,737	2,737	2,737	2,737	2,737	2,737	2,737	2,737	2,737	2,737	2,737	2,737	2,737	2,737

	(15) Health Prof.	(16) History	(17) Legal Prof.	(18) Liberal Arts	(19) Library Sci.	(20) Math & Stats	(21) Nat. Resources	(22) Parks & Rec.	(23) Phil. & Rel.	(24) Physical Sci.	(25) Psychology	(26) Public Admin.	(27) Social Sci.	(28) Visual/Perf. Arts
1962-70 Mean Female Share	0.29	0.73	0.25	1.00	0.00	0.42	0.00	0.00	0.06	0.18	0.54	0.14	0.48	0.39
Female	-0.0173***	0.0111***	-0.0482***	0.000348	0.00626***	-0.00895***	-0.000677	0.000716*	0.00352*	-0.00371	0.0497***	0.00532***	0.0682***	0.0234***
	(0.00513)	(0.000940)	(0.00213)	(0.000271)	(0.000626)	(0.00152)	(0.000449)	(0.000319)	(0.00137)	(0.00289)	(0.00156)	(0.000907)	(0.00261)	(0.00144)
Selected Interactions between Female dummy and 3Year dummy														
1962-1964	-0.0484***	0.0218***	0.0660***	0.000788	-0.00328**	0.00190	-0.00947***	0.000491	-0.0223***	0.0355***	-0.0273***	-0.0184***	-0.0594***	-0.0104***
	(0.00898)	(0.00164)	(0.00372)	(0.000475)	(0.00109)	(0.00265)	(0.000786)	(0.000558)	(0.00240)	(0.00505)	(0.00273)	(0.00159)	(0.00457)	(0.00252)
1965-1967	0.0103	-0.00686***	0.0297***	0.00883***	-0.00399***	0.00861***	0.00303***	-0.000991	-0.0349***	-0.0497***	-0.0316***	-0.0186***	-0.00363	-0.0220***
	(0.00821)	(0.00150)	(0.00340)	(0.000434)	(0.00100)	(0.00242)	(0.000718)	(0.000510)	(0.00219)	(0.00462)	(0.00250)	(0.00145)	(0.00417)	(0.00231)
1968-1970	-0.000296	-0.0131***	0.0265***	0.000327	-0.00733***	0.0311***	0.000427	-0.000650	-0.0109***	-0.0278***	0.00108	-0.00252	-0.0128***	-0.0244***
	(0.00743)	(0.00136)	(0.00308)	(0.000393)	(0.000906)	(0.00219)	(0.000650)	(0.000462)	(0.00199)	(0.00418)	(0.00226)	(0.00131)	(0.00378)	(0.00209)
1974-1976	-0.0502***	0.00523***	0.0454***	0.000157	-0.00384***	0.0351***	-0.00245***	-0.000604	-0.0267***	0.00674	-0.0522***	0.00709***	-0.0116**	-0.0456***
	(0.00726)	(0.00133)	(0.00301)	(0.000383)	(0.000885)	(0.00214)	(0.000635)	(0.000451)	(0.00194)	(0.00408)	(0.00221)	(0.00128)	(0.00369)	(0.00204)
1977-1979	-0.0520***	0.0204***	0.0276***	-0.000540	0.0165***	0.0109***	-0.000203	-0.00192***	-0.0282***	-0.0239***	0.00745***	-0.00675***	-0.0501***	-0.0247***
	(0.00737)	(0.00135)	(0.00305)	(0.000390)	(0.000899)	(0.00218)	(0.000645)	(0.000458)	(0.00197)	(0.00415)	(0.00224)	(0.00130)	(0.00375)	(0.00207)
1980-1982	0.0638***	-0.00204	0.0524***	0.000194	0.00759***	0.0101***	0.000746	-0.00883***	-0.0165***	-0.0543***	-0.00157	0.0108***	-0.000291	-0.00823***
	(0.00702)	(0.00128)	(0.00291)	(0.000371)	(0.000856)	(0.00207)	(0.000614)	(0.000436)	(0.00188)	(0.00395)	(0.00213)	(0.00124)	(0.00357)	(0.00197)
1983-1985	-0.0735***	-0.00379**	0.0759***	0.00544***	0.0103***	-0.00979***	0.00358***	-0.00121**	0.00831***	-0.00185	-0.0265***	0.00681***	-0.00369	-0.0432***
	(0.00724)	(0.00132)	(0.00300)	(0.000382)	(0.000882)	(0.00214)	(0.000633)	(0.000449)	(0.00193)	(0.00407)	(0.00220)	(0.00128)	(0.00368)	(0.00203)
Constant	0.862***	-0.000754	-0.00683	0.000389	-0.000344	0.0125	-0.00866	0.00120	-0.0150	-0.00415	-0.0171	-0.00941	0.0442	0.00479
	(0.0524)	(0.00960)	(0.0217)	(0.00277)	(0.00639)	(0.0155)	(0.00459)	(0.00326)	(0.0140)	(0.0295)	(0.0159)	(0.00927)	(0.0267)	(0.0147)
Year Fixed Effects	X	X	X	X	X	X	X	X	X	X	X	X	X	
Demographic Controls	X	X	X	X	X	X	X	X	X	X	X	X	X	
N	2,737	2,737	2,737	2,737	2,737	2,737	2,737	2,737	2,737	2,737	2,737	2,737	2,737	

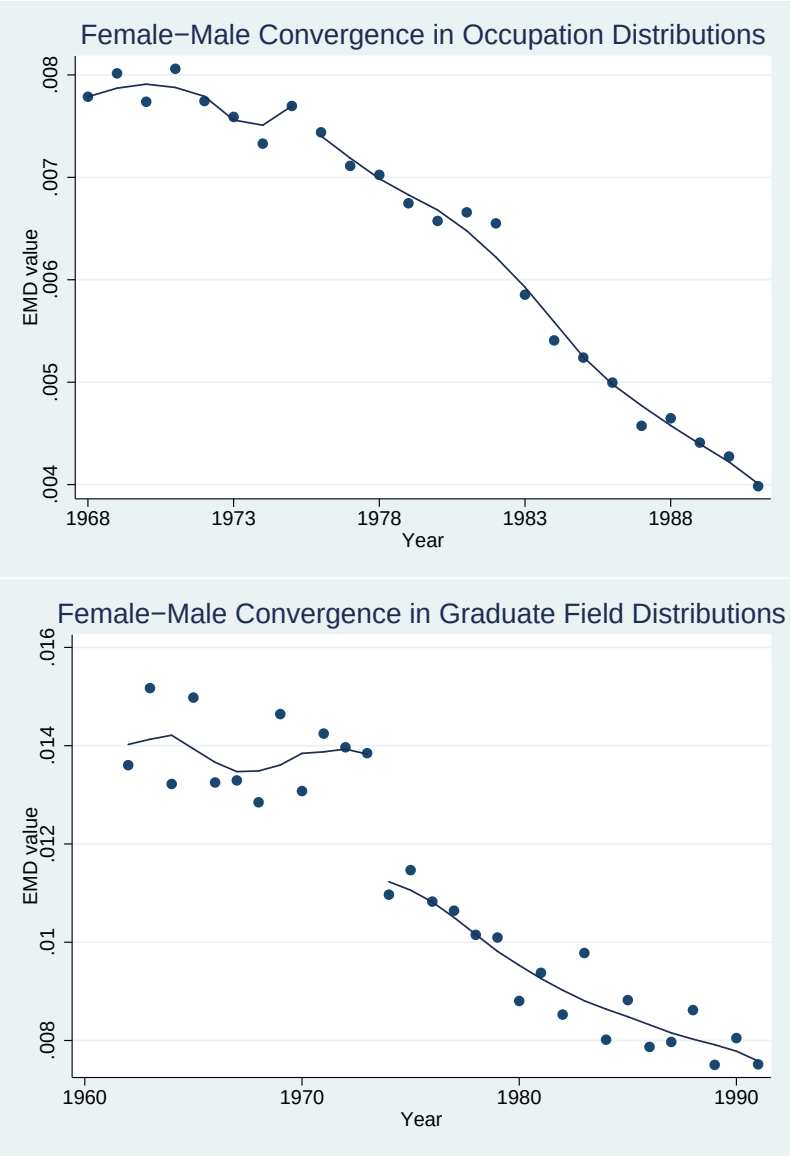
Source: NSGC 1993 data. DID sample runs from 1962-1985. Demographic controls include race and state of birth dummies. * p<0.05, ** p<0.01, *** p<0.001

Figure 6. Example of EMD values



Source: NSCG 1993 data.

Figure 7.



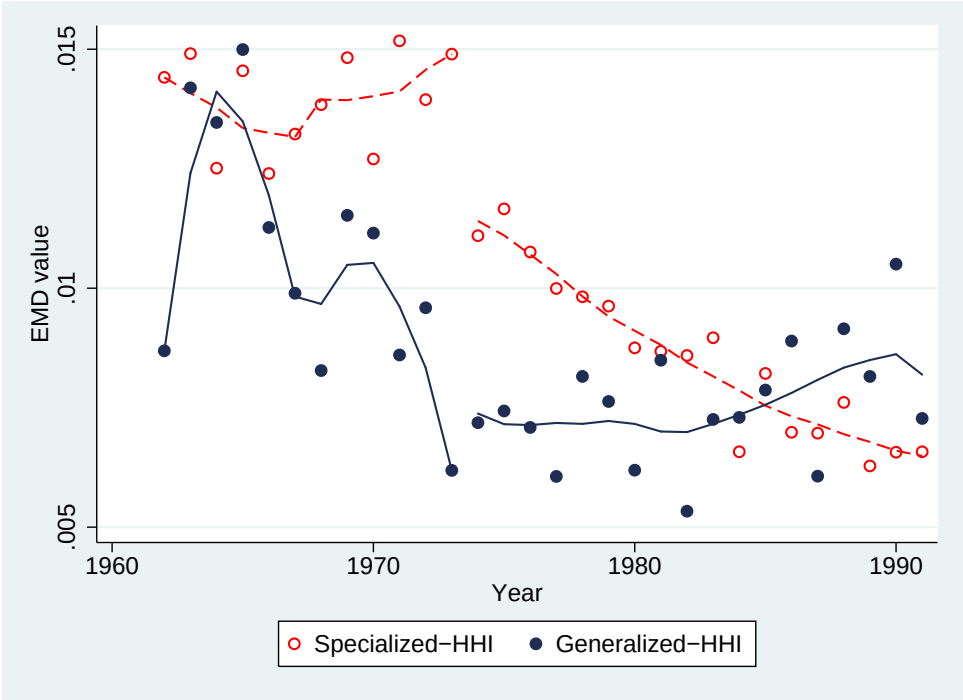
Source: NSCG 1993 data, 1962-2014 Census IPUMS 5 percent samples.
Note: The solid line is the lowess smoother applied to the distribution allowing for a break in 1975.

Table 8. Occupation Distributional Analysis

	Log(Convergence in Occupation Distribution)				
	(1)	(2)	(3)	(4)	(5)
Pre-Title IX Mean Distance			0.0079		
Log(Convergence in Graduate Field Distribution)	0.914*	1.151*	0.217	1.237*	0.297
	(0.107)	(0.201)	(0.330)	(0.184)	(0.870)
Post-1975		0.126	5.679*	0.196+	5.066
		(0.0920)	(1.698)	(0.0975)	(3.830)
Post-1975 x Log(Convergence in Graduate Field Distribution)			1.252*		-0.105
			(0.382)		(1.002)
Transition period (1972-1975)				0.0330	-0.485
				(0.0824)	(4.316)
Transition x Log(Convergence in Graduate Field Distribution)					1.117
					(0.889)
Constant	-0.872+	0.129	-3.919*	0.469	-3.566
	(0.491)	(0.874)	(1.433)	(0.791)	(3.735)
N	24	24	24	24	24
R-squared	0.770	0.789	0.862	0.811	0.862
Adjusted R-squared	0.759	0.769	0.842	0.783	0.823

Source: NSCG 1993 data, 1962-2014 Census IPUMS 5 percent samples.
Note: * p< 0.05, ** p< 0.01, *** p< 0.001

Figure 8. Female-Male Convergence in Graduate Field Distributions by Field Specialization



Source: NSCG 1993 data.
Note: The solid line is the lowess smoother applied to the distribution allowing for a break in 1975.

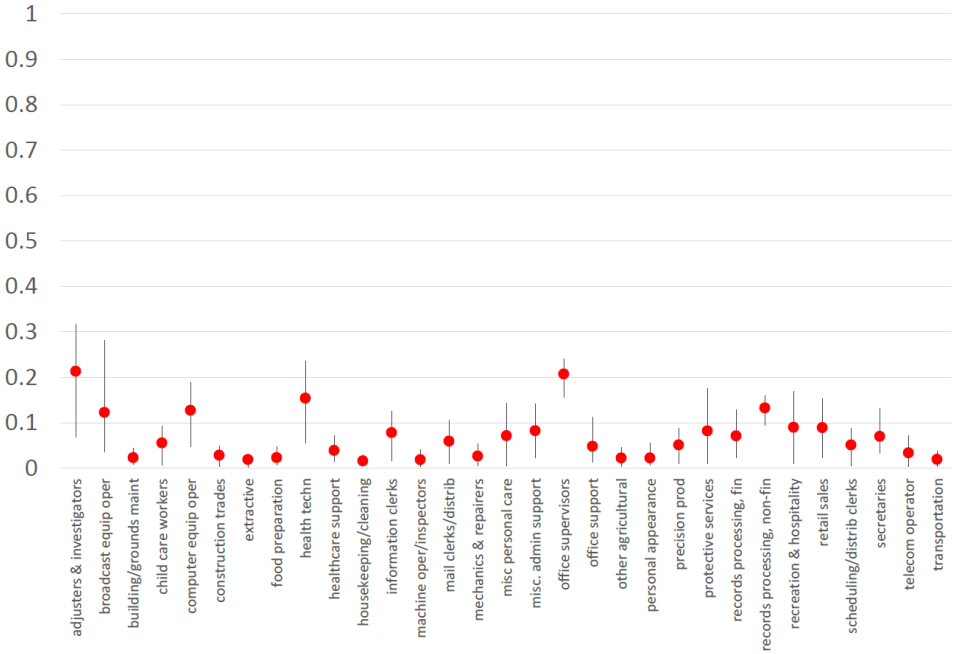
Table 9. Occupation Distributional Analysis by Field Specialization

	Outcome Variable: Log(Convergence in Occupation Distribution)									
	Specialized Fields					Generalized Fields				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Pre-Title IX Mean Distance			0.0079					0.0079		
Log(Convergence in Graduate Field Distribution)	0.717*	0.927*	0.183	0.948*	0.242	0.0396	-0.251	0.0825	-0.340	-0.00573
	(0.0698)	(0.122)	(0.237)	(0.109)	(0.570)	(0.248)	(0.190)	(0.287)	(0.227)	(0.630)
Post-1975		0.150+	4.113*	0.184*	3.613		-0.357*	-3.098	-0.416*	-2.701
		(0.0737)	(1.149)	(0.0765)	(2.478)		(0.0778)	(1.808)	(0.118)	(3.213)
Post-1975 x Log(Convergence in Graduate Field Distribution)			0.901*		0.794			-0.569		-0.485
			(0.261)		(0.579)			(0.375)		(0.687)
Transition period (1972-1975)				0.0170	-0.425				-0.134	0.303
				(0.0679)	(2.887)				(0.152)	(4.120)
Transition x Log(Convergence in Graduate Field Distribution)					-0.0915					0.0715
					(0.674)					(0.866)
Constant	-1.742*	-0.867	-4.073*	-0.802	-3.810	-4.884*	-6.053*	-4.468*	-6.414*	-4.868
	(0.325)	(0.527)	(1.022)	(0.468)	(2.428)	(1.206)	(0.909)	(1.367)	(1.053)	(2.916)
N	24	24	24	24	24	24	24	24	24	24
R-squared	0.827	0.856	0.910	0.871	0.908	0.001	0.501	0.553	0.447	0.477
Adjusted R-squared	0.820	0.842	0.896	0.851	0.882	-0.044	0.454	0.485	0.364	0.332

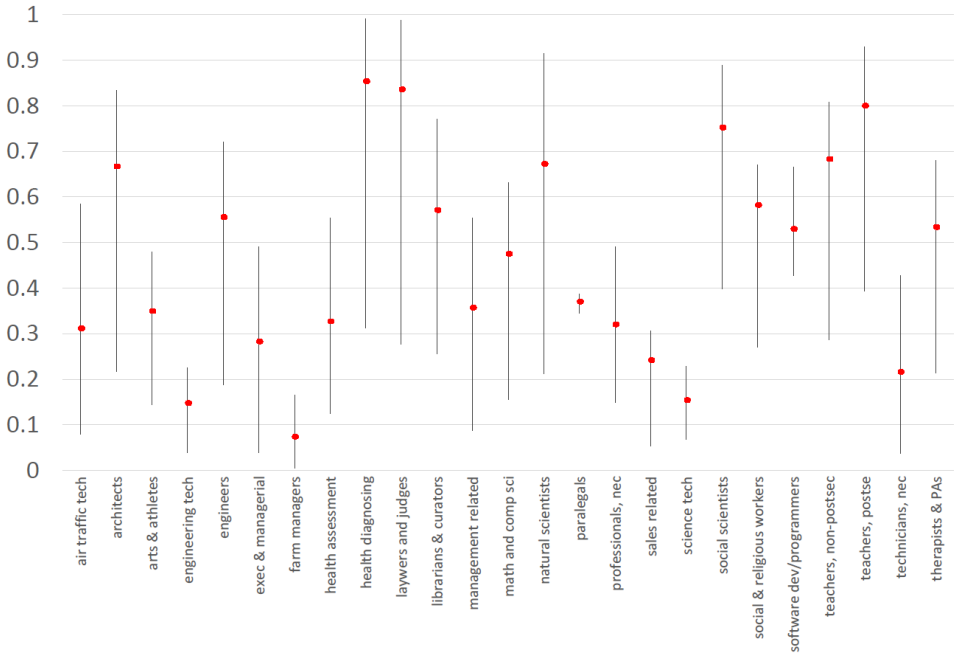
Source: NSCG 1993 data, 1962-2014 Census IPUMS 5 percent samples.
Note: A graduate field is categorized as "specialized" if its HHI share is greater than 0.15, and categorized as "generalized" otherwise. * p< 0.05, ** p< 0.01, *** p< 0.001

Figure 9.

Share of BA degree holders in <BA Occupations, 1950-2000

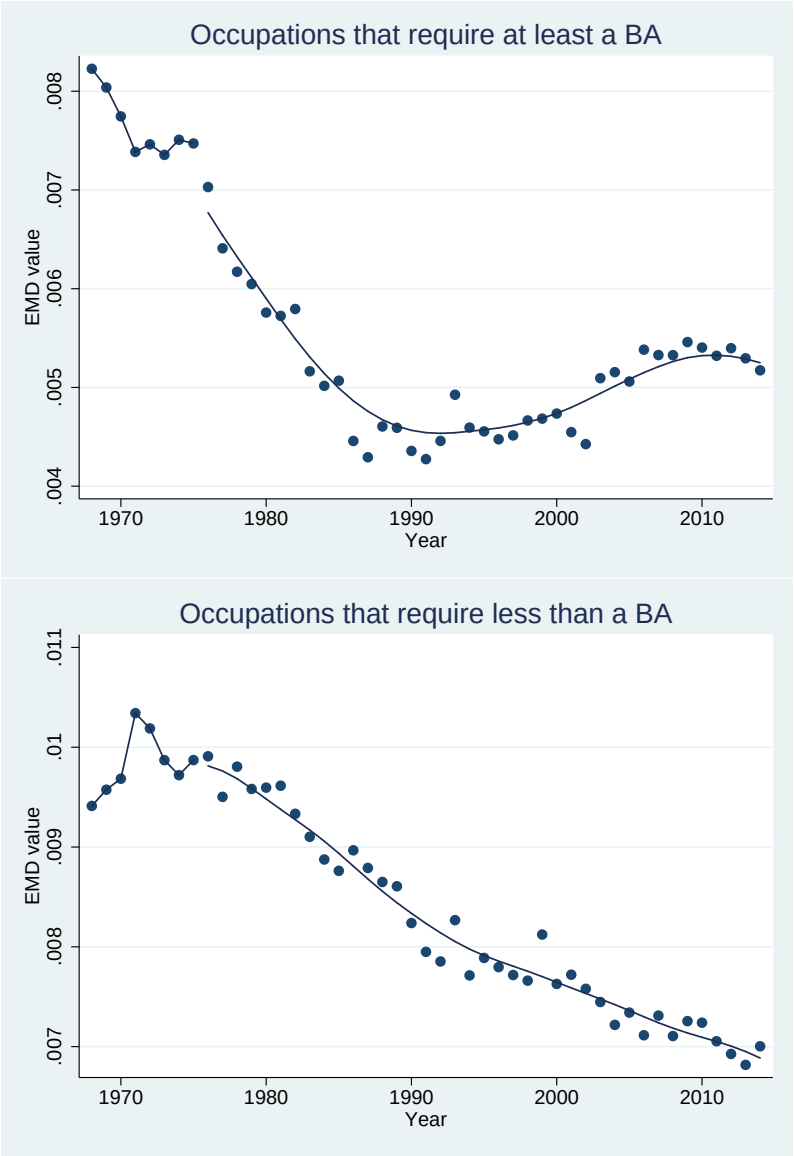


Share of BA degree holders in BA+ Occupations, 1950-2000



Source: 1962-2014 Census IPUMS 5 percent samples, O*NET data.

Figure 10. Female-Male Convergence in Occupation Distributions by Occupation Skill



Source: 1962-2014 Census IPUMS 5 percent samples.
Note: The solid line is the lowess smoother applied to the distribution allowing for a break in 1975.

Table 10. Occupation Distributional Analysis by Occupation's Required Education

Panel A: Occupations requiring at least a BA

	Log(Convergence in Occupation Distribution)				
	(1)	(2)	(3)	(4)	(5)
Pre-Title IX Mean Distance			0.0078		
Log(Convergence in Graduate Field Distribution)	0.943*	0.871*	0.0499	1.006*	-0.262
	(0.0825)	(0.162)	(0.250)	(0.156)	(0.646)
Post-1975		-0.0387	4.844*	0.0399	6.391*
		(0.0738)	(1.288)	(0.0829)	(2.843)
Post-1975 x Log(Convergence in Graduate Field Distribution)			1.101*		1.461*
			(0.290)		(0.660)
Transition period (1972-1975)				0.0108	0.832
				(0.0700)	(3.204)
Transition x Log(Convergence in Graduate Field Distribution)					0.207
					(0.744)
Constant	-0.790*	-1.097	-4.657*	-0.530	-5.970*
	(0.380)	(0.702)	(1.087)	(0.673)	(2.773)
N	24	24	24	24	24
R-squared	0.856	0.858	0.917	0.858	0.920
Adjusted R-squared	0.849	0.844	0.905	0.836	0.898

Panel B: Occupations requiring less than a BA

	Log(Convergence in Occupation Distribution)				
	(6)	(7)	(8)	(9)	(10)
Pre-Title IX Mean Distance			0.0098		
Log(Convergence in Graduate Field Distribution)	0.242*	0.334*	0.0806	0.367*	0.300
	(0.0392)	(0.0736)	(0.134)	(0.0651)	(0.344)
Post-1975		0.0494	1.559*	0.0868*	0.535
		(0.0336)	(0.691)	(0.0345)	(1.515)
Post-1975 x Log(Convergence in Graduate Field Distribution)			0.340*		0.101
			(0.156)		(0.351)
Transition period (1972-1975)				0.0411	-0.681
				(0.0291)	(1.707)
Transition x Log(Convergence in Graduate Field Distribution)					-0.165
					(0.396)
Constant	-3.564*	-3.172*	-4.273*	-3.054*	-3.345*
	(0.181)	(0.320)	(0.583)	(0.280)	(1.477)
N	24	24	24	24	24
R-squared	0.634	0.668	0.732	0.723	0.746
Adjusted R-squared	0.617	0.636	0.692	0.681	0.675

Source: NSCG 1993 data, 1962-2014 Census IPUMS 5 percent samples. * $p< 0.05$, ** $p< 0.01$, *** $p< 0.001$

Appendix A. Timeline of Gender Discrimination Legislation and Regulation

1960 The birth control pill becomes available to the public.

1963 The Equal Pay Act of 1963 is passed, prohibiting wage differentials based on gender.

1964 On July 2, Congress passes the Civil Rights Act, outlawing discrimination based on race, color, religion, sex, or national origin. The areas covered by the Civil Rights Act include voter registration, public accommodations, the use of public facilities, public schools, any government agency or program that receives federal funds, and employment.

1965 President Lyndon B. Johnson signed Presidential Executive Order 11246 on September 24, prohibiting federal contractors from discrimination in employment decisions based on race, color, religion, or national origin.

1968 On October 13, Executive Order 11246 was amended to include discrimination based on sex and was renamed "Executive Order 11246 (1965) as amended by Executive Order 11375 (1967)."

1972 Title VII of the Civil Rights Act amended in separate action to cover all employees in educational institutions. Title VII originally applied onto programs and activities that received federal funding.

1972 Congress passes the Title IX of the Education Amendments of 1972 ("Title IX") making it illegal to discriminate on the basis of gender in any education program or activity receiving Federal financial assistance.

1973 On January 22, the U.S. Supreme Court rules that a woman's decision to have an abortion falls under her right to privacy as granted by the 14th Amendment. Roe v. Wade.

1974 Congress passes the Women's Educational Equity Act (WEEA), which made education more equitable for girls and women by providing incentives and guidance to schools and community groups.

1975 Title IX regulations are stipulated on May 27:

1. School systems or other recipients of federal funds must designate at least one employee as the Title IX coordinator to oversee compliance efforts and investigate any complaints of sex discrimination.
2. All students and employees must be notified of the names, office addresses, and telephone numbers of the designated coordinators of Title IX.
3. Grievance procedures and nondiscrimination policies must be made public.
4. Recipient school systems had to perform a one-time self-evaluation, with obligations to modify practices that did not comply with Title IX.
5. School systems may take remedial and affirmative steps to increase the participation of students in programs or activities where bias has occurred.

Appendix B. Female Age of Majority by State, 1969 to 1974

State	Age of Majority			State	Age of Majority		
	1969	1971	1974		1969	1971	1974
AL	21	21	21	MO	21	21	21
AK	19	19	19	MT	21	19	18
AZ	21	18	18	NE	20	20	19
AR	18	18	18	NV	18	18	18
CA	21	21	18	NH	21	21	18
CO	21	21	21	NJ	21	21	18
CT	21	21	18	NM	21	18	18
DE	21	21	18	NY	21	21	18
DC	21	21	21	NC	21	18	18
FL	21	21	18	ND	21	18	18
GA	21	21	18	OH	21	21	18
HI	20	20	20	OK	18	18	18
ID	18	18	18	OR	21	21	18
IL	21	18	18	PA	21	21	21
IN	21	21	18	RI	21	21	18
IA	21	21	18	SC	21	21	21
KS	21	21	18	SD	21	21	18
KY	18	18	18	TN	21	18	18
LA	21	21	18	TX	21	21	18
ME	21	18	18	UT	18	18	18
MD	21	21	18	VT	21	18	18
MA	21	21	18	VA	21	21	18
MI	21	21	18	WA	21	18	18
MN	21	21	21	WV	21	21	18
MS	21	21	21	WI	21	18	18
				WY	21	21	19

Source: *1969:* Pilpel and Wechsler (1969). *1971:* U.S. Dept. of Health, Educ., and Welfare (1974). *1974:* Panel et al. (1974).

Appendix C. Public Abortion Funding Status by State

		Public Funding		
		Restrictive	Not Restrictive	
State Initials	State	Life, Rape, and Incest	Voluntary	Court Ordered
AL	Alabama	Yes		
AK	Alaska			2001
AZ	Arizona			2002
AR	Arkansas	Yes		
CA	California			1981
CO	Colorado	Yes		
CT	Connecticut			1986
DE	Delaware	Yes		
FL	Florida	Yes		
GA	Georgia	Yes		
HI	Hawaii		Yes	
ID	Idaho	Yes		
IL	Illinois			1994
IN	Indiana	Yes		
IA	Iowa	Yes		
KS	Kansas	Yes		
KY	Kentucky	Yes		
LA	Louisiana	Yes		
ME	Maine	Yes		
MD	Maryland		Yes	
MA	Massachusetts			1981
MI	Michigan	Yes		
MN	Minnesota			1995
MS	Mississippi	Yes		
MO	Missouri	Yes		
MT	Montana			1995
NE	Nebraska	Yes		
NV	Nevada	Yes		
NH	New Hampshire	Yes		
NJ	New Jersey			1982
NM	New Mexico			1998
NY	New York		Yes	
NC	North Carolina	Yes		
ND	North Dakota	Yes		
OH	Ohio	Yes		
OK	Oklahoma	Yes		
OR	Oregon			1983
PA	Pennsylvania	Yes		
RI	Rhode Island	Yes		
SC	South Carolina	Yes		
SD	South Dakota	Yes		
TN	Tennessee	Yes		
TX	Texas	Yes		
UT	Utah	Yes		
VT	Vermont			1986
VA	Virginia	Yes		
WA	Washington		Yes	
WV	West Virginia			1993
WI	Wisconsin	Yes		
WY	Wyoming	Yes		

Source: ACLU, Guttmatcher Institute 2014.

Appendix D. List of Major Fields of Study by Gender Parity

Low Gender Parity: Fields of Study with < 10% Female Share of All Graduate Degrees

- Agriculture, Agriculture Operations, and Related Sciences
- Architecture and Related Services
- Business, Management, Marketing, and Related Support Services
- Computer and Information Sciences and Support Services
- Engineering
- Engineering Technologies and Engineering-Related Fields
- Legal Professions and Studies

Mid Gender Parity: Fields of Study with 11-48% Female Share of All Graduate Degrees

- Biological and Biomedical Sciences
- Communication, Journalism, and Related Programs
- Health Professions and Related Programs
- History
- Homeland Security, Law Enforcement, Firefighting and Related Protective Services
- Mathematics and Statistics
- Natural Resources and Conservation
- Parks, Recreation, Leisure, and Fitness Studies
- Philsophy and Religious Studies; Theology and Religious Vocations
- Physical Sciences
- Psychology
- Social Sciences

High Gender Parity: Fields of Study with > 48% Female Share of All Graduate Degrees

- Area, Ethnic, Cultural, Gender, and Group Studies
- Education
- English Language and Literature/Letters
- Family and Consumer Sciences/Human Sciences
- Foreign Languages, Literatures, and Linguistics
- Liberal Arts and Sciences, General Studies and Humanities
- Library Science
- Public Administration and Social Service Professions
- Visual and Performing Arts

Source: NSCG 1993 data.

Appendix Table 1. Female-Male Difference in Graduate Degrees, Relative to 1971-1973

	Graduate Degree
1962-70 Mean Female Share	0.30
Female	-0.0789***
	(0.000596)
Selected Interactions between Female dummy and 3Year dummy	
1962-1964	-0.110***
	(0.00112)
1965-1967	-0.0859***
	(0.00101)
1968-1970	-0.0335***
	(0.000904)
1974-1976	0.0289***
	(0.000811)
1977-1979	0.0367***
	(0.000809)
1980-1982	0.0499***
	(0.000796)
Constant	0.361***
	(0.000974)
Year Fixed Effects	X
Demographic Controls	X
N	97,546

Source: NSCG 1993 data.
Note: The DID sample runs from 1962-1985. Demographic controls include race and state-of-birth dummies. * $p< 0.05$, ** $p< 0.01$, *** $p< 0.001$

Appendix Table 2. Female-Male Cohort Difference in Select Graduate Fields of Study, Base Analysis

	Outcome Variable: Graduate Field of Study			
	Business (1)	**Health (2)**	**Legal (3)**	**Education (4)**
Pre-Cohort Mean Female Share	0.088	0.247	0.151	0.601
Female*Post-Title IX cohort	0.0599***	0.0276***	0.0227***	-0.0802***
	(0.000831)	(0.000783)	(0.000708)	(0.000882)
Post-Title IX cohort	-0.0403***	0.0809***	0.0982***	-0.130***
	(0.00123)	(0.00116)	(0.00104)	(0.00130)
Female	-0.146***	-0.0255***	-0.0703***	0.244***
	(0.000567)	(0.000534)	(0.000482)	(0.000601)
Constant	0.173***	0.150***	0.159***	0.133***
	(0.00197)	(0.00185)	(0.00167)	(0.00209)
Time Fixed Effects	X	X	X	X
Demographic Controls	X	X	X	X
Control for Birth Control Pill				
Control for Roe vs. Wade				
N	14,706	14,706	14,706	14,706

Source: NSCG 1993 data.
Note: Pre-Title IX birth cohorts are people born between 1944-1948. Post-Title IX birth cohorts are born between 1956-1961. Both cohorts are restricted to ages 18-30. Time fixed effects include year and birth cohort dummies. Demographic controls include race and state-of-birth dummies. * $p< 0.05$, ** $p< 0.01$, *** $p< 0.001$

Appendix Table 3. Female-Male Cohort Differences in Graduate Fields of Study Controlling for Access to the Birth Control Pill

Outcome Variable: Graduate Field of Study			
Agriculture	0.00379***	History	-0.0248***
	(0.000692)		(0.000564)
Architecture	-0.0138***	Homeland Security	-0.00375***
	(0.000581)		(0.000396)
Area And Ethnic Studies	0.000211	Legal Professions	0.0409***
	(0.000200)		(0.00200)
Biological Studies	0.00517***	Liberal Arts	-0.00132***
	(0.000959)		(0.000134)
Business	0.0698***	Library Science	-0.0441***
	(0.00224)		(0.000675)
Communication	0.0245***	Math And Stats	-0.0106***
	(0.000717)		(0.000642)
Computer Science	-0.0144***	Natural Resources	0.00992***
	(0.000732)		(0.000412)
Education	0.0102***	Parks And Rec	-0.000722
	(0.00240)		(0.000376)
Engineering	-0.00960***	Philosophy And Religion	-0.0189***
	(0.00128)		(0.000908)
Engineering Technologies	-0.00783***	Physical Science	0.0142***
	(0.000300)		(0.00101)
English Lang And Lit	-0.0341***	Psychology	-0.00748***
	(0.000880)		(0.00118)
Family Sciences	-0.00648***	Public Admin	-0.0284***
	(0.000517)		(0.00111)
Foreign Lang And Lit	-0.000673	Social Sciences	-0.000537
	(0.000553)		(0.000936)
Health Professions	0.0617***	Visual And Perf Arts	-0.0129***
	(0.00214)		(0.000968)

Source: NSCG 1993 data.
Note: Coefficients reported are all from the interaction dummy between female and post-cohort dummies (see Equation 1). Pre-Title IX birth cohorts are people born between 1944-48. Post-Title IX birth cohorts are 1956-61. Both cohorts are restricted to ages 18-30. All regresions include time fixed effects (year and birth cohort dummies) and demographic controls (race and state of birth dummies). I also control for access to the pill by restricting the data to birth states where the age of majority was ¡20 in 1971. See Appendix B for the list of states. * p< 0.05, ** p< 0.01, *** p< 0.001

Appendix Table 4. Female-Male Cohort Differences in Graduate Fields of Study Controlling for Access to the Birth Control Pill and *Roe v. Wade*

Outcome Variable: Graduate Field of Study			
Agriculture	0.00326***	History	-0.0264***
	(0.000738)		(0.000594)
Architecture	-0.0160***	Homeland Security	-0.000975**
	(0.000612)		(0.000376)
Area And Ethnic Studies	0.000258	Legal Professions	0.0344***
	(0.000215)		(0.00204)
Biological Studies	0.00690***	Liberal Arts	-0.00149***
	(0.000999)		(0.000144)
Business	0.0653***	Library Science	-0.0337***
	(0.00236)		(0.000645)
Communication	0.0270***	Math And Stats	-0.0134***
	(0.000769)		(0.000676)
Computer Science	-0.0165***	Natural Resources	0.00550***
	(0.000769)		(0.000383)
Education	0.0173***	Parks And Rec	-0.000823*
	(0.00248)		(0.000404)
Engineering	-0.0113***	Philosophy And Religion	-0.0182***
	(0.00129)		(0.000955)
Engineering Technologies	-0.00815***	Physical Science	0.0114***
	(0.000322)		(0.00105)
English Lang And Lit	-0.0317***	Psychology	-0.00780***
	(0.000925)		(0.00122)
Family Sciences	-0.00734***	Public Admin	-0.0272***
	(0.000555)		(0.00117)
Foreign Lang And Lit	-0.000890	Social Sciences	0.00791***
	(0.000594)		(0.000940)
Health Professions	0.0584***	Visual And Perf Arts	-0.0158***
	(0.00223)		(0.00102)

Source: NSCG 1993 data.
Note: Coefficients reported are all from the interaction dummy between female and post-cohort dummies (see Equation 1). Pre-Title IX birth cohorts are people born between 1944-48. Post-Title IX birth cohorts are 1956-61. Both cohorts are restricted to ages 18-30. All regresions include time fixed effects (year and birth cohort dummies) and demographic controls (race and state of birth dummies). I control for access to the pill by restricting the data to birth states where the age of majority was < 20 in 1971. See Appendix B for the list of states. I control for Roe vs. Wade by restricting my data to birth states that had restrictive abortion funding in 1983. See Appendix C for the list of these states. * $p< 0.05$, ** $p< 0.01$, *** $p< 0.001$