Field of Study and Future Fertility

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Abstract

While field of study is a stronger predictor of fertility than education level—by age 45, 86% of women with education or health degrees have had a child compared to only 73% of women with science degrees—we know little about the causal relationship between field of study and childbearing. Using Swedish administrative data linking college applications, birth records, and labor market outcomes, we estimate causal effects of field of study on fertility by exploiting quasi-random variation at admission thresholds for oversubscribed programs, comparing individuals with similar stated preferences who scored just above or below the cutoff. We find substantial heterogeneous effects on both fertility timing and completed fertility across fields and genders—with much larger impacts on entry into parenthood than completed fertility. Our unique data allow us to observe completed fertility for many cohorts and link enrollment to occupations, revealing how effects operate through income trajectories, work hours, job flexibility, and skill requirements. These findings demonstrate that field of study shapes outcomes well beyond labor market returns, with important implications for family formation, gender inequality, and the broader determinants of declining fertility.

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1 Introduction

Fertility rates have been declining globally in recent decades, with total fertility rates (TFR) now below replacement in most developed countries. This decline has profound implications, such as slowing population growth, economic challenges from shrinking labor forces, and mounting pressure on social security systems as populations age (Harper, 2014; Doepke et al., 2023; Bloom et al., 2023). While the causes and consequences of declining fertility rates have been extensively studied, we know relatively little about the role of education – particularly field of study. This is surprising given that education fundamentally shapes many key drivers of fertility decisions: including wages, opportunity costs, career disruptions, work schedules, and life aspirations (Kearney et al., 2022; Kearney and Levine, 2022). In this paper, we study the causal impacts of education on fertility rates, specifically focusing on field of study.

While the field of study is an important determinant of labor market opportunities and gender gaps (Altonji et al., 2012a, 2016; Patnaik et al., 2021; Humphries et al., 2024), much less is known about the impacts on fertility. Field of education has been found to be a stronger predictor of childlessness and first-birth rates than the level of education (Lappegård and Rønsen, 2005; Hoem et al., 2006). Using linked Swedish administrative labor market, education, and medical birth records, we also find that field-specific gaps exceed the gap between college and high school graduates. For example, 86% of women with education and health degrees have had a child by age 45, while 17 percentage points fewer women with humanities degrees and 13 percentage points fewer women with science degrees have had a child by age 45. In comparison, the difference is only 6 percentage points between the average high school graduate and the average college graduate. These field-specific gaps, however, can reflect a range of factors that affect both fertility and education choice. For example, those who become elementary and pre-school teachers may both choose their education, occupation, *and* be more likely to have children based on their passion for teaching and spending time with children. This makes it challenging to identify and estimate causal effects.

We use college application data to compare individuals with similar rankings of college programs combined with randomness around admission cut-offs for oversubscribed college programs. We corroborate that whether individuals are just above or just below these admission cut-offs is essentially random, since individuals can neither manipulate their admission score nor fully anticipate where the exact threshold is as it depends on the supply and demand for each program in a given application round. We are further holding stated preferences, given anticipated constraints at the time of application, fixed by comparing individuals that state the same preference for preferred and next-best program. This empirical strategy was first proposed by Kirkebøen et al. (2016) and has been utilized to estimate the causal effect of field of study in high school (Dahl et al., 2023) and college (Altmejd, 2018; Heinesen et al., 2022; Humphries et al., 2025) on labor

market outcomes and assortative mating in the marriage market (Kirkebøen et al., 2025).[1] It is important to study fertility separately from marriage and assortative mating due to the decoupling of marriage and childbearing (Smock and Greenland, 2010; Hayford et al., 2014; Guzzo and Hayford, 2020). We push this literature in a new direction by estimating causal effects of field of college education on fertility.

Is there a causal effect of field of study on future fertility? Our preliminary estimates reveal heterogeneous effects of preferred field enrollment on both the timing and completion of childbearing. Enrolling in a preferred field accelerates the transition to parenthood for both men and women across approximately half of all fields. For women, the acceleration into motherhood is strongest for Medicine and short Education programs, where women are 14 and 16 percentage points more likely to have had a child 10 years after college application, respectively. Conversely, enrollment in Engineering or short STEM programs delays motherhood, with women 6 and 14 percentage points less likely to have had their first child seven years after application.

However, these timing effects largely fade by 25 years after application—when individuals are on average over 45 years old—consistent with field of study shifting the timing of childbearing rather than fundamentally altering completed fertility. The main exception is Medicine, where women have 0.22 more children 25 years after application, suggesting that for this field, the timing acceleration translates into a lasting fertility gain.

The completed fertility effects for men broadly mirror those for women, with enrollment in Medicine, Health, and short Education programs accelerating the transition to fatherhood. As with women, most of these timing effects do not persist to completed fertility. The exception again is Medicine, where men are 11 percentage points more likely to be fathers 25 years after application, though this estimate is only marginally significant. Taken together, these results suggest that field of study primarily reshapes the life-cycle timing of family formation, with completed fertility remaining largely unaffected except in the most selective and demanding professional programs.

Prior research on the causal effect of education on fertility has primarily focused on education *level* rather than *field*. Most studies focus on women at low levels of education and rely on increases in the duration of compulsory schooling for identification: compulsory schooling law reforms (Black et al., 2008; Monstad et al., 2008; Silles, 2011; Cygan-Rehm and Maeder, 2013; Fort et al., 2016; Chen and Guo, 2022), age at school entry policies (McCrary and Royer, 2011), and the raising of school leaving age (ROSLA) in the UK (Geruso and Royer, 2018; Cummins, 2022). Most of these papers find that increasing womens' education reduces teenage pregnancy rates.[2] The effect on total fertility is either found to be negative or insignificant

[1] Similarly, Artmann et al. (2021) use admission lotteries for four oversubscribed programs in the Netherlands, and find that field of study matters for partner choice. The working paper version (Artmann et al., 2018) also includes fertility, where they only find a significantly positive effect for male doctors.

[2] Fort et al. (2016) is an exception, not finding evidence of a negative relationship between women's education level and teenage fertility.

(Monstad et al., 2008; Cygan-Rehm and Maeder, 2013; Fort et al., 2016; Cummins, 2022).

Research on the causal effects of education on fertility beyond the post-secondary level remains scarce, but includes a few notable papers. Grönqvist and Hall (2013) study an education reform in Sweden in which vocational tracks in upper secondary school were prolonged from two to three years and the curricula became more academic. They find that women who enrolled in the new programs were significantly less likely to give birth early in life, though they do not find statistically significant effects on men's fertility rates. Humlum et al. (2017) use discontinuities in college admission in Denmark to show that the timing of college enrollment affects early family formation, finding that being above the admission threshold for the preferred program accelerates college enrollment, graduation, labor market entry, and family formation eight years after application—when individuals are on average in their late 20s. Virtanen et al. (2024) use discontinuities in admission to secondary and tertiary education in Finland, finding that increasing educational attainment raises the probability that women have children by their late 30s, with no significant effects for men. Finally, Currie and Moretti (2003) find that college access increases graduation rates and reduces the likelihood of having a child and overall parity for individuals in their early 30s, speaking to the importance of the extensive margin of college enrollment for fertility. We contribute to the literature by tracing impacts from the extensive margin of college enrollment through individuals' mid-40s—closer to completed fertility than existing work—and, importantly, by showing that not only the level but also the field of education is an important determinant of fertility decisions.

This paper also contributes to the emerging literature on the broader economic impacts of college selectivity and elite programs. Ge et al. (2022) match U.S. college applicants based on their application, acceptance, and rejection patterns – comparing those who chose more versus less selective institutions. They find that attending more selective colleges increases advanced degree attainment and earnings while reducing the probability of marriage for women, but shows no significant effects on fertility when measured 19 years after application, at which point participants are in their mid-30s and approximately 70% have children. Building on the school choice literature (Abdulkadiroğlu et al., 2020), Campos et al. (2026) estimate how field of study affects labor market and fertility outcomes in Chile, observing individuals up to thirteen years after high school graduation—when they are in their early 30s. They find substantial heterogeneity across fields, with the smallest reductions in fertility among graduates in Education and Health and the largest among those in Law and Humanities. Other contemporaneous work follows a similar approach to ours and leverages randomness around college admission thresholds to identify causal effects. Razavi (2024) focuses on the role of colleges in social mobility in Denmark. He finds that crossing admission thresholds has no significant impact on partnership formation, but increases fertility by 0.08 children 12 years after application. This effect emerges during the early 30s, coinciding with the modal age of women at first childbirth

in Denmark. Barrios Fernández et al. (2024) similarly focus on the role of elite college education in the intergenerational transmission of human and social capital in Chile, but do not find significant effects on fertility. Kaufmann et al. (2021) also find no effect on marriage or fertility rates for individuals in their early 40s in Chile, though women admitted to elite programs partnered with higher educational achievement spouses. Kirkebøen et al. (2025) also find strong evidence of positive assortative mating among Elite college students, and present evidence of temporary fertility delays during women's early careers. These effects diminish 13 years after college application (around age 33-34), raising questions about longer-term impacts on completed fertility. We advance this literature by examining how marginal admission to more selective programs affects both fertility timing *and* completed fertility rates. Understanding this temporal evolution is crucial, as shifts in fertility timing can have significant career and economic consequences (Miller, 2011; Bailey et al., 2012; Gallen et al., 2025). These insights are also important for the literature analyzing the complex interrelationships between career and family decisions.[3]

What could be driving the effects of field of study on fertility? The key to answering this question is understanding what changes at college admission thresholds. Several papers document a strong association between college field and occupation (Black et al., 2003; Altonji et al., 2012b, 2016; Kinsler and Pavan, 2015; Altonji et al., 2016; Ransom and Phipps, 2017; Arcidiacono et al., 2020; Sloane et al., 2021), and Campos et al. (2026) find suggestive evidence that this relates to heterogeneity in the fertility effects of college majors through its impact on work-family balance (Goldin, 2021)—a central consideration in recent theories of fertility (Doepke et al., 2023; Dahl and Løken, 2024; Olivetti et al., 2024). To better understand the mechanisms driving these fertility effects, we explore several channels through which field of study may shape fertility decisions. We analyze how measures of occupational hours, skill demands, and flexibility (Goldin, 2014a) change at college admission thresholds, drawing on O*NET-derived occupation characteristics including schedule predictability, teleworkability, and time pressure to capture the extent to which different fields lead to so-called "greedy jobs" (Goldin, 2021). Beyond individual career characteristics, we examine partner-level mechanisms—including partner income, assortative mating within fields, and partner leave-taking norms—that may mediate fertility effects through household-level incentives and bargaining. We further explore firm-level channels such as workplace parental leave culture and peer fertility norms, as well as career risk and dynamics, including earnings variance and the steepness of age-earnings profiles, which affect the opportunity cost of career interruptions (Miller, 2011; Bailey et al., 2012; Gallen et al., 2025). Together, these analyses build on foundational work in family economics to illuminate how education choices shape both career trajectories and family formation decisions in contemporary labor markets.[4] This

[3] See e.g. Adda et al. (2017) and Eckstein et al. (2019).

[4] For more on the literature on family formation see e.g. Becker 1960; Mincer 1963; Becker 1965; Becker and Lewis 1973; Willis 1973; Heckman and Walker 1990; Francesconi 2002; Sheran 2007; Keane and Wolpin 2010; Goldin 2014b; Adda et al.

is important for understanding the determinants of fertility more broadly, and how fertility rates can be affected by policy.

Our preliminary findings suggest that the field of education specialization may be as consequential as overall educational attainment. However, a large part of the observed gaps in fertility rates by field are due to preferences. Separating the importance of preferences and constraints in driving fertility rates is pivotal for policy design.[5] In future research, we will continue to explore these intricate relationships and identify specific constraints. Key areas of inquiry include the long-term impacts of education-specific family policies, the interactions between emerging work configurations and family formation, and the nuanced ways different professional fields shape reproductive choices. This evolving understanding moves beyond simplistic economic models, revealing fertility as a dynamic process influenced by a complex interplay of economic opportunities, policy environments, technological capabilities, and social expectations.

The remainder of the paper proceeds as follows. Section 2 describes the Swedish institutional setting and data. Section 3 describes our empirical strategy. We then present our empirical results in Section 4. Finally, Section 5 concludes.

2 Institutional Setting and Data

In this section, we describe relevant institutional details (Section 2.1) and the Swedish administrative data (Section 2.2) to put the empirical analysis into context. In Section 2.3, we present summary statistics on the enrollment field gaps in labor market and fertility outcomes.

2.1 Institutional Setting

College admission in Sweden is predominantly conditional on high school grade point average (GPA), but other factors also affect the admission score, including the Swedish Scholastic Aptitude test (SweSAT), high school courses, and labor market experience.[6] For example, only academic STEM track graduates have the qualifications to enroll in *all* 4-year STEM college majors without additional supplementary courses, and only students in the science line are directly qualified for *all* 4-year college majors. College admission is largely centrally administered. A college application includes a rank-ordered list of up to 12 college-programs.[7]

2017; Bronson and Sanin 2024.

[5] Of course, expected constraints enter in the ex-ante decision of which fields individuals apply to. Nonetheless, the causal effect of field should reflect constraints that individuals face ex-post, especially as young adults do not have perfect information about income and amenities of different occupations (Wiswall and Zafar, 2015, 2018, 2021).

[6] Öckert (2010) describes the college admission process for the earlier cohorts, while Altmejd (2018) describes it for the later cohorts. The SweSAT has become a more important factor over time, particularly after 1991, and it was the key factor for admission for more than a third of our sample. All the details can be found in the Higher Education Act 1992:1434 and the Higher Education Ordinance 1993:100.

[7] In this respect, the college application in Sweden is similar to, for example, Norway (Kirkebøen et al., 2016), Denmark (Humlum et al., 2017; Heinesen et al., 2022), Chile (Hastings et al., 2013; Bordon and Fu, 2015). Altmejd et al. (2021) directly

Selectivity varies greatly across college majors and individual programs: the 4-year programs in medicine, law, and humanities are the most selective.[8] Higher education is tuition-free for all students and largely financed by the central government. College students are eligible for universal financial aid of which around one third of the total amount is a grant (or scholarship) and the remaining two thirds are provided as a loan. Student aid is largely independent of parental resources but means-tested on student income and the maximum eligibility period is 240 weeks (the equivalent of 12 semesters or six enrollment years). Student loans are subsidized, and the loan repayment plan was income-contingent for those in our sample.[9]

Sweden has a variety of "family-friendly" policies intended to help families balance children and careers. In the years we study, parents are allotted a total of 16 months of leave for each child of which two months are earmarked to each of the parents. During 13 of these months, parents that were employed at least 240 days before leave receive higher benefits based on past income. Abortion access is relatively unrestricted with free abortion until the 18th week of pregnancy, and later abortions are only allowed if the fetus is deemed unable to survive. Healthcare is universal and free-of-charge for children until age 20. Childcare is highly subsidized and enrollment is 70% for 1-2 year old children and 90% for 3-6 year old children. These institutions are described in more detail in Appendix A. It is important to keep this setting in mind when interpreting the empirical results – fertility choices are made in a setting with relatively low direct monetary costs of children. The effect sizes may well differ in places like the U.S. where direct costs of healthcare and childcare are higher and family support is lower, but the direction of effects and underlying mechanisms for how preferences and the constraints people are facing shape choies and outcomes are likely similar.[10]

2.2 Swedish Administrative Data

We use university application records from Sweden's centralized admission system covering 1977–2023, spanning three administrative systems: UHA (1977–1992), VHS/H97 (1993–2005), and NyA (2005–present, administered by UHR). These data contain the complete set of ranked program choices, admission scores in each admission group, and final admission outcomes for every applicant. Our data construction follows Altmejd (2026), who builds on the framework of Kirkebøen et al. (2016). For each applicant, we identify pairs of consecutively ranked programs in different fields, where the higher-ranked program defines the "preferred" field and the lower-ranked program defines the "next-best" (counterfactual) field. The admission cutoff for each program-admission-group combination is defined as the lowest score among admitted applicants in the

compare college application in Sweden to Croatia, Chile, and the United States.

[8] We provide more descriptives and details in Appendix A.1.

[9] The students in our sample are enrolled in college during the pre-2001-reform study aid regime as detailed in Joensen and Mattana (2020).

[10] This is consistent with the cross-country comparisons in Kleven et al. (2019) that show remarkably similar patterns, but different magnitudes, of the relationship between parenthood and income by time since first childbirth.

final admission round.

From the Higher Education registry and degree registers at Statistics Sweden, we observe enrollment spells and degree completions linked to SUN2000 education codes. We classify programs into 14 field groups that distinguish between long programs ($\geq$ 4 years: Medicine, Engineering, Business, Business, Education, Health, Science, Social Sciences, Humanities) and short programs ($\leq$ 3 years: Education, Health, Business, STEM, non-STEM). This separation is important because labor market returns and career trajectories differ substantially by program length even within the same broad field. Medicine is separated from Health, and Law and Business from Social Sciences, to align with distinct professional tracks. Among short programs, fields with few students are grouped into STEM (science, math, engineering) and non-STEM (humanities, social science) categories. Our treatment variable is enrollment in the preferred field within five years of application; we also report the first stage for enrollment within one year and degree completion in the same field within eight years.[11]

We merge several administrative registers via a unique individual identifier. Labor market data are collected and administered by Statistics Sweden (SCB). The primary source of labor market data is the longitudinal integration database for health insurance and labour market studies (LISA) that contains yearly observations during the period 1990-2023 on earnings, social transfers, employment, sector, and occupation. Our primary income measure is earnings (that most closely proxies labor market productivity). We also analyze occupation outcomes to study how occupational characteristics can influence fertility. We construct measures of the types of jobs women do in terms of skill requirements, typical weekly work hours, and workplace flexibility.[12] These data also include the level and field of highest completed education, information on enrollment in education, age, civil status, family status, and some information on household composition; including the number of children in various age-groups and the identity of the partner for married couples and for unmarried couples cohabiting with common (biological or adopted) children.

We merge education and labor market data with health data collected and administered by the National Board of Health and Welfare ("*Socialstyrelsen*"). This includes the Medical Birth Registry (MFR), containing all births between 1973 and 2023; the Prescribed Drug Register (LMED), which includes all prescriptions from July 2005 through 2023; and the National Patient Register (NPR), which includes all in-patient care (1987-2023) and outpatient doctor visits including day surgery and psychiatric care from both private and public caregivers (2001-2023), but *not* primary care.

[11] Appendix A.1 provides more details on the field classification, application data construction, and descriptives by field.

[12] The first 3-digits of the Swedish occupation code (SSYK96) have an almost one-to-one mapping to the international ISCO88 code that we use to merge with the O*Net data to construct measures of workplace flexibility, based on Goldin (2014a) applied to the Swedish population distributions across occupations. The measure includes seven primary occupation characteristics in O*Net to characterize flexibility. These seven characteristics are the variables from O*Net called Structured Work, Freedom to Make Decisions, Contact with Others, Time Pressure, Establish Interpersonal Relationships with Others, Frequency of Decision Making, and Face to Face Discussions. Note that higher values mean "less flexibility".

Our sample includes all individuals who are born between 1950-1980 and reside in Sweden.

2.3 Descriptives

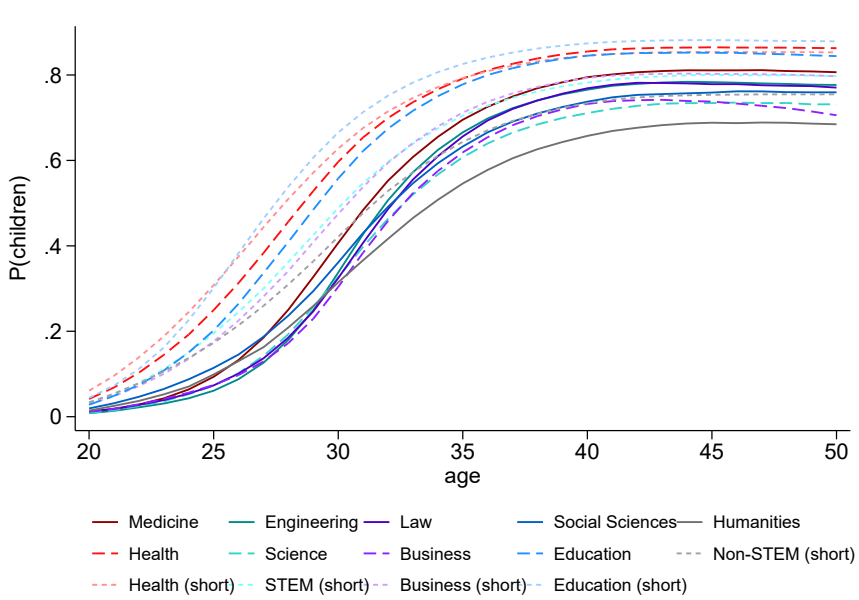
Figure 1 shows how both (a) the probability of having children and (b) the number of children vary by age and field of study. These gaps widen when individuals are in their 20s, and the gaps in childlessness narrow again during the late 30s and early 40s. It is notable how some fields, in particular the three highest-paying fields (Medicine, Business, Engineering, and Law) delay childbearing to a higher extent, but especially those in Medicine catch up to a high extent.[13]

Table 1 shows how earnings and occupational characteristics at ages 40–45 vary by field of initial enrollment. The table reports coefficients on indicators for the field of study using OLS regressions with birth-year fixed effects, with short Education as the reference category. Individuals enrolling in Medicine, Engineering, and Business have the highest earnings. Medicine stands out with the largest income premium but also least occupational flexibility. Enrollees in Humanities have the lowest earnings.

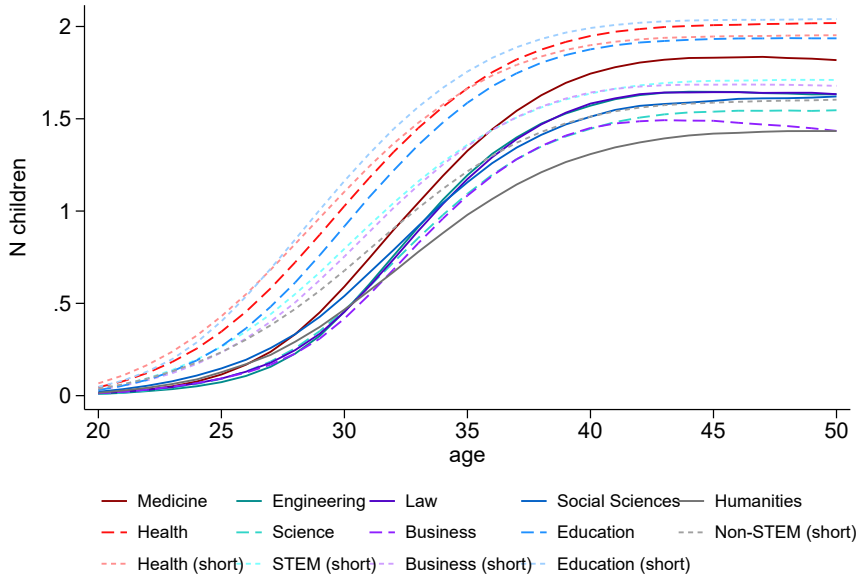
Tables 2 and 3 report similar OLS regressions for fertility outcomes separately for women and men. For women, the fields with the highest earnings (Medicine, Business, Engineering) show substantially delayed childbearing — women in Medicine are much less likely to have a child by age 30 relative to short Education, though many of these gaps narrow by age 45. Women in Health and Education fields have the highest fertility. For men, the patterns are broadly similar but attenuated, with smaller gaps across fields.

[13] Figure A3 shows that these patterns are similar for men.

Figure 1: Fertility by Age and Field of Study (Women).



(a) Any child



(b) Number of children

Note: This Figure describes how fertility rates of women vary by age and field of study. Panel (a) shows the probability of having any child. Panel (b) shows the number of children.

Table 1: Field of Study and Labor Market Outcomes (Ages 40-45)

	Income	Flexibility	Typical Hours	>40 Hours/Week
Medicine	305.123***	0.366+	0.424***	0.205**
	(12.251)	(0.211)	(0.029)	(0.059)
Business	241.605***	0.046*	0.130	−0.013
	(10.684)	(0.018)	(0.097)	(0.089)
Engineering	270.672***	−0.349***	0.508***	0.280**
	(8.838)	(0.028)	(0.089)	(0.086)
Law	236.031***	0.384***	0.000	−0.220**
	(9.486)	(0.034)	(0.074)	(0.060)
Science	118.848***	−0.283***	0.276***	0.097
	(4.625)	(0.026)	(0.072)	(0.068)
Social Sciences	87.980***	0.044*	−0.123*	−0.312***
	(4.742)	(0.016)	(0.051)	(0.039)
Health	85.365***	0.611***	−0.172***	−0.396***
	(5.239)	(0.019)	(0.023)	(0.009)
Education	35.094***	0.102***	0.383***	0.514***
	(2.779)	(0.016)	(0.046)	(0.047)
Humanities	−17.922***	−0.080**	−0.222***	−0.272***
	(2.681)	(0.025)	(0.057)	(0.056)
Short Business	146.256***	−0.048	−0.018	−0.242*
	(8.180)	(0.031)	(0.121)	(0.114)
Short STEM	120.299***	−0.469***	0.138	−0.179*
	(4.993)	(0.028)	(0.082)	(0.072)
Short non-STEM	30.933***	−0.253***	−0.354***	−0.603***
	(2.170)	(0.018)	(0.077)	(0.071)
Short Health	2.679**	0.117***	−0.620***	−0.855***
	(0.912)	(0.011)	(0.016)	(0.011)
Num.Obs.	1 561 618	954 568	954 568	954 568
R2	0.176	0.212	0.122	0.143
Ref. group mean (Short Education)	226.530	0.450	0.450	0.700

+ p <0.1, * p <0.05, ** p <0.01, *** p <0.001
Fixed effects for birthyear included in all models. Reference group: Short Education.

Table 2: Field of Study and Fertility Outcomes (Women, ages 30 and 45)

	Any Child 30	Any Child 45	N Children 30	N Children 45
Medicine	−0.252***	−0.082***	−0.556***	−0.205***
	(0.005)	(0.004)	(0.010)	(0.020)
Business	−0.332***	−0.154***	−0.675***	−0.555***
	(0.006)	(0.009)	(0.011)	(0.023)
Engineering	−0.309***	−0.088***	−0.671***	−0.348***
	(0.007)	(0.004)	(0.008)	(0.016)
Law	−0.329***	−0.106***	−0.685***	−0.393***
	(0.004)	(0.005)	(0.009)	(0.017)
Science	−0.320***	−0.153***	−0.659***	−0.501***
	(0.004)	(0.003)	(0.008)	(0.007)
Social Sciences	−0.295***	−0.138***	−0.599***	−0.476***
	(0.010)	(0.004)	(0.014)	(0.010)
Health	−0.073***	−0.020***	−0.153***	−0.056***
	(0.005)	(0.002)	(0.010)	(0.006)
Education	−0.099***	−0.027***	−0.228***	−0.097***
	(0.003)	(0.003)	(0.005)	(0.007)
Humanities	−0.340***	−0.199***	−0.673***	−0.623***
	(0.006)	(0.004)	(0.010)	(0.010)
Short Business	−0.188***	−0.082***	−0.408***	−0.355***
	(0.005)	(0.003)	(0.013)	(0.011)
Short STEM	−0.164***	−0.080***	−0.342***	−0.320***
	(0.006)	(0.002)	(0.010)	(0.007)
Short non-STEM	−0.230***	−0.133***	−0.457***	−0.452***
	(0.006)	(0.002)	(0.009)	(0.007)
Short Health	−0.049***	−0.032***	−0.079***	−0.105***
	(0.002)	(0.002)	(0.005)	(0.005)
Num.Obs.	935 754	741 002	935 754	741 002
R2	0.065	0.019	0.077	0.027
Ref. group mean (Short Education)	0.670	0.880	1.180	2.040

+ p <0.1, * p <0.05, ** p <0.01, *** p <0.001
Fixed effects for birthyear included in all models. Reference group: Short Education.

Table 3: Field of Study and Fertility Outcomes (Men, ages 30 and 45)

	Any Child 30	Any Child 45	N Children 30	N Children 45
Medicine	−0.106***	−0.014*	−0.200***	0.011
	(0.006)	(0.006)	(0.013)	(0.019)
Business	−0.179***	−0.078***	−0.316***	−0.305***
	(0.008)	(0.007)	(0.016)	(0.021)
Engineering	−0.152***	−0.026***	−0.288***	−0.159***
	(0.005)	(0.004)	(0.012)	(0.014)
Law	−0.169***	−0.033***	−0.309***	−0.143***
	(0.006)	(0.007)	(0.013)	(0.023)
Science	−0.167***	−0.101***	−0.304***	−0.344***
	(0.005)	(0.005)	(0.012)	(0.015)
Social Sciences	−0.144***	−0.087***	−0.257***	−0.319***
	(0.004)	(0.005)	(0.008)	(0.013)
Health	−0.063***	−0.012**	−0.131***	−0.055**
	(0.004)	(0.004)	(0.009)	(0.017)
Education	−0.025***	0.019***	−0.051***	0.012
	(0.005)	(0.005)	(0.009)	(0.014)
Humanities	−0.148***	−0.126***	−0.232***	−0.327***
	(0.005)	(0.006)	(0.012)	(0.024)
Short Business	−0.103***	−0.025***	−0.197***	−0.161***
	(0.005)	(0.004)	(0.011)	(0.015)
Short STEM	−0.046***	−0.028***	−0.086***	−0.176***
	(0.004)	(0.003)	(0.007)	(0.010)
Short non-STEM	−0.073***	−0.063***	−0.127***	−0.220***
	(0.004)	(0.003)	(0.007)	(0.010)
Short Health	−0.031***	−0.037***	−0.057***	−0.132***
	(0.005)	(0.004)	(0.010)	(0.012)
Num.Obs.	774 832	621 635	774 832	621 635
R2	0.040	0.006	0.045	0.009
Ref. group mean (Short Education)	0.430	0.800	0.690	1.870

+ p <0.1, * p <0.05, ** p <0.01, *** p <0.001
Fixed effects for birthyear included in all models. Reference group: Short Education.

3 Empirical Strategy

Our empirical strategy adapts the design from Kirkebøen et al. (2016) to the Swedish setting. In particular, we start with ranked lists from the centralized college application process. Similar to many centralized college application processes, individuals submit a ranked list of specific programs (fields of study) at specific institutions. Following Kirkebøen et al. (2016) and our prior work (Altmejd, 2026; Humphries et al., 2025), we focus on regression discontinuity analyses where we collapse application data to the field of study. Next, we consider the pairs of applications where the applicant's GPA put them near the threshold and where they would not have already been admitted to a program higher on their list. Like Kirkebøen et al. (2016), this setup gives us individuals who are just-below or just-above the threshold for being admitted to a specific major and is the top program where they could be admitted. This approach additionally allows us to look at RD estimates for admission into a particular major, conditional on the next-best major. Figures 2 and 3 display the preferred fields and the share of next-best fields. We consider most admissions scores used in the period 1977-2000, excluding those who have already been admitted to higher ranked programs based on any other admissions criteria.

Using this approach, we consider 2SLS regressions of the following form:

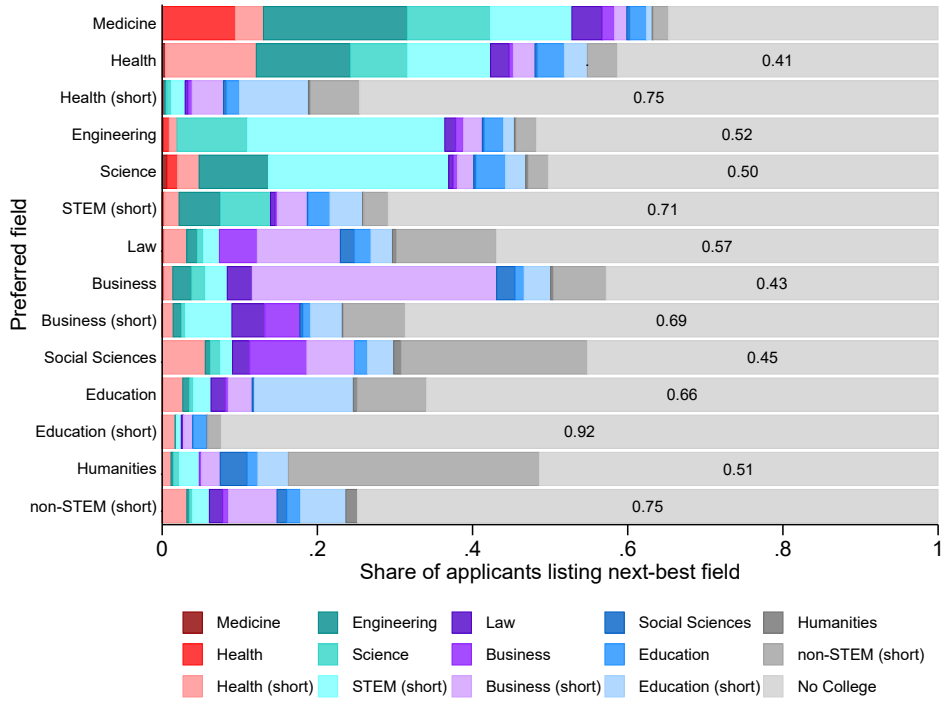
$$Y = \sum_{j \neq k} \beta_{jk} D_j + X'\delta_k + \gamma_{jk} + \epsilon_k$$

$$D = \sum_{j \neq k} \alpha_{jk} Z_j + X'\lambda_k + \eta_{jk} + \nu_{jk}, \ \forall \ j \neq k,$$

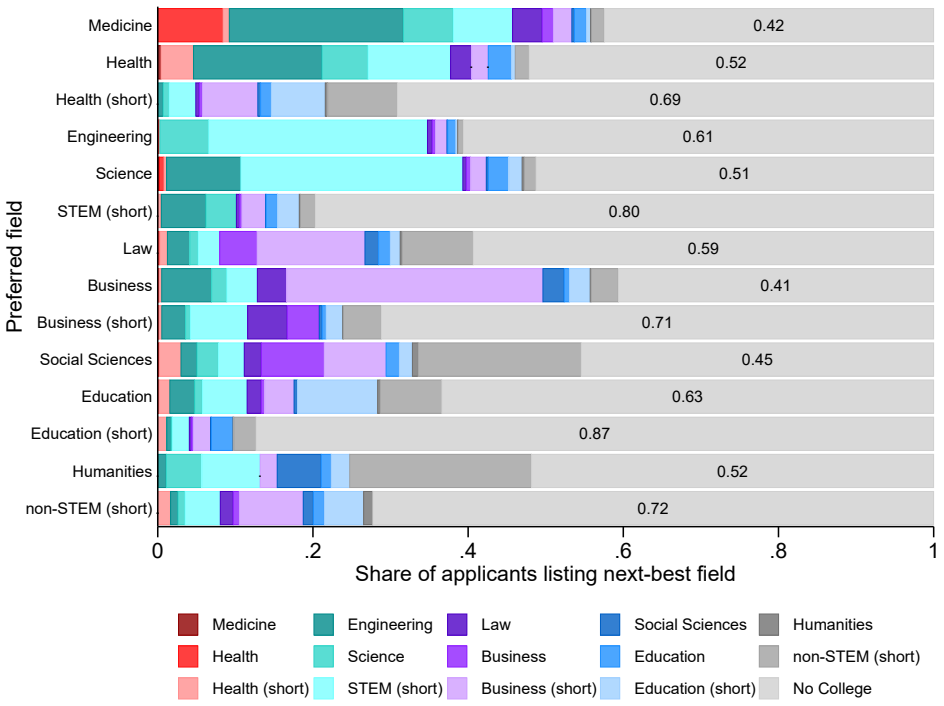
where j is the individuals' preferred field and k is the next-best field. D_j is an indicator for enrolling in field j while Z_j is an indicator for being above the GPA threshold for admissions to that major. γ_{jk} is a fixed effect for top program (j) and next-best program (k) and X is a vector of controls including birth cohort and functions of the running variable.

Note that we group admission thresholds by field of study in our main empirical analysis, but the college applications are at the program level and we observe hundreds of such (major, institution) pairs. To explore mechanisms, we can thus also group the admission cut-offs on other dimensions, incl. institution, selectivity, location, and various characteristics of the program.

Figure 2: Preferred Field and Share of Applicants listing each Next-best Alternative.



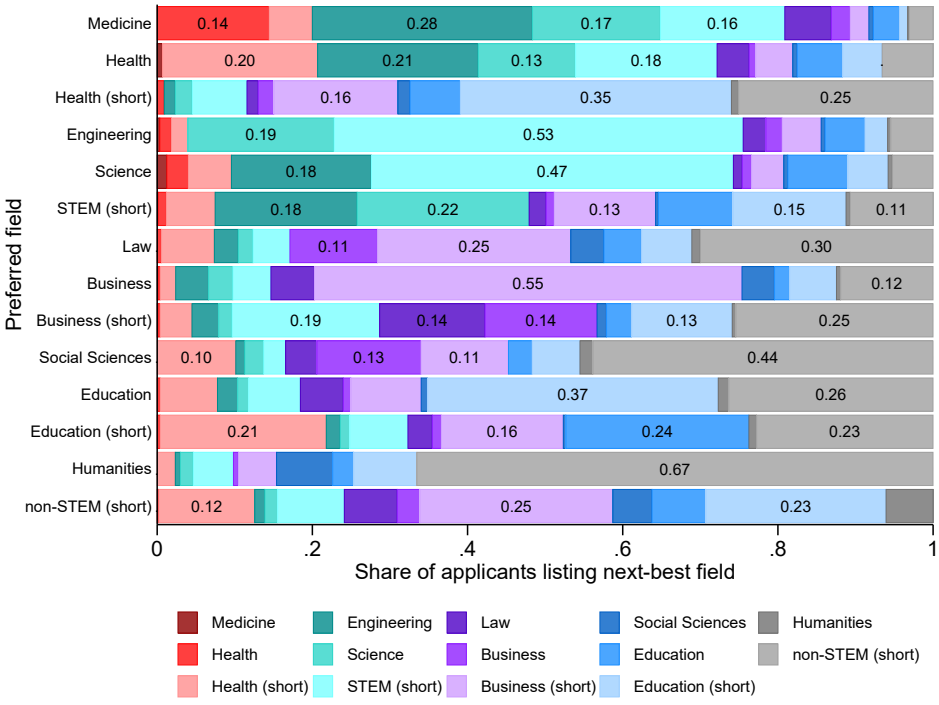
(a) Women



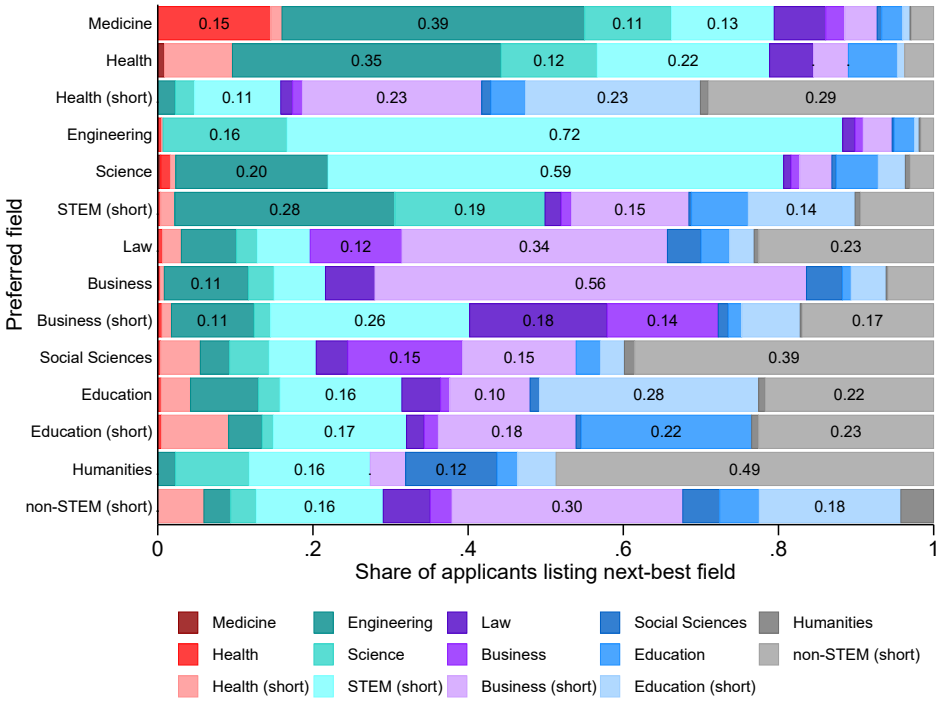
(b) Men

Note: This Figure describes the share of applicants listing each next-best field (horizontal axis) by preferred field (vertical axis). Panel (a) displays the shares for women while Panel (b) displays the shares men. Sample: All college applicants with preferred field j and next-best alternative k pairs, where the preferred field has a higher cut-off than the next-best alternative. Note that applicants listing "No College" as the next-best alternative are also included in this figure, and numbers denote their share on the light gray bar.

Figure 3: Preferred Field and Share of Applicants listing each Next-best Field.



(a) Women



(b) Men

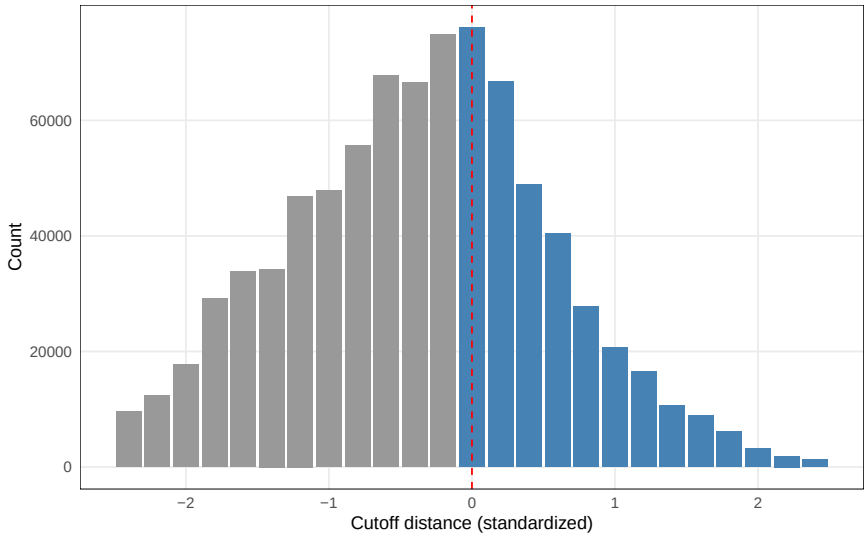
Note: This Figure describes the share of applicants listing each next-best field (horizontal axis) by preferred field (vertical axis). Panel (a) displays the shares for women while Panel (b) displays the shares men. Numbers on bars denote shares that are 0.10 or larger. Sample: All college applicants with preferred field j and next-best field k pairs, where the preferred field has a higher cut-off than the next-best field. Note that this figure only calculates shares for the subset of applicants listing another college field as their next-best alternative.

4 Results

In the college applications data, we see if students score above the admissions thresholds based on high school GPA or the Swedish SAT. These discontinuities result in regression discontinuities similar to those used in Kirkebøen et al. (2016). The first panel of Figure 5 shows that at the admissions threshold for a particular program there is a average jump of over 60 percentage points in being admitted. If instead of admissions we consider enrolling in the same major, we see that there is a seventeen percentage point jump at the admissions cutoff. This evidence shows that those barely missing the cutoff for admission are much less likely to be admitted to a program, and that this causes students to be less likely to enroll in that major. Table 4 shows the increase in admission, enrollment, and graduation in the same field from crossing the admission cutoff threshold for individual fields of study.

We look for evidence that students were able to manipulate the running variable by checking whether the density of the running variable is smooth around the cutoff. Figure 4 shows the distribution of the standardized cutoff distance for all application pairs with no obvious discontinuity at the cutoff.

Figure 4: Density of Running Variable Around Admission Cutoff



Notes: Distribution of standardized cutoff distance. Excludes ceiling cutoffs.

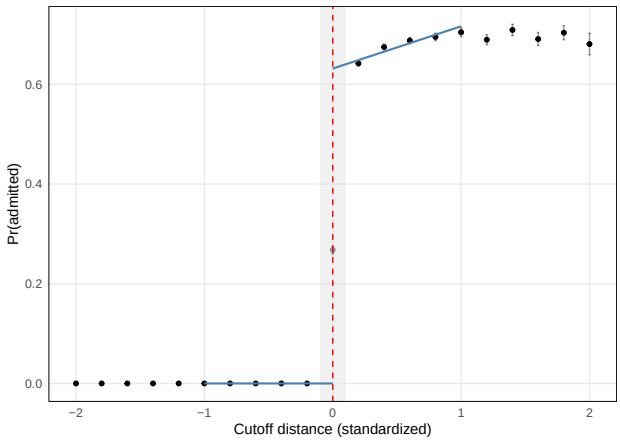
We present another validation of the quasi-random variation at the cutoff by showing how relevant pre-treatment variables vary across the admissions threshold. Figure 6 shows how pre-treatment covariates vary across the college admissions threshold. There is no sign of discontinuities near the cutoff. Note that applications exactly at the cutoff are excluded as that is more likely to happen for certain admissions scores and time periods.

Table 4: RDD: First Stage Estimates

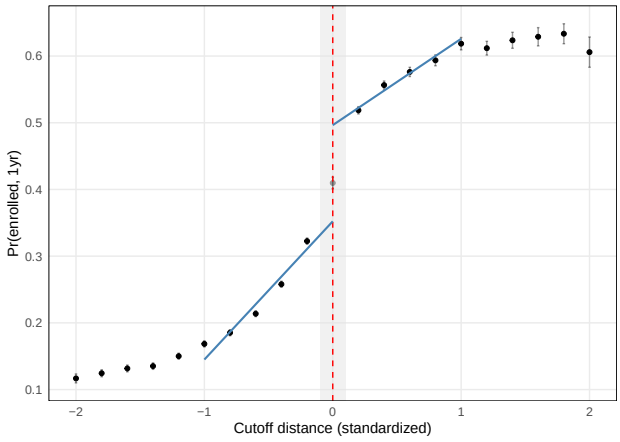
Field	Admitted	Enrolled	Degree (field)
Long programs			
Medicine	0.779***	0.358***	0.325***
	(0.010)	(0.009)	(0.012)
Business	0.657***	0.124***	0.021**
	(0.006)	(0.007)	(0.007)
Engineering	0.693***	0.214***	0.158***
	(0.003)	(0.004)	(0.004)
Law	0.653***	0.242***	0.109***
	(0.005)	(0.007)	(0.007)
Science	0.642***	0.114***	0.036***
	(0.005)	(0.007)	(0.007)
Social Sciences	0.594***	0.160***	-0.006
	(0.008)	(0.010)	(0.009)
Health	0.574***	0.111***	0.000
	(0.010)	(0.012)	(0.012)
Education	0.608***	0.159***	0.058***
	(0.006)	(0.007)	(0.007)
Humanities	0.505***	0.047**	-0.078***
	(0.015)	(0.017)	(0.010)
Short programs			
Short Business	0.617***	0.057***	0.055***
	(0.003)	(0.005)	(0.005)
Short STEM	0.620***	0.032***	0.017***
	(0.003)	(0.005)	(0.005)
Short non-STEM	0.502***	0.003	-0.001
	(0.004)	(0.005)	(0.005)
Short Health	0.549***	0.113***	0.083***
	(0.005)	(0.006)	(0.006)
Short Education	0.598***	0.088***	0.101***
	(0.004)	(0.005)	(0.005)
N		491,066	

Notes: Each column reports reduced-form estimates of the effect of scoring above the admission cutoff on the probability of being admitted, enrolling (within 5 years), and completing a degree (within 8 years) in the preferred field. Each coefficient corresponds to a separate field, estimated jointly in a single regression that includes field-pair and application-year fixed effects. The running variable (standardized cutoff distance) enters with separate slopes for each cutoff-selectivity quintile, above and below the cutoff. Observations within 0.1 SD of the cutoff and at ceiling cutoffs are excluded. Bandwidth = 1.0 SD. Standard errors in parentheses, clustered at the individual level. $^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p < 0.05$.

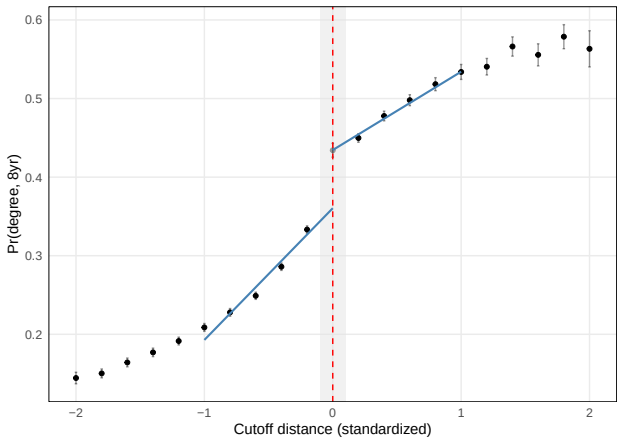
Figure 5: Reduced Form: First Stage Estimates



College Admission



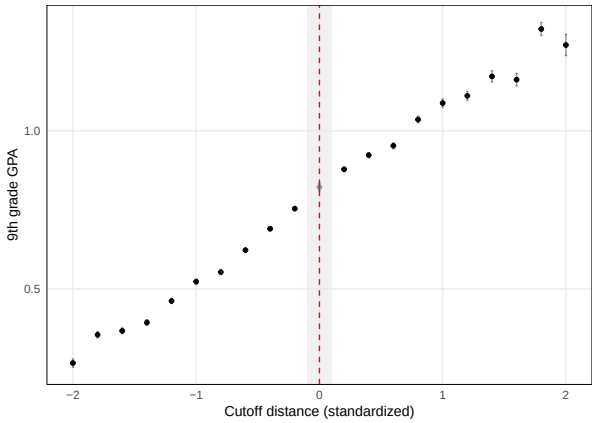
College Enrollment (1 year)



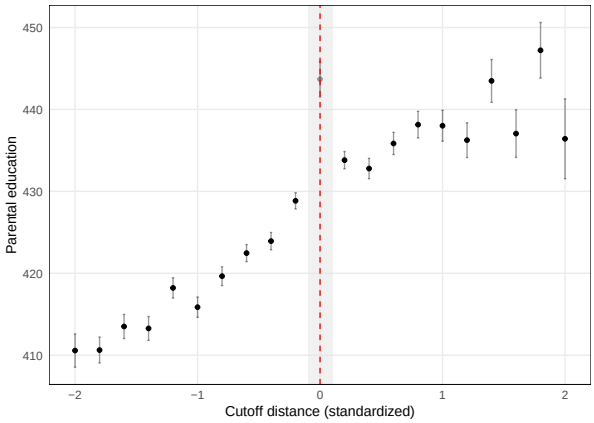
College Graduation

Notes: These RD figures plot the reduced form using the GPA and SweSAT admissions threshold discontinuities on admission, enrollment, and graduation in the same field.

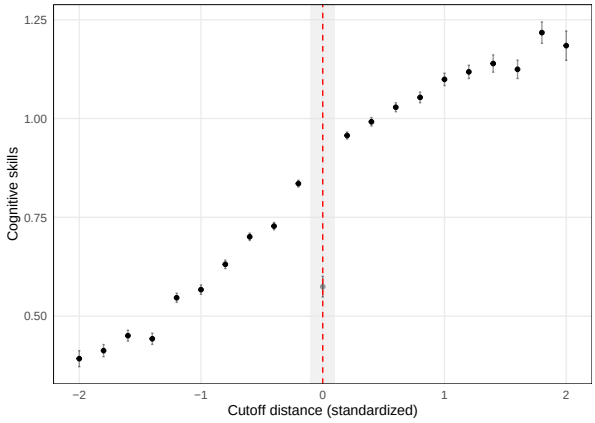
Figure 6: Balance at Admission Cut-offs



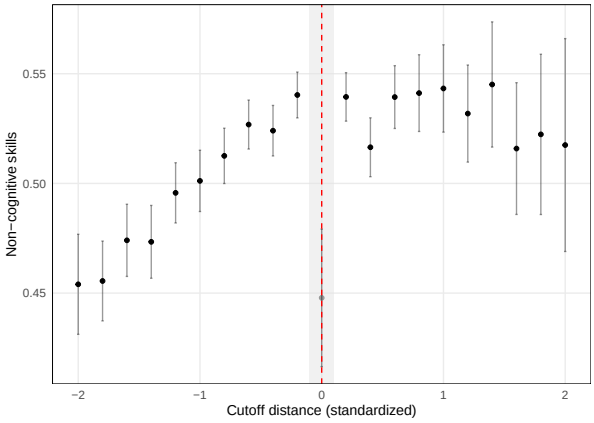
(a) 9th Grade GPA



(b) Parental Education



(c) Cognitive Skills (men)



(d) Non-cognitive Skills (men)

Notes: These figures show how pre-treatment covariates vary near the admissions cutoff. Grey region indicates the donut $[-0.1, 0.1]$ excluded from estimation. Applications exactly at the cutoff are excluded as that is more likely to happen for certain admissions scores and time periods.

4.1 Labor Market Outcomes

Next we estimate the causal effect of enrolling in a college field on labor market outcomes at ages 40–45 for women. Table 5 shows two-stage-least-squares estimates, where enrollment in each field is instrumented by scoring above the admission cutoff. Each coefficient represents the effect of enrolling in that field relative to the applicant's next-best alternative. Short Business, Engineering, Business, and Medicine show the largest positive income effects. Science, Health, and Law also show significant positive returns. Education shows near-zero effects on income, consistent with low earnings variation between education and its typical counterfactual alternatives. Columns two through four show effects on occupational flexibility, typical hours, and the probability of working more than 40 hours per week.

Table 5: Causal Effects of Enrollment Field on **Labor Market** outcomes

Field	Income	Flexibility	Typ. Hours	>40 Hrs/Wk
Long programs				
Medicine	134.884***	0.692***	-0.015	0.026
	(23.197)	(0.101)	(0.056)	(0.063)
Business	141.651***	-0.041	0.073	0.077
	(33.205)	(0.067)	(0.096)	(0.113)
Engineering	145.814***	-0.151**	0.137*	0.119
	(16.391)	(0.048)	(0.061)	(0.071)
Law	68.455***	0.273***	-0.137	-0.170*
	(19.020)	(0.051)	(0.071)	(0.083)
Science	92.059***	-0.244**	0.151	0.096
	(26.890)	(0.089)	(0.105)	(0.123)
Social Sciences	64.400*	0.211*	0.114	0.123
	(30.124)	(0.085)	(0.109)	(0.132)
Health	90.699**	0.121	0.135	0.046
	(32.038)	(0.129)	(0.119)	(0.141)
Education	-0.739	-0.027	0.364***	0.587***
	(19.364)	(0.054)	(0.085)	(0.100)
Humanities	34.510	-0.562**	-0.428	-0.617
	(59.185)	(0.217)	(0.311)	(0.380)
Short programs				
Short Business	180.451***	-0.055	0.321**	0.342**
	(29.965)	(0.072)	(0.108)	(0.126)
Short STEM	131.416***	-0.434***	0.472**	0.518**
	(38.824)	(0.109)	(0.152)	(0.178)
Short non-STEM	53.406	-0.308**	-0.092	-0.125
	(36.714)	(0.103)	(0.147)	(0.173)
Short Health	24.062	0.331***	0.052	-0.003
	(21.074)	(0.071)	(0.099)	(0.116)
Short Education	-19.195	-0.000	0.312**	0.454***
	(21.317)	(0.066)	(0.103)	(0.119)
N		267,269		

Notes: Two-stage least squares estimates of the causal effect of enrolling in a field on labor market outcomes at ages 40–45, for women. Enrollment in the preferred field (within 5 years) is instrumented by an indicator for scoring above the admission cutoff, interacted with field. All regressions include field-pair and application-year fixed effects. The running variable enters with separate slopes for each cutoff-selectivity quintile, above and below the cutoff. Observations within 0.1 SD of the cutoff and at ceiling cutoffs are excluded. Bandwidth = 1.0 SD. Sample restricted to applicants with no prior children and age ≤ 23. Standard errors in parentheses, clustered at the individual level. $^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p < 0.05$.

4.2 Results on Fertility Outcomes

Finally, we show our results of the effect of enrollment field on future fertility. Tables 6 and 7 report 2SLS estimates of the effect of enrollment in each field on the probability of having any child at 5, 10, 15, 20, and 25 years after application, separately for women and men. Figures 7 and 9 show the full dynamic path of these effects for selected fields, while Figures 8 and 10 show the corresponding effects on the number of children.

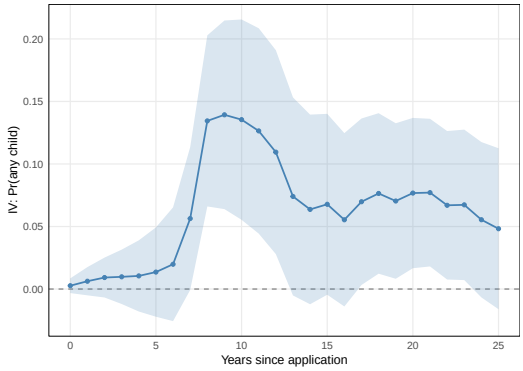
For women, enrolling in Medicine accelerates the transition to motherhood: women are 13.5 percentage points more likely to have had a child 10 years after application, an effect that remains positive but attenuates to about 5 percentage points by $t = 25$. Short Education shows a similar early acceleration (15.7 pp at $t = 10$), which also fades over time. These patterns are consistent with field of study shifting the timing of childbearing rather than fundamentally altering completed fertility. By 25 years after application, when individuals are on average in their mid-40s, most field-specific effects on the probability of having any child are small and statistically insignificant. Business and Health show the largest positive point estimates at $t = 25$ (7–8 pp), though neither is statistically significant.

For men, the patterns are broadly similar but with some notable differences. Health shows the strongest early effect: men enrolling in Health are 31 percentage points more likely to have had a child at $t = 10$. Medicine again shows a persistent positive effect, with men 11 percentage points more likely to be fathers at $t = 25$, the only field with a statistically significant effect on completed fertility for either gender. Short Education and Law also show significant early accelerations for men that fade by $t = 25$.

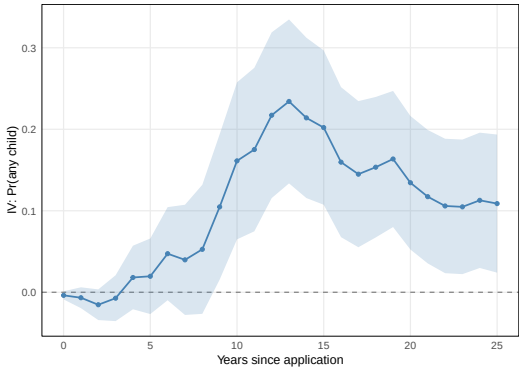
Turning to the number of children (Figures 8 and 10), the dynamic patterns largely mirror the extensive margin results. Medicine shows the clearest positive effect on completed fertility for both women and men. Engineering and Business show near-zero effects throughout, consistent with these fields affecting neither the timing nor the quantity of childbearing relative to applicants' next-best alternatives.

These results suggest that field of study primarily reshapes the life-cycle timing of family formation. The transition to parenthood is accelerated by enrollment in Medicine, Health, and short Education programs, and somewhat delayed by Engineering and short STEM. However, most of these timing effects do not translate into lasting differences in completed fertility. The main exception is Medicine, where the early acceleration appears to result in a modest but persistent fertility gain, particularly for men.

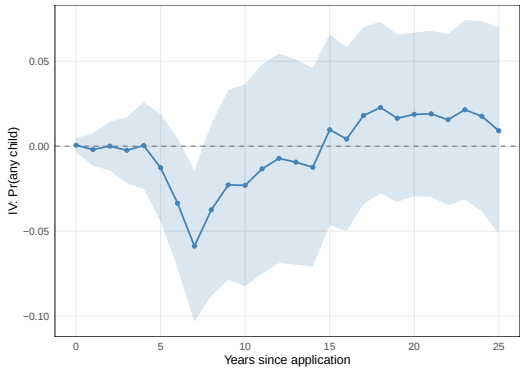
Figure 7: Dynamic Treatment Effects on Pr(Any Child): Medicine, Engineering, Business



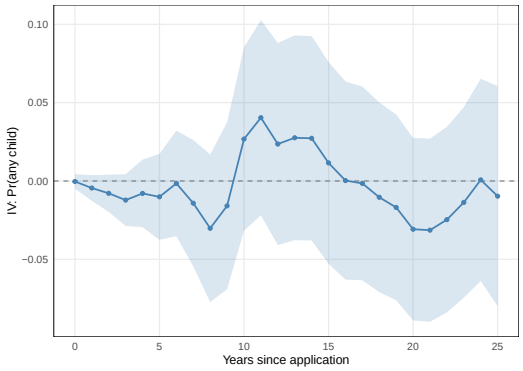
(a) Medicine — Women



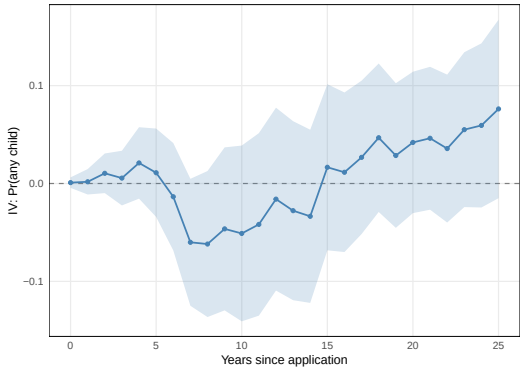
(b) Medicine — Men



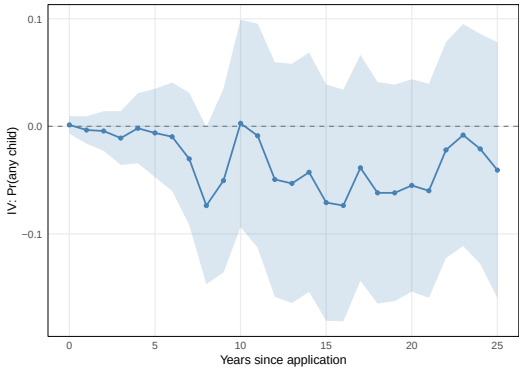
(c) Engineering — Women



(d) Engineering — Men



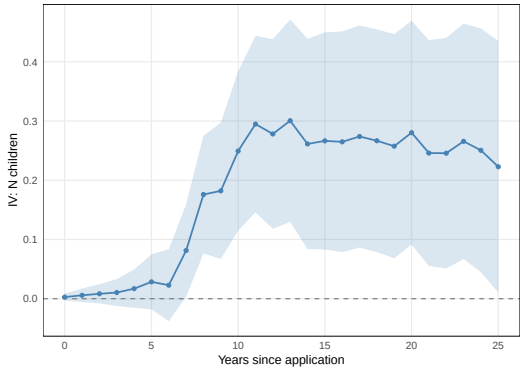
(e) Business — Women



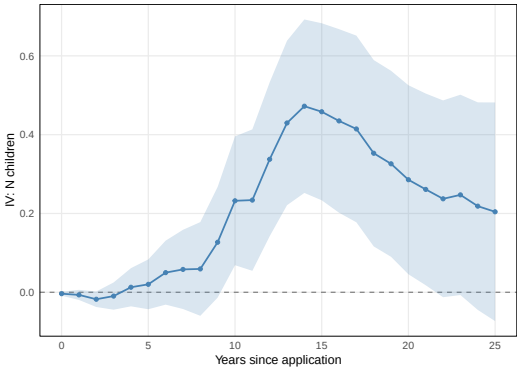
(f) Business — Men

Notes: Each panel shows 2SLS estimates of the effect of enrolling in the field on the probability of having any child, by years since application. Enrollment (within 5 years) is instrumented by scoring above the admission cutoff. Shaded area shows 95% confidence intervals. Regressions include field-pair and application-year fixed effects with cutoff-selectivity-quintile slopes. Donut = 0.1 SD, bandwidth = 1.0 SD. SEs clustered at the individual level.

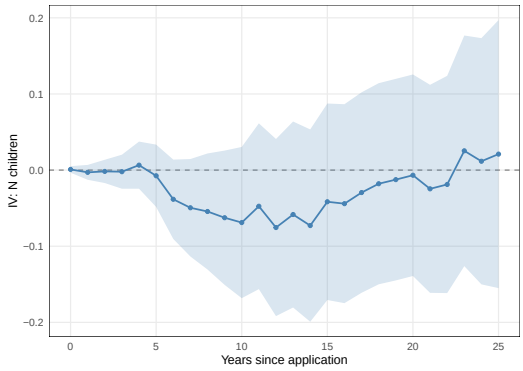
Figure 8: Dynamic Treatment Effects on Number of Children: Medicine, Engineering, Business



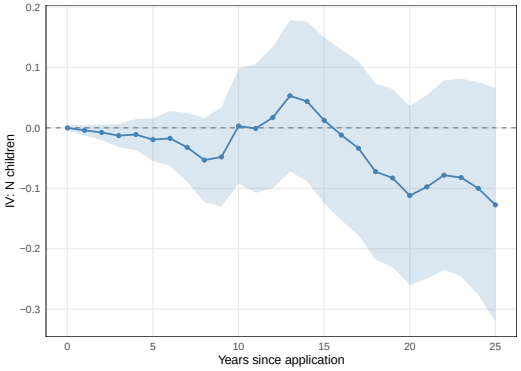
(a) Medicine — Women



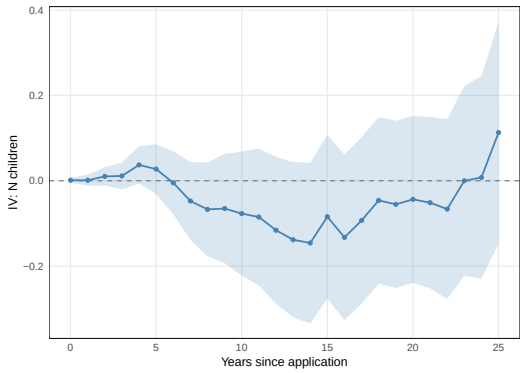
(b) Medicine — Men



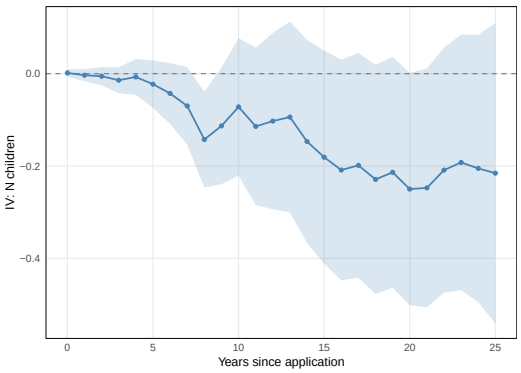
(c) Engineering — Women



(d) Engineering — Men



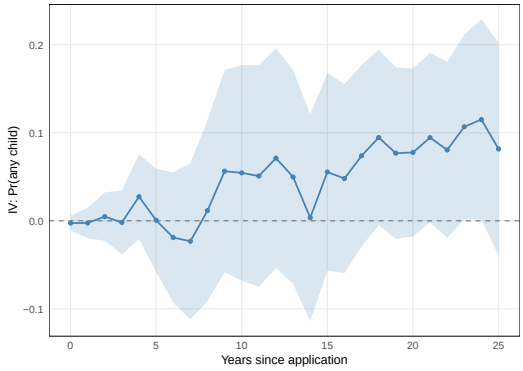
(e) Business — Women



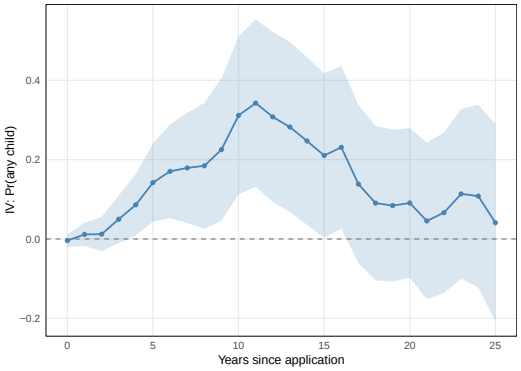
(f) Business — Men

Notes: Each panel shows 2SLS estimates of the effect of enrolling in the field on the number of children, by years since application. Enrollment (within 5 years) is instrumented by scoring above the admission cutoff. Shaded area shows 95% confidence intervals. Regressions include field-pair and application-year fixed effects with cutoff-selectivity-quintile slopes. Donut = 0.1 SD, bandwidth = 1.0 SD. SEs clustered at the individual level.

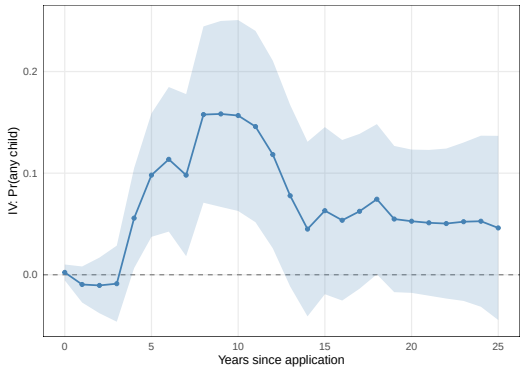
Figure 9: Dynamic Treatment Effects on Pr(Any Child): Health, Short Education, Short STEM



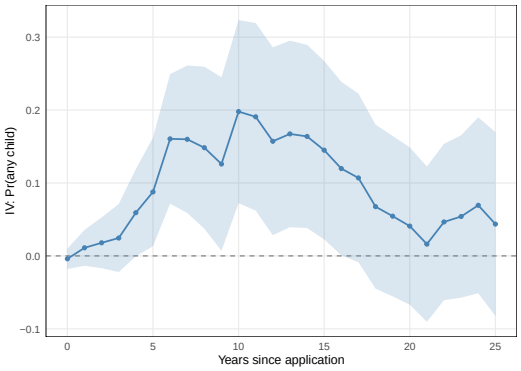
(a) Health — Women



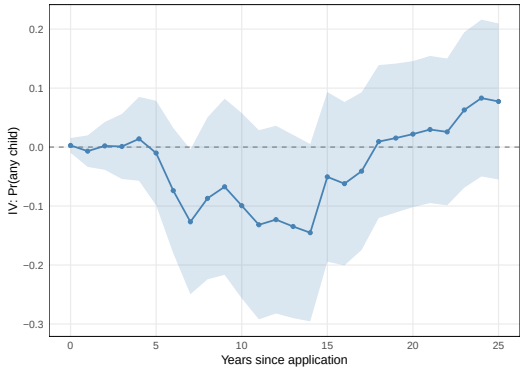
(b) Health — Men



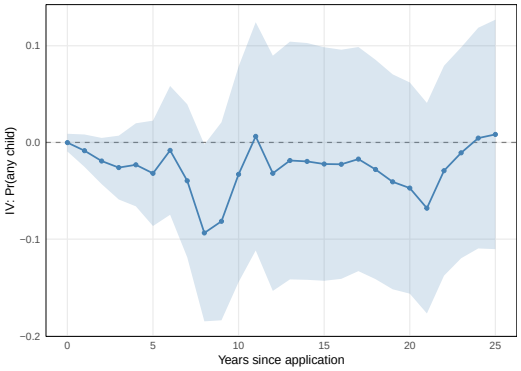
(c) Short Education — Women



(d) Short Education — Men



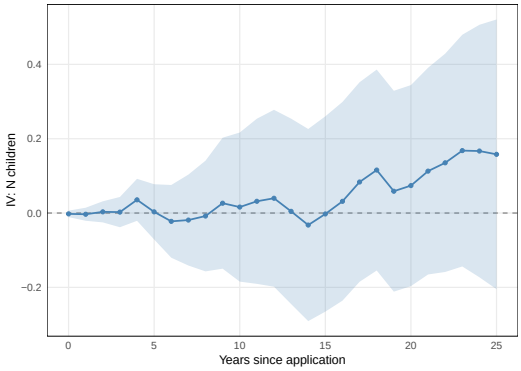
(e) Short STEM — Women



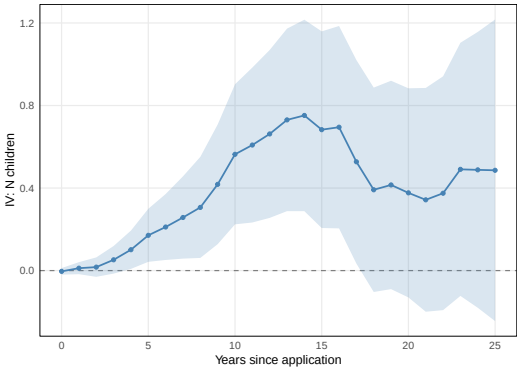
(f) Short STEM — Men

Notes: Each panel shows 2SLS estimates of the effect of enrolling in the field on the probability of having any child, by years since application. Enrollment (within 5 years) is instrumented by scoring above the admission cutoff. Shaded area shows 95% confidence intervals. Regressions include field-pair and application-year fixed effects with cutoff-selectivity-quintile slopes. Donut = 0.1 SD, bandwidth = 1.0 SD. SEs clustered at the individual level.

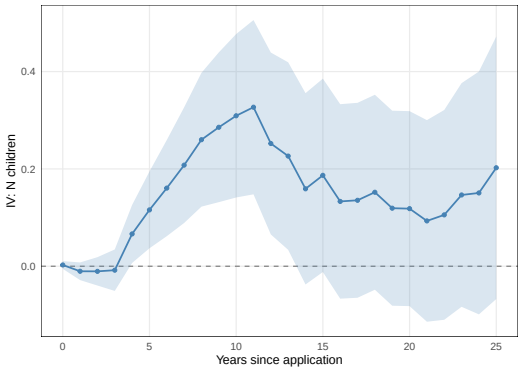
Figure 10: Dynamic Treatment Effects on Number of Children: Health, Short Education, Short STEM



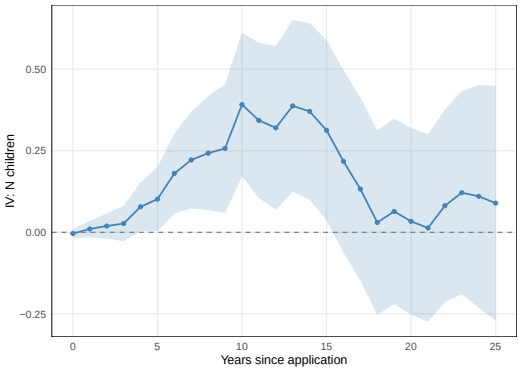
(a) Health — Women



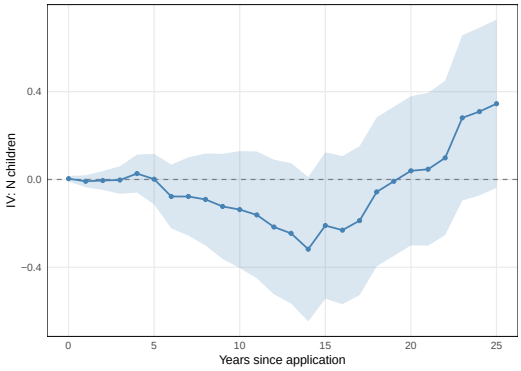
(b) Health — Men



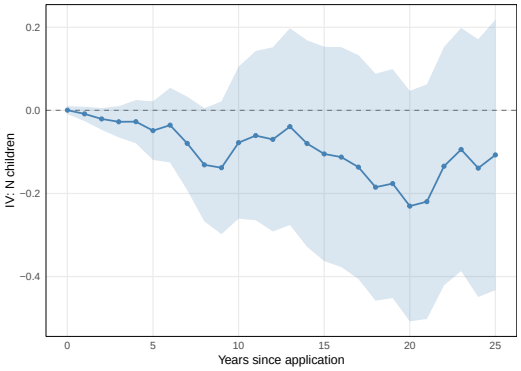
(c) Short Education — Women



(d) Short Education — Men



(e) Short STEM — Women



(f) Short STEM — Men

Notes: Each panel shows 2SLS estimates of the effect of enrolling in the field on the number of children, by years since application. Enrollment (within 5 years) is instrumented by scoring above the admission cutoff. Shaded area shows 95% confidence intervals. Regressions include field-pair and application-year fixed effects with cutoff-selectivity-quintile slopes. Donut = 0.1 SD, bandwidth = 1.0 SD. SEs clustered at the individual level.

Table 6: Causal Effect of Enrollment Field on **Fertility Outcomes** for Women

Field	t=5	t=10	t=15	t=20	t=25
Long programs					
Medicine	0.014	0.135***	0.068	0.077*	0.048
	(0.018)	(0.041)	(0.037)	(0.031)	(0.033)
Business	0.011	-0.051	0.017	0.042	0.076
	(0.023)	(0.046)	(0.043)	(0.037)	(0.047)
Engineering	-0.013	-0.023	0.010	0.019	0.009
	(0.016)	(0.030)	(0.029)	(0.025)	(0.031)
Law	0.018	0.020	-0.011	-0.013	-0.010
	(0.019)	(0.034)	(0.033)	(0.029)	(0.032)
Science	0.002	0.003	0.028	0.066	0.062
	(0.027)	(0.054)	(0.051)	(0.044)	(0.054)
Social Sciences	-0.006	-0.026	-0.010	0.046	0.003
	(0.029)	(0.054)	(0.051)	(0.044)	(0.061)
Health	0.001	0.054	0.055	0.078	0.082
	(0.030)	(0.062)	(0.057)	(0.049)	(0.062)
Education	-0.008	0.051	-0.007	0.002	-0.006
	(0.025)	(0.044)	(0.039)	(0.033)	(0.038)
Humanities	0.039	-0.048	-0.066	-0.173	-0.142
	(0.062)	(0.123)	(0.126)	(0.113)	(0.136)
Short programs					
Short Business	0.021	0.054	0.009	0.027	0.001
	(0.031)	(0.055)	(0.050)	(0.043)	(0.045)
Short STEM	-0.010	-0.099	-0.051	0.022	0.077
	(0.045)	(0.080)	(0.073)	(0.063)	(0.068)
Short non-STEM	0.014	-0.105	-0.064	0.001	-0.012
	(0.042)	(0.073)	(0.067)	(0.058)	(0.065)
Short Health	0.035	0.066	-0.005	0.012	-0.011
	(0.029)	(0.047)	(0.041)	(0.035)	(0.050)
Short Education	0.098**	0.157**	0.063	0.053	0.046
	(0.031)	(0.048)	(0.042)	(0.036)	(0.046)
N			281,952		

Notes: Two-stage least squares estimates of the causal effect of enrolling in a field on the probability of having any child, by years since application, for women. Enrollment in the preferred field (within 5 years) is instrumented by an indicator for scoring above the admission cutoff, interacted with field. All regressions include field-pair and application-year fixed effects with cutoff-selectivity-quintile slopes. Observations within 0.1 SD of the cutoff and at ceiling cutoffs are excluded. Bandwidth = 1.0 SD. Sample restricted to applicants with no prior children and age $\leq$ 23. Standard errors in parentheses, clustered at the individual level. $^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p < 0.05$.

Table 7: Causal Effect of Enrollment Field on **Fertility Outcomes** for Men

Field	t=5	t=10	t=15	t=20	t=25
Long programs					
Medicine	0.020	0.161**	0.202***	0.134**	0.109*
	(0.024)	(0.049)	(0.048)	(0.042)	(0.043)
Business	-0.006	0.003	-0.071	-0.055	-0.041
	(0.021)	(0.049)	(0.056)	(0.050)	(0.061)
Engineering	-0.010	0.027	0.012	-0.031	-0.010
	(0.014)	(0.030)	(0.033)	(0.030)	(0.036)
Law	0.015	0.085*	0.070	0.039	0.022
	(0.018)	(0.037)	(0.040)	(0.036)	(0.038)
Science	-0.033	0.003	-0.060	-0.102*	-0.097
	(0.022)	(0.048)	(0.054)	(0.049)	(0.062)
Social Sciences	-0.041	0.004	-0.029	-0.021	-0.036
	(0.023)	(0.052)	(0.058)	(0.052)	(0.079)
Health	0.142**	0.312**	0.210*	0.091	0.041
	(0.050)	(0.102)	(0.106)	(0.096)	(0.127)
Education	-0.034	-0.035	-0.053	-0.043	-0.053
	(0.025)	(0.049)	(0.050)	(0.045)	(0.051)
Humanities	0.024	0.207	0.076	-0.122	-0.212
	(0.082)	(0.171)	(0.184)	(0.175)	(0.237)
Short programs					
Short Business	-0.041	0.041	-0.002	-0.008	-0.006
	(0.025)	(0.052)	(0.056)	(0.050)	(0.049)
Short STEM	-0.032	-0.033	-0.022	-0.047	0.008
	(0.028)	(0.057)	(0.062)	(0.056)	(0.061)
Short non-STEM	0.022	0.057	-0.038	-0.086	-0.014
	(0.042)	(0.086)	(0.094)	(0.085)	(0.089)
Short Health	0.072*	0.132*	-0.040	-0.020	-0.049
	(0.036)	(0.059)	(0.058)	(0.052)	(0.066)
Short Education	0.088*	0.198**	0.145*	0.041	0.044
	(0.038)	(0.064)	(0.062)	(0.055)	(0.064)
N			209,114		

Notes: Two-stage least squares estimates of the causal effect of enrolling in a field on the probability of having any child, by years since application, for women. Enrollment in the preferred field (within 5 years) is instrumented by an indicator for scoring above the admission cutoff, interacted with field. All regressions include field-pair and application-year fixed effects with cutoff-selectivity-quintile slopes. Observations within 0.1 SD of the cutoff and at ceiling cutoffs are excluded. Bandwidth = 1.0 SD. Sample restricted to applicants with no prior children and age $\leq$ 23. Standard errors in parentheses, clustered at the individual level. $^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p < 0.05$.

5 Conclusions

Our preliminary analysis reveals the importance of observing completed fertility, as field of study affects both the timing and the total number of children. We find substantial heterogeneous effects across fields and genders, with much larger impacts on entry into parenthood than on completed fertility. For example, 10 years after application, enrolling in Medicine or short Education programs accelerates the transition to motherhood, while Engineering and short STEM programs cause delays. However, these timing effects largely fade by 25 years after application, when individuals are on average over 45 years old—consistent with field of study reshaping the life-cycle timing of family formation rather than fundamentally altering completed fertility. The main exception is Medicine, where both women and men show persistent positive effects on completed fertility.

These findings complement recent work showing that the link between field of study and occupational outcomes shapes work-family balance (Campos et al., 2026; Goldin, 2021), and contribute to our understanding of the broader determinants of declining fertility (Doepke et al., 2023; Dahl and Løken, 2024; Olivetti et al., 2024). Our results suggest that field of study is as consequential as education level for fertility outcomes, with important implications for gender inequality and family formation.

To better understand the mechanisms driving these effects, we will explore several channels: whether income effects dominate substitution effects, how field shapes labor market opportunities and occupational characteristics including work hours, flexibility, and skill demands (Goldin, 2014a), the role of parental leave policies and employer variation, partner-level mechanisms including assortative mating and spousal leave-taking, and firm-level channels such as workplace fertility norms. Our analysis builds on foundational work in family economics (Becker and Lewis, 1973; Heckman and Walker, 1990; Francesconi, 2002; Sheran, 2007; Keane and Wolpin, 2010; Goldin, 2014b; Adda et al., 2017; Eckstein et al., 2019) and aims to illuminate how educational choices shape both career trajectories and family formation decisions—and their complex interrelationship—in contemporary labor markets.

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A Institutional Setting Appendix

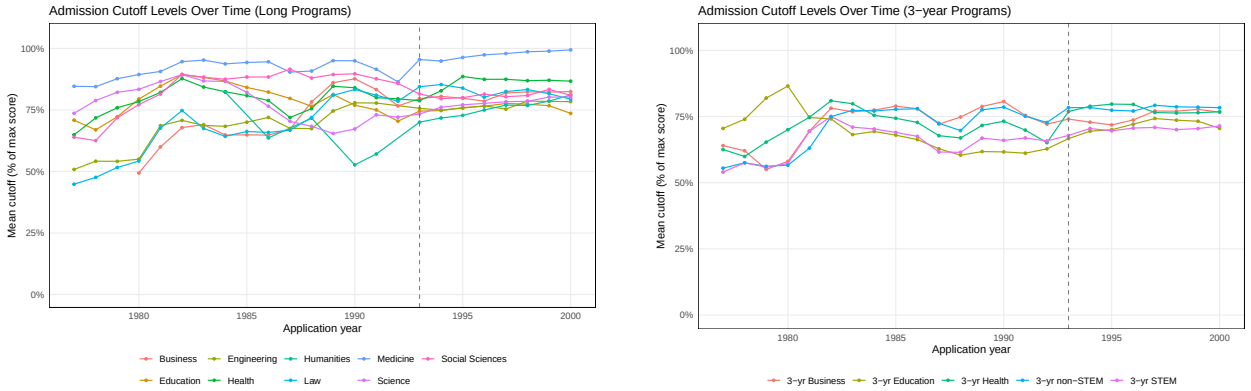
A.1 College Admissions

In this Appendix, we describe the college application, admission, enrollment, and graduation decisions in more detail.

College admission is largely centrally administered. A college applications consist of a list with up to 20 rank-ordered alternatives, and students also submit their high school diploma and transcripts. An alternative consists of a program (e.g. Economics) and a college (e.g. Stockholm University). Universities/colleges are responsible for specifying competence requirements and selection within the regulation of the Higher Education Act, while the Swedish National Agency for Higher Education (now UHR) is a supervisory authority that checks that colleges comply with the regulatory framework. If there are more seats than applicants, then all qualified applicants are admitted. Qualifications are determined by high school courses, and may vary by programs and colleges. The basic requirement is a high school degree, and each college-program has additional requirements related to prerequisite high school courses and grades. When there are more applicants for a college-program than there are seats, the selection is based on the following three main admission groups are screening students on: (i) high school GPA, (ii) SweSAT test score, and (iii) SweSAT test score with additional admission points for relevant labor market experience. Each college-program has a fixed number of seats available in each admission group: at least one third has to be admitted through group (i), at least one third has to be admitted through groups (ii) and (iii), and at most a third through alternative admission rules; predominantly personal interviews. GPA and SweSAT cut-offs in each admission group are determined are determined by a serial dictator mechanism. Each student is admitted to the highest priority they are above the cut-off for in one of the admission groups. After admission decisions are communicated in the first round, students who are evaluated to be qualified based on their high school transcripts but are not admitted to their preferred alternative can be wait-listed and admitted in a second round in August as seats can become available if someone does not accept their initial allocation.

Figure A1 shows the average admission cutoff by field over time, expressed as a fraction of the maximum possible score. Selectivity varies substantially across fields: Medicine consistently requires scores near the maximum, while Education and short programs are much less selective. The dashed line at 1993 marks the transition from the old admission system (UHA) to the new system (H97/VHS), which changed the scoring scale. Law became increasingly competitive over the period, rising from moderate selectivity in the late 1970s to near-Medicine levels by the 1990s.

Finally, the micro data on college applications and admissions from the Swedish National Archives (*Riksarkivet*) enables us to directly assess to which extent admission probabilities are taken into account when



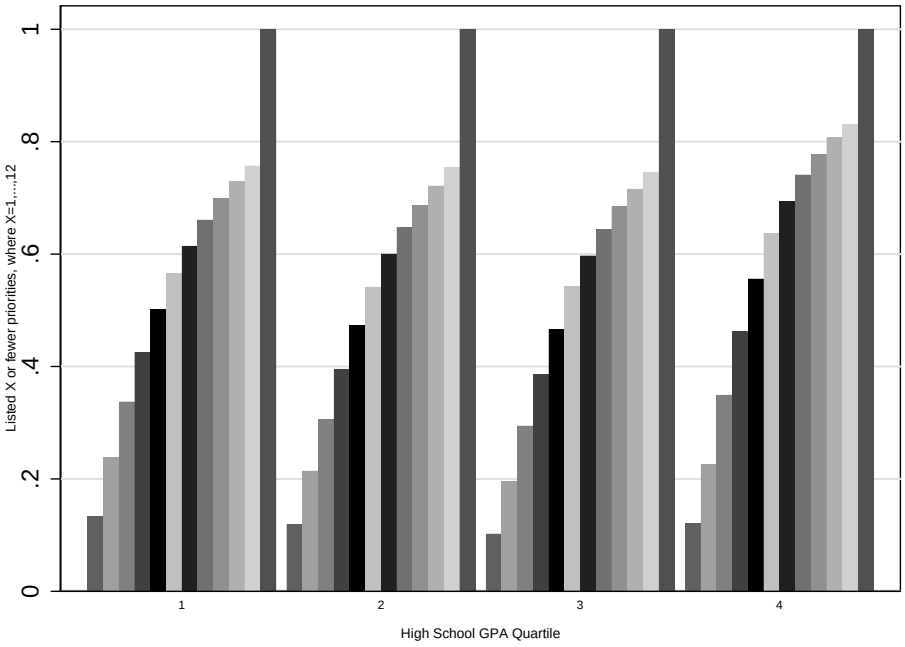
(a) Long programs

(b) Short programs

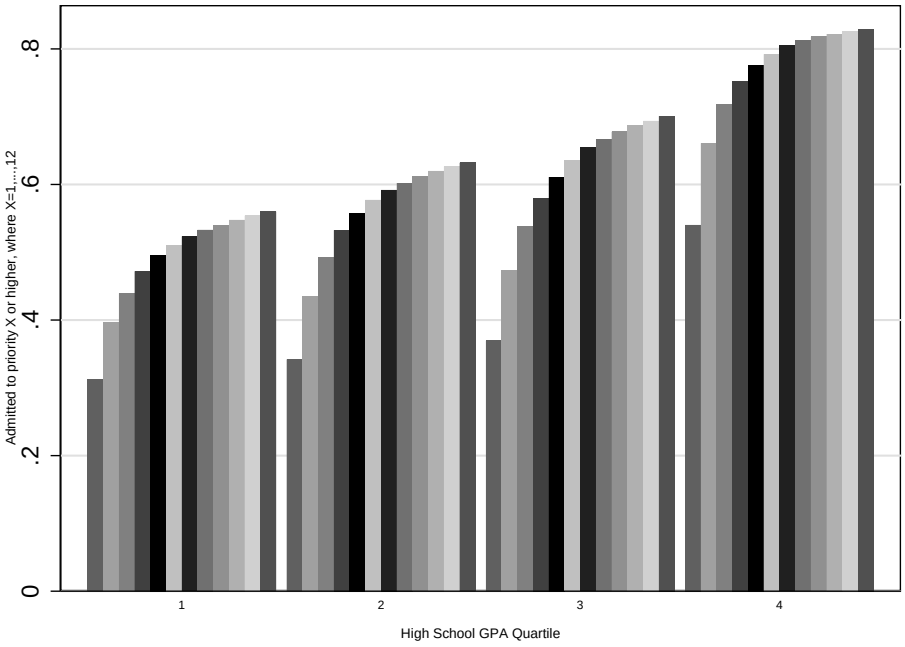
Appendix Figure A1: Mean Admission Cutoff by Field Over Time (as % of maximum score). Dashed line marks the 1993 system change.

applying. Figure A2 reveals that students with high high school GPA have highes admission probabilities, apply to more selective programs, and are more likely to be admitted to their more preferred programs.

Appendix Figure A2: College Application and Admission.



(a) Fraction listed at least X priorities



(b) Fraction Admitted to Priority X or higher

Note: This Figure describes how many priorities are listed on college applications and which priority individuals were admitted to, by hich school GPA quartile. Panel (a) shows the fraction of applicants within each GPA quartile listing at least X priorities, where $X \in \{1, ..., 12\}$. Panel (b) shows the fraction of applicants within each GPA quartile that is admitted to priority X or a higher/preferred priority, where $X \in \{1, ..., 12\}$.

Appendix Table A1: College Programs within Major, First Enrollment for men

College Major, 1st enrollment	Fraction of major	SUN2000Inr Code
Non-STEM (short)		
Journalism and Media Science	0.14	321
History and Archeology	0.13	225
Media production	0.10	213
Transportation	0.05	840
Sociology, Ethnology, and Cultural Geography	0.06	312
Business (short)		
Business Administration, Trade and Administration (general)	0.64	340
Management and Administration	0.14	345
Purchasing, Sales, and Distribution	0.08	341
Business Administration, Trade and Administration (other)	0.08	349
Marketing	0.05	342
STEM (short)		
Energy- and Electrical Engineering	0.25	522
Mechanical Engineering	0.21	521
Electronics, Computer Engineering and Automation	0.17	523
Building- and Construction Engineering	0.10	582
Computer Science and Systems Science	0.06	481
Health Sci		
Nursing	0.47	723
Social work and Guidance	0.23	762
Therapy, Rehabilitation, and Dietary treatment	0.15	726
Dental care	0.05	724
Technically oriented health education	0.05	725
Education		
Specialist Teacher	0.41	145
Pedagogy and Teacher education (other)	0.21	149
Teacher, primary school	0.14	144
Teacher, preschool and leisure activities	0.14	143
Teacher, vocational and practical/aesthetic subjects	0.09	146
Humanities		
Foreign Language	0.21	222
History and Archeology	0.18	225
Religion	0.17	221
Music, Dance, and Drama	0.15	212
Media production	0.07	213
Social Sciences		
Social and Behavioral Science (general)	0.47	310
Psychology	0.11	311
Sociology, Ethnology, and Cultural Geography	0.07	312
Transportation	0.07	840
Political Science	0.06	313
Business		
Business Administration, Trade and Administration (general)	0.87	340
Marketing	0.10	345
Management and Administration	0.02	342
Business Administration, Trade and Administration (other)	0.01	349
Law		
Law	1.00	380
Sciences and Computer Science		
Computer Science and Systems Science	0.37	481
Mathematics and Science (other)	0.25	469
Biology and Biochemistry	0.07	421
Physics	0.06	441
Chemistry	0.04	442
Engineering		
Mechanical Engineering	0.17	521
Electronics, Computer Engineering and Automation	0.17	523
Technology and Industry Engineering (general)	0.16	520
Energy and Electrical Engineering	0.14	522
Industrial Economics and Organization	0.08	526
Medicine		
Medicine	1.00	721

A.2 Social Insurance in Sweden

Sweden has a high level of social insurance, and it is a Nordic welfare state with a long history of providing high quality and low cost (to the individual) health- and childcare. Sweden simultaneously has maintained high fertility rates and women are almost as likely to work as men (Gustafsson and Jacobsson, 1985; Sundström and Stafford, 1992; Rønsen and Sundström, 2002) but not as likely to reach the top of the career ladder and earn top incomes (Albrecht et al., 2003, 2015).

This could partly be because Sweden has a generous family policy aimed at supporting the combination of working *and* raising children.[14] The Swedish welfare state provides both financial and in-kind support for families with children; including paid parental leave, subsidized child care, paid leave to take care of sick children, and universal child allowances. Swedish family policy asserts the same rights and obligations regarding family and labor market work for both women and men. Most support is conditional on (past) earnings, but individual and independent of civil status (Gustafsson and Stafford, 1992, 1994). This together with individual (progressive) taxation provides strong work incentives in single- as well as dual-earner families.

Parental Leave Sweden already had paid maternity leave and strong job protection for mothers from the mid-1950s. Björklund (2006) describes the evolution of family policies from the 1960s through the following two decades in which there were several major extensions of its generosity. Importantly, in 1974, it became a parental leave system. Although fathers have the same rights to parental leave as mothers, mothers continue to utilize the bulk of paid leave opportunities (Sundström and Duvander, 2002; Duvander et al., 2020; Ginja et al., 2023). More recent papers describing the parental leave scheme during our sample period include Liu and Skans (2010) and Avdic and Karimi (2018).

Parents generally have the right to take full-time parental leave with a duration until their child is up to 18 months old. Since 2002, parents have been allotted a total of 480 days (approximately 16 months) of leave for each child. 390 of these days (approximately 13 months) are based on past income ("parental salary") provided they had been employed for 240 days before leave, otherwise they receive a basic "parental allowance" that is the same amount as the sick leave benefit. The parental salary amount depends on unemployment insurance fund membership and the collective agreement the individual is subject to. Most of the largest funds provide a parental salary such that the total parental benefits replace up to 90% of the parents' salary for the first six months of leave. Many employers also top this up such that many parents face an effective replacement rate of up to 95% for the duration of a year. The remaining 90 days are worth 90 SEK per day if the child was born before July 1, 2006, and 180 SEK per day if the child was born after

[14] See, for example, Hoem and Hoem (1996), Rønsen and Sundström (2002), Björklund (2006), and Duvander (2008) for an overview of Swedish family policy and related employment legislation and Jaumotte (2004) for an OECD country comparison.

July 1, 2006.

The only restriction on how parents distribute the parental leave time among them (during our sample period, or more specifically 2002-2016) is that two months of the allotted leave time is set aside to each parent.[15]

Child Benefits During our sample period of 2005-2012, other benefits related to having a child include temporarily taking care of a sick child, taking care of a sick child for more than six months, and the municipal extension of taking care of a 1-3 year old in special circumstances.

The monetary transfer for temporarily taking care of a sick child is known as *Vab* (an abbreviation of "*vård av barn*"). Parents are eligible for this benefit when they are taking care of a child who must miss school due to sickness, accompanying a child to a visit with a doctor, children's health center, dentist, or child and adolescent psychiatry. Parents can receive these benefits for either 75, 50, 25, or 12.5 percent of a day. Payment is equivalent to slightly less than 80 percent of income. Parents are allotted a maximum of 120 days of *Vab* per year per child, with both parents sharing these 120 days. If a child is sick for more than seven days, parents must submit a letter from a doctor or nurse to the Swedish Social Insurance Agency.

If taking care of a sick child for more than six months, parents are eligible for an additional benefit ("*vårdbidrag*") primarily intended for parents whose child had a disability and/or a chronic disease.[16]

The remaining benefit related to having a child is the municipal extension of taking care of a 1-3 year old in specific circumstances ("*kommunalt vårdnadsbidrag*") which was fully in place in 2011, but it was discontinued in 2016. This transfer allowed municipalities to provide monetary benefits to parents if their child was registered in the municipality and did not have a full-time spot in a preschool program. Aid was split evenly between both parents, regardless of whether one of them was registered outside the municipality. In any given month, parents would not be eligible for payments if they had received parental leave benefits, unemployment benefits, vocational aid, government-provided sick pay, pension payments, aid for assisting the elderly, or certain aid for newly-arrived immigrants.[17]

Childcare Local-government-subsidized center-based childcare is another important component of Swedish family policy. The contemporary daycare system was established in the 1960s and expanded substantially through the 1970s (Björklund, 2006; Gustafsson and Stafford, 1994). The children born during our sample period attend daycare during the post-reform regime described in more more details in Lundin et al. (2008),

[15] See the Parental Leave Act (1995:584) for the complete law text and its changes over time, available in the Swedish digital law archives. The law was enacted in 1995 and there was only one minor change during our sample period in 2006 (2006:442). Also see the Social Security Code (2010:110) for more details.

[16] See the Act on Disability Compensation and Care Allowance (1998:703) and the Social Security Code (2010:111) for complete law text and changes over time.

[17] See the Act on Municipal Guardianship Allowance (2008:307) for the complete law text and changes over time.

Mörk et al. (2013), Aalto et al. (2019), and van den Berg and Siflinger (2022).

Municipalities are required by law to provide highly subsidized, high-quality care to children whose parents work or study during regular work hours. Consequently, enrollment rates are as high as around 70% for children ages 1-2 years old and 90% for children ages 3-6 years old. Childcare is highly subsidized and parents pay a percent of household income but with a cap.[18] The cap is low as the intention in the law is that no parent refrain from childcare due to economic reasons. Child care is offered during regular work hours.

Health Care Healthcare is universal, mostly public, and organized at the county level.[19] Co-payments and out-of-pocket expenses are generally low and capped.[20]

A key source of care for young children in Sweden is the child health care service (BHV). Its goal is to promote children's health, development, and well-being. It focuses on children's everyday lives, health, and development, raises awareness of various health risks, performs age-based health checkups, administers vaccinations, assists children with disabilities and/or chronic illnesses, and aids parents who are at risk. Like overall healthcare, BHV is controlled at the county level. BHV is free of charge and universally offered to children from birth to when they start pre-school (or first grade for those who do not attend pre-school). For school-aged children, preventive health services and vaccinations are organized and provided by school nurses within schools. These services cover all children, and they are also free of charge.[21]

While healthcare is primarily provided at the public level, private healthcare is also available in Sweden. Private healthcare can either be under contract with the local/regional authorities or not be under contract. With healthcare administration being decentralized, patient fees differ across the country. Referrals from general practitioners are not required to contact a specialist, but if a patient does not have a referral, they may need to pay more and/or wait longer.

B Additional Descriptives

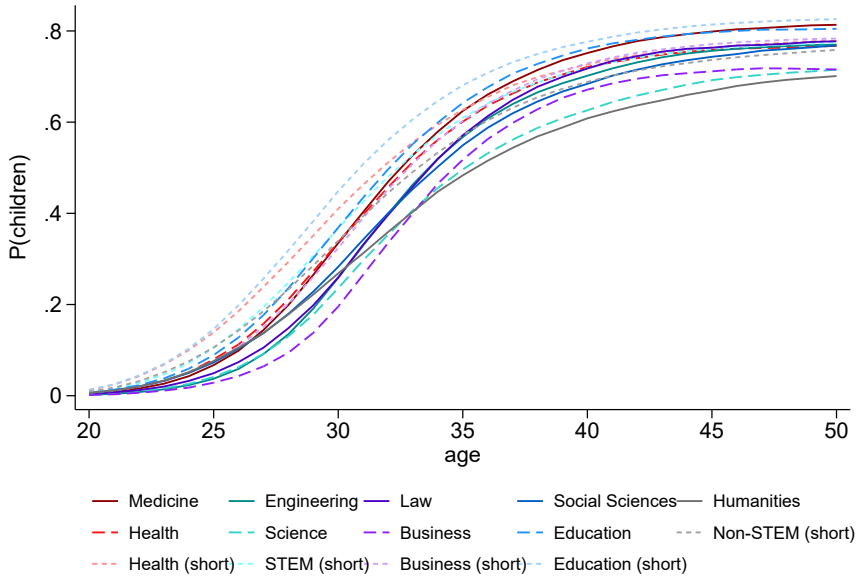
[18] Domeij and Klein (2013) use data from Germany to show that subsidizing daycare can substantially increase welfare by encouraging women with small children to work in an economy with distortionary taxes on labor, while Lundin et al. (2008) find that female labor supply inelastic at the high level of daycare prize subsidies in the Swedish childcare system the mothers in our sample face.

[19] Aalto et al. (2019) and van den Berg and Siflinger (2022) describe health care for children in Sweden during our sample period in more details.

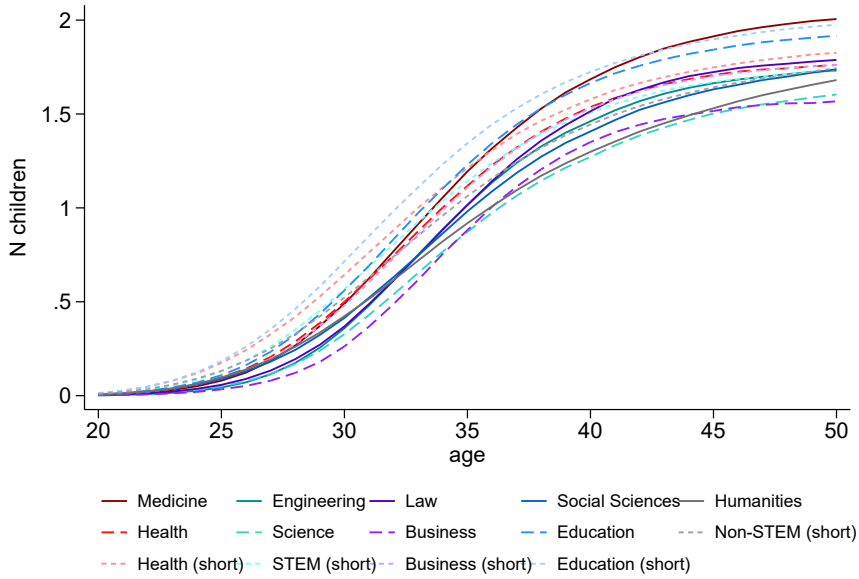
[20] Act (2002:160) on Pharmaceutical Benefits (consolidated until SFS 2013:1141) reflects all changes until the end of our sample period. This law contains provisions on pharmaceutical benefits and price regulation of goods included in the benefit.

[21] The Health and Medical Care Act (1982:763) (consolidated until SFS 2013:1141 to reflect all changes until the end of our sample period) states the goal of health care and thus also child health care: "The goal of health care is good health and care for equal conditions for the entire population. Care must be given with respect for the equal value of all people and for the dignity of the individual person. Those who have the greatest need for health care must be given priority to receive care."

Appendix Figure A3: Fertility by Age and Field of Study (Men).



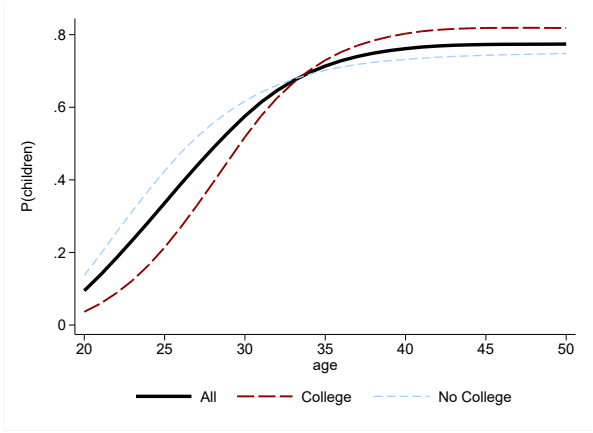
(a) Any child



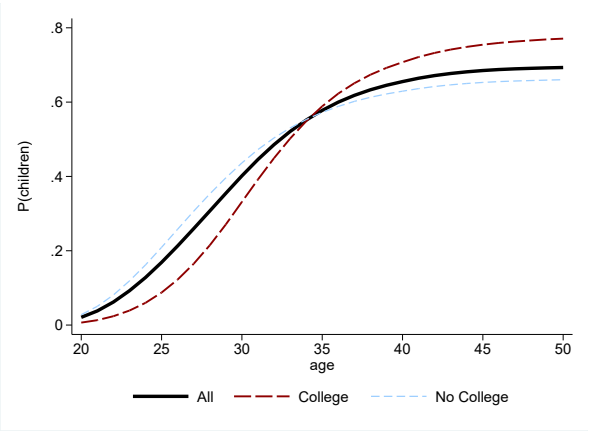
(b) Number of children

Note: This Figure describes how fertility rates of men vary by age and field of study. Panel (a) shows the probability of having any child. Panel (b) shows the number of children.

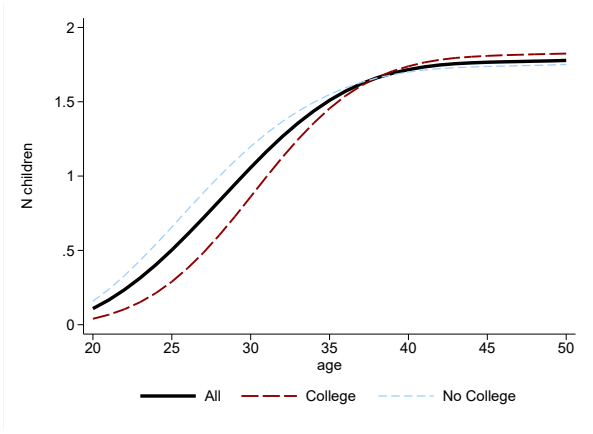
Appendix Figure A4: Fertility by Age and Education Level.



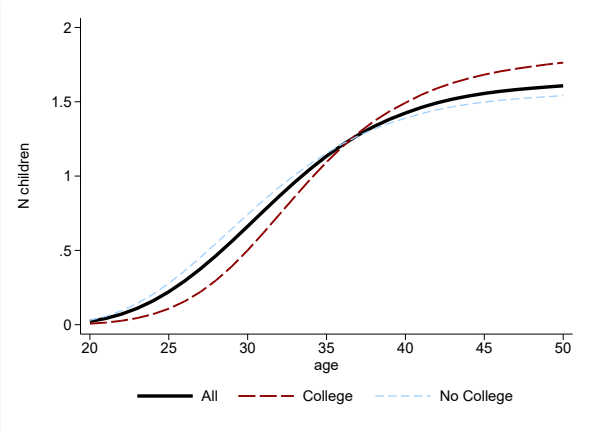
(a) Any child, Women



(b) Any child, Men



(c) Number of children, Women



(d) Number of children, Men

Note: This Figure describes how fertility rates of women and men vary by age and education level. Black lines denote the full sample, maroon lines denote those with a college degree, and blue lines denote those without a college degree.