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Not in a Class of One's Own: Social Origin Differentials in Applying to Gender-(A)Typical Fields of Study across the Educational Hierarchy

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Abstract

How and why does social origin matter for gender-segregated field of study choices? Analyses of gender-(a)typical educational interests have framed social origin differentials primarily through the lens of socialization, resting on the idea that children from socioeconomically advantaged families develop less gender-stereotypical interests via more egalitarian notions of gender roles. The social stratification literature, on the other hand, has discussed social gradients in field of study choice mainly from a perspective of social mobility and life chance risks, while remaining fairly detached from questions of gender segregation. Our aim in this article is to shed new light on how social inequality may be of consequence for gender-(a)typical interests in fields of study. Comparing register-based application patterns of a complete Finnish birth cohort (1989–1991) across three levels in the educational hierarchy, our results show that the same social origin may either lower or increase the probability of applying to gender-(a)typical fields, depending both on the educational level targeted and applicants' gender. This context-dependency calls into question a strongly culturally framed interpretation of social origin gradients in gender-(a)typical interests. We conclude that social mobility prospects may align in a more nuanced and pragmatic way with gendered interests than previously suggested.

Introduction

Gender differences in internalized interests have been shown to play a considerable role for the well-known overrepresentation of women in the humanities and care fields, as well as men's clustering in technical domains within educational systems (Cech, 2013; Morgan *et al.*, 2013; Ochsenfeld, 2016). Many scholars argue that early childhood socialization and later processes of social control play a vital role in shaping these gendered interests. Accordingly, the gender ideology of parents, teachers, and peers may lead them to biased responses that reinforce children's gender-typical and sanction their gender-atypical inclinations (Legewie and DiPrete, 2014; Eberhard, Matthes and Ulrich, 2015; Gabay-Egozi, Shavit and Yaish, 2015).

However, fields of study do not differ only by their gender composition, but also with regard to their labour market links and social prestige. As such, recent social stratification research has increasingly shown that intergenerational status reproduction strategies rely not only on educational attainment, but extend to horizontal educational differentiations (Triventi, Vergolini and Zanini, 2017), amounting to a *socioeconomic* segregation by field of study (Hällsten and Thaning, 2018).

Against this background, it is surprising that research on field of study choice has treated gender segregation patterns in relative isolation from broader social stratification processes. For analyses of *gender-segregated* field of study choice, this has meant that social origin has played a relatively subordinate role. While some studies have discarded family background perspectives altogether (Legewie and DiPrete, 2014; Alon and DiPrete, 2015; Ochsenfeld, 2016), other research in this tradition has interpreted social origin primarily via the lens of socialization. This account constitutes an extension of the gender socialization argument, resting on the idea that socioeconomically advantaged parents socialize their children to adopt a more egalitarian notion of gender roles, which leads to less gender-stereotyped interests among children from more advantaged social origins (Dryler, 1998; Polavieja and Platt, 2014; Chesters, 2021). In contrast to the socialization-based framing of social origin dominating in the gender segregation literature, much of sociological class and stratification research has interpreted social origin gradients in educational outcomes as expressing differentials in life chances risks rather than culture (Goldthorpe, 1996). Overall, questions of social mobility and status maintenance risks have remained of marginal relevance for much research on gender-segregated field choices, while the stratification literature has remained fairly detached from questions of gender segregation.

In part, the preoccupation with higher education that dominates much prior research of (gender-segregated) field of study choices (Correll, 2001; Mann and DiPrete, 2013; Ochsenfeld, 2016; Seehuus, 2019) may impede a more comprehensive view as to how social mobility dynamics intersect with gender-segregation patterns, due to the narrow scope of *social destinations* typically associated with these educational pathways. The restriction to a single educational level also risks misinterpreting the sociological significance of social origin for gendered field choices, given that it necessarily excludes those segments within each social origin group that embarked on alternative educational pathways associated with different stratification outcomes. Although a focus on children's gender-segregated occupational aspirations rather than their realized choices may enable a more comprehensive perspective in this respect (Polavieja and Platt, 2014; Liu, 2020; Chesters, 2021), this research angle typically faces limitations with regard to disentangling 'vertical' social mobility aspirations from the gendered 'horizontal' ways of pursuing them.

Our aim in this article is to shed new light on how social inequality may be of consequence for gender-(a)typical interests in fields of study. Drawing on Finnish register data on a complete birth cohort (1989–1991) of young people applying to three qualification levels, our contribution rests on four pillars. First, by comparing applications *across the educational hierarchy*, we are able to connect young people's gendered field of study aspirations more comprehensively with different potential social mobility prospects approximated by their educational target level. In addition, this comparative setup also allows us to examine the gender socialization interpretation of social origin differentials from a new angle, as we examine the stability of social gradients across aspired educational pathways. Second, we approach *social origin dynamics in a gender-specific way*, which allows for the possible interaction of gender and social inequality. Previously, much research on gender-segregated field of study choices had to treat social origin as a control variable alongside gender (Mann and DiPrete, 2013; Morgan *et al.*, 2013; Gabay-Egozi, Shavit and Yaish, 2015), which necessarily precludes a view on how social origin dynamics may unfold in gender-specific patterns (van de Werfhorst, 2017; Seehuus, 2019). Third, rather than resorting to single or aggregate measures of family background (Correll, 2001; Ayalon, 2003), our analysis distinguishes between different *components of social origin*. Recent research has highlighted the way in which different types of family resources may each independently affect educational outcomes (Hällsten and Thaning, 2018), potentially aligning with distinct social mechanisms (Bukodi and Goldthorpe, 2013). Against this background, we expect that parental education and parental class may differently link up with socialization- and mobility-based explanatory accounts of social origin gradients in gendered field of study choices. Fourth, we are able to provide a more realistic picture of the sometimes quite diverse spectrum of young people's interests (Barone *et al.*, 2019), given that we accommodate young people's entire *choice set* of fields of study on their application. This focus on *applications* also allows us to more directly tap into candidates' interests and aspirations, whereas enrolling (or graduating) from a given field usually depends not only on one's own, but also on the educational institution's choice to admit a candidate in the first place.

Nevertheless, our analyses are not able to determine the final causality of the mechanisms linking social origin to gendered study aspirations. Instead, we provide a nuanced description of empirical patterns and examine their alignment with theory-driven expectations, which will assist future causal testing and contribute to the sociological understanding of the ways in which gender inequality and social inequality intertwine within education.

Social Origin's Relevance for Gendered Field Choices: Mechanisms, Components, and Hypotheses

Gendered Fields of Study as Self-Expressive Choices: Parental Education and Gender Socialization Processes

Traditionally, sociological approaches to gender segregation have tended to follow social learning theory, which highlights role imitation as a primary mechanism of socialization processes. Accordingly, children are assumed to learn the basic expectations of feminine and masculine behaviour by imitating the example provided by their parents and their social environment. As a result, children adopt particular cultural values and attitudes regarding gender-specific roles, in short, a gender ideology, which may affect their view of what domains are acceptable educationally and occupationally for themselves (Dryler, 1998; Chesters, 2021).

Some scholars have criticized this view for overly emphasizing passive reception of orientations and neglecting the power of individual agency for resisting such environmental socialization pressures (Polavieja and Platt, 2014). But individual agency may be a corollary rather than an opposing force in the gender socialization process, making their distinction far more ambiguous. Social psychologists have shown that parents' perceptions of and reactions to their children is biased by their gender stereotypes, which reinforces children's development of gendered self-concepts with regard to their abilities and interests (Eccles *et al*., 2000). Because of this effect on individuals' self-concepts, gender socialization processes tend to be channelled through the personal agency of self-expressive choices, rather than proceed as passive norm-following (Correll, 2001; Ridgeway and Correll, 2004; Cech, 2013).

Importantly, it is plausible to expect that the degree to which children's role learning, ideologies, and self-concepts take on a gender normative shape may significantly vary by social origin, in particular by *parents' education*. Prior research has found gender egalitarian beliefs to be more prevalent among young people with highly educated parents (Davis and Greenstein, 2009; Chesters, 2021). If higher levels of education lead parents to adhere less strongly to gender-traditional ideologies, this may also mean that they respond with lower levels of gender bias to their children's behaviour and inclinations, thus alleviating the gendering of children's developing self-concepts. Furthermore, from a social control perspective (Jacobs, 1989; Eberhard, Matthes and Ulrich, 2015), it can be expected that these children grow up in contexts that may be more supportive of gender-atypical choices, as their social environments (friends, class mates, neighbours) may be characterized by similarly high levels of education as their own family (Van Gent, Das and Musterd, 2019). Based on this strand of the research literature, we derive the following expectations:

H1 (Differential gender socialization):
a) Both women and men with high levels of parental education should be more (less) likely to consider gender-atypical (gender-typical) fields compared to their peers whose parents have lower levels of education.

b) The greater (lower) inclination to consider gender-atypical (gender-typical) fields among children of highly educated parents should be consistent, regardless of the educational level to which children submit their application.

Gender-Devalued Fields from the Perspective of Social Class Mobility: Are Female-Dominated Fields Always a Status Risk??

While parental education may shape children's attitude to gender norms via socialization processes, parents' social class is likely to affect children's expectations regarding their social mobility trajectory. In the account of *relative risk aversion theory*, the common denominator for all social classes is their primary interest in avoiding downward social mobility (Goldthorpe, 1996). In other words, parents and children are assumed to prefer educational trajectories that reproduce their parents' social class position and the social status derived from it. In contrast, educational moves that represent significant degrees of upward mobility may appear as the more risky alternative, as failed attempts to succeed on such trajectories may incur significant costs in terms of time, status, and forgone earnings.

Against this backdrop, we argue that field of study specializations may moderate the degree to which a particular level of qualification represents a risky or feasible pathway for class maintenance or upward mobility strategies. In contrast to our gender socialization expectations, this also means that social class gradients in gender-(a)typical applications should vary in direction across the educational hierarchy, as well as between men and women.

For men who apply to university to *reproduce* their parents' advantageous class position, female-dominated fields may represent a risk of status loss, given their links with on average lower earnings (Bobbitt-Zeher, 2007; Hällsten, 2010; Prix, 2013). For them, traditional male-dominated fields (e.g. engineering) or elite gender-balanced fields (e.g. medicine, law, or business) are more likely to reproduce and consolidate both the class position and the prestige of their social origins. However, *upwardly mobile*

men, such as working-class applicants to the universities, may be significantly less constrained by such status considerations when choosing their field of study, as *any* higher education degree already constitutes a clear socially upward move for them. The lower prestige of female-dominated fields may even make these fields appear as the less intimidating road towards a higher class and status position than their parents, especially if these female-dominated fields provide clear avenues to respectable middle-class occupations (see, e.g. Lupton, 2006), such as school teachers, pharmacists, or psychologists.

For women, both the typically better-paid male-dominated fields as well as elite fields with a more integrated gender profile may further bolster the prestige and labour market prospects attached to university education. From a social mobility perspective, avoiding female-dominated fields should therefore be particularly relevant for women that are set to reproduce their advantaged social origins via entering the universities (see also England, 2010).

Taken together, this account presumes that men and women from advantaged class origins share the same *preference for male-dominated fields* and *avoidance of devalued female-dominated fields*. Implicit in this argument is the idea that the labour market and prestige connotations associated with female- and male-dominated fields, rather than their gender-(a)typicality, constitute the main mechanism for social class gradients in field of study applications (van de Werfhorst, 2017; Seehuus, 2019). This may also be interpreted from the Effectively Maintained Inequality perspective (Lucas, 2001): even within specific levels of education, socioeconomically privileged parents aim to secure qualitative advantages for their children, including through field-of-study choices (Triventi, 2013; Thomsen, 2015). Therefore, we hypothesize the following patterns:

H2 (Social mobility in university contexts):
a) Women from service class families are more (less) likely to apply to gender-atypical (gender-typical) fields compared to women from working class origins.

b) Men from service class origins are less (more) likely to apply to gender-atypical (gender-typical) fields compared to men from working class families.

Class-Devalued Fields from a Perspective of Social Class Mobility: Can Male-Dominated Fields Constitute a Status Risk?

Preparing for skilled working class occupations, the vocational branch of upper secondary education represents a downward trajectory in social mobility terms for children from service class origins. Unsurprisingly, it is rare for the offspring of socioeconomically advantaged parents to enter this type of secondary education in Finland (Kilpi-Jakonen, Erola and Karhula, 2016). Service class children, who in defiance of social expectations apply to vocational schools, may be concerned with buffering some of the entailed status loss via their field of study choice. We assume that the economic and cultural devaluation of female-typical domains may not be the primary source of status differentials between fields (see also Magnusson, 2009) in the eyes of these applicants. Instead, we expect that class- rather than gender-based threats of status loss may take on greater salience for this group. This is because male-dominated vocational fields, due to their association with skilled manual, blue-collar occupations, are likely to carry the most stereotypical working class connotations, which may strengthen downward mobility perceptions of this pathway. By contrast, gender-balanced and female-dominated vocational fields may somewhat buffer such status loss, as their stronger links to care and service occupations may invoke comparatively stronger associations with non-manual, middle-class destinations (Robison and Stubager, 2018).

Working class applicants, on the other hand, for whom the vocational sector represents an educational pathway set to reproduce their class origins, may perceive the manual/non-manual divide among vocational fields as less salient for their status-maintenance considerations. Based on this assumed relatively greater avoidance of male-dominated fields among downwardly mobile service class applicants, we expect the following social gradients in the vocational sector:

H3 (Social mobility in vocational education contexts):
a) Women from service class social origins are less likely to apply to gender-atypical fields compared to their peers from working class families.

b) Men from service class origins are more (less) likely to apply to gender-atypical (gender-typical) fields compared to men with working class origins.

In formulating our hypotheses, we have focused particularly on the university sector and the vocational branch of upper secondary education. This is mainly because we expect social mobility trajectories to play the most significant role for field of study considerations when applicants are facing 'long' social distances. Polytechnics, on the other hand, occupy a middle position in terms of prestige and labour market outcomes in the Finnish educational hierarchy (see the next section), which is why we will adopt a more exploratory perspective for this sector.

The Finnish Context

The first educational turning point in the Finnish system takes place after 9 years of comprehensive school, typically at around the age of 16 (Figure 1). Young people at this stage are faced with a decision to enter either high school *(lukio)* or upper secondary vocational school *(ammattikoulu)*. Both a high school diploma and the basic vocational qualifications generally require 3 years of full-time study to complete, follow standardized curricula, and grant eligibility for applying to higher education programmes. Despite relying on school-based instruction (rather than apprenticeships), vocational upper secondary programmes in Finland are quite occupation-specific and aim at preparing young people for skilled manual and non-manual working class positions. During the time when our study cohort was 16–22 years old, the Finnish vocational system offered more than 50 vocational qualifications, many of which included further areas of specialization (Cedefop, 2015).

Higher education in Finland has a dual structure consisting of polytechnics (*ammattikorkeakoulu*, also translated as universities of applied sciences) and the traditional universities *(yliopisto)*. Although both sectors grant bachelor's and master's degrees, polytechnics place a greater emphasis on applied skills with more concrete labour market relevance, whereas university programmes have a stronger orientation towards research training and have the monopoly on awarding PhD degrees. Furthermore, polytechnics and universities differ markedly with respect to their historical roots as well as their graduates' average labour market prospects. Due to these prestige differences, we rank polytechnics below universities in the educational hierarchy.

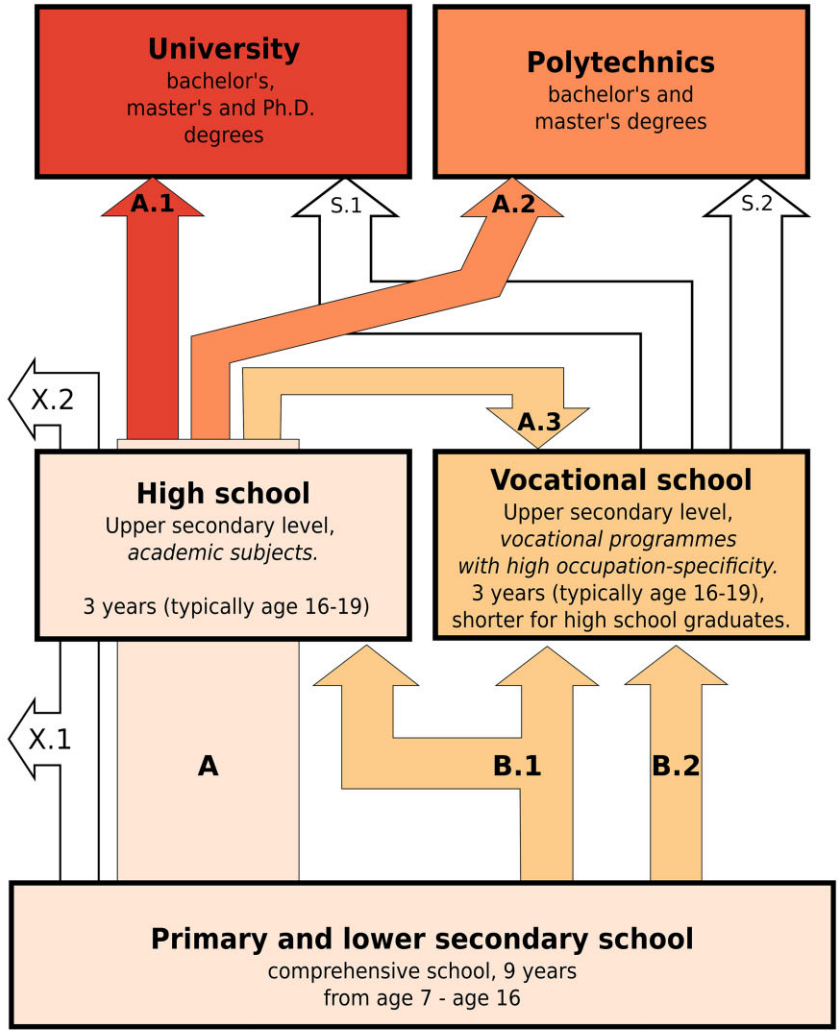
Study places are allocated via (separate) centralized application systems for upper secondary education and higher education programmes *(yhteishaku)*. During each application round, applicants can list one or more (typically up to six) detailed programmes, ranked in order of preference. Candidates are selected based on previous scholastic success, but for some programmes, also relevant work experience, or (particularly with regard to higher education) an entrance examination may determine admission.

Data and Methods

The point of departure for our analyses is a register-based, longitudinal data set provided by Statistics Finland (2021), which we restrict to all children who were born in Finland between 1989 and 1991 ($n = 192{,}057$). After matching these children with their educational application patterns and family background information from official administrative registers, we followed them in the data from their birth up until the year they turned 22. In total, 4.6 per cent of these young people (8,745 individuals) never applied to either the vocational branch of upper secondary education or any higher education program in Finland during our observation window, which excludes them from our analyses (see paths X.1 and X.2 in Figure 1). A further 1.3 per cent (2,354 individuals) of remaining observations was listwise deleted due to missing information on the variables used in our analysis. The resulting analytical data set comprises 180,958 young people.

Our main analyses rely on binary regression methods to separately model whether or not applicants included any gender-atypical and gender-typical fields of study on their application to a given educational level. Additionally, we model differences in the strength of emphasis on gender-atypical programmes among applicants using multinomial logit regression. We express the associations in our logit models in terms of percentage point differences with regard to the average predicted outcome probability (average marginal effects, AME). To complement the substantive meaning of these absolute differences, we also present the *relative* social origin differences in average outcome probabilities that correspond to these AME derived from our fully adjusted logit regression models.

When discussing the substantive significance of our findings (Bernard, Chakhaia and Leopold, 2017), we take an *absolute* percentage point difference of 1.5 as the benchmark for a minimally sociologically relevant social origin difference. For determining this lower limit, we take as our point of reference a recent study utilizing similar (administrative) data from a culturally similar context (Sweden). Distinguishing 16 broad tertiary fields, this study found a mean absolute difference of 1.5 percentage points between the predicted probabilities of young people from high- and low-educated family backgrounds to have graduated from a given field (see Tables 4 and 5 in Hällsten and Thaning, 2018). To further illustrate the substantive meaning of this benchmark value for the present study, let us first assume a scenario where all social origin groups in our data were equally likely to apply to gender-atypical fields of study. If applicants with the highest (lowest) level of parental education would now increase their share of gender-atypical applications by 1.5 percentage points, the absolute number of young people considering gender-atypical programmes would rise by 120 (1,016) applicants in the case of the vocational sector and 273 (161) applicants in the case of university education.[1] We will apply the same threshold value for both



Legend:

1. Of all the young people born in Finland between 1989-91 (n=192,057), we excluded
   - path X.1: those who did not apply to any post-compulsory schooling when aged 16-22 (2.5%)
   - path X.2: those who applied only to general, but not field-specific education when aged 16-22 (2.1%)

   Note that compulsory education for the cohorts in our study ended after the lower secondary stage. Starting with August 2021, compulsory education in Finland has been extended to include also the upper secondary level.

2. Young people in our analytical sample (n=180,958) submitted their first field-specific application:
   - path A: *after* having applied to high school in previous years (42.9%)
   - path B.1: to vocational schools, but simultaneously with a high school application (19.4%)
   - path B.2: to vocational schools, without any previous or current high school application (37.7%)

3. Among those who had previously only applied to high school (path A):
   - path A.1: 61.4% applied to university
   - path A.2: 29.0% applied to polytechnics
   - path A.3: 9.6% applied to vocational schools

   as the highest educational level targeted on their first field-specific application.

4. Pathways *after* the first field-specific application (S.1, S.2, and any subsequent applications after A.1, A.2, A.3) are not considered in this article.

Figure 1. Overview of the Finnish educational system and the application pathways included in this study's analyses

parental education and parental class across all target levels of education.

Given that our data comprises entire birth cohorts, the role that inferential statistics should play in our analyses is not self-evident (Bollen, 1995). Therefore, we chose to focus primarily on the direction and substantive size of conditional associations and treat the data as a true population. However, for readers favouring a superpopulation approach, we also present the corresponding standard errors (which are cluster-robust to accommodate a small degree of dependence between observations due to occasional siblings in the data) and *P*-value threshold markers.

First-Time Application to an Educational Level That Requires a Field Specialization

Our analyses centre on young people's *first application* to an educational level that requires specializing in a particular field of study within the Finnish educational system. We open the observation window in the year the young people in our data end their lower secondary education (age 16) and close it after the year they turn 22. We categorize applicants according to the highest educational level they targeted in the first year they submit a field-specific application, which includes vocational upper secondary schools, polytechnics, and universities (Figure 1). Consequently, this also means that the applicants to the university and polytechnic programmes in our analyses are those who had *never applied to the vocational track*, but had kept their focus exclusively on general tracks (high school) during the upper secondary stage (paths A.1 and A.2 in Figure 1). In contrast, our models comprising vocational applicants include both 'direct' vocational applicants (path B.2 in Figure 1) as well as those who combined their vocational application with a previous or current high school application (paths A.3 and B.1 in Figure 1).

We argue that this restriction to the first field-specific application should most effectively capture social origin effects with regard to both status attainment motives and socialization-based interests. First, the young people in our university and polytechnic models are those with unequivocal high status maintenance or upward mobility aspirations, while the vocational applicants include those who were at the very least doubtful about such an exclusively academic pathway. Second, although this first application may differ quite substantially from the eventual educational pathways and outcomes of the young people concerned, the impact of family-based social environments on young people's aspirations should nevertheless be largest at this first point in time when young people consider educational specializations. By contrast, later applications may be more (though not completely) independent from parental or peer influence and to a larger extent shaped by young adults' own life course experiences (Fan and Marini, 2000).

Defining Gender-Atypical, Balanced, and Gender-Typical Fields of Study

We regard male-dominated fields as gender-atypical for women and female-dominated fields as gender-atypical for men. In categorizing fields as male- or female-dominated, we rely on programme-specific official educational enrolment statistics published by the Finnish National Agency for Education (Vipunen Education Statistics Finland, 2021b), which differentiate between 56 and 68 detailed fields of study within each level of education. We apply these gender labels separately for each level of education, defining fields as female-dominated (male-dominated) if women's (men's) average odds of enrolment were more than three times greater than men's (women's) during the period 2004–2014. Applying odds ratios (OR) rather than gender percentages should help avoid problems of margin-dependency and improve the comparability of gender segregation definitions across years and levels of education (Grusky and Charles, 1998). The gender OR threshold ($OR > 3$) was chosen in order to identify those programmes that depart most clearly from gender-integration. Robustness analyses using an alternative threshold ($OR > 2$) are reported in the Supplementary Appendix 2 (see Supplementary Figures S1 and S2 and Supplementary Tables S1–S5).

To make these categorizations more palpable, Table 1 (for women) and Table 2 (for men) present an overview of the most common detailed fields among gender-atypical, gender-balanced, or gender-typical applications in our data. Labour market statistics for these detailed programmes suggest that graduates tend to achieve higher median earnings with male-dominated rather than female-dominated qualifications, although unemployment risks are frequently lower for graduates in female-dominated fields, especially at the lower- and mid-tier of the educational hierarchy (see Tables 1 and 2).

As shown in Table 3, applicants in our analytical sample included on average three programmes on their application. Furthermore, those who selected programmes from gender-atypical fields of study typically combined them with gender-balanced or gender-typical fields on their application (Table 3), which suggests an

Table 1. Characteristics of women's most common gender-atypical, gender-balanced, and gender-typical fields of study in the data, by detailed field and level of application

Top 5 atypical fields				Top 5 balanced fields				Top 5 typical fields			
Detailed field	Percent of women's atypical fields in data	Earnings (percent unemployed)[a]	Male–female OR[b] (percent female)	Detailed field	Percent of women's balanced fields in data	Earnings (percent unemployed)[a]	Female–male OR[b] (percent female)	Detailed field	Percent of women's typical fields in data	Earnings (percent unemployed)[a]	Female–male OR[b] (percent female)
VET applicants											
Building	23.5	28,600 (17.5)	16.0 (7.0)	Business	30.6	25,300 (9.6)	1.6 (60.1)	Nursing	37.7	27,400 (4.8)	9.8 (88.8)
ICT	20.6	29,300 (10.9)	5.7 (17.9)	Hotel, restaurants	30.4	22,900 (11.5)	2.6 (71.3)	Hair, beauty	37.3	18,700 (7.0)	53.9 (98.1)
Motor vehicles	17.2	30,600 (9.3)	11.6 (9.1)	Audiovisual media	10.0	25,700 (13.2)	0.9 (53.1)	Textiles	9.0	19,600 (15.2)	17.6 (94.5)
Electricity, energy	13.9	32,100 (10.7)	43.1 (2.9)	Handicrafts	8.0	18,800 (15.1)	2.6 (72.2)	Travel, tourism	5.6	20,150 (11.2)	5.0 (83.4)
Mechanics, metal	10.4	30,300 (14.2)	24.6 (4.5)	Materials	7.4	27,700 (15.8)	0.4 (30.9)	Child care	4.5	23,300 (7.6)	6.4 (85.7)
Other fields	14.4			Other fields	13.6			Other fields	5.9		
Total (per cent)	100				100				100		
Total (*N*)	6,921				35,716				27,878		
Polytechnic applicants											
ICT	28.7	36,700 (6.1)	7.5 (16.1)	Business	51.1	30,200 (4.1)	1.6 (62.9)	Nursing	30.5	31,200 (1.4)	8.0 (88.2)
Building	18.5	39,200 (3.2)	7.7 (14.2)	Audiovisual media	20.6	25,500 (12.0)	1.0 (53.8)	Social work	20.0	27,600 (3.5)	7.1 (87.9)
Engineering	13.4	36,00 (6.2)	3.5 (25.6)	Sports	8.9	25,000 (3.9)	1.2 (49.1)	Travel, tourism	12.0	24,400 (5.3)	4.1 (81.7)
Mechanics, metal	8.1	39,500 (5.5)	20.2 (6.0)	Music, perf. arts	4.3	16,400 (14.4)	1.3 (60.4)	Therapy, rehab.	8.2	26,100 (3.9)	4.1 (81.9)
Forestry	6.8	32,700 (5.7)	3.8 (23.9)	Crop, livestock	4.0	25,700 (4.4)	1.1 (55.8)	Fashion, design	6.4	20,800 (9.8)	3.4 (79.4)
Other fields	24.5			Other fields	11.1			Other fields	22.9		
Total (per cent)	100				100				100		
Total (*N*)	1,154				5,504				11,170		
University applicants											
Engineering	30.6	51,900 (6.2)	6.5 (17.8)	Business	12.8	48,500 (4.2)	1.3 (47.5)	Languages	32.8	33,300 (5.6)	4.4 (82.5)
ICT	22.6	48,600 (3.2)	6.9 (16.8)	Primary teaching	12.4	39,600 (1.7)	2.8 (75.9)	Psychology	12.9	36,600 (2.4)	4.2 (82.7)
Physics	21.4	43,700 (4.7)	3.4 (26.2)	Chemistry	6.9	41,900 (5.5)	1.1 (56.4)	Pre-school teaching	11.3	25,850 (1.5)	10.3 (92.1)

(continued)

Table 1. (Continued)

Top 5 atypical fields				Top 5 balanced fields				Top 5 typical fields			
Detailed field	Percent of women's atypical fields in data	Earnings (percent unemployed)[a]	Male–female OR[b] (percent female)	Detailed field	Percent of women's balanced fields in data	Earnings (percent unemployed)[a]	Female–male OR[b] (percent female)	Detailed field	Percent of women's typical fields in data	Earnings (percent unemployed)[a]	Female–male OR[b] (percent female)
Electricity, energy	12.5	53,400 (4.0)	9.0 (12.2)	Law	6.7	54,900 (2.8)	1.3 (60.0)	Education science	9.0	36,400 (3.5)	6.4 (87.7)
Mechanics, metal	8.6	51,700 (3.7)	14.8 (7.8)	History	5.6	30,300 (7.1)	1.5 (62.7)	Literature	8.0	34,600 (5.7)	3.8 (81.1)
Other fields	4.3			Other fields	55.6			Other fields	26.0		
Total (per cent)	100				100				100		
Total (N)	2,939				22,290				13,506		

[a]Median gross annual earnings from (self-/)employment (in euro, rounded) and share unemployed among 25–54 year olds in 2010, by field and level of highest educational qualification.
Source: Statistics Finland (2021), own calculations.
[b]Numbers refer to enrolled students, averaged across the years 2004–2014.
Source: Vipunen Education Statistics Finland (2021b), own calculations.

element of diversity and flexibility in applicants' preferences.

In our binary logit models, we thus focus separately on whether or not young men and women have listed *any gender-atypical* programme and *any gender-typical* programme on their application. This means that in contrast to previous studies, we do not require applicants to have singled out these fields as their highest-ranking choice (Dryler, 1998) or to have enrolled in these fields eventually (Seehuus, 2019), only to have considered gender-(a)typical fields seriously enough to include them on their application. This is because we regard choice ranking and enrolment as subsequent processes to deciding on the choice set, subject to possibly distinct social mechanisms. Nevertheless, our primary focus on whether any gender-atypical fields have been included at all does obscure differences in the strength of applicants' gender-atypical orientations. As shown in Table 3, applicants to gender-atypical fields divide roughly evenly between those with a stronger and those with a weaker emphasis on gender-atypical programmes (as indicated by the share of gender-atypical fields on their application).[2] To add further nuance to our main results, we also present a series of multinomial logit models that differentiate between this weak and stronger gender-atypical orientation among applicants (Appendix Table A1).

Key Independent Variables

Parents' education refers to the highest qualification children's parents had obtained by the time the child turned 15 years of age. We distinguish secondary or lower education, short-cycle tertiary qualifications (including qualifications from the now defunct vocational colleges and bachelor degrees), and university degrees (i.e. master's level or higher).[3]

We measure *parental social class* using a modified version of the Erikson–Goldthorpe–Portocarero (EGP) class scheme, condensing it into five categories: the higher service class (EGP I), lower service class (EGP II), small business owners and farmers (EGP IV), skilled manual and non-manual working class occupations (EGP III, V, VI), and a category combining parents in low-skilled working class occupations (EGP VII) with those never observed as working in our data. We assigned a parent's EGP class based on the class position we observed most frequently during the time the children in our data were 7–15 years old.

For reasons of parsimony, we apply the dominance approach when defining parental occupation and education, which means that the parent in the more

Table 2. Characteristics of men's most common gender-atypical, gender-balanced, and gender-typical fields of study in the data, by detailed field and level of application

Top 5 atypical fields				*Top 5 balanced fields*				*Top 5 typical fields*			
Detailed field	Percent of men's atypical fields in data	Earnings (per cent unemployed)[a]	Female–male OR[b] (percent female)	Detailed field	Percent of men's balanced fields in data	Earnings (percent unemployed)[a]	Female–male OR[b] (percent female)	Detailed field	Percent of men's typical fields in data	Earnings (percent unemployed)[a]	Male–female OR[b] (percent female)
VET applicants											
Nursing	46.7	27,400 (4.8)	9.8 (88.8)	Business	30.4	25,300 (9.6)	1.6 (60.1)	Electricity, energy	43.9	32,100 (10.7)	43.1 (2.9)
Travel, tourism	17.1	20,150 (11.2)	5.0 (83.4)	Materials	28.7	27,700 (15.8)	0.4 (30.9)	Mechanics, metal	22.6	30,300 (14.2)	24.6 (4.5)
Child care	15.1	23,300 (7.6)	6.4 (85.7)	Hotel, restaurants	16.7	22,900 (11.5)	2.6 (71.3)	Building	18.3	28,600 (17.5)	16.0 (7.0)
Horticulture	5.7	19,800 (18.9)	3.7 (79.0)	Audiovisual media	9.7	25,700 (13.2)	1.1 (53.1)	ICT	7.1	29,300 (10.9)	5.7 (17.9)
Hair, beauty	5.2	18,700 (7.0)	53.9 (98.1)	Crop, livestock	5	23,300 (6.2)	1.8 (65.0)	Motor vehicles	4.2	30,600 (9.3)	11.6 (9.1)
Other fields	10.2			Other fields	9.5			Other fields	3.9		
Total (per cent)	100				100				100		
Total (*N*)	3,209				29,523				55,391		
Polytechnic applicants											
Therapy	23.7	26,100 (3.9)	4.1 (81.9)	Business	51.9	30,200 (4.1)	1.6 (62.9)	ICT	22.2	36,700 (6.1)	7.5 (16.1)
Nursing	20.8	31,200 (1.4)	8.0 (88.2)	Audiovisual media	16.8	25,500 (12.0)	1.0 (53.8)	Building	17.9	39,200 (3.2)	7.7 (14.2)
Social work	13.6	27,600 (3.5)	7.1 (87.9)	Sports	12.7	25,000 (3.9)	0.8 (49.1)	Mechanics, metal	17.7	39,500 (5.5)	20.2 (6.0)
Tourism	12.8	24,400 (5.3)	4.1 (81.8)	Chemical engin.	5.1	32,200 (7.6)	1.2 (48.7)	Electronics	10.9	39,600 (5.8)	23.0 (5.0)
Hotel, restaurants	9.8	28,300 (4.3)	3.0 (77.2)	Crop, livestock	4.1	25,700 (4.4)	0.9 (55.8)	Motor vehicles	9.4	39,200 (2.8)	26.9 (4.3)
Other fields	19.3			Other fields	9.4			Other fields	21.9		
Total (per cent)	100				100				100		
Total (*N*)	2,888				4,523				5,537		
University applicants											
Languages	39.0	33,300 (5.6)	4.4 (82.5)	Business	21.5	48,500 (4.2)	0.8 (47.5)	Mechanics, metal	28.6	51,700 (3.7)	14.7 (7.8)
Psychology	14.6	36,600 (2.4)	4.2 (82.7)	Chemistry	6.6	41,900 (5.5)	1.1 (56.4)	ICT	19.2	48,600 (3.2)	6.9 (16.8)
Pharmacy	8.6	35,100 (1.6)	3.1 (77.5)	Law	6.4	54,900 (2.8)	1.3 (60.0)	Engineering	17.9	51,900 (6.2)	6.5 (17.8)

(continued)

Table 2. (Continued)

Top 5 atypical fields				*Top 5 balanced fields*				*Top 5 typical fields*			
Detailed field	Percent of men's atypical fields in data	Earnings (per cent unemployed)[a]	Female–male OR[b] (percent female)	Detailed field	Percent of men's balanced fields in data	Earnings (percent unemployed)[a]	Female–male OR[b] (percent female)	Detailed field	Percent of men's typical fields in data	Earnings (percent unemployed)[a]	Male–female OR[b] (percent female)
Sociology	8.1	35,300 (3.9)	3.4 (79.3)	Environm. tech.	5.9	37,300 (5.9)	0.9 (51.9)	Electricity, energy	15.1	53,400 (4.0)	9.0 (12.2)
Literature	7.3	34,600 (5.7)	3.8 (81.1)	Medicine	5.3	74,100 (0.7)	1.4 (61.9)	Physics	9.7	43,700 (4.7)	3.4 (26.2)
Other fields	22.4			Other fields	54.3			Other fields	9.5		
Total (per cent)	100			Total (per cent)	100			Total (per cent)	100		
Total (N)	2,861			Total (N)	15,358			Total (N)	7,635		

[a]Median gross annual earnings from (self-/)employment (in euro, rounded) and share unemployed among 25–54 year olds in 2010, by field and level of highest educational qualification.
Source: Statistics Finland (2021), own calculations.
[b]Numbers refer to enrolled students, averaged across the years 2004–2014.
Source: Vipunen Education Statistics Finland (2021b), own calculations.

advantaged position (within each domain) serves as our main point of reference for defining children's social origins. In the Supplementary Appendix 2, we report additional models that explore whether results differ depending on whether the mother, the father, or both parents constitute the source of an advantageous social origin (Supplementary Tables S5–S8).

Control Variables

Our models include percentile ranks of *household income*, calculated based on the average equivalized and deflated annual gross household income during the child's compulsory schooling years (age 7–15). As economic well-being is likely to be confounded with other dimensions of social origin, we control for this predictor in order to improve our measurement of the independent associations of parental education and parental class with gendered field of study choices. Similarly, our models contain children's *grade point average* in the final year of lower secondary school (as decile ranks), in order to purge our results from such social origin differences in field of study choices that are less likely to derive from socialization or risk assessments, but rather from social inequalities in scholastic success and subsequent admission restrictions.

To improve model predictions, we add further variables that may capture additional sociocultural factors associated with gendered educational aspirations. Children who *lived with both parents by the time they turn 15* may differ from children in single- and step-parent families with regard to the intensity of exposure to their parents' social resources and gender socialization influences. Areas with differing *urbanization degrees* (rural, semi-rural, urban) may shape young people's perspectives via differences in local culture as well as available educational and occupational opportunities. Similarly, net of differences in socioeconomic resources, children with *at least one immigrant parent* may have experienced additional cultural influences with regard to family dynamics and socialization patterns, which may potentially affect their outlook and aspirations. Table 4 lists the summary statistics for the key predictors and control variables used in our study.

Results

Does Higher Parental Education Increase Young People's Interest in Alternatives to Gender-Typical Fields of Study?

With regard to young women applying to vocational secondary education, our results contradict our socialization

Table 3. Applicants' choice set and numbers of programmes on their first field-specific application. Means and column percentages

	Women			Men		
Variable	*Vocational*	*Polytechnic*	*University*	*Vocational*	*Polytechnic*	*University*
Number of programmes listed on application (mean)	2.8	3.2	3.1	3.0	3.0	3.2
Field combinations on first application (column per cent)						
Typical only	19.9	55.4	20.3	51.5	32.9	15.3
Balanced only	32.2	13.7	44.4	11.0	18.0	47.8
Atypical only	2.5	1.7	0.9	0.9	11.2	4.7
Combined without atypical	33.1	22.4	25.0	32.5	17.0	22.0
Combined with atypical	12.3	6.8	9.4	4.1	21.0	10.1
Share of gender-atypical programmes on application (column per cent)						
At least 50 per cent	6.8	4.4	4.3	2.2	22.3	9.1
Some, but <50 per cent	7.9	4.2	6.0	2.8	9.8	5.7
No gender-atypical programmes	85.3	91.5	89.6	95.0	67.9	85.2
Number of observations	46,984	13,524	28,379	63,765	8,987	19,319

hypothesis (H1a), given that female applicants with university-educated parents are 15 per cent *less* likely (Figure 2, upper left panel) to apply to gender-atypical fields compared to women whose parents have at most secondary education (–2.2 percentage points, see Supplementary Appendix Table 1). However, we do find a small decrease of –6 per cent (Figure 2, lower left panel) in women's average probability to apply to gender-typical fields if their parents had a university degree (–3.8 percentage points, see Supplementary Appendix Table 2). Although parental education thus appears to slightly lower gender-typicality, it also tends to *decrease* rather than increase gender-atypicality for women at this education level (against H1a). Broadly similar trends are found among women applying to the polytechnics, although absolute effect sizes remain below our threshold for substantive significance (see Supplementary Appendix Tables 1 and 2).

For young women submitting a university application, on the other hand, we find women with highly educated parents to be much more inclined (by 43 per cent, corresponding to 3.6 percentage points, see Supplementary Appendix Table 1) towards including gender-atypical fields on their application compared to women from non-academic family backgrounds (Figure 2, upper right panel). However, contrary to H1a, this increased gender-atypical interest fails to be accompanied by a reduction in gender-typical applications among women from highly educated families, net of other social origin measures (Figure 2, lower right panel, and Supplementary Appendix Table 2).

In the case of men, applications to the vocational sector conform in direction to expectations derived from hypothesized parental education differentials in gender socialization (H1a). However, due to the very low overall level of gender-atypical applications among men at this educational level, the higher relative interest (by 23 per cent, Figure 3, upper left panel) in gender-atypical fields among vocational applicants with university-educated parents remains very weak in absolute terms (below our threshold of 1.5 percentage points, see Supplementary Appendix Table 3). High levels of parental education also slightly lower men's probability for considering gender-typical fields (–5 per cent, Figure 3) on their vocational application (–4.5 percentage points, Supplementary Appendix Table 4). We find these patterns replicated also among applicants to the polytechnic level, with larger absolute effect sizes (see Supplementary Appendix Tables 3 and 4).

With regard to university applications, on the other hand, men with university-educated parents do not appear to be substantially more open towards gender-atypical fields (right upper panel in Figure 3 and Supplementary Appendix Table 3). In fact, our models suggest they may be even slightly more inclined (by 7 per cent, lower panel of Figure 3) than men with lower-educated parents to apply to gender-typical university fields (+2.7 percentage points, see Supplementary Appendix Table 4).

Overall, our results regarding both men's and women's field of study applications across the educational hierarchy contradicted more often than supported the expectations derived from the hypothesis of social origin differentials in gender socialization (H1a). Importantly, the parental education differentials we found were inconsistent in their direction not only between men and women, but also between lower and higher levels of education (against H1b).

Table 4. Descriptives of variables: frequency distributions (per cent) of categorical variables; means and standard deviations (SD) of continuous variables

A. Frequency distributions by gender (column per cent)

Categorical variables	Women	Men	Total
Included at least one gender-atypical field			
No	87.6	90.3	89.0
Yes	12.4	9.7	11.0
Included at least one gender-balanced field			
No	28.5	46.3	37.6
Yes	71.5	53.7	62.4
Included at least one gender-typical field			
No	40.9	25.5	33.1
Yes	59.1	74.5	66.9
Target level of first field-specific application			
Vocational school	52.9	69.3	61.2
Polytechnic	15.2	9.8	12.4
University	31.9	21.0	26.4
Parents' highest level of education			
Secondary or less	48.0	48.4	48.2
Short tertiary	35.2	34.9	35.1
University	16.7	16.7	16.7
Parents' class position			
Higher service (EGP I)	18.4	18.4	18.4
Lower service (EGP II)	27.5	27.4	27.5
Own business (EGP IV)	15.3	15.0	15.2
Skilled (EGP III, V, VI)	28.1	28.3	28.2
Low-skilled (EGP VII) or none	10.7	10.8	10.7
Urbanization degree of municipality at age 15			
Urban	57.5	57.0	57.2
Semi-urban	19.7	19.9	19.8
Rural	22.7	23.1	22.9
Has at least one immigrant parent			
No	98.2	98.1	98.1
Yes	1.8	1.9	1.9
Lived with both parents when age 15			
No	34.0	34.1	34.1
Yes	66.0	65.9	65.9

B. Means and standard deviations (SD) by gender

	Women		Men		Total	
Continuous variables	***Mean***	***SD***	***Mean***	***SD***	***Mean***	***SD***
Average equivalized household income	22,071.5	29,070.4	22,038.6	21,879.2	22,054.7	25,664.5
Lower secondary GPA	8.1	0.9	7.5	0.9	7.8	0.9
Number of observations	88,887		92,071		180,958	

High Status Educational Pathways and Gender-Devalued Fields: Parental Class Gradients in Gendered Field Choices at the University Level

Turning our attention to the social mobility hypothesis, we find our results to conform to our expectations among university applicants (H2). Net of other controls, women from the higher service class are 27 per cent more likely to include a gender-atypical field and 15 per cent less likely to consider a gender-typical field on their university application (Figure 4, upper and lower right

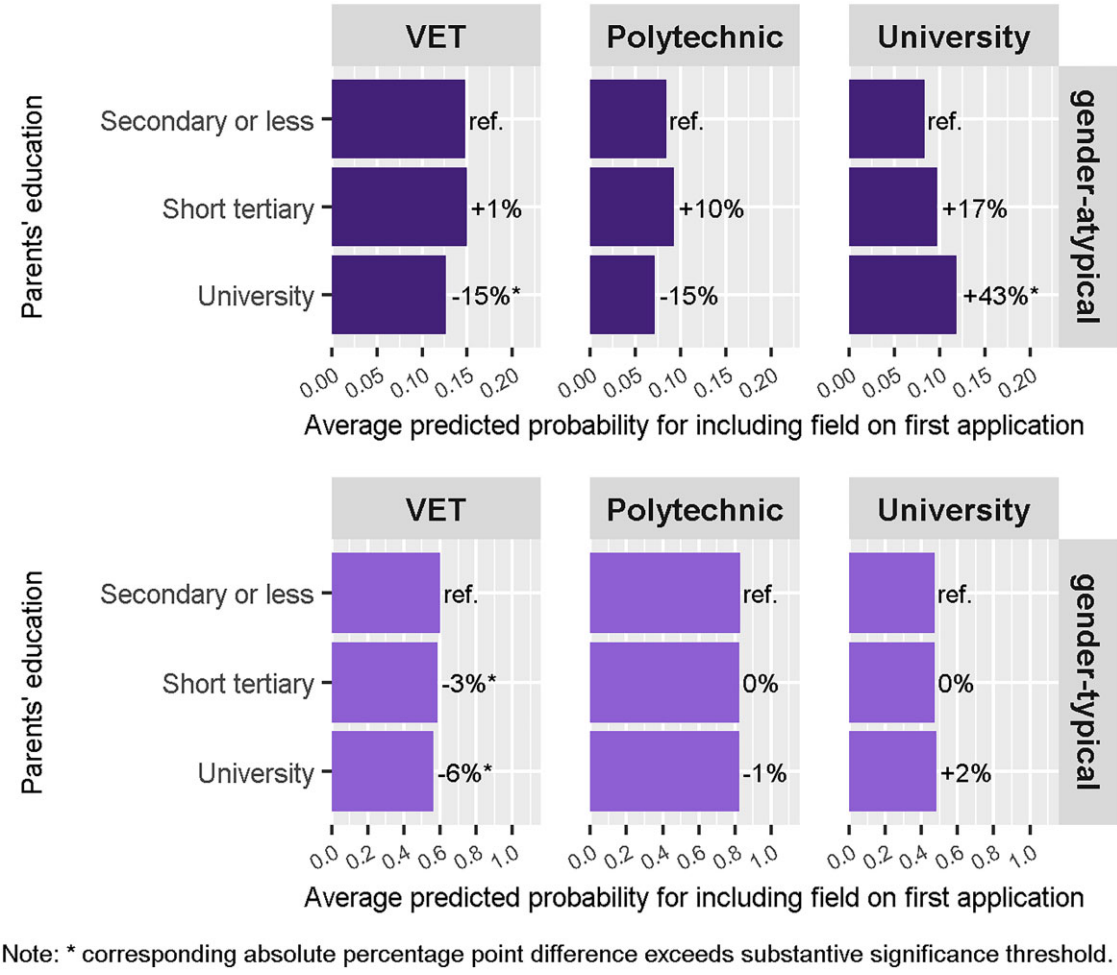


Figure 2. Women's average probability to include gender-atypical and gender-typical fields on their first application, by target level of education and parental education (results derived from fully adjusted Model 3 in Supplementary Appendix Tables 1 and 2)

panel) compared to women from the skilled working class (+2.6 percentage points and −7.9 percentage points, respectively; see Model 3 in Supplementary Appendix Tables 1 and 2).

In line with our social mobility expectations at this sector, the direction of social class gradients is reversed among men (H2b). Higher service class men are 17 per cent less likely to consider gender-atypical fields and 11 per cent more likely to include gender-typical fields on their university application (Figure 5), compared to working class applicants (−2.8 percentage points and +4.3 percentage points, respectively; see Model 3 in Supplementary Appendix Tables 3 and 4). Our polytechnic results broadly echo these patterns, particularly among women and to a lesser extent among men.

Low Status Educational Pathways and Class-Devalued Fields: Parental Class Gradients in Gendered Field Choices among Vocational Applicants

At the vocational level, we find that the service class preference for male-dominated fields previously observed among male and female university applicants does not extend to this educational level. In line with our social mobility expectation (H3a), women from higher service class origins are less likely (−4 per cent, lower left panel in Figure 4) than women with working class backgrounds to include gender-atypical fields on their vocational application, but absolute effect sizes fall below our substantive significance threshold (<|1.5| percentage points, see Model 3 in Supplementary Appendix Table 1).

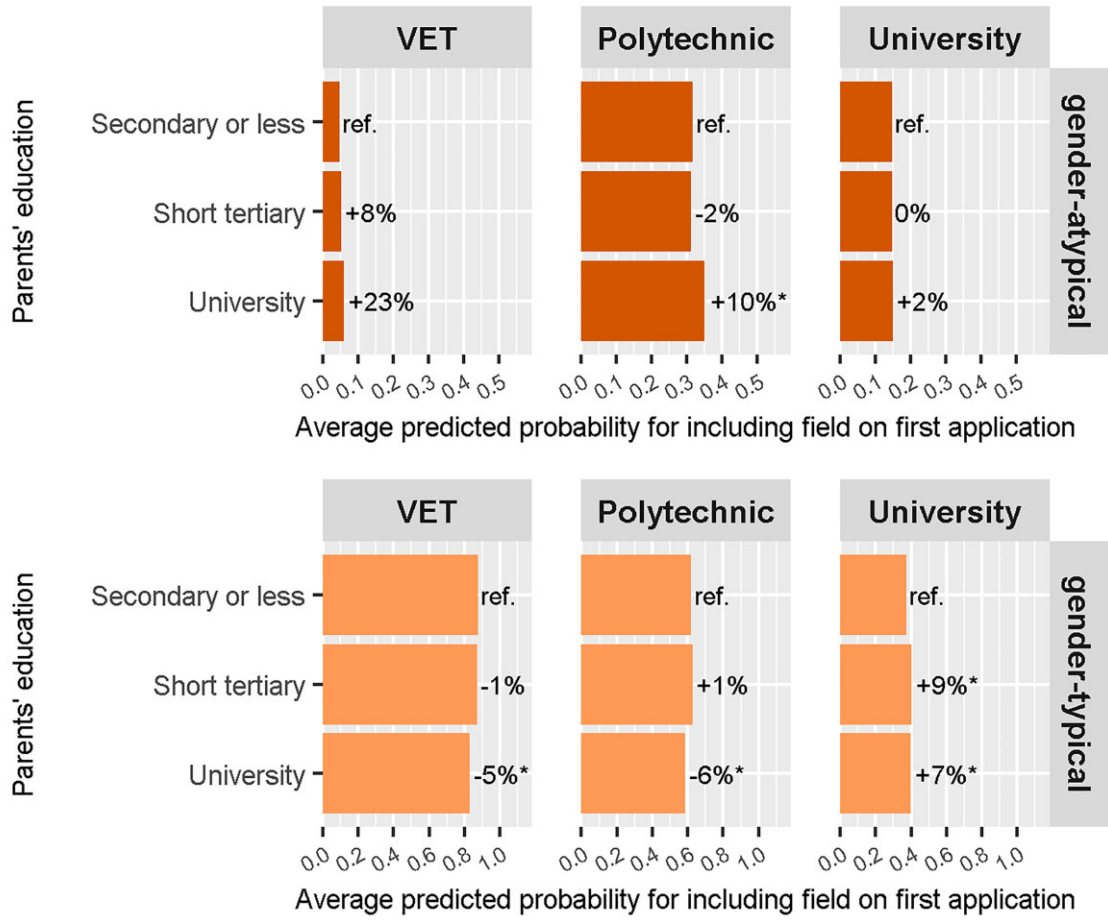


Figure 3. Men's average probability to include gender-atypical and gender-typical fields on their first application, by target level of education and parental education (average probabilities derived from fully adjusted Model 3 in Supplementary Appendix Tables 3 and 4)

Conversely, downwardly mobile higher service class men are 5 per cent less likely to include male-dominated fields on their vocational application (Figure 5, lower panel) compared to working class applicants (–4.8 percentage points, see Supplementary Appendix Table 4). However, contrary to our expectations, higher service class applicants failed to exceed their working class peers in terms of their interest in female-dominated vocational fields (–10 per cent corresponding to $<|1.5|$ percentage points, see Supplementary Appendix Table 3).

In summary, support for H3 remains partial with rather weak class gradients overall. Women on a downward mobility trajectory expectedly avoided gender-atypical fields, but the strength of this social origin gradient fell short of our expectations (H3a). Men on a downwardly mobile trajectory clearly avoided gender-typical fields (in line with H3b), without however being drawn into gender-atypical fields (against H3b).

Social Origin Gradients in the Strength of Gender-Atypical Preferences and Robustness Checks

To explore further nuances in the relationship between social origin and gender-atypical aspirations, we next differentiated between a greater and lower intensity in gender-atypical orientation on young people's application, as indicated by the share of gender-atypical programmes included (Appendix Table A1). Among

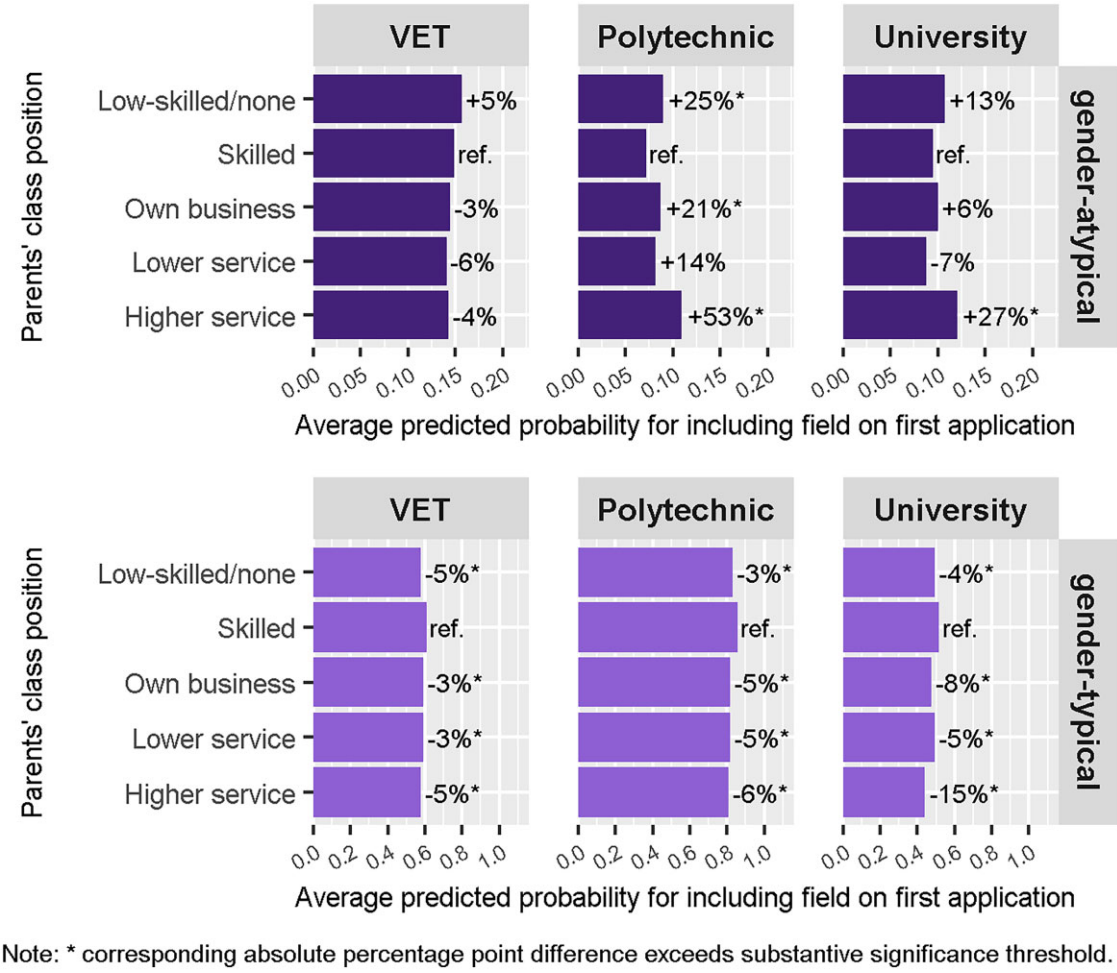


Figure 4. Women's average probability to include gender-atypical and gender-typical fields on their first application, by target level of education and parental class (results derived from fully adjusted Model 3 in Supplementary Appendix Tables 1 and 2)

women, applicants with university-educated parents were only more likely to include a weak (but not a strong) emphasis on gender-atypical programmes on their university application, suggesting that parental education may indeed increase openness, but not necessarily strong commitment, to gender-atypical programmes among female university applicants. At the vocational level, in turn, young women with university-educated parents were more likely to *avoid* application profiles with a weak atypical emphasis compared to those with lower-educated parents. Possibly, women with highly educated parents making the unlikely choice of applying to vocational education aim at entering quite particular programmes, leading to lower diversity of (gendered) programmes on their application. With regard to women's social class origins, on the other hand, we found similar associations in direction and strength for both stronger and weaker gender-atypical application profiles at all target levels.

Among men, parental education gradients remained weak in terms of absolute effect sizes and did not clearly distinguish between a strong or weak emphasis on gender-atypical programmes. However, higher service class men's reluctance regarding gender-atypical higher education fields centred most clearly on avoiding a strong emphasis on gender-atypical programmes. This may suggest that status reproduction strategies among male university applicants preclude dedicated commitment more than a sense of openness towards gender-atypical fields.

Further robustness analyses, which apply alternative gender-domination thresholds and differentiate the parental source of advantaged origins, did not substantially alter

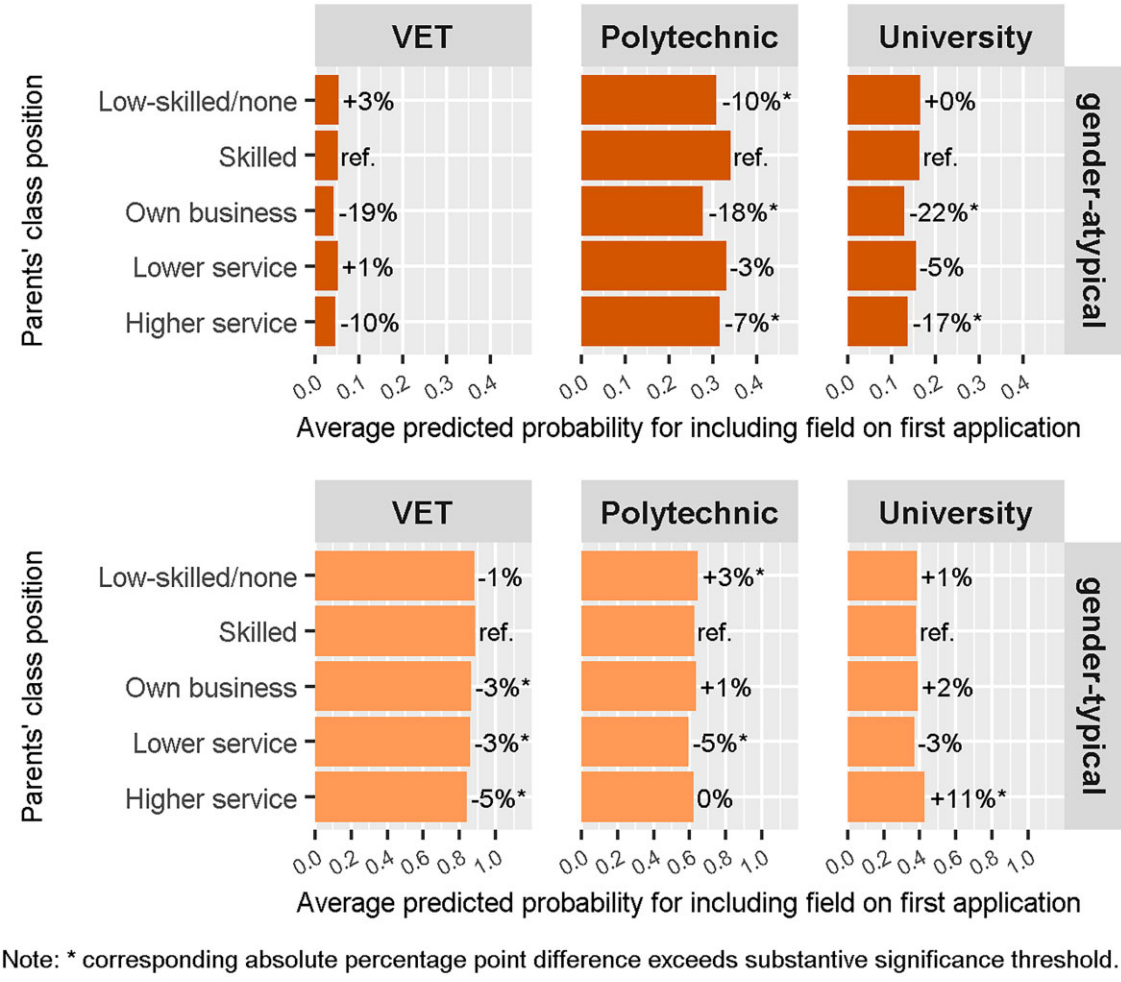


Figure 5. Men's average probability to list gender-atypical and gender-typical fields on their first application, by target level of education and parental class (results derived from fully adjusted Model 3 in Supplementary Appendix Tables 3 and 4)

our main conclusions. We report them in more detail in the Supplementary Appendix 2 (Supplementary Tables S1–S5).

Discussion and Conclusion

How and why does social origin matter for gender-segregated field of study choices? One common view is that social background's significance derives from the less traditional gender socialization experienced by children from advantaged social origins (Dryler, 1998; Polavieja and Platt, 2014; Chesters, 2021). This predominately cultural interpretation of social origins sets the gender segregation literature apart from sociological research on educational attainment, where social mobility risks have been extensively debated as alternative to socialization-based mechanisms for explaining the persistence of social origin differentials in educational outcomes (Goldthorpe, 1996, 2007; van de Werfhorst and Hofstede, 2007). This literature has increasingly recognized horizontal differentiations as playing a part in strategies to secure intergenerational socioeconomic advantage (Triventi, 2013; Triventi, Vergolini and Zanini, 2017; Hällsten and Thaning, 2018), without however engaging with the issues of gender inequality that lie at the core of the gender segregation literature.

Against this background, this article aimed to bridge the gap between questions of gender segregation and social inequality in sociological research on educational outcomes. Our primary ambition in this article has been to provide a new perspective on how social inequality may matter for gender-segregated field choices. Comparing educational patterns of a complete Finnish birth cohort across

three distinct levels in the Finnish educational hierarchy, we proposed a perspective drawing on differential mobility risks to examine how and in what contexts young people's social background acts to promote or deter gender-(a)typical interests. Additionally, our comparative approach of pathways through the educational system allowed us to shed some new light on the old question as to whether social differentials in gender socialization patterns may underpin variations observed in young people's gender-(a)typical educational aspirations. Based on previous work on the multidimensionality of social origins (Bukodi and Goldthorpe, 2013; Hällsten and Thaning, 2018), we considered parental education as a likely conduit for socialization-based inclinations towards gender-(a)typical fields (Davis and Greenstein, 2009) and assumed parental class gradients to follow patterns derived from our adaption of risk aversion theory (Goldthorpe, 1996). Our analytical setup thus accommodated the possible simultaneous expression of risk aversion and socialization mechanisms. We believe our focus on the (sometimes quite diverse) range of fields young people considered on their application, before institutional admissions procedures place further constraints on young peoples' choices, was particularly suited to gauging these dynamics.

Overall, the results of our analyses have shown the limits of a strongly culturally framed interpretation of how social origin affects gendered field choices for this Finnish cohort. This is because applicants with highly educated parents were sometimes more, but often also less inclined than their peers with low-educated parents to consider alternatives to gender-typical fields. For instance, high parental education increased women's gender-atypical application only if they applied to the university sector, but not when submitting vocational applications. Similarly, high parental education lowered the gender-typicality men chose on their vocational application, but not if they applied to university.

Although it may be the case that 'men lose money and suffer cultural disapproval when they choose traditionally female-dominated fields' (England, 2010: pp. 155), this could still be a smaller price to pay for the net social mobility working class men may attain via a university pathway. Indeed, in line with our expectations derived from risk-based social mobility arguments, we found that working class men were more likely to include and even emphasize female-dominated programmes on their university application compared to their male peers from higher service class backgrounds. Echoing previous research on socially stratified field of study choices at the tertiary level (e.g. Thomsen, 2015), applicants from advantaged origins may experience greater pressures to consolidate their family's prestige and class position also via their field choice. Coherent with this line of argument, we found women from advantaged class origins as more likely than their working class peers to consider gender-atypical university programmes, which resonates also with recent Norwegian findings (Seehuus, 2019). Social mobility and status reproduction strategies may thus simultaneously reinforce and weaken gender segregation tendencies in education.

As part of our social mobility argument, we expected that male-domination may not in all contexts feature as a marker of prestige and advantageous labour market prospects (see also Magnusson, 2009). In fact, we expected higher service class applicants applying to vocational fields to perceive particularly *male*-dominated vocational fields as possible exacerbating rather than buffering the status loss implied by their aspired educational pathway, due to the stronger manual, blue-collar connotations coupled with potentially declining employment prospects in these fields. Indeed, our results showed that sons (and, in a more restricted sense, daughters) of the higher service class tended to avoid male-dominated vocational fields, despite their (relative) preference for these fields at the university level. Against our expectations, however, the possibly stronger middle-class connotation of female-typical vocational fields did not appear to compensate (to any substantially significant extent) for what may be a gender-devalued status of these domains (Ridgeway and Correll, 2004) in the eyes of downwardly mobile men (and women) to the vocational sector.

From this rather nuanced picture of social differentials in gendered educational applications, we draw two main conclusions. First, our results showed that gender-typical and gender-atypical interests appear to be context-dependent rather than stable characteristics of advantaged and disadvantaged social groups. Applicants from working class and lower educational backgrounds may be more likely to consider gender-atypical fields than their peers from service class and higher educational backgrounds in some contexts, while the exact opposite pattern may come into play in other social mobility contexts. In this sense, our study resonates with previous research that has highlighted the pragmatic ways in which the seemingly contradictory notions of gender may combine (Usdansky, 2011; Grunow, Begall and Buchler, 2018).

Second, the findings reported in this article are difficult to reconcile with approaches that implicitly or explicitly draw on cultural deficit notions of social origin when explaining differences in gender-(a)typical interests. We do not dispute that gendered ideology and self-concepts developed via socialization processes may have a role to play in shaping interests and the valuation of

gendered domains. Indeed, whether or not particular fields constitute a risk in terms of prestige and status (rather than economic security) may in itself also be culturally shaped (Helland and Wiborg, 2019). However, the contradictory ways in which social origin was associated with gendered application patterns across the educational hierarchy nevertheless calls into doubt the idea that particular cultures, specific to low- and high-educated social groups and expressed through distinct patterns of gender socialization, should qualify as the primary explanatory mechanism for social differentials in young people's gender-segregated applications.

Finally, note that a number of limitations characterize our research. Gender socialization differences may not be captured sufficiently by differences in parental education, or they may also have attenuated in recent birth cohorts. Furthermore, the fact that parts of our downward social mobility hypotheses were only partly supported encourages further research on the relevance of social mobility considerations for gender-(a)typical field choices. Most obviously, despite our ambitions to present a nuanced picture utilizing high-quality register-based data, our analyses cannot give a definitive answer regarding the causal nature and the exact mechanisms linking social origin with gendered field of study choices. Instead of directly gauging the conscious and unconscious motives that young people attach to gender- and class-based educational decisions, we have relied on interpreting indirect evidence. Scholars needs to continue unpacking the ways in which cultural and socioeconomic aspects of social origin, for instance via the constellation of mothers' and fathers' social resources, may create and resolve contradictory pulls with regard to gender- and class-normative behaviour in the context of social stratification and social mobility processes.

Notes

1 These figures are roughly comparable to the yearly intake in small- to medium-sized detailed fields. Among new vocational students aged 15–19, 102 started in female-dominated horticulture and 1,440 in male-dominated mechanics and metal programmes in 2017. Among new university students (aged 20–24) in 2017, 225 started in female-dominated pharmacy programmes and 171 in male-dominated electricity and energy (Vipunen Education Statistics Finland, 2021b).

2 Note that the high share of men's gender-atypical and women's gender-typical applications at the polytechnic sector in part reflects this sector's strong links to registered health and welfare professions in Finland (e.g. nurses, physiotherapists, some types of social workers). Among first-choice polytechnic applicants (aged 19–22), 41 per cent submitted their application to the field of health and welfare in 2017 (60 per cent among women, 18 per cent among men). By comparison, health and welfare programmes attracted an overall of 8 per cent first-choice vocational applicants (aged 15–19) and 4 per cent of first-choice university applicants (aged 19–22) in 2017 (Vipunen Education Statistics Finland, 2021a).

3 Polytechnics have awarded master's degrees only since 2005, hence only a handful of parents held such a qualification during the childhood of our cohort. Therefore, we assign all polytechnic degrees (which are overwhelmingly bachelor degrees) to the short-cycle tertiary category.

Supplementary Data

Supplementary data are available at *ESR* online.

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References

Alon, S. and DiPrete, T. (2015). Gender differences in the formation of a field of study choice set. *Sociological Science*, **2**, 50–81.

Ayalon, H. (2003). Women and men go to university: mathematical background and gender differences in choice of field in higher education. *Sex Roles*, **48**, 277–290.

Barone, C. *et al.* (2019). Nudging gender desegregation: a field experiment on the causal effect of information barriers on gender inequalities in higher education. *European Societies*, **21**, 356–377.

Bernard, F., Chakhaia, L. and Leopold, L. (2017). 'Sing Me a Song with Social Significance': the (mis)use of statistical significance testing in European sociological research. *European Sociological Review*, **33**, 16–15.

Bobbitt-Zeher, D. (2007). The gender income gap and the role of education. *Sociology of Education*, **80**, 1–22.

Bollen, K. A. (1995). Apparent and Nonapparent Significance Tests. Sociological Methodology, **25**, 459–468 10.2307/271074

Bukodi, E. and Goldthorpe, J. H. (2013). Decomposing 'social origins': the effects of parents' class, status, and education on the educational attainment of their children. *European Sociological Review*, **29**, 1024–1039.

Cech, E. A. (2013). The self-expressive edge of occupational sex segregation. *American Journal of Sociology*, **119**, 747–789.

Cedefop. (2015). *Finland – Reforming Vocational Qualifications*. European Centre for the Development of Vocational Training, available from: https://www.cedefop.europa.eu/en/news-and-press/news/finland-reforming-vocational-qualifications [accessed 9 July 2021].

Chesters, J. (2021). Gender attitudes and occupational aspirations in Germany: are young men prepared for the jobs of the future? *Work, Employment and Society*, Advance online publication. Doi: 10.1177/09500170211017046.

Correll, S. J. (2001). Gender and the career choice process: the role of biased self-assessments. *American Journal of Sociology*, **106**, 1691–1730.

Davis, S. N. and Greenstein, T. N. (2009). Gender ideology: components, predictors, and consequences. *Annual Review of Sociology*, **35**, 87–105.

Dryler, H. (1998). Parental role models, gender and educational choice. *British Journal of Sociology*, **49**, 375–398.

Eberhard, V., Matthes, S. and Ulrich, J. G. (2015). The need for social approval and the choice of gender-typed occupations. In Imdorf, C., Hegna, K., Reisel, L. (Eds.), *Gender Segregation in Vocational Education*. Bingley: Emerald Group Publishing, pp. 205–235.

Eccles, J. S., Freedman-Doan, C., Frome, P., Jacobs, J., Yoon, K. S. (2000). Gender-role socialization in the family: A longitudinal approach. In: Eckes, T. and Trautner, H. M (Eds.), *The developmental social psychology of gender*. Lawrence Erlbaum Associates Publishers. pp. 333–360.

England, P. (2010). The gender revolution: uneven and stalled. *Gender & Society*, **24**, 149–166.

Fan, P.-L. and Marini, M. M. (2000). Influences on gender-role attitudes during the transition to adulthood. *Social Science Research*, **29**, 258–283.

Gabay-Egozi, L., Shavit, Y. and Yaish, M. (2015). Gender differences in fields of study: the role of significant others and rational choice motivations. *European Sociological Review*, **31**, 284–297.

Goldthorpe, J. H. (1996). Class analysis and the reorientation of class theory: the case of persisting differentials in educational attainment. *British Journal of Sociology*, **47**, 481–505.

Goldthorpe, J. H. (2007). 'Cultural Capital': some critical observations. *Sociologica: Italian Journal of Sociology Online*, **2**, 1–22.

Grunow, D., Begall, K. and Buchler, S. (2018). Gender ideologies in Europe: a multidimensional framework. *Journal of Marriage and Family*, **80**, 42–60.

Grusky, D. B. and Charles, M. (1998). The past, present, and future of sex segregation methodology. *Demography*, **35**, 497–504.

Hällsten, M. (2010). The structure of educational decision making and consequences for inequality: a Swedish test case. *American Journal of Sociology*, **116**, 806–854.

Hällsten, M. and Thaning, M. (2018). Multiple dimensions of social background and horizontal educational attainment in Sweden. *Research in Social Stratification and Mobility*, **56**, 40–52.

Helland, H. and Wiborg, Ø. N. (2019). How do parents' educational fields affect the choice of educational field? *The British Journal of Sociology*, **70**, 481–501.

Jacobs, J. A.*Revolving Doors: Sex Segregation and Women's Careers*, Stanford University Press, 1989.

Kilpi-Jakonen, E., Erola, J. and Karhula, A. (2016). Inequalities in the haven of equality? Upper secondary education and entry into tertiary education in Finland. In Blossfeld, H.-P. *et al.* (Eds.), *Models of Secondary Education and Social Inequality: An International Comparison*. Cheltenham: Edward Elgar, pp. 181–195.

Legewie, J. and DiPrete, T. A. (2014). The high school environment and the gender gap in science and engineering. *Sociology of Education*, **87**, 259–280.

Liu, R. (2020). Do family privileges bring gender equality? Instrumentalism and (de) stereotyping of STEM career aspiration among Chinese adolescents. *Social Forces*, **99**, 230–254.

Lucas, S. R. (2001). Effectively maintained inequality: education transitions, track mobility, and social background effects. *American Journal of Sociology*, **106**, 1642–1690.

Lupton, B. (2006). Explaining men's entry into female-concentrated occupations: issues of masculinity and social class. *Gender, Work & Organization*, **13**, 103–128.

Magnusson, C. (2009). Gender, occupational prestige, and wages: a test of devaluation theory. *European Sociological Review*, **25**, 87–101.

Mann, A. and DiPrete, T. A. (2013). Trends in gender segregation in the choice of science and engineering majors. *Social Science Research*, **42**, 1519–1541.

Morgan, S. L., Gelbgiser, D. and Weeden, K. A. (2013). Feeding the pipeline: gender, occupational plans, and college major selection. *Social Science Research*, **42**, 989–1005.

Ochsenfeld, F. (2016). Preferences, constraints, and the process of sex segregation in college majors: a choice analysis. *Social Science Research*, **56**, 117–132.

Polavieja, J. G. and Platt, L. (2014). Nurse or mechanic? The role of parental socialization and children's personality in the formation of sex-typed occupational aspirations. *Social Forces*, **93**, 31–61.

Prix, I. (2013). More or different education? The joint impact of educational level and fields of study on earnings stratification in Finland, 1985–2005. *Acta Sociologica*, **56**, 265–284.

Ridgeway, C. L. and Correll, S. J. (2004). Unpacking the Gender System. Gender & Society, **18**, 510–531. 10.1177/0891243204265269

Robison, J. and Stubager, R. (2018). The class pictures in citizens' minds. *The British Journal of Sociology*, **69**, 1220–1247.

Seehuus, S. (2019). Social class background and gender – (a)typical choices of fields of study in higher education. *The British Journal of Sociology*, **70**, 1349–1373.

Statistics Finland. (2021). FOLK Register Data Modules. Population Permanently Living in Finland on the Last Day of Each Year 1987–2020. User Licence Number TK-53-731-16.

Thomsen, J. P. (2015). Maintaining inequality effectively? Access to higher education programmes in a universalist welfare state in periods of educational expansion 1984–2010. *European Sociological Review*, **31**, 683–696.

Triventi, M. (2013). Stratification in higher education and its relationship with social inequality: a comparative study of 11 European countries. *European Sociological Review*, **29**, 489–502.

Triventi, M., Vergolini, L. and Zanini, N. (2017). Do individuals with high social background graduate from more rewarding fields of study? Changing patterns before and after the 'Bologna process'. *Research in Social Stratification and Mobility*, **51**, 28–40.

Usdansky, M. L. (2011). The gender-equality paradox: class and incongruity between work-family attitudes and behaviors. *Journal of Family Theory & Review*, **3**, 163–178.

van de Werfhorst, H. G. (2017). Gender segregation across fields of study in post-secondary education: trends and social differentials. *European Sociological Review*, **33**, 449–464.

van de Werfhorst, H. G. and Hofstede, S. (2007). Cultural capital or relative risk aversion? Two mechanisms for educational inequality compared. *The British Journal of Sociology*, **58**, 391–415.

Van Gent, W., Das, M. and Musterd, S. (2019). Sociocultural, economic and ethnic homogeneity in residential mobility and spatial sorting among couples. *Environment and Planning A: Economy and Space*, **51**, 891–912.

Vipunen Education Statistics Finland. (2021a). *Applicants and Selected Candidates*, available from: https://vipunen.fi/en-gb/combined/Pages/Hakeneet-ja-hyv%C3%A4ksytyt.aspx [accessed 5 July 2021].

Vipunen Education Statistics Finland. (2021b). *Students and Qualifications and Degrees*, available from: https://vipunen.fi/en-gb/combined/Pages/Opiskelijat-ja-tutkinnot.aspx [accessed 5 July 2021].

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Table A1. Share of gender-atypical programmes on first field-specific application, by gender and target level of education: strong emphasis (share of 50 per cent or more), weak emphasis (<50 per cent atypical programmes on application), none (no gender-atypical fields on application, results not shown)

	Women						*Men*					
	Vocational		Polytechnic		University		Vocational		Polytechnic		University	
	Strong	Weak	Strong	Weak	Strong	Weak	Strong	Weak	Strong	Weak	Strong	Weak
Parental education (ref. basic)												
Short tertiary	0.005	–0.004	0.005	0.004	0.004	0.010**	0.003	0.001	0.005	–0.010	0.001	–0.001
	(0.003)	(0.003)	(0.004)	(0.004)	(0.003)	(0.004)	(0.001)	(0.002)	(0.011)	(0.008)	(0.006)	(0.005)
University	–0.003	–0.019***	–0.008	–0.004	0.009*	0.026***	0.005	0.006	0.036*	–0.003	0.001	0.002
	(0.005)	(0.006)	(0.006)	(0.006)	(0.004)	(0.005)	(0.003)	(0.003)	(0.015)	(0.011)	(0.007)	(0.006)
Parents' EGP class (ref. Skilled (EGP III, V, VI))												
Higher service (EGP I)	–0.004	–0.003	0.022***	0.015*	0.014**	0.012*	–0.002	–0.002	–0.021	–0.003	–0.025**	–0.003
	(0.005)	(0.006)	(0.006)	(0.007)	(0.005)	(0.005)	(0.002)	(0.003)	(0.015)	(0.011)	(0.008)	(0.006)
Lower Service (EGP II)	–0.006	–0.002	0.009*	0.001	–0.007	0.000	0.001	–0.001	–0.007	–0.004	–0.011	0.003
	(0.003)	(0.004)	(0.005)	(0.005)	(0.004)	(0.005)	(0.002)	(0.002)	(0.013)	(0.009)	(0.007)	(0.006)
Own business (EGP IV)	–0.003	–0.002	0.016**	–0.000	0.004	0.003	–0.001	–0.009***	–0.047**	–0.016	–0.034***	–0.002
	(0.004)	(0.004)	(0.006)	(0.005)	(0.005)	(0.006)	(0.002)	(0.002)	(0.015)	(0.011)	(0.008)	(0.007)
Low-skilled (EGP VII)/none	0.001	0.007	0.016	0.002	–0.002	0.014	0.001	0.000	–0.014	–0.019	0.002	–0.001
	(0.004)	(0.004)	(0.008)	(0.007)	(0.007)	(0.010)	(0.002)	(0.002)	(0.022)	(0.014)	(0.013)	(0.009)
McFadden's pseudo-R^2	0.013	0.013	0.005	0.005	0.059	0.059	0.010	0.010	0.005	0.005	0.015	0.015
AIC	48,206.5	48,206.5	9,459.3	9,459.3	21,554.2	21,554.2	29,583.2	29,583.2	14,789.3	14,789.3	19,750.8	19,750.8
BIC	48,311.6	48,311.6	9,549.4	9,549.4	21,653.3	21,653.3	29,692.0	29,692.0	14,874.5	14,874.5	19,845.2	19,845.2
Observations	46,984	46,984	13,524	13,524	28,379	28,379	63,765	63,765	8,987	8,987	19,319	19,319

Note: Gender-atypical fields defined as fields with a male-female OR >3 for women and a female–male OR >3 for men. All models include controls for family type, urbanization, immigrant parent, equivalized household income and lower secondary grade point average. Average marginal effects based on multinomial logit models (cluster-robust standard errors in parentheses).

*$P < 0.05$,

**$P < 0.01$,

***$P < 0.001$.