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EXPLORING THE DECLINE IN THE MALE SHARE OF COLLEGE ENROLLMENT: WHAT IT SAYS ABOUT MASCULINITY

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I. Abstract

This paper explores the declining male share of enrollment in higher education and the implications for the economy, society, and gender relations. The United States, like many other developed nations, places high emphasis on producing college-educated individuals. The hope is that an investment in a college education will increase a person's human capital and in turn, yield higher salary returns in the labor market. In the early 20th century, women were excluded from college, and thus male college enrollment exceeded female enrollment. Since the 1980s, however, the college gender gap has declined and is now reversed with men a minority of college enrollees (DiPrete & Buchmann, 2013). The gender gap in higher education has occurred simultaneously with rising labor market and education incentives, suggesting that men are not responding to these increased returns, as seen by the recent slowdown in men's enrollment (DiPrete & Buchmann, 2013). This paper explores the factors that have contributed to this shift in enrollments. To do so, I present an economic regression analysis using panel data from national higher education institutions as well as macro-level data and sociological variables to explore the determinants of the declining share of male enrollment. The results may be useful in addressing the causes of this trend, and in identifying policies to remedy the problem.

II. Introduction

The declining male share of college enrollment is a truly puzzling phenomenon and one that began in the 1980's along with changes in labor markets, and gender and social dynamics. Many researchers have written about the rising achievement and success of women, but what about men? As women now comprise a majority of college enrollments, what other paths are young men pursuing, if they are not one of the 41 percent of males that have a higher education degree?

To better understand the gender trends in enrollment, this research will focus on the determinants of male share of enrollment in higher education and answer the question "why are males turning away from a college education relative to women?" This is a particularly acute problem since access to work and earnings in the United States economy (as well as in other industrialized economies) increasingly are linked to college degree. Today, a bachelor's degree is often a pre-requisite to entry-level jobs and thus the gateway to upward social mobility. A better understanding of causes of the decline in male enrollments, in both absolute and relative terms, within the current education system and society will be helpful as a precursor to developing policies that will encourage all individuals to pursue higher education in order to adequately prepare for the labor market.

The gender reversal in male-female share of college enrollments is especially compelling as a focus of research since little attention has been paid to this phenomenon by researchers. As gender equality within the household and the labor market has increased, women are becoming more equal to men through their access to education. With this, they are now able to attend college, enter a career path, marry later in life, and file for divorce, which all contribute to a relative rise in family instability. As more women are becoming man's equal within the

household and the labor market, previous cultural and societal norms are shifting. The rise of the breadwinner wife is now associated with the destruction of marriage (Rosin, 2012). And now that women are more educated, they are likely to have increased wage opportunities, marriage with those of similar educational attainments, a higher standard of living, and an increased protection against poverty (DiPrete & Buchmann, 2013).

Interestingly, the highly male-dominated (masculine) sector, manufacturing has been central to the United States economy. Within the manufacturing sector, there are many jobs ranging from low-skill to high skill, requiring an advanced degree. Since 2000, jobs in manufacturing for those with graduate degrees have grown by 32 percent while manufacturing jobs for those with less than a high school diploma have declined by 44 percent between 2000 and 2012 (Levinson, 2017). Men with a lower socioeconomic status tend to work in manual labor jobs as a means to compensate for the lack of social capital they feel should be afforded to them as men, which often leads to an educational divide between these low skill men and those in power (Reed, 2011). Within a wealthy society like the US that shows off military strength, backbreaking manual labor jobs are no longer needed. In today's market where interpersonal skills and intellectual abilities are in high demand, men are not prepared compared to women (Salzman et al., 2005). Some manufacturing jobs, which do not require a college education are decreasing and labor-intensive jobs that were once ubiquitous, are moving overseas or becoming automated. On one hand, men may then be interested in attending college because the opportunity cost is low but on the other hand, they might not be interested in entering rapidly growing, female-dominated fields such as nursing. As the number of bachelor's degrees awarded to men decline, men without degrees are not setting themselves up to be highly desirable in the labor market. Instead, they are setting their sights on a shrinking sector that

embodies masculinity, rather than growing sectors with enhanced job security. This male trend can lead to an increased male unemployment rate due to structural unemployment. These potential implications for labor and marriage markets should be noted for their future impacts on the economy. The changing opportunity costs of pursuing higher education has provided women with more freedom of choice than before. Additionally, women's ability to more easily socially integrate in college has contributed to this female advantage (Ewert, 2012).

Anticipating the results of my analysis, this study provides evidence that the male shares of enrollment, applicants, and admissions are all influenced by the characteristics of institutions of higher learning and that those characteristics are mediated by men's attitudes toward their own masculinity. However, the male share of enrollment, manufacturing as a percentage of employment seems to highly influence male enrollment decision. Other demographic and labor market variables, such as life expectancy, marriage rate, divorce rate, and earnings given educational attainment, do not appear to be statistically significant, suggesting that more attention from researchers is needed specifically on sociological variables to explore the gendered difference. While the declining share of male enrollment in higher education is far from being fully understood, this paper empirically explores the general phenomenon and establishes a framework for the determinants of the gap.

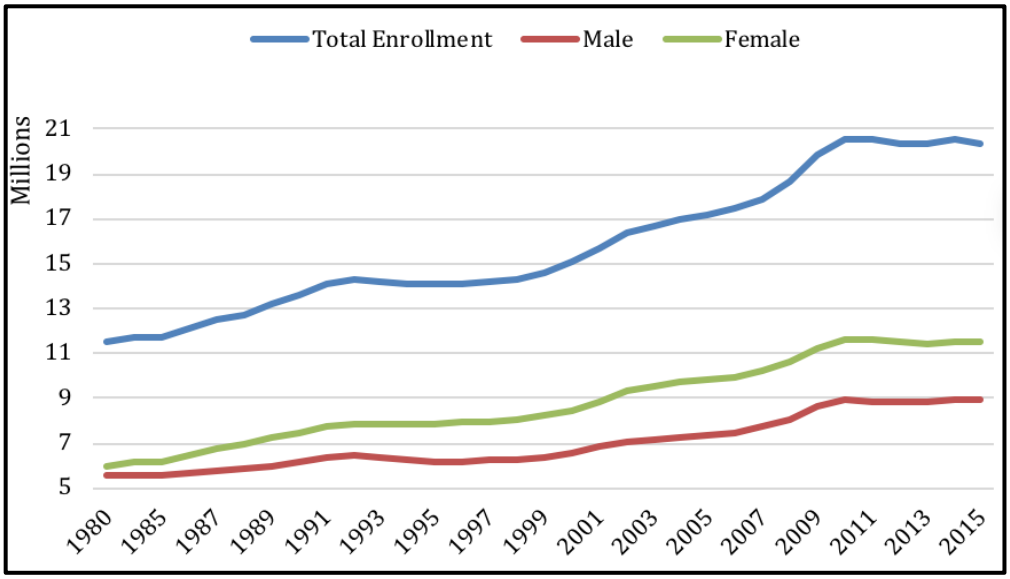
The Gender Gap Background

The following figures show how the enrollment numbers and shares of enrollment by gender have changed from 1980 to 2015 using data from the National Center for Education Statistics. *Panel A* in Figure 1 shows that total, male, and female enrollment have increased overtime but the gap between male and female enrollment has widened, with women's

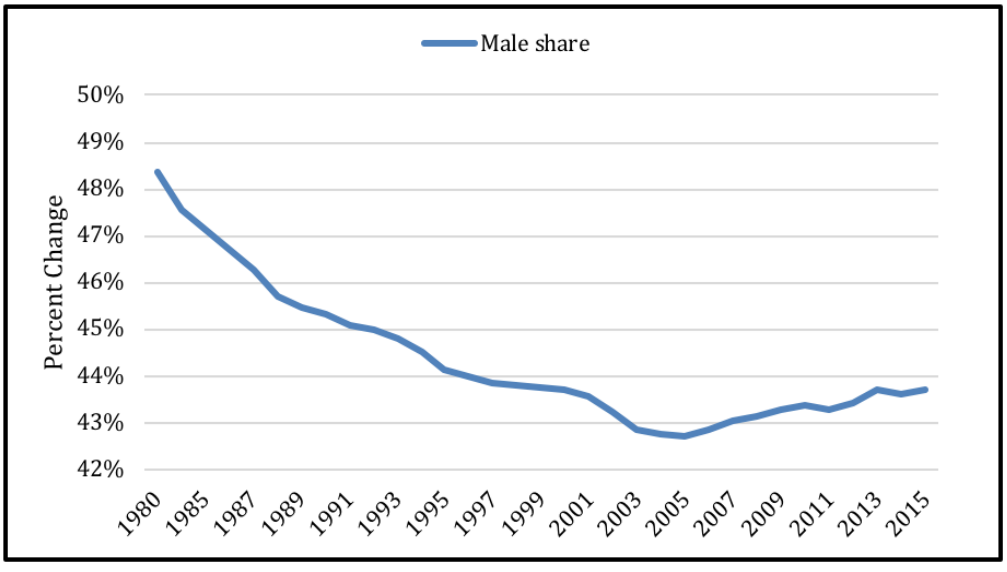
enrollment growing 93 percent since 1980 compared to men's percentage change increase of 60 percent. *Panel B* shows the male share of enrollment has declined since 1980, dropping around 4 percentage points from 1980 to 2015.

Figure 1. College and University Enrollment Rate Trends by Gender, 1980-2015

Panel A: Male and Female as Shares of Total College University Enrollment 1980-2015



Panel B: Male Share of Total College University Enrollment 1980-2015



Source: National Center for Education Statistics

In the early 1900s, patriarchal culture in the U.S. emphasized male education, making it difficult for women to receive higher education *and* bear children (DiPrete & Buchmann, 2013). In the 1800.s, schools such as Harvard, Columbia, and Brown allowed women to attend but they were heavily supervised and classes were segregated (Madigan, 2009). At that time, women were pushed into one of four main occupations: secretarial, nursing, teaching, or motherhood. Many women at that time enrolled in single-gender institutions. It was not until 1972, with the passage of Title IX, that made it illegal for public schools to discriminate based on sex, financial aid, athletics, and admission practices (Madigan, 2009).

Over time, changing social roles shifted family structures, which altered marriage expectations, fertility rates, and overall gender relations. In 1960 age at first marriage was 23 for men and 20 for women and in 2008 the age had increased to 28 for men and 26 for women (DiPrete & Buchmann, 2013). In 1970, women contributed 2 to 6 percent of family income and now the American wife contributes 42 percent (Rosin, 2012). As female education increases, it is associated with a delayed timing of marriage, an increase in age at first marriage, and an overall higher marriage rate for college-educated women. In Gary Becker's (1981) microeconomic theory of family change, he states that the economic division of labor (male breadwinner and the female caretaker) between a couple contributes to more stability, while the rise of gender equality in the labor market breaks down this stability resulting in fewer marriages and more divorces (qtd. in DiPrete & Buchmann, 2013). Given this, the traditional breadwinner husband model has declined and today, only one in five American families conform to this model (Boushey 2009, qtd. in DiPrete & Buchmann, 2013). In addition, changing pathways to college such as the proliferation of two-year institutions, enabled high achieving women to more easily continue their education. From 1970 to 2007, the number of two-year institutions increased from

654 to 1,668 and total enrollment at those schools increased from 2.3 million to 6.6 million (Flashman, 2013).

By 1960, 65 percent of bachelor's degrees were earned by men. Women continued to lag behind male college graduation rates until 1982, and by 2010, women received 57 percent of bachelor degrees and represented 57 percent of all college students (DiPrete & Buchmann, 2013). Interestingly, this phenomenon is not unique to the United States. It has occurred internationally, suggesting that there are structural and social changes occurring globally. These changes could be related to changing norms of masculinity, structural economic changes in male-dominated occupations (with lower demand), increased employment opportunities for women, and changes in gender relations where more women are becoming economically independent. As a country, the United States has been underperforming in terms of tertiary degrees awarded, compared to other industrialized countries that have produced more college-educated individuals (DiPrete & Buchmann, 2013).

The goal of this research is to investigate the determinants of male and female college enrollment, and men's declining share of enrollment. Specifically, the question to be explored is what causes males and female enrollments to differ and what has led to the declining male share of enrollments from 2000 to present. This question will be addressed by regression analysis that accounts not only for demographic variables that reflect changing gender relations but also macroeconomic factors that shape employment opportunities such that labor market effects can be identified. Integrating multidisciplinary insights can help to paint a more complete portrait of the factors that have led to declining male share of enrollment than previous studies, and further contribute to economic and higher educational research.

III. Literature Review: Changing Social Norms

Many studies that have investigated declining share of male college enrollment, found that changing social norms and expectations explained a lot of the gender gap in higher education. Jennifer Flashman's (2013) study on cohorts representing the high school graduating classes of 1972, 1982, and 1992 used three surveys that captured the transition from high school to postsecondary education, controlling for academic achievement, educational and occupational expectations, and parental education. She first used a regression analysis to predict logged odds that an individual attends college, then she added the independent variables in a stepwise fashion. She found, primarily due to the increased educational opportunity for women coupled with the dramatic shift in norms and returns to education, that women have changed their decisions in post-secondary opportunities while men's decisions have remained relatively constant (Flashman, 2013). Goldin et al. (2006), similarly used three National Longitudinal Survey (1957, 1972,1992) to evaluate Wisconsin high school seniors' odds of completing a bachelor's degree, controlling for high school rank, achievement, gender, courses, mother's education, income, race, and ethnicity. They concluded that due to changing social norms, work expectations, marriage patterns, contraceptive patterns, and a general leveling of the playing field, women have taken advantage of increasing returns to education relative to men. They also noted that this has occurred simultaneously with a slower social development and large behavioral problems for males. Likewise, Bowen's et al. (2009) cohort study on public universities used regression analysis to explore the factors that explained college selectivity at public flagship universities. The authors controlled for family income, parental education, and academic achievement and found that substantially more females than males graduated within four years in all racial groups. They found that the students with low achievement were not due to them being underprepared.

The authors suggested that something else was occurring in the education system that their model could not explain. While these studies controlled for important achievement-predictor variables, they did not find gender-specific variables or greater labor market variables to inform their model. Nevertheless, the studies aimed to find important variables that influence college attendance and they found that women are overachieving compared to men.

However, Stephanie Ewert (2012) used data from the National Education Longitudinal Study of 1988 on 8,500 students to find the determinants of completing a bachelor's degree, given enrollment. Her logistic regression controlled for race, ethnicity, socioeconomic status, intact families, and high school performance to measure attendance patterns, college major, and social integration. She found that more women than men who enroll in college, graduate, primarily because of gendered attendance patterns, social integration, and academic performance in college. Ewert's findings showed differing male graduation rates based on gendered differences in college experience and empirically explored the female advantage in college graduation. She did not find that women are more likely than men to enroll, but the different gendered experiences in college contributed to varying rates college completion. While Ewert's findings are important, they suggest that gendered variables must be considered in regression analyses.

Linda Sax and Cassandra Harper (2007) used data from a national longitudinal study conducted by UCLA on 17,500 students to examine differences between men and women on 19 outcomes of college to see if those differences were due to a pre-college gender gap or due to different gender experiences in college. They use an ordinary least squares regression analysis to test these different outcomes against pre-college characteristics, college environments, and college behaviors. They found that controlling for gender differences could still not explain the

differential outcomes and that gender differences observed at the end of college are unrelated to the college experience itself. Their study suggests that gendered variables are important and that the gender gap in higher education originates before college in adolescent years.

The above studies and the majority of related studies find that gender differences in pre-college, college, and social experiences ultimately influence the gender gap in higher education. What these studies lack, is a comprehensive explanation for why *males* are not pursuing a college education in the context of the labor market. While this previous research is important, it does not truly capture social effects *and* labor market outcomes that could inform us about the opportunity costs of male college enrollment. If men are not graduating or even enrolling from higher education, are they choosing a more direct, lucrative path in the job market? Labor market factors are important include because they help indicate the health of our economy. My regression analysis includes institutional variables, labor market variables, and demographic/social variables that will aim to better predict the declining share of male enrollment.

Social differences between males and females

Many sociologists and researchers have hypothesized why women are higher performing in academic settings compared to men. Differences in endocrine functioning are argued to cause gender differences such as more male aggression, competition and violence while females exhibit more tenderness and compassion by using different parts of the brain (qtd. in Kimmel & Messner, 2007). Sociologist Susan Pinker (2008) stated that females are "biologically superior to males" as an explanation of female rising educational achievement (qtd. in DiPrete & Buchmann, 2013, p. 11). However, biological arguments, once popular in earlier time periods, tend to lack

sufficient empirical evidence in current society. Today, sociologists favor the social constructionist model which refers to the concept that the construction of masculinity is not trans-historical or universal, but rather that the definitions of masculinity differ by region, time period, class, and race (Kimmel & Messner, 2007).

Men are also found to be more competitive and involved in athletics, which plays an influential role in shaping their masculine identities (Morrison and Eardley 1985 qtd. in Kimmel & Messner, 2007). Blazina and Watkins (Kimmel & Messner, 2007) find that masculine gender role conflict is related to college male consumption of alcohol. Additionally, higher female life expectancy suggests a female biological advantage but demands a closer look into changing trends in gendered social and cultural factors such as behavior and lifestyle (Kimmel & Messner, 2007). Other sociologists support the gender socialization model for explaining educational attainment, which states that children form their aspirations through interactions with parents, teachers, and peers. As female educational attainment has risen, the question has become more about ‘what is wrong with boys’ where conservative commentators who once used biologically backed theories are now shifting to sociocultural ones (DiPrete & Buchmann, 2013).

Significance to higher education research

Changes in trends such as the college gender gap may signal other changes in society, politics, or institutions. Higher education is where many individuals develop academic passions and professional skills. Looking into why college males tend to drop out or choose not to enroll has many economic implications for the labor market including occupational segregation. Many view declining male enrollment as a great achievement for women given their historical late start in higher education. However, any unusual trend such as declining share of male enrollment in

college, necessitates an explanation as to why. The importance of higher education relates to the future of the labor market and the health of the economy. This project explores the determinants of the declining share of male enrollment, in hopes to gather a better understanding of the recent trend. Many studies previously mentioned, discuss declining male participation in education even before college which may suggest improvements to the K-12 system. Exploring current economic trends alongside higher education data can provide information as to where the education system (as a function of the economy) may be lacking.

The methodology I adopt to ascertain the determinants of male share of enrollment is an ordinary least squares regression analysis. I integrate higher education, labor market, and demographic data into a single panel dataset for the period 1984–2016. I use the male share of total enrollment in both two and four-year institutions as my dependent variable, and three categories of independent variables: institutional, labor market, and sociological variables. Using two different disciplines –sociology and economics – to examine this topic is both powerful and informative since it utilizes multiple perspectives in hopes to better understand this puzzling phenomenon.

IV. Methodology

This study aims to explore gendered differences that impact the decision to enroll in higher education, across three dimensions: institutional characteristics, labor market conditions, and demographics. Using an ordinary least squares regression, the dependent variable is male share of enrollment measured by the number of males enrolled in undergraduate studies divided by total enrollment. This paper empirically explores the determinants of the decline in the male share of enrollment from state-level panel data for the years 1984 to 2016. To most clearly understand the data, the regressions are broken up in blocks by type of variable (institutional, labor market, demographic/sociological) then put back together into one regression. I also alter the dependent variable to equal male share of total applicants and male share of total admission, to examine all steps of the male college decision process (see tables A.2 and A.3 in the appendix). The following estimating equation represents the full regression using the dependent variable, male share of enrollment:

$$\begin{aligned} MFenr = {} & \beta_0 + \beta_1 \ln(enr) + \beta_2 NW_{enr} + \delta_1 4yr + \delta_2 pub + \delta_3 town + \delta_4 city + \beta_3 sf \\ & + \beta_4 \ln(tuition) + \beta_5 minw + \beta_6 FM_{HSearn} + \beta_7 FM_{SCearn} + \beta_8 FM_{BAearn} \\ & + \beta_9 FM_{Gearn} + \beta_{10} manu + \beta_{11} MF_{UE} + \beta_{12} pov + \beta_{13} div + \beta_{14} marr \\ & + \beta_{15} MF_{le} + \beta_{16} yr + \beta_{17} fe + e, r \end{aligned}$$

where β_1 is the natural log of the institution's enrollment, β_2 is the share of nonwhite institution enrollment, δ_1 is the four-year institution dummy, δ_2 is the public institution dummy, δ_3 is the town dummy (for where the institution is located), δ_4 is the city dummy (for where the institution is located, with rural omitted), β_3 is the institution's student to faculty ratio, β_4 is the institution's tuition and fees, β_5 is state minimum wage, β_6 is the female to male earnings given a high school diploma, β_7 is the female to male earnings given some college degree (associates

degree included), β_8 is the female to male earnings given a bachelor's degree, β_9 is the female to male earnings given a graduate degree, β_{10} is manufacturing as a share of total employment, β_{11} is the male to female unemployment rate, β_{12} is the poverty rate, β_{13} is the divorce rate, β_{14} is the marriage rate, β_{15} is the male to female life expectancy at birth, β_{16} is the year trend, and β_{17} represents state fixed effects to account for state-specific characteristics. A table describing the variable measurements and data sources can be found in the appendix (Table A.4).

To explore how the variables interact, I break the variables up by institutional, labor market, and demographic/sociological:

Block 1: Institutional ($\beta_1 - \beta_4$) and ($\delta_1 - \delta_4$)

Block 2: Labor Market ($\beta_5 - \beta_{12}$)

Block 3: Demographic/sociological ($\beta_{13} - \beta_{15}$)

I first run block 1, then run blocks 1 and 2, then run all three to form the complete regression. All regressions include state fixed effects and robust standard errors. This stepwise strategy serves as a robustness check to see if the coefficients change.

I predict that that the coefficient of enrollment and student to faculty ratio will be negative since males are more likely to perform better in smaller schools. Similarly, I predict that nonwhite enrollment will have a negative sign based on the fact that larger schools tend to be more diverse. The coefficient on four-year institution will be positive since two-year schools tend to attract more females. Additionally, two-year schools are likely community colleges and women are more likely than men to choose a school close to home (Sax, 2008). I also predict that tuition will have a negative coefficient since men are more risk adverse when taking out loans to pay for college. I predict that minimum wage will take on a negative coefficient because males may choose to work for a higher wage instead of investing in a college education. If female

earnings relative to male earnings rise given a bachelor's degree and a graduate degree, I predict these variables will take on a positive effect on undergraduate enrollment since the opportunity costs are high. If female earnings relative to male earnings for a high school diploma or some college increase, then males would be incentivized to enroll in a bachelor's or a graduate program. Since manufacturing is a predominately male sector, I predict that an increase in manufacturing will have a negative effect on the dependent variable. For poverty, I predict that it will yield a positive coefficient since many view education as insurance against poverty. I predict that divorce will have a negative effect on enrollment since men are not as economically resilient after a divorce, and that at an age of divorce, it is likely that many would not go back to school. Finally, if male life expectancy rises relative to female life expectancy, I predict that this variable will have a positive effect on male college enrollment.

Data

This data for this analysis comes from many different sources. The National Center for Education Statistics (NCES), provides extensive data on both undergraduate and graduate programs across the country. Since schools report their numbers voluntarily, not all schools are followed throughout the years or some variables are not available for all years. From the NCES data tool, Integrated Postsecondary Education Data System (IPEDS), I extract following variables for the years 1984 to 2016: enrollment, nonwhite enrollment, four-year institution dummy, public dummy, town dummy, city dummy, student to faculty ratio, and tuition. All of the data are panel data and record values by state so that region can be controlled for.

The Current Population Survey (CPS) provides historical data on unemployment rates by gender, manufacturing as a percentage of employment, and percentage of people in poverty. The Department of Labor provides historical state-level minimum wage data. The Centers for

Disease Control and Prevention (CDC), provides data on marriage and divorce rates by state per 1,000 people for the years 1990 to 2015. The Institute for Health Metrics and Evaluation provides data on male and female life expectancy by state from 1985 to 2015. Finally, the American Community Survey (ACS) provides median earnings by gender for those ages 25 and over, classified by educational attainment– high school or equivalent, some college or associates degree, a bachelor's degree, and a graduate degree. In contrast with most previous studies, I consider economic opportunity costs as seen by the labor market data as well as the incorporation of sociological/demographic variables. Including these variables at a state level in the regression, may suggest other occurring trends that may affect college enrollments.

V. Results

Table 1 shows the summary statistics of all the independent variables.

Table 1: Summary Statistics of Key Variables

VARIABLE	N	Mean	Std. Dev	Min	Max
Enrollment (ln)	155,501	6.680	1.860	0	12.181
Nonwhite enrollment	117,412	.382	.277	0	1
Four-year inst dummy	131,675	.571	.495	0	1
Public dummy	170,761	.349	.477	0	1
Town dummy	123,765	.419	.493	0	1
City dummy	123,765	.480	.500	0	1
Student/faculty ratio	49,338	16.268	8.224	1	323
Tuition (ln)	62,732	9.315	.703	4.382	11.222
Minimum Wage	160,378	7.246	1.144	2.205	10.170
w/m hs earnings	86,640	.664	.052	.382	1.133
w/m some college earnings	86,640	.682	.047	.469	1.179
w/m bachelors earnings	86,640	.686	.042	.512	.960
w/m graduate earnings	86,640	.680	.039	.569	.945
Manufacturing %	96,262	.078	.030	.001	.174
m/w UE ratio	101,333	1.091	.157	.756	1.889
Poverty rate	160,904	.134	.032	.029	.272
Divorce	117,901	3.806	1.042	1.1	11.4
Marriage	136,734	7.626	3.684	4	99
m/w life expectancy at birth	160,904	.926	.041	.755	4.042
Year	238,260	2000	9.522	1984	2016

Source: See table A.4 in appendix

Table 2 presents the results from the linear regression model exploring male share of college enrollment. The first column represents the regression model that uses the institutional variables, the second column includes institutional and labor market variables, and the third

column represents the regression model with institutional, labor market, and demographic variables. By including all three columns in the same figure, it serves as a robustness check. Across all three regressions, the coefficients do not change by a large margin, indicating that they are robust, or not easily changed by the addition of new variables.

Table 2. Determinants of Male Share of Enrollment, 1984 to 2016

	Model 1	Model 2	Model 3
Enrollment (ln)	-0.022***	-0.023***	-0.023***
	(0.001)	(0.001)	(0.001)
Nonwhite enrollment	-0.106***	-0.105***	-0.114***
	(0.006)	(0.006)	(0.006)
Four-year inst dummy	0.087***	0.088***	0.093***
	(0.004)	(0.004)	(0.004)
Public dummy	0.053***	0.053***	0.054***
	(0.003)	(0.003)	(0.004)
Town dummy	0.004	0.005	0.005
	(0.003)	(0.003)	(0.003)
City dummy	-0.006*	-0.006*	-0.005
	(0.003)	(0.003)	(0.003)
Student/Faculty ratio	0.003***	0.003***	0.003***
	(0.000)	(0.000)	(0.000)
Tuition (ln)	-0.013***	-0.013***	-0.015***
	(0.003)	(0.003)	(0.003)
Minimum wage		-0.003	-0.003
		(0.002)	(0.003)
f/m hs earnings		-0.038	-0.039
		(0.055)	(0.059)
f/m some college earnings		-0.015	-0.015
		(0.062)	(0.066)
f/m bachelors earnings		0.067	0.076
		(0.057)	(0.061)
f/m graduate earnings		0.032	0.026
		(0.049)	(0.052)
Manufacturing %		-1.129***	-1.207**
		(0.435)	(0.476)
m/f UE ratio		0.013	0.013
		(0.010)	(0.010)
Poverty rate		-0.087	-0.102
		(0.095)	(0.103)
Year	0.002***	0.001*	0.001
	(0.000)	(0.001)	(0.001)
Divorce rate			0.001
			(0.006)
Marriage rate			-0.001
			(0.003)
m/w life expectancy at birth			0.029
			(0.153)
Constant	-2.820***	-1.447	-1.760
	(0.916)	(1.314)	(2.045)
Observations	27,781	27,684	23,284
R-squared	0.095	0.096	0.102

Notes: ***, **, * denote statistical significance at the 1, 5, and 10 percent levels, respectively. Robust standard errors are in parentheses. All regressions include state fixed effects.
Source: See table A.4 in appendix

Among the institutional variables, the size of the institution, the share of nonwhite students, the institution being located in a city, and the cost of tuition and fees all negatively affect male enrollment. While these variables are statistically significant at the 1 percent level (except for the city dummy at the 10 percent level), their coefficients are not large enough to classify them as economically meaningful. However, based on the nonwhite enrollment coefficient, a one percentage point increase in nonwhite enrollment yields a 10.6 percentage point decrease in male share of enrollment, which is a large difference for a small institution. The results indicate that males are also likely to attend a four-year institution relative to a two-year institution, they are likely to attend a public rather than a private institution, they are likely to attend a school in a town rather than a rural locale, and they are likely to attend a school with a larger student to faculty ratio. While only the four-year institution dummy, the public dummy, and the student to faculty ratio variable are statistically significant at the 1 percent level, they carry little economic significance.

Next, with the addition of the labor market variables, a rise in minimum wage, a relative rise in women's earnings given a high school education, a relative rise in women's earnings relative to some college, and a rise in the poverty rate result in a negative, statistically and economically insignificant effect on male share of enrollment. Surprisingly, lower male bachelor and graduate degree earnings as well as the increase in male unemployment do not heavily influence the model. This could suggest that men are less likely to respond to rising earning incentives through education. The most interesting, statistically and economically significant variable is manufacturing as a percentage of total employment. The results indicate that for every percentage point increase in manufacturing share of state employment, it corresponds with a 113-percentage point decrease in male share of enrollment. This could suggest that men are

particularly attracted to an occupation that generally does not require a bachelor's degree. However, this trend has more profound effects as more manufacturing-related jobs are transitioning to overseas locations and are in demand for college-educated individuals.

Finally, with the inclusion of the three demographic variables– divorce rate, marriage rate, and male to female life expectancy– the coefficients do not fluctuate. While marriage and divorce rates do not have a statistically or economically significant effect on male enrollment, it appears that marriage has a negative effect and divorce has a positive effect. However, these coefficients are incredibly small and close to zero, thus, their true effect is uncertain. Additionally, as male life expectancy increases relative to female life expectancy at birth, it has a non-statistically significant effect on male enrollment. All three regressions show that the model only explains 10 percent of the variation, leaving 90 percent unexplained by these variables.

VI. Conclusion

A lower relative share of male college enrollment has raised many concerns, from being unprepared for the labor market to structural unemployment. Since 1980, the male share of enrollment has declined which may suggest that with increasing gender equality within all aspects of society, somehow male identity is being challenged.

This research shows that institutional variables are statistically significant and impact male college enrollment decisions. For men, they prefer smaller four-year public institutions with a larger percentage of white students and that are inexpensive. Assuming that larger universities also have a more diverse student body, it makes sense that more women relative to men attend since men are more challenged and conflicted by diversity than women (Sax, 2008). It also seems that men are not heavily influenced by changing relative monetary incentives to higher education, as seen by the small earnings coefficients given a high school diploma and some college. I would expect that if men's earnings relative to women's earnings is lower given a high school or some college degree, that men would want to enroll in higher education to increase their human capital and thus future earnings. However, they are largely persuaded by jobs that relate to their male identity, as seen by the large negative effect of manufacturing. If men are accepting low skill jobs in manufacturing and foregoing college all together due to strictly monetary incentives, it would be interesting to assess the impact of a free tuition policy. Literature on college debt states that males drop out of college at lower levels of debt compared to women, where males see education as an impediment rather than a long term investment (Dwyer et al., 2013). Gendered differences in college enrollment decisions should be noted by all institutions as most face the problem of the missing male. However, as an education system it

may be helpful to pay closer attention to males in K-12 by redefining the discipline system and providing additional career support.

Given that 90 percent of the phenomenon is left unexplained by the regression analysis, future studies might consider other gendered variables such as employment sectors, dropout rates, discipline records, and general social opinions. A more comprehensive understanding of the underlying causes surrounding this issue is warranted, specifically involving sociological evidence and variables that reflect gendered behaviors. Due to the evolving and constantly changing nature of this research, it would be informative to focus future studies over a long-time span so that variables that are affected by changing norms can be evaluated. Another explanation for the low R-squared is that the majority of the phenomenon is left empirically inconclusive simply due to human freedom of choice and thus, remains difficult to quantify. Overall, this research could benefit from the combination of both qualitative and quantitative data to find a more accurate explanation of the declining share of male enrollment.

VII. Appendices

Table A.2: Determinants of Male Share of Applicants, 2001 to 2016

Male Share of Applicants	Model 1	Model 2	Model 3
Enrollment (ln)	-0.038***	-0.038***	-0.040***
	(0.002)	(0.002)	(0.002)
Nonwhite enrollment	-0.080***	-0.078***	-0.095***
	(0.009)	(0.009)	(0.009)
Four-year inst dummy	0.151***	0.152***	0.150***
	(0.009)	(0.009)	(0.010)
Public dummy	0.044***	0.044***	0.049***
	(0.004)	(0.004)	(0.005)
Town dummy	0.007	0.007	0.008
	(0.006)	(0.006)	(0.006)
City dummy	-0.018***	-0.018***	-0.017***
	(0.006)	(0.006)	(0.006)
Student/Faculty ratio	0.004***	0.004***	0.004***
	(0.001)	(0.001)	(0.001)
Tuition (ln)	-0.014**	-0.014**	-0.013**
	(0.006)	(0.006)	(0.007)
Minimum wage		0.002	0.004
		(0.003)	(0.004)
f/m hs earnings		-0.043	-0.051
		(0.082)	(0.086)
f/m some college earnings		0.022	0.026
		(0.086)	(0.092)
f/m bachelors earnings		0.053	0.029
		(0.082)	(0.088)
f/m graduate earnings		0.032	0.015
		(0.072)	(0.075)
Manufacturing %		-0.821	-0.932
		(0.628)	(0.706)
m/f UE ratio		0.019	0.015
		(0.014)	(0.015)
Poverty rate		-0.068	-0.113
		(0.132)	(0.140)
Year	0.001*	0.001	0.002
	(0.001)	(0.001)	(0.001)
	(0.024)		
Divorce rate			0.010
			(0.010)
Marriage rate			0.000
			(0.004)
m/w life expectancy at birth			-0.211
			(0.232)
Constant	-1.843	-0.894	-3.115
	(1.338)	(1.875)	(2.966)
Observations	14,674	14,614	12,398
R-squared	0.137	0.137	0.147

Notes: ***, **, * denote statistical significance at the 1, 5, and 10 percent levels, respectively. Standard errors are in parentheses. All regressions include state fixed effects.
Source: See table A.4 in appendix

Table A.3: Determinants of Male Share of Admissions, 2001 to 2016

Male Share of Admissions	Model 1	Model 2	Model 3
Enrollment (ln)	-0.042***	-0.042***	-0.043***
	(0.002)	(0.002)	(0.002)
Nonwhite enrollment	-0.071***	-0.069***	-0.086***
	(0.009)	(0.009)	(0.009)
Four-year inst dummy	0.147***	0.148***	0.146***
	(0.009)	(0.009)	(0.010)
Public dummy	0.042***	0.042***	0.049***
	(0.004)	(0.004)	(0.005)
Town dummy	0.008	0.008	0.010
	(0.006)	(0.006)	(0.006)
City dummy	-0.015**	-0.015**	-0.013**
	(0.006)	(0.006)	(0.007)
Student/faculty ratio	0.004***	0.004***	0.004***
	(0.001)	(0.001)	(0.001)
Tuition (ln)	-0.017***	-0.017***	-0.016**
	(0.006)	(0.006)	(0.006)
Minimum Wage		0.002	0.004
		(0.004)	(0.004)
f/m hs earnings		-0.032	-0.023
		(0.083)	(0.087)
f/m some college earnings		-0.017	-0.006
		(0.087)	(0.093)
f/m bachelors earnings		0.057	0.032
		(0.083)	(0.089)
f/m graduate earnings		0.050	0.040
		(0.074)	(0.078)
Manufacturing %		-0.920	-1.027
		(0.630)	(0.711)
m/f UE ratio		0.018	0.015
		(0.014)	(0.015)
Poverty rate		-0.070	-0.122
		(0.133)	(0.141)
Year	0.003***	0.002**	0.004**
	(0.001)	(0.001)	(0.001)
divorce			0.012
			(0.010)
marriage			0.002
			(0.004)
m/w life expectancy at birth			-0.363
			(0.236)
Constant	-4.413***	-3.326*	-6.424**
	(1.332)	(1.879)	(2.965)
Observations	14,559	14,499	12,298
R-squared	0.143	0.144	0.153

Notes: ***, **, * denote statistical significance at the 1, 5, and 10 percent levels, respectively. Standard errors are in parentheses. All regressions include state fixed effects (available on request).
Source: see table A.4 in appendix

Table A.4 Variables

Variable name	Name	Measurement	Type	Source
enrollmshare	Share of male enrollment	Share of male enrollment	Percentage	NCES-IPEDS
enroll	Total institution enrollment	Number of students enrolled	Percentage	NCES-IPEDS
Enroll_nonwhite	Nonwhite percentage	Nonwhite students over total enrollment	Percentage	NCES-IPEDS
Four-year	Four year inst dummy	Four year institution	1=four-year, 0= two-year	NCES-IPEDS
Control	Public dummy	Public or private	1=public 0=private	NCES-IPEDS
Town	Town dummy	Institution locale by population (town and suburb)	1=town 0=not town	NCES-IPEDS
Rural (omitted)	Rural dummy (omitted)	Institution locale by population (rural)	Omitted	NCES-IPEDS
City	City dummy	Institution locale by population (city and urban)	1=city 0=not city	NCES-IPEDS
Rural	Rural dummy (omitted)	Institution locale by population (rural)	1=rural 0=not rural	NCES-IPEDS
Sf	Student/faculty ratio	Number of students to one faculty	Percentage	NCES-IPEDS
Ln(ofs)	Natural log of out of state tuition	Out of state tuition and fees	Number	NCES-IPEDS
Minwage	Minimum wage	State or federal minimum wage	Number	Department of Labor
w/m hs earnings	Women/male earnings given HS	Female to male earnings given a HS diploma or equivalent by state, age 25+	Number	ACS
f/m some college earnings	Female/male earnings given some college	Female to make earnings given some college or an associate's degree by state, age 25+	Number	ACS
f/m bachelors earnings	Female/male earnings given a bachelor's degree	Female to male earnings given a bachelor's degree by state, age 25+	Number	ACS
f/m graduate earnings	Female/male earnings given a graduate degree	Female/male earnings given a graduate degree by state, age 25+	Number	ACS
manu	manufacturing	Manufacturing as a percentage of a state’s total employment	Percentage	BLS
UEratio	Male/female unemployment rate ratio	Male unemployment rate divided by female unemployment rate	Number (number/number)	CPS
poverty	Poverty rate	Percent of poor by state	Percentage	CPS
divorce	Divorce rate	Rate per 1,000 people by state	Number	CDC
marriage	Marriage rate	Rate per 1,000 people by state	Number	CDC
m/f life expectancy at birth	Male/female life expectancy at birth	Male/female life expectancy at birth by state	Percentage	Institute for Health Metrics and Evaluation

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