How Coed is College?

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We examine levels and trends in gender segregation in college classrooms. We first use national data on higher education institutions—IPEDS data—to document significant segregation in the distribution of male and female college students across institutions and majors. We find that most segregation derives from the different gender distributions of majors within the same schools. There is also segregation by institution, but it is quantitatively less important. We then consider segregation among majors *and classes* at the University of Kentucky (UK), the flagship university in the Commonwealth of Kentucky. We find that gender segregation by major at UK is similar to that found in colleges across the country, but we also find that segregation evolves over students' careers. Segregation is present in introductory and lower-level courses, but it increases as students move into higher-level classrooms. We also find that, even within majors, there are significant differences in the particular classes taken by male and female students and that these differences are associated with the gender of the instructor—male students are more likely to take courses taught by male instructors while female students are less likely to take courses taught by men—and this differences also increases with the level of the course. Majors of course have implications for post-college earnings, and we quantitatively explore how the earnings implications of gender segregation changes as cohorts of men and women move through college.

I. Introduction

American higher education changed on many dimensions over the past century, with more high school graduates continuing immediately on to college; more older adults attending college; and the end of *de jure* racial segregation induced by Supreme Court decisions such as *Sweatt v. Painter* (1950). Yet the decline in single-sex schooling and the growth in the percent of bachelor's degrees being awarded to women – rising from roughly 30% of students in 1920 to 57% in 2020 – may be the most important changes of all. These changes suggest that men and women have increasingly come to attend the same schools, to take the same classes, and to graduate with the same majors. If this were true, then gender differences in post-graduation outcomes – say employment or earnings – likely have their roots in something other than patterns of post-secondary education.

It has already been established, of course, that there are significant gender differences in majors and that these differences strongly influence later outcomes such as occupation, wages, and earnings (e.g., Altonji, Blom, and Meghir, 2012). Women are particularly unlikely, for example, to major in certain high-earning majors such as computer science and engineering, and particularly likely to major in certain low-earning fields such as social work. Gender differences in majors have been attributed to a range of causes, including social norms (Bordalo et al., 2019; Nollenberger, Rodriguez-Plana, Sevilla, 2016)), the gender distribution of professors (Carrell, Page, and West, 2010; Lim and Meer, 2020; Mansour et al, 2022), gender differences in high school preparation (Altonji, 1992; Rose and Betts, 2004) and gender differences in aversion to poor grades (Astorne-Figari and Speer, 2019; Ahn, et al., 2024). Sloane, Hurst, and Black (2021) map majors to earnings and find that, among college graduates, more than half of the

hourly wage gap between men and women is connected to differences in majors and occupations.

Yet while the impact of majors is increasingly understood, there is much less information available on the extent to which men and women share the same institutions and classrooms. The lack of focus on institutions is unfortunate in that College Scorecard data (maintained by the Department of Education) indicate substantial variance in average earnings across institutions. As just one example, average earnings among Harvard graduates is $95,000 while the corresponding average for Auburn University is $61,000. The predominant focus on majors rather than institutions as a locus of segregation is driven in part by the well-founded prior that such segregation is important, but it may also be driven by data limitations of studies that rely on individual survey data that record respondents' majors but not alma maters. This lacuna is unfortunate in that, given the Scorecard data, interschool segregation might well be a driver of gender differences in post-school labor market outcomes.

There is also relatively little known about classroom segregation *within* major. The scope for such segregation within major will of course depend on the detail with which any particular study codes up major. A study that differentiates between subsets of engineering – say chemical versus mechanical – will by construction find less within-major segregation than a study that relies on a broader classification of "Engineering." Nevertheless, there will always be some scope for within-major segregation by course and by class in even the most detailed major classification systems. Yet survey data is not equipped to measure within-major segregation, say whether, within the English Literature major, women tend to take courses on Jane Austen and Virginia Woolf while men take courses on Ernest Hemingway and Norman Mailer. These are obviously stereotypes of gendered interests and these and other within-major differences may

only be weakly correlated with subsequent earnings, yet the possibility remains that men and women tend to take different courses within any given major and that these in turn have some effect on subsequent labor market outcomes.

These facts imply that while we know quite a bit about intermajor segregation, the lack of information on interinstitutional or inter-class/intra-major segregation means that there is no systematic answer to the question posed in this paper's title – How Coed Is College? This paper assesses these questions with analysis of two separate databases. We first examine national data on the gender distribution of students by major and institution from the Integrated Postsecondary Education Data System (IPEDS). Schools that participate in Title IV programs such as Pell grants and student loans – which is to say almost all four-year public or private, non-profit schools – must annually report to the Department of Education on the number of enrolled students by sex, race, and various other attributes. Schools must also separately report the distribution of graduating students by sex, race, and major subject (such as Psychology, Mathematics, or French). These data therefore provide a nearly complete count – i.e., not a sample – of students by sex and institution and, for the subset of students who graduate each year, they provide counts by sex, institution and major.

We use the IPEDS data to examine gender segregation across units defined by school and major. We find that there is substantial sex segregation along these dimensions and that there has been little trend in these measures since 2005, the earliest IPEDS data that we use.[1] One way to summarize the data is to note that, omitting each student from his or her own calculation, the average share of women in a graduating student's college/major is 68% for women and 41% for

[1] We start with 2005 because the definition of several of the variables are consistent starting in this year.

men – recalling again that women account for 57% of all bachelor's degrees. As another method of summary, we find that half of women graduate with a combination of school and major in which more than 66% of the other students are women; and we find that 20% of men graduate with a combination in which more than 66% of the other students are men. We also analyze these data with the Duncan Index of segregation and find that complete gender parity would require that between 30 and 40% of students switch institution/major. These data indicate that despite the long run trend towards female success – and even predominance – in post-secondary education, it is still the case that men and women tend to not graduate from the same schools with the same majors.

We then ask whether the segregation is driven by sex differences in the distribution of students across majors, across schools, or by some combination of the two. We first use the IPEDS school-by-major data for graduating students to examine whether there is more segregation by major or by school. Our main finding is that segregation by major is quantitatively more important than segregation by school. For example, recalling again that women receive 57% of all bachelors' degrees, the average woman graduates with a major (across all schools) in which 63% of the other students are female and graduates from a school (across all majors) in which 59% of the other students are female. Conversely, we find that the average man graduates with a major that is 50% male and from a school that is 45% male. From this perspective, and from related measures that we develop, men and women are far more segregated by major than by institution. Thus, while male and female undergraduates tend to roam the same campuses, libraries, and bars, they see relatively little of one another in the classroom.

We also examine the IPEDS data for all enrolled students – not just those who graduate – noting again that each students' major is not available in these data. There must, of course, be at

least some selection among those who graduate from institutions and, indeed, the female share of graduates is slightly larger than the female share of all students, reflecting the well-known fact that male matriculants are less likely to complete college. We show, however, that patterns of inter-institution segregation are similar between the two sets of IPEDS data. Put bluntly, inter-institutional sex segregation exists for students at all levels of post-secondary school, but it does not appear to change much as cohorts advance through their college careers. Or, to put it another way, male and female freshman are no more segregated – by institution – than are corresponding seniors. However, because we do not have information on major in the all-students data, we cannot use IPEDS data to measure whether by-major segregation evolves over students' educational careers.

We further explore the evolution of major segregation with institutional data from the University of Kentucky (UK). UK is of course the flagship school of the Commonwealth of Kentucky, and as such is a Carnegie Tier 1 research institution. It is also a very large public school located in a state with a large white majority (82%) and with income per capita well below the national average, and so there are surely some ways in which it is not representative. Relative to the IPEDS data, however, the UK data have the advantage of telling us the gender makeup of every course offered during the 2018-19 academic year as well as the gender of the instructor of the course. While we do not know students' majors, we can assess the extent to which all male and female students – not just those who are graduating – tend to take the same courses, both across and within the departments in which students can major.[2] The data also allow us, unlike the IPEDS data, to assess the extent to which intra-institutional segregation

[2] For example, when taking an Economics class we code students as "majoring" in Social Science & History. Similarly, if they are in an English literature class then they are counted as majoring in Humanities.

varies with course levels. Put differently, it allows us to see whether, as some earlier research suggests, that young men and women gradually sort into more segregated classes as their college careers advance.

Our analysis of the UK data reveals considerable sex segregation across majors, with some majors being predominantly male and others being primarily female. Examples of predominantly male majors include Computer Engineering (92% male), Electrical Engineering (86%), and Mechanical Engineering (83%), while examples of predominantly female majors include Communication Science and Disorders (93% female), Nursing (90%), and Social Work (86%). For comparison, the overall UK undergraduate population is 58% female. These patterns are roughly consistent with the broader findings on intra-institutional segregation by major that we found in IPEDS. However, the data allow us to develop three additional facts that, while only demonstrably true for the UK data, might have wider applicability. First, we find that courses become more gender-specific/segregated as they become more advanced within majors. As a particularly stark example, the 100 level introductory courses in the Physics Department that have titles like "Physics & Astronomy for Teachers" are nearly three quarters female, whereas the introductory 200 level courses for prospective physics majors are roughly three quarters male. More generally, it is the introductory classes, the Econ 101's of the world, that are the least segregated, and the most advanced classes that are the most segregated by gender. Second, we find non-trivial segregation within-major, even among courses at the same level. A stylized version of this effect would be that, among 200 level English courses, women are more likely to take a course on Virginia Woolf while men are more likely to take a course on Ernest Hemingway. Third we find that male students are more likely to take classes taught by men than female students and that this difference also increases with the level of the course.

We explore in both datasets how segregation in college classrooms affects earnings after college. In particular, we use data from the 2016 and 2021 rounds of the American Community Survey to estimate the average earnings for young college graduates (ages 25-35) by field of study. We then use these estimates to impute to graduates (in the IPEDS data) and to current students (in the UK data) the average earnings of the fields and majors in which they take classes. The results indicate that a significant portion of the gender earnings gap among young college graduates is connected to their earlier choices of classes and majors. In addition, we use the UK data to show that some of the gap evident among graduates in the IPEDS data is evident in lower-level courses, but that the major-related gender earnings gap grows as cohorts move through the UK system.

The rest of this paper provides the details of this analysis. Section II discusses our data taken from both the IPEDS system and the University of Kentucky. An important aspect of each database is that they are complete counts rather than samples. Section III then studies the extent of gender differences by institution and major. Section IV studies the segregation by schools, by major and by school and major. The section also uses UK data to understand both within-major segregation and how inter-major segregation evolves over students' college careers and uses ACS data to understand the implications of gender segregation for the earnings of male and female college graduates at the start of their careers. Section V concludes.

II. Data

This paper measures the extent to which undergraduate men and women share the same institutions, majors, and coursework. Many surveys shed light on how students choose institutions, majors, and coursework, but there are two reasons why these surveys are ill-suited

for the goals of this paper. First, surveys often record one or the other of our desiderata – especially majors – but they typically do not record all three data elements for the same students. These data therefore do not allow researchers to measure the extent to which male and female undergraduates tend to be grouped – or not – into the categories defined by crosses of those attributes. Second, even if surveys *did* record all of those elements, the sample sizes are too small to accurately measure segregation for anything but the largest institutions or the largest majors, and they are not useful for measuring segregation across crosses of institutions and majors. Sample size matters because random sampling within units (e.g., institution or major) will lead to some measured segregation even among units that are, at the population level, fully integrated.[3] As a simple example, suppose that a small sample is taken from each of a large number of fully integrated institutions. If the sample is small enough – and some surveys have very few students in any given institution – then the schools may *seem* segregated even if every school has, in its overall population, the same shares of men and women in their student bodies.[4]

These issues led us to focus on two sets of institutional data that reflect full population counts for the schools and majors within the data collection frame. The first database is the IPEDS database that is administered by the U.S. Department of Education and that reports data for nearly all post-secondary institutions in the United States. The second database is drawn

[3] We have previously analyzed these issues in Carrington and Troske (1997). In that paper, and in related work by Rathelot (2012) and d'Haultfœuille and Rathelot (2017), researchers have proposed measures of segregation that attempt to measure systematic segregation, i.e., the segregation that is in excess of that which would be predicted by random allocation or sampling. We focus, with some exceptions, on conventional measures of segregation, however, because they are more easily understood and because we analyze segregation in population data, i.e., data in which we have a complete count that is not affected by incomplete sampling.

[4] To see this, consider a set of large institutions that are completely integrated, which is to say that each institution has the same share of female students. For illustrative purposes, assume that the female share across all institutions is 50%. If a sample of two students were taken from each institution, then each institution would have a sample that was either two males (25% of the time), two females (also 25%), or one male and one female (50%). Standard segregation measures would interpret these samples as reflecting significant segregation even though he underlying populations from which the samples are drawn is perfectly integrated.

from course enrollment data maintained by the University of Kentucky (UK). The two databases dovetail in that the UK data are the basis for UK's own reporting to IPEDS so that, in a sense, the UK data is a subset of the broader IPEDS data. That feature makes the UK data relatively unrepresentative, but it carries the advantage of allowing us to measure male/female overlap in more detail than is feasible in the IPEDS data. In particular, the UK data allow us to measure segregation by major for students across all undergraduate levels – introductory classes through advanced seminars – whereas the IPEDS data on major is restricted to graduating students. The UK data also allow us to study *within*-major segregation, i.e., whether male and female students tend to take different types of classes even within the same major. As we show, this additional information points to interesting gender dynamics of course and major selection that are not visible in the IPEDS data.

IPEDS

The Integrated Postsecondary Education Data System (IPEDS) data are collected by the U.S. Department of Education as part of its administration of Title IV of the 1965 Higher Education Act (HEA). Title IV is the enabling law for the federal student loan program, Pell grants, and certain other programs that help students pay for college and that are essential inputs to the budgets of virtually all post-secondary institutions. This act also established the Higher Education General Information System (HEIGS), the predecessor to IPEDS. The Department of Education began transitioning from HEIGS to IPEDS in 1985. Starting with the 1992 reauthorizations of the HEA all schools participating in Title IV programs were required to report data to IPEDS. Since nearly all undergraduate institutions rely heavily on Title IV funding, this means that compliance with IPEDS reporting requirements is taken seriously by nearly all institutions. Many large schools have institutional research offices whose job, in part,

is to produce statistics that are reported to IPEDS. Indeed, the UK data discussed below were compiled by one such office.

Attendee vs. Graduate Databases

There are many components of the IPEDS reporting process, but we focus on two in particular. First, in the Fall of each year, schools are required to report the counts of all students enrolled in the Fall term identified by such attributes as sex, race, level (graduate vs. undergraduate), and whether or not the student is attending their first college. Schools vary in how they collect that data, but in most cases, they are built up from information that students have self-reported on applications or on other entry forms. Thus, for the fall semester of each year, the IPEDS data provide a population count – not a sample – of the students enrolled in every Title IV institution.[5] These data therefore allow us to identify precisely the extent to which young men and women tend to attend the same institutions or types of institutions. We form a panel of IPEDS data starting in 2005 since this is the first date after which there was consistent collection and definitions for most of the variables used in our analysis. We end our panel in 2019-2020 academic year (data collected on enrollment and graduation in Fall 2019) since this is the last year before the onset of the Covid pandemic. We perform some analysis focusing exclusively on data collected in 2019. We also limit our analysis to a) data from four-year or above public or private not-for-profit schools that have a Ph.D, Master's, or Baccalaureate program and b) to students seeking an undergraduate degree. We do this because these schools are more consistent reporters to IPEDS, minimizing the impact of schools moving in and out of the data or the amount of missing or misreporting data. These schools also have similar processes for determining who is admitted and who graduates from the institution. We

[5] We limit our data to higher education institutions operating in the 50 U.S. States and the District of Columbia.

refer to these as the "Attendee Data" because they contain information about all attendees at each school.

The Attendee Data are limited, however, in that they do not measure each student's major of course of study. In some cases, of course, the institution provides some guidance on the likely curriculum, say because students at Rensselaer Polytechnic Institute are more likely to be studying engineering than are students at the Rhode Island School of Design. For many large institutions, however, particularly large state schools such as the University of Michigan or the University of Kentucky, there are such a wide range of students that the institution tells us little about the course of study pursued by any individual student in the Attendee Data. For this reason, we also use data from a separate IPEDS database that collects counts of *graduating* students by both institution and major – we refer to these as the "Graduate Data" so as to contrast it with the Attendee Data. These data are also collected in the Fall of each year, but refer to students graduating in the previous academic year. For example, the 2019 Graduate data consist of students graduating between July 1, 2018 and June 30, 2019.[6] There are two main differences between the two databases. The first is that graduates are obviously not completely representative of all students, both because graduates are older and more likely to be women. The second is that the Graduate Data collect information on major whereas the Attendee Data do not. We view both databases as useful, each with strengths and weaknesses that we try to note as we move through the analysis.

The institutions in our data vary considerably on dimensions such as size, graduation rates, gender composition, and main courses of study. The largest schools in our 2019 attendees

[6] For both the Attendee and Graduate data we refer to the year they are collected in our tables.

data have over 50,000 undergraduates, while the smallest schools in our data have fewer than 100 undergraduate attendees. There are many large schools that have enrollment counts over 20,000, but there are far more medium and small schools. As will be familiar to anyone who has worked with institutions of different size, large schools account for a disproportionate share of total enrollment. Schools also vary considerably in their graduation rates, which we define in these data as the ratio of graduates to attendees within the same year. Some schools graduate nearly one quarter of their students each year, and examples of such schools include Duke University (28%) and the University of Florida (27%). Yet there are other schools – such as Weber State University (14%) and University of Alaska (12%) - where graduating students are a much smaller share of all enrolled students. One implication of this latter fact is that, when we focus on the majors of graduating students in the IPEDS data, we are by construction focusing on the types of students who graduate, and who are surely not representative of all enrolled students.

III. Gender Differences in Institutions and Majors

This section outlines some features of the IPEDS data and reviews broad patterns of attendance, separately by gender, across types of post-secondary institutions. Table 1 depicts trends in the number of attendees and graduates in our sample, both in total and separately by gender. The table shows that total enrollment grew over the 2005-2019 period, reflecting both increased cohort sizes and higher rates of college attendance among younger and (especially) older adults. The table shows that the women's share of enrollees at these institutions has been over 54% over the entire period, but also that this share fell a bit between 2005 and the early 2010s before rebounding in the last few years of our data. While women account for well over half of the enrollees in our data, female attendance shares are even larger for the types of institutions *not* covered in our data. For the schools in the 2019 IPEDS attendees data excluded

from our sample, e.g., two-year public and for-profit schools, the women's share is 68%. Thus, the sample selection criteria that we impose leads us to focus on a subset of the higher education landscape in which men are relatively well-represented.

Post-secondary institutions vary on many dimensions, but we highlight a few in the following discussion. Table 2 provides statistics for institutions divided into Public and Private (not-for-profit) groups. The data show that about 70% of the students in our IPEDS data are enrolled in public schools, with the balance of course in the private sector, a 70-30 split that has not changed much since 2005. The table also shows that women account for a larger share of enrollment at private schools (57.6% in 2019) than at public schools (54.5%) and that this difference has remained stable since the early 2000s.

Table 3 reports similar statistics when schools are grouped on the basis of the highest degree granted – Bachelors, Masters, or Doctorate – by each institution. This classification overlaps with the size and selectivity of schools, with small or less selective schools less likely to provide advanced degrees. The data show that about half of all students were enrolled in Ph.D.-granting institutions in 2019, a share that was up slightly from 2005. Most of that gain arose from the smaller share of students enrolled in institutions whose highest degree is a bachelors. That is in turn due to a shift in enrollment across types of schools, but also to the changing classification of schools as institutions add masters or doctoral programs. The table also shows that men's representation is consistently higher at the Ph.D. granting institutions than at the institutions with lower terminal degrees. Again, some of the changes in women's shares occur when schools change level by adding advanced degrees to their curriculum.

Table 4 reports similar statistics when schools are grouped on the basis of total undergraduate enrollment rather than highest degree or public status. The left panel of the table

shows that there has been a trend towards a larger fraction of enrollment occurring institutions with more than 20,000 enrollees. This growth has come at the expense of enrollment in smaller institutions, including both small and medium-sized schools. The growth in the largest schools' share is driven both by medium-sized schools becoming large and by growth among schools that are large throughout our sample period. The right panel of Table 4 indicates that women's share of enrollment is well above 50% in every year and size class, but also that women's share tends to be highest among the smaller schools with fewer than 10,000 students. This is of course consistent with Table 2's finding that women's shares are higher among private schools, as private schools tend to have lower enrollment than public schools.

Gender Differences in Majors

Tables 1-4 illustrate that women's share of enrollment is generally higher than 50%, but it also shows that that share varies across types of institutions, with women's share being highest in small, private institutions whose highest degree offered is a bachelors. This section considers gender differences in the majors among graduating students in the IPEDS data. The graduates data include major as well as institution, and these data are also very messy, with more than 1,000 different majors listed in 2019 data.[7] We aggregated these majors ourselves into 18 distinct categories, both to eliminate distinctions due to coding errors or to institutional idiosyncrasies in what they call majors, and also because we wanted a system that was reasonably consistent across the twenty years of our data.[8] The 18 majors are listed in Table 5 along their respective share of the graduates data for selected years between 2004 and 2019. The particular 18 majors represented in the table reflect both the aggregations implied by the two-digit major codes in the IPEDS data as well as our own effort to get to a number of majors in the

[7] Majors are based on the classification of program (CIP) codes in the data.
[8] Appendix Table 1 shows the two-digit CIP codes in each category.

teens. Given the broad diversity of majors, the use of an 18-way categorization necessarily means that certain sets of gendered majors – such as Economics and Sociology, for example – will be aggregated into the same broad major class. This in turn implies that there is some opportunity for within-major segregation among some of our major categories. We explore the consequences of this more thoroughly in our analysis of the Kentucky data.

More substantively, Table 5 indicates some familiar patterns and trends in the majors of graduates of 4-year not-for-profit schools. The three largest major groups in the 2019 data are Business (19.9%), Health (10.6%), and Social Science and History (10.8%), and the three smallest are Philosophy and Theology (0.7%), Architecture (0.4%), and Legal Studies (0.2%). The share of students accounted for by each major has changed over time. The most notable risers have been Biology (4.7% in 2005 and 6.5% in 2019) and especially Health (5.3% to 10.6%), while the majors that have most notably fallen in share are Social Science and History (13.7% to 10.8%) and Humanities (13.6% to 9.5%). These patterns are widely recognized among education researchers and reflect in part the growth of employment in health-related fields that has accompanied the U.S.' aging population.

Table 6 illustrates that the female share of graduates in the IPEDS data varies considerably by major, a result that is also familiar from the literature. There are some majors, such as Agriculture and Natural Resources and Social Science and History, where women's share of graduates roughly reflects the national average of 57%, but there are many others where the gender shares are quite at odds with national averages. Three large majors – Education, Psychology, and Health – each graduate more than three women for every man, and there are also large majors – particularly Engineering, where the opposite is true. We will shortly turn to more systematic summaries of gender overlap, but Table 6 suggests that there has been little if

any movement towards greater gender homogeneity of majors over the past two decades. Indeed, the fastest growing major over the past twenty years has been Health, and it has remained a predominantly female major throughout this period, and so its growth tends to increase rather than decrease inter-major gender segregation.

IV. Segregation by School and Major

The previous section outlined certain features of the IPEDS data and, for majors, indicated that male and female students are not distributed evenly across categories. This section takes a more systematic view of the question of segregation by gender along dimensions defined by both school and major. Parametric measures of segregation, such as gini coefficient or the Duncan index, map interunit variation in gender shares into the 0-1 interval, where a "unit" can be defined as a major, a school, or by a cross of major and school, and where gender shares are simply the share of women in each unit. If every unit has very similar gender shares, then segregation is low, while if many units are either all male or all female, then segregation will be high. We focus on the Duncan index in what follows, though similar results were obtained when using other indices of segregation.

Table 7 takes a non-parametric first look at the distribution of enrollment across units grouped by each gender's share of enrollment, where units are defined on the basis of school, major, or school-x-major. Panel A of Table 7 reports the distribution of female students across units grouped by women's share of enrollment within each group. Column 1, for example, reports that 35.8% of women are in combinations of school and major where more than 73% of the students are women, and that only 5% of female students are enrolled in majors where less than 33% of the students are women. Note that the cut points between the five categories were

chosen to straddle 53%, women's share of enrollment across the entire population, and that, because these units are defined on the basis of major, these data are computed from the Graduates Data (which has major) rather than the Attendee Data (which does not). The remaining columns of Panel A of Table 7 make similar calculations for alternative definitions of units. Column 2 shows that the distribution of women's enrollment across units defined by major is similar to that obtained when units are defined by both school and major as in column 1. The implication, of course, is that most of the segregation evident in column 1 is due to segregation by major rather than by school. Or, put yet another way, schools tend to be fairly "coed," but majors do not.

This view is confirmed by columns 3-5 of Panel A of Table 7, each of which reports the distribution of women's enrollment across units defined by women's share of unit enrollment. Column (3) uses the Graduates Data, so that it is based on the same data used for the computations in columns 1 and 2. As conjectured above, about 75% of female students attend a school where the women's share of enrollment is within 10% of the national average of 53%. There are a substantial number of female students – 21.8% – attending schools that are more than two-thirds women, and there are a small number of women – 1.6% – attending schools that are less than 43% women. Yet the share of women in these tails of the distribution are much smaller when units are defined by school than by major. Columns 4 and 5 produce similar results with two different approaches towards measuring inter-institutional gender segregation. Column 4 uses the Attendees Data rather than the Graduates Data, which is possible when units are defined without reference to major, and Column 5 restricts the Attendees Data to the subset of attendees who are "first-time" college students, i.e., students who have not transferred from another post-

secondary institution. The results continue to show more segregation by major than by institution.

Parametric measures of segregation map interunit variation in gender shares, such as that depicted in Panel A of Table 7, into the unit interval. The more weight in the tails of the gender share distribution, the higher will be the value of a segregation index. Because the segregation measure we consider are based on a binary categorization – students are characterized as either male or female – it is just as informative to examine the male analog to Panel A, and Panel B of Table 7 undertakes this exercise. Again, as it must, the table shows that, like women, men are more likely to be "in the tails" when units are defined on the basis of major or school-x-major than when units are defined on the basis of school alone.

Table 8 uses the Duncan Index to systematically map interunit variation into a scalar value that can be compared across time, sample populations, and unit definitions. As is well-known, the Duncan Index can be interpreted as the smallest share of women (or men) that could be moved to eliminate interunit variation in gender shares, i.e. to create complete integration. The table shows that, using this measure, about 85% of school-x-major segregation can be accounted for by major, whereas by itself school can only account for about one third of segregation. Overall segregation has trended up slightly over the years we examine, with School x Major segregation being about 7% higher in 2019 than it was in 2005. Nearly all this increase is attributable to an increase in segregation by major, which increased by roughly 11% over that same period, and very little of the increase in segregation can be attributed to changes in inter-school segregation.

Table 9 considers whether segregation varies among subpopulations of schools defined by enrollment and various other school attributes. The table shows that there are large schools,

highly-gendered schools, but that there are no large, highly-gendered schools. The table reveals these facts by measuring segregation (as of 2019) separately for schools stratified by enrollment. Column 1 of the table shows that school-x-major segregation is negatively correlated with school size, with the largest schools being only two thirds as segregated as the smallest ones. Column 2 shows that this is *not* because the genders are particularly segregated across majors among small institutions, while column 3 shows that, in contrast, there is far more inter-school segregation among the small schools than among the large schools. A small amount of this excess inter-school segregation is potentially due to random selection of students by institutions, but inter-school segregation is only slightly reduced when we use segregation indices designed to abstract from random allocation or sampling.[9] The rest of Table 9 examines segregation within institutions grouped on dimensions such as highest-degree-granted, type, share of female professors, and region. Our reading of these data is that, for the main part, segregation by school tends to be largest among the smallest schools and that small schools tend to be private schools in the Midwest and particularly the East.

Table 10 explores a different but related question – in which types of schools are the sexes most segregated across majors? This is a slightly different exercise, vis-à-vis Table 9, in that we are asking whether certain types of schools tend to have more inter-major segregation among their male and female students. The first column of Table 10 reports the average of intermajor segregation across schools of various types while the second and third columns report the coefficient and standard error from a regression in which the unit of observation is a school and the dependent variable is each school's Duncan index of intermajor segregation. The results

[9] For example, when we use the methods of systematic segregation developed in Carrington and Troske (1997), we find that the ratio of segregation of small schools to large schools is only slightly reduced.

indicate that there tends to be more intermajor segregation at schools that are small, private, or staffed by female professors, though the strongest relationship is again size. Some of this effect is in turn due to the greater opportunity for students' random major choice to generate apparent segregation among small schools.

What does intermajor segregation imply about post-graduation earnings differences between men and women. To address this question, we impute to each student in the Graduates data the average earnings for people in their major based on separate calculations from the American Community Survey (ACS). More particularly, we take ACS data that includes both annual earnings and major (for college graduates) and calculate the average earnings (including zeros for non-earners) for each major for people between the ages of 25 and 35. The averages of these imputed earnings, by sex and year, are reported in Table 11. The results show that, solely based on the majors that they graduate with, women are projected to earn about 9% less than men. The results have varied only slightly over the past 20 years. These results echo the recent findings of Sloane, Hurst, and Black (2021), who find that differences in majors statistically explain a substantial chunk of the male/female wage gap.

We draw the following conclusions from our analysis of the two IPEDS databases. First, there is significant segregation of the sexes across units defined by both major and institution. Second, the large majority of this segregation is due to the different majors that men and women attend and graduate with rather than to the institutions that they attend. Third, there has been relatively little trend in segregation by institution, but there has been an increase in intermajor segregation, in part driven by the growth of predominantly female Health fields. Lastly, these sex differences in major to explain a significant portion of the gap in men's and women's earnings that emerges soon after graduation.

Institutional Data from University of Kentucky

The IPEDS-based Graduates and Attendees data are each limited – the former by its restriction to graduating students and the latter by its absence of data by major – and so we also examine institutional data from the University of Kentucky ("UK data") that complement the IPEDS data. The UK data were provided to us by the University of Kentucky and, unlike the IPEDS data, they are not readily available to the public.[10] These data are drawn from the same databases that UK uses when it fulfills its own IPEDS reporting requirements and, as such, it allows us to "look under the hood" of one particular IPEDS reporting institutions. The UK data is restricted to students at the state's flagship institution and does not include data from other Kentucky state institutions such as, for example, University of Louisville, Murray State University, or Eastern Kentucky University. Thus, the UK data are obviously maximally limited in terms of the diversity of institutions included, but it is worth noting that UK is a large institution (22,188 enrolled undergraduate students in Fall 2018) that, on dimensions such as size, geography, and demographics, lies roughly in the middle of the distribution of large American state universities.

The UK data to which we have access provide a complete count of enrollees, by sex, at all undergraduate courses at UK during the 2018-2019 academic year along with the gender of the instructor of the course. The data do *not* tell us precisely which specific students are in which classes, and they also do not tell us directly the student's level (e.g.. Freshman or Sophomore) or whether the student has declared a major or, if so, what that major might be. Thus, the information is not fully analogous to the "major" field that exists in the IPEDS graduate data. However, the data do provide a full picture of the extent to which UK

[10] These data are counts by gender of students enrolled in classes, and do not contain any information that would allow someone to identify students in a class, so they are not considered confidential data.

undergraduates are enrolled in courses in each department and, uniquely, they tell us the level (i.e. Introductory vs. Intermediate vs. Advanced) of the class that each student is enrolled in. These data thus allow us to assess the extent to which, on a course-by-course basis, young men and women at UK are segregated by major and the gender of the instructor. They also allow us to assess the extent to which segregation varies by course level, and to test the hypothesis that young men and women are increasingly sorted into specific courses of study as their undergraduate careers progress and how the sorting is associated with the gender of the instructor.

In Table 12 we present results from a non-parametric analysis of segregation at Kentucky, analogous to how we approached the IPEDS data, noting of course that all students attend the same institution. Column 1 finds that about 25% of UK courses have women's enrollment above 73%, and that about 21% of those courses have men's enrollment above 75%. The implication, of course, is that there are many courses at UK that are stereotypically "male" or "female." The remaining columns of Table 12 examine whether the frequency of such heavily-gendered courses varies with the level of the course. We note here that 100 level courses are typically for non-majors, 200 level courses are introductory courses designed for majors, and that 300 and 400 level courses are upper level classes within each respective major. The table shows that higher-level courses are significantly more gendered than are the lower level courses. As one example, the share of enrollment in classes with more than 73% women is only 15.4% among 100 level courses, but rises to 39.1% for 400 level courses.

Table 13 presents more parametric measures of gender segregation among undergraduate courses offered at the University of Kentucky for the 2018-2019 academic year. The first row indicates a significant amount – .319 – of course-level segregation across all courses at UK. To

review, this amount is greater than the amount of inter-major segregation we found in the IPEDS data across all institutions. Put differently, if we compare courses at UK to majors across all US institutions, then the courses at UK are slightly more segregated. Table 13 also shows that course-level segregation at UK varies considerably as students progress into higher-level courses. At 100 level courses, which are introductory courses at Kentucky, segregation is .245, lower than the overall intermajor segregation just discussed. But course-level segregation increases as students move into higher-level courses. Amongst the highest-level undergraduate courses at UK, the 400-level courses, segregation is .409. These patterns suggest that while young men and women tend to experiment with many of the same courses, they tend to ultimately focus on sequences of courses that are increasingly gendered.

Table 14 considers whether students gravitate towards teachers of the same gender. We address this question with records from the University of Kentucky on the number of men and women attending each combination of course and teacher's gender. These data allow us to examine whether, for example, male and female students tend to enroll in courses taught by the same gender and the extent to which this tendency varies by course level and department. The top row indicates that, across all courses at the University, male teachers account for about 50% of the courses taken by male students but only 40% of the courses taken by female students. Since all teachers are classified as either male or female in these data, the implication of course is that female teachers account for 50% of male students' courses and about 60% of female students' courses.

The next panel of Table 14 examines whether this tendency varies as students progress through the undergraduate curriculum. The panel shows that professors' genders are most similar for male and female students in the 100 courses, which again at Kentucky are courses for

non-majors. This difference expands at each level, however, as male students' courses are about 10% more likely than female students' to be taught by a male teacher at the 200 level. By the time that students arrive at 400 level courses, typically taken in their last year or two at the University, this difference has ballooned to more than 25%, with female students taking only 28% of their 400 level courses from male teachers while 54% of male students are taking courses from male teachers. The last panel of Table 14 presents similar calculations for courses grouped by our broad department categorization. Aside from the fact that the share of male teachers is much higher in departments like Engineering and Computer Science than in departments like Education and Social Work, the panel shows that the tendency for male and female students to gravitate towards teachers of their own sex is not purely driven by choice of major. In Humanities, for example, a department with significant shares of both male and female students, male students are nearly 10% more likely to take a class from a male teacher.

The results here echo a longstanding literature on student preference for and evaluation of teachers. Correlations between teachers, students, and gender are almost certainly not completely stable over time and so results from decades ago may be of limited current use, but recent results have also shown that the gender of teachers may play an important role in students' willingness to enroll and persist in courses or departments that are somewhat at odds with gendered expectations. Mansour et al. (2022), for example, find that female students enrolled in STEM classes at the United States Air Force Academy are more likely to enter STEM-related jobs and occupations. Similarly, Lim and Meer (2020) find that Korean middle-school girls exposed to female STEM teachers are more likely to take STEM classes in high school than are similar girls taking STEM classes from male teachers. Though we cannot directly relate within-department segregation to any subsequent outcome in our data, the results are certainly

consistent with the idea that students self-segregate towards departments and courses led by teachers of their own sex, and that this could in turn have significant downstream effects on earnings.

Table 15 maps the segregation observed in Tables 12, 13, and 14 and into earnings consequences. In particular, we imputed to each UK undergraduate student/class combination the average hourly earnings of adults with that major in the American Community Survey. Note that, given the structure of the UK data, these are means of student/class combinations rather than students, as we cannot tell which particular UK undergraduates are in each class. The results suggest that, across all course levels, women take courses associated with later earnings that are about 92% as high as those of UK male undergraduates. This pay gap grows considerably across course levels, however. The gap in imputed pay is only 4.5% among 100 level courses, for example, whereas the gap grows to 10.2% among 300 level courses and to 15.2% among 400 level courses. These results are qualitatively similar to the results we reported above on the IPEDS data.

V. Conclusion

This paper has added to the existing literature on the role of college majors in determining post-college outcomes for men and women. Relying on survey data, earlier studies have found that differences in fields of study within college predict a significant fraction of the differences in post-school outcomes observed among post-graduate men and women. We add to this literature in two distinct ways. First, we consider segregation between majors, between schools, and between combinations of schools and majors. These results largely support the prior literature's focus on inter-major segregation, as that is the quantitatively more important

type of segregation. Yet there is segregation by institution, too, particularly among smaller, private schools, and given the wide range of salaries attached to various schools' graduates, this may explain an additional portion of the male-female wage gap.

We also use institutional data from the University of Kentucky to further develop these ideas. The UK results echo the IPEDS results on some dimensions, i.e., intermajor segregation is substantial at UK and differences in majors among UK students likely explains a significant portion of any post-college wage gap between the sexes. Yet we also use the UK data to establish two additional facts. First, we show that segregation increases as students progress into higher-level courses – it is the Econ 101's of the world that are the most integrated and the higher-level seminars that tend to be heavily concentrated in one sex or the other. We cannot say much about the causes of this progressive sorting by gender, but it clearly happens among students at the University of Kentucky, and it likely happens elsewhere, too. Second, we show that, even within majors, there are some differences in the courses taken by young men and women, both by level and by course within a given level. We also find that segregation by course is related to the gender of the instructor. Finally, we show that segregation by major accounts for a significant difference in the observed gender wage gap among UK students and the pay differential increases with the course level.

This paper started with a question – How Coed Is College? Our results suggest that some aspects of the college experience – certainly the institutions they attend and graduate from – are fairly integrated, particularly for large state schools. Yet the answers are different when it comes to actual classrooms. Male and female populations graduate with very different distributions of majors, a within-institution form of segregation that is there when students matriculate but that also grows significantly as they choose majors and move into higher level courses. We show,

following in the footsteps of earlier researchers, that the evolution of courses and majors likely has implications for graduates earnings as young adults. So, to get back to our question, the answer depends a bit upon whether you ask about freshman or seniors.

VI. References

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Table 1
Undergraduate Enrollment and Graduation, by Year

	Enrollment (in millions)			Graduates (in millions)		
Year	**Men**	**Women**	**Women's share**	**Men**	**Women**	**Women's share**
2005	3.10	3.91	55.8%	1.13	1.56	57.9%
2006	3.16	3.96	55.6%	1.16	1.59	57.9%
2007	3.21	3.99	55.4%	1.19	1.62	57.7%
2008	3.29	4.06	55.2%	1.22	1.65	57.5%
2009	3.39	4.15	55.0%	1.25	1.67	57.3%
2010	3.50	4.27	54.9%	1.29	1.72	57.2%
2011	3.57	4.34	54.9%	1.33	1.77	57.1%
2012	3.60	4.35	54.8%	1.37	1.82	57.0%
2013	3.60	4.33	54.6%	1.40	1.85	56.9%
2014	3.63	4.36	54.6%	1.43	1.88	56.9%
2015	3.62	4.36	54.6%	1.45	1.90	56.8%
2016	3.63	4.39	54.7%	1.47	1.94	56.8%
2017	3.65	4.43	54.8%	1.51	1.99	56.8%
2018	3.64	4.47	55.1%	1.54	2.03	56.9%
2019	3.59	4.45	55.4%	1.56	2.06	56.9%

Source: All data are from the Integrated Postsecondary Education Data System.
Note: Enrollment refers to all degree-seeking undergraduates enrolled at a Title-IV non-profit post-secondary schools (public or private) that grant a 4-year degree. Students are excluded if they are enrolled at a for-profit school or at a non-profit school that does not grant a 4-year degree. "Year" refers to the fall semester when the data were collected.

Table 2
Aspects of Undergraduate Enrollment: Public vs. Private

	Enrollment Shares			Women's Enrollment Share	
Year	Public	Private	Total	Public	Private
2005	70.7%	29.3%	100%	54.9%	58.2%
2006	70.7%	29.3%	100%	54.6%	58.0%
2007	70.8%	29.2%	100%	54.4%	57.8%
2008	70.6%	29.4%	100%	54.2%	57.7%
2009	70.9%	29.1%	100%	54.0%	57.6%
2010	70.7%	29.3%	100%	53.8%	57.6%
2011	70.8%	29.2%	100%	53.8%	57.6%
2012	70.7%	29.3%	100%	53.7%	57.4%
2013	70.6%	29.4%	100%	53.6%	57.2%
2014	70.7%	29.3%	100%	53.6%	57.0%
2015	70.6%	29.4%	100%	53.6%	57.1%
2016	70.8%	29.2%	100%	53.7%	57.2%
2017	71.0%	29.0%	100%	53.8%	57.3%
2018	70.9%	29.1%	100%	54.2%	57.5%
2019	70.7%	29.3%	100%	54.5%	57.6%

Source: All data are from the Integrated Postsecondary Education Data System.
Note: Enrollment refers to all degree-seeking undergraduates enrolled at a Title-IV non-profit post-secondary schools (public or private) that grant a 4-year degree. Students are excluded if they are enrolled at a for-profit school or at a non-profit school that does not grant a 4-year degree. “Year” refers to the fall semester when the data were collected.

Table 3
Aspects of Undergraduate Enrollment, by Institutional Level

	Enrollment Shares				Women's Enrollment Share		
Year	Ph.D.	Masters	Bachelors	Total	Ph.D.	Masters	Bachelors
2005	47.0%	41.0%	12.0%	100%	52.8%	58.7%	57.9%
2006	46.9%	40.4%	12.7%	100%	52.6%	58.6%	57.5%
2007	46.9%	40.4%	12.7%	100%	52.4%	58.3%	57.2%
2008	46.9%	40.0%	13.1%	100%	52.2%	58.1%	57.1%
2009	46.8%	40.1%	13.1%	100%	52.1%	57.8%	57.0%
2010	47.7%	40.5%	11.8%	100%	52.1%	57.8%	56.5%
2011	47.7%	40.5%	11.7%	100%	52.1%	57.7%	56.4%
2012	47.9%	40.5%	11.7%	100%	52.0%	57.7%	56.2%
2013	48.1%	40.4%	11.5%	100%	51.9%	57.5%	56.0%
2014	48.3%	40.4%	11.4%	100%	51.9%	57.4%	55.9%
2015	48.7%	40.0%	11.3%	100%	52.0%	57.6%	55.9%
2016	49.1%	39.7%	11.2%	100%	52.1%	57.6%	55.9%
2017	49.1%	39.8%	11.0%	100%	52.3%	57.6%	56.0%
2018	49.3%	39.8%	10.9%	100%	52.7%	57.9%	56.2%
2019	50.0%	39.3%	10.6%	100%	52.9%	58.2%	56.5%

Source: All data are from the Integrated Postsecondary Education Data System.
Note: Enrollment refers to all degree-seeking undergraduates enrolled at a Title-IV non-profit post-secondary schools (public or private) that grant a 4-year degree. Students are excluded if they are enrolled at a for-profit school or at a non-profit school that does not grant a 4-year degree. “Year” refers to the fall semester when the data were collected.

Table 4
Aspects of Undergraduate Enrollment, by Institutional Size

	Share of Enrollment					Women's Share of Enrollment				
Year	<1,000	1,000-4,999	5,000-9,999	10000-19,999	20,000+	<1,000	1,000-4,999	5,000-9,999	10,000-19,999	20,000+
2005	1.7%	19.7%	16.6%	25.5%	36.4%	57.9%	59.6%	58.3%	54.9%	53.2%
2006	1.7%	19.5%	16.5%	25.3%	37.0%	57.8%	59.3%	58.1%	54.8%	53.0%
2007	1.6%	19.1%	16.6%	25.1%	37.6%	57.4%	59.2%	57.9%	54.5%	52.8%
2008	1.5%	18.5%	16.4%	24.4%	39.3%	57.7%	59.1%	57.6%	54.6%	52.7%
2009	1.2%	18.5%	15.9%	24.2%	40.2%	57.1%	59.0%	57.2%	54.7%	52.5%
2010	1.3%	18.2%	15.8%	24.1%	40.7%	56.8%	59.0%	56.8%	55.2%	52.1%
2011	1.2%	18.0%	15.3%	23.8%	41.6%	56.4%	58.9%	56.7%	55.3%	52.2%
2012	1.2%	17.7%	15.1%	23.3%	42.7%	56.0%	58.7%	56.5%	55.4%	52.2%
2013	1.2%	17.8%	15.1%	22.2%	43.7%	55.8%	58.5%	56.8%	55.0%	52.1%
2014	1.2%	17.6%	15.0%	21.6%	44.6%	55.6%	58.3%	56.8%	55.0%	52.1%
2015	1.2%	17.2%	14.9%	20.8%	45.8%	55.7%	58.3%	56.8%	54.9%	52.4%
2016	1.2%	16.7%	15.2%	20.5%	46.5%	54.4%	58.5%	56.8%	55.0%	52.6%
2017	1.3%	16.2%	14.3%	21.0%	47.2%	55.1%	58.5%	56.8%	55.3%	52.8%
2018	1.2%	16.1%	13.5%	21.4%	47.7%	54.4%	58.5%	57.0%	55.5%	53.3%
2019	1.3%	15.9%	13.5%	21.1%	48.2%	54.9%	58.8%	57.7%	55.7%	53.5%

Source: All data are from the Integrated Postsecondary Education Data System.
Note: Enrollment refers to all degree-seeking undergraduates enrolled at a Title-IV non-profit post-secondary schools (public or private) that grant a 4-year degree. Students are excluded if they are enrolled at a for-profit school or at a non-profit school that does not grant a 4-year degree. “Year” refers to the fall semester when the data were collected.

Table 5
Majors Share of Graduates, by Year

	Year			
Major	2005	2009	2014	2019
Agriculture & Natural Resources	1.7%	1.7%	2.0%	2.2%
Architecture	0.6%	0.6%	0.5%	0.4%
Social Science & History	13.7%	13.5%	12.4%	10.8%
Communications	5.5%	5.4%	5.3%	5.1%
Computer Science	3.0%	1.8%	2.4%	4.3%
Education	7.7%	6.8%	5.6%	4.3%
Engineering	5.6%	5.4%	6.2%	7.7%
Humanities	13.6%	13.3%	11.6%	9.5%
Business	22.1%	21.5%	19.2%	19.9%
Legal Studies	0.2%	0.2%	0.2%	0.2%
Biology	4.7%	5.4%	6.2%	6.5%
Mathematics and Statistics	1.1%	1.1%	1.3%	1.4%
Multidiscipline	2.2%	2.4%	2.5%	2.7%
Philosophy and Theology	1.2%	1.1%	1.0%	0.7%
Physical Sciences	1.4%	1.5%	1.7%	1.7%
Psychology	6.3%	6.3%	6.8%	6.2%
Health	5.3%	7.0%	9.3%	10.6%
Vocational	4.3%	4.9%	5.7%	5.7%
Total	100.0%	100.0%	100.0%	100.0%

Source: All data are from the Integrated Postsecondary Education Data System.
Note: Graduates refers to all degree-seeking undergraduates graduating from a non-profit post-secondary schools (public or private) that grant a 4-year degree. Students are excluded if they are enrolled at a for-profit school or at a non-profit school that does not grant a 4-year degree. “Year” refers to the fall semester when the data were collected.

Table 6
Female Share of Graduates, by Major and Year

	Year			
Major	2005	2009	2014	2019
Agriculture & Natural Resources	48.0%	47.7%	51.1%	55.2%
Architecture	42.8%	42.7%	43.4%	48.2%
Social Science & History	54.8%	54.0%	54.4%	57.0%
Communications	64.8%	64.2%	64.0%	64.1%
Computer Science	21.4%	16.5%	17.0%	20.5%
Education	78.6%	79.0%	78.8%	81.6%
Engineering	18.7%	16.9%	18.7%	21.7%
Humanities	66.6%	65.1%	64.9%	65.7%
Business	51.7%	49.8%	48.7%	48.1%
Legal Studies	70.2%	70.1%	65.1%	67.9%
Biology	62.2%	59.5%	58.5%	63.2%
Mathematics and Statistics	44.8%	43.3%	43.0%	42.6%
Multidiscipline	68.7%	68.2%	66.1%	65.8%
Philosophy and Theology	38.6%	38.4%	37.6%	41.0%
Physical Sciences	42.3%	41.0%	39.4%	40.5%
Psychology	77.9%	77.1%	76.6%	79.1%
Health	86.8%	85.3%	84.1%	84.0%
Vocational	46.2%	44.9%	44.6%	48.5%
All Majors	57.9%	57.3%	56.9%	56.9%

Source: All data are from the Integrated Postsecondary Education Data System.
Note: Graduates refers to all degree-seeking undergraduates graduating from a non-profit post-secondary schools (public or private) that grant a 4-year degree. Students are excluded if they are enrolled at a for-profit school or at a non-profit school that does not grant a 4-year degree. “Year” refers to the fall semester when the data were collected.

Table 7
Variation in Gender Shares, by Unit Definition, Fall 2019

	(1)	(2)	(3)	(4)	(5)
	Panel A: Percent Female				
Women's share within the unit	School x Major	Major	School 1	School2	School2-First time
73% +	35.8%	30.5%	3.1%	2.6%	2.6%
63.0-72.9%	17.4%	27.3%	18.7%	13.4%	13.3%
53.0-62.9%	20.4%	12.9%	52.7%	54.6%	55.6%
43.0-52.9%	15.4%	22.1%	23.9%	26.9%	25.3%
33.0-42.9%	6.0%	2.8%	1.2%	2.0%	2.6%
32.9% -	5.0%	4.5%	0.4%	0.5%	0.6%
Total	100.0%	100.0%	100.0%	100.0%	100.0%
	Panel B: Percent Male				
Men's share within unit	School x Major	Major	School 1	School2	School2-First time
73% +	20.2%	21.9%	1.1%	1.2%	1.4%
63.0-72.9%	8.4%	0.0%	1.8%	1.3%	2.1%
53.0-62.9%	18.2%	5.2%	7.5%	12.2%	11.4%
43.0-52.9%	21.7%	44.4%	44.9%	51.9%	45.2%
33.0-42.9%	16.6%	19.5%	39.5%	30.8%	37.2%
32.9% -	15.0%	8.9%	5.2%	2.7%	2.8%
Total	100.0%	100.0%	100.0%	100.0%	100.0%

Source: All data are from the Integrated Postsecondary Education Data System.
Note: School1 refers to schools based on the Graduates data while School2 refers to schools based on the Attendees data. "First time" only includes undergraduate students who have not enrolled in a college previously.

Table 8
Gender Segregation, by Unit Definition and Year

	Unit Definition				
	(1)	(2)	(3)	(4)	(5)
Year	**School x Major**	**Major**	**School1**	**School2**	**School2-First time**
2005	0.316	0.263	0.128	0.121	0.120
2006	0.318	0.266	0.130	0.123	0.119
2007	0.318	0.266	0.128	0.122	0.118
2008	0.318	0.264	0.128	0.120	0.116
2009	0.316	0.265	0.126	0.117	0.116
2010	0.318	0.265	0.125	0.116	0.116
2011	0.318	0.268	0.124	0.115	0.117
2012	0.318	0.270	0.120	0.115	0.118
2013	0.319	0.272	0.120	0.115	0.121
2014	0.323	0.276	0.121	0.115	0.122
2015	0.326	0.280	0.120	0.116	0.123
2016	0.328	0.282	0.119	0.117	0.119
2017	0.332	0.288	0.121	0.117	0.121
2018	0.337	0.292	0.122	0.119	0.123
2019	0.338	0.293	0.124	0.118	0.121

Source: All data are from the Integrated Postsecondary Education Data System.
Note: All segregation measures are indices of dissimilarity (aka Duncan index). School1 refers to schools based on the Graduates data while School2 refers to schools based on the Attendees data. "First time" only includes undergraduate students who have not enrolled in a college previously. "Year" refers to data from the fall semester.

Table 9
Gender Segregation, by Institutional Type, Fall 2019

	Unit Definition				
	(1)	(2)	(3)	(4)	(5)
School Size	**School x Major**	**Major**	**School1**	**School2**	**School2-First time**
<1,000	0.448	0.284	0.246	0.215	0.239
1,000-4,999	0.388	0.300	0.173	0.163	0.171
5,000-9,999	0.352	0.310	0.131	0.127	0.143
10,000-19,999	0.336	0.300	0.110	0.104	0.110
20,000+	0.314	0.288	0.096	0.088	0.088
Highest Degree					
BA	0.387	0.280	0.175	0.160	0.170
Masters	0.350	0.311	0.114	0.109	0.113
Ph.D.	0.318	0.287	0.098	0.094	0.100
School Type					
Public	0.326	0.291	0.108	0.102	0.107
Private	0.371	0.303	0.161	0.145	0.153
Female Share of Professors, by quartile					
1st	0.331	0.285	0.117	0.120	0.135
2nd	0.315	0.282	0.085	0.082	0.087
3rd	0.324	0.285	0.083	0.084	0.097
4th	0.378	0.310	0.140	0.122	0.129
Region					
East	0.349	0.294	0.152	0.145	0.146
South	0.352	0.312	0.123	0.114	0.118
Midwest	0.336	0.295	0.111	0.110	0.116
West	0.317	0.280	0.108	0.094	0.090

Source: All data are from the Integrated Postsecondary Education Data System.
Note: All segregation measures are indices of dissimilarity (aka Duncan index). School1 refers to schools based on the Graduates data while School2 refers to schools based on the Attendees data. "First time" only includes undergraduate students who have not enrolled in a college previously. "Year" refers to data from the fall semester.

Table 10

Correlates of Intra-School/Inter-Major Segregation

		Regression	
School Size	Mean Segregation Index	Coefficient	S.E.
<1,000	0.341	--	--
1,000-4,999	0.327	-0.016	0.003
5,000-9,999	0.309	-0.030	0.003
10,000-19,999	0.297	-0.033	0.004
20,000+	0.288	-0.031	0.004
Highest Degree			
Ph.D.	0.291	--	--
Masters	0.321	0.011	0.003
BA	0.328	0.008	0.003
School Type			
Public	0.305	--	--
Private	0.326	0.001	0.002
Female Share of Professors, by quartile			
1st	0.305	--	--
2nd	0.304	-0.001	0.002
3rd	0.309	0.003	0.002
4th	0.353	0.042	0.002
Region			
East	0.315	--	--
South	0.332	0.019	0.002
Midwest	0.322	0.010	0.002
West	0.283	-0.027	0.002

Source: All data are from the Integrated Postsecondary Education Data System.

Note: All segregation measures are indices of dissimilarity (aka Duncan index). School1 refers to schools based on the Graduates data while School2 refers to schools based on the Attendees data. "First time" only includes undergraduate students who have not enrolled in a college previously. "Year" refers to data from the fall semester.

Table 11
Average Imputed Earnings by Year
IPEDS Data

	Average Imputed Salary		
Year	Women	Men	Women/Men
2005	$65,051	$71,553	90.9%
2006	$64,920	$71,317	91.0%
2007	$64,908	$71,195	91.2%
2008	$64,936	$71,059	91.4%
2009	$65,019	$71,068	91.5%
2010	$65,137	$71,208	91.5%
2011	$65,182	$71,266	91.5%
2012	$65,207	$71,326	91.4%
2013	$65,266	$71,362	91.5%
2014	$65,471	$71,642	91.4%
2015	$65,807	$72,095	91.3%
2016	$66,125	$72,596	91.1%
2017	$66,357	$73,108	90.8%
2018	$66,564	$73,502	90.6%
2019	$66,670	$73,823	90.3%

Source: All data are from the Integrated Postsecondary Education Data System and American Community Survey (ACS).

Table 12
Variation in Gender Shares, by Course Level
University of Kentucky Data, AY 2018-19

	Course Level				
	(1)	(2)	(3)	(4)	(5)
Women's share of Enrollment	All Courses	100 Level	200 Level	300 Level	400 Level
73% +	25.1%	15.4%	22.6%	37.5%	39.1%
66.2-72.9%	19.7%	26.2%	18.0%	15.0%	10.0%
53.0-62.9%	25.2%	30.9%	29.1%	15.3%	17.3%
43.0-52.9%	13.9%	16.3%	13.6%	12.2%	10.0%
33.0-42.9%	8.7%	5.9%	8.6%	11.1%	13.8%
32.9% -	7.4%	5.3%	8.1%	8.9%	9.9%
Total	100.0%	38.9%	26.5%	25.4%	9.2%
Men's share of Enrollment	All Courses	100 Level	200 Level	300 Level	400 Level
76% +	21.2%	13.7%	26.6%	22.2%	31.9%
66.0-75.9%	11.6%	9.8%	9.0%	16.0%	14.4%
53.0-65.9%	18.4%	13.2%	18.4%	25.1%	20.6%
43.0-52.9%	19.7%	30.4%	15.6%	11.9%	11.4%
33.0-42.9%	16.7%	19.0%	20.0%	11.8%	11.1%
32.9% -	12.3%	13.8%	10.4%	13.0%	10.5%
Total	100.0%	36.9%	27.9%	25.3%	9.9%

Note: All data drawn from institutional data from the University of Kentucky for the 2018-2019 academic year.

Table 13
Gender Segregation, by Class Level and Level of Aggregation
University of Kentucky Data, AY 2018-19

Class Level	Courses	Department	Broad Major
All	0.319	0.290	0.224
100 Level	0.245	0.214	0.175
200 Level	0.322	0.293	0.215
300 Level	0.371	0.359	0.317
400 Level	0.409	0.398	0.355

Source: All data are drawn from institutional data from the University of Kentucky for the 2018-2019 academic year. All segregation measures are indices of dissimilarity (aka Duncan index). Columns vary by the extent to which classes are merged into broader units before segregation indices are calculated. The "courses" column does not aggregate across courses at all so that, for example, Economics 101 and Economics 102 would be separate units. The "Department" column aggregates courses into units by the University of Kentucky's department system, which comprises roughly 120 distinct departments. Examples of such departments include Economics, History, Sociology, and Political Science. The last column – "Broad Major" – aggregates these departments into the same 18-way classification system that we used in the IPEDS data discussed earlier. In this categorization, Economics, History, Sociology, and Political Science are all subsumed within the broad major of "Social Science and History."

Table 14
Student Shares, by Sex of Instructor
University of Kentucky, AY 2019

	Courses Taught by Male Instructors	
	Male Students	Female Students
All Courses	49.9	38.1
By Level		
100	44.9	39.6
200	44.3	33.8
300	47.6	34.7
400	53.6	28.4
By Department		
Agriculture & Natural Resources	41.4	27.8
Architecture	44.8	30.8
Social Science & History	48.7	43.7
Communications	48.8	42.7
Computer Science	85.4	75.3
Education	24.2	15.7
Engineering	77.5	74.4
Humanities	43.3	34.2
Business	57.8	53.4
Biology	36.1	30.4
Mathematics & Statistics	55.5	51.8
Philosophy & Theology	44.9	38.5
Physical Sciences	54.4	40.1
Health	31	20.9
Social Work	8.6	12.9

Note: All data drawn from institutional data from the University of Kentucky for the 2018-2019 academic year. The numbers reported are weighted shares with the weight being the number of students in a class.

Table 15
Average Imputed Earnings, by Gender and Level
University of Kentucky, AY 2018-2019

Level	Women	Men	Women/Men
All	$63,036	$68,466	92.1%
100-199	$59,169	$61,959	95.5%
200-299	$66,705	$70,871	94.1%
300-399	$64,590	$71,939	89.8%
400-499	$64,611	$76,187	84.8%

Note: Data come from the University of Kentucky institutional data and the American Community Survey (ACS). Only individuals with non-zero earnings are included in the ACS data.

Appendix Table 1
Mapping of Majors into Two-digit CIP Codes

Major	Two-digit CIP Code
Agriculture & Natural Resources	03
Architecture	04
Social Science & History	05, 44, 45, 54
Communications	09, 10
Computer Science	11
Education	13
Engineering	14, 15
Humanities	16, 23, 24, 25, 50
Business	19, 52
Legal Studies	22
Biology	26
Mathematics and Statistics	27
Multidiscipline	30
Philosophy and Theology	38, 39
Physical Sciences	40, 41
Psychology	42
Health	51
Vocational	12, 29, 31, 43, 46, 47, 48, 49