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Abstract

While men's and women's tendency to specialize in different fields of study is well-established worldwide, little is known about the extent that such gender segregation is tied up with issues of social stratification. Drawing on Finnish register-based data of over 90,000 young people, we investigate the ways in which social background is associated with men's and women's gender-atypical field choices at both the level of upper secondary vocational education and two types of higher education. Findings from our linear probability models show that social origin matters for entry into gender-atypical fields. However, the direction of association varies between lower and higher levels of education, particularly in the case of men. Comparing our findings with expectations derived from socialization-based interpretations of social origin and risk aversion theory, we argue that considerations related to social class and status maintenance may be more important promotors of gender-atypical field choice than gender-egalitarian orientations.

Introduction

Women and men differ markedly in the type of educational fields they enroll in, as a plethora of sociological studies on a variety of countries has established over the past decades (e.g., Barone 2011; Charles and Bradley 2009; Bradley 2000). Manifold explanatory approaches have been proposed to explain this gender segregation by field of study. Among them, mechanisms emphasizing cultural factors and those based on rational considerations are best supported by empirical evidence. Cultural explanations typically emphasize the role of gender-specific childhood socialization and cultural norms in social environments which positively sanction gender-typical pathways in early adulthood (Legewie and DiPrete 2014; Polavieja and Platt 2014). Other studies have argued for the role of rational considerations in gender-specific field choices, such as subjective risk assessments regarding earnings possibilities, possible failure or anticipated future discrimination in non-typical fields (Alon and DiPrete 2015; Gabay-Egozi, Shavit, and Yaish 2015).

This distinction between cultural factors and rational action in the debate on gendered fields of study choices echoes another, older debate in the sociology of education, which focuses on the persistent social class differences in educational attainment. In trying to explain why working class children are underrepresented at higher levels of education, cultural reproduction theory emphasizes class differences in cultural resources and socialization patterns, reinforced by a class bias in educational institutions (Bourdieu 1977; Bowles and Gintis 1976). Against this view, rational action theorists have argued that class differences in education are not a product of class-specific culture, but of rational action, given that the same educational pathway constitutes different levels of risk for children from advantaged and disadvantaged social backgrounds (Breen and Goldthorpe 1997; Goldthorpe 1996). Despite the dispute on whether educational decision are mainly culturally-based or derived from socioeconomic risk considerations, what both of these contrary approaches have in common is their view of social origin as a main channel for the primary mechanism driving educational pathways.

Whichever side of this classic debate one takes, the fact that in many educational systems, entry into a particular level also entails the choice of a particular field of study, should

mean that the proposed mechanisms driving class differences in educational attainment are likely to also affect field of study choices. Within the context of gender-segregated educational systems, this may also mean that culturally or rationally grounded gender differences in preferring or avoiding particular fields can be expected to vary by social origin. However, only rarely have such interactions between gender and social class been considered in research on gender-segregated field of study choices (for a recent exception, see van de Werfhorst 2017). Instead, most studies have treated gender and social background as separate and additive influences on entering educational fields (e.g., Correll 2001; Lörz, Schindler, and Walter 2011; Ma 2009; Mann and DiPrete 2013; van de Werfhorst, Sullivan, and Cheung 2003; Wang 2013). In addition, the debate on class differentials in education also suggests that social class may matter for educational decisions not simply in terms of the social resources associated with different social origins, but also with regard to the likely social *destinations* associated with different educational trajectories – in other words, the question whether entering a particular educational level constitutes a socially upward, stable, or downward move relative to one's parents' education and (by approximation) their occupational class position. However, the almost exclusive concern with higher education prevalent in the gender segregation literature (e.g., Correll 2001; Goyette and Mullen 2006; Lörz, Schindler, and Walter 2011; Mann and DiPrete 2013; Ochsenfeld 2016) means that most previous research has only been able to examine the gendered field choices of upwardly mobile working class children and the stable segment of the middle class. By contrast, we know very little about how these gendered patterns compare with middle class children on socially downwardly mobile educational pathways, or working class children on educational trajectories associated with skilled working class outcomes. This is because only rarely has gendered enrolment in education been directly contrasted between several types or levels of education (for an exception, see Imdorf et al. 2015).

Our study aims at a more comprehensive and differentiated view on the role social origin and social mobility (approximated by educational pathways) play for gendered educational field choices, in order to further illuminate the possible role of risk-related and socialization-based explanatory approaches. We focus on gender-*atypical* fields of study rather than gender differences in field of study choice more broadly (cf. Ayalon 2003; Davies and Guppy 1997; Hällsten 2010; Ma 2009; Ochsenfeld 2016; van de

Werfhorst, Sullivan, and Cheung 2003), since such outright unconventional choices constitute the clearest defiance of prevailing gendered expectations and an important element in desegregation processes.

While this focus on gender-atypical fields is not altogether new, it has typically been restricted to women's entry into the typically male-dominated science, technology, engineering and mathematics (STEM) fields (e.g., Alon and DiPrete 2015; Correll 2001; Gabay-Egozi, Shavit, and Yaish 2015; Lörz, Schindler, and Walter 2011; Ma 2011; Mann and DiPrete 2013; Morgan, Gelbgiser, and Weeden 2013; Riegle-Crumb et al. 2012). By contrast, quantitative studies elaborating men's gender-atypical entry into female-dominated domains are almost entirely lacking. This is especially surprising as the same arguments made to motivate research on women's STEM entry – looming workforce shortages and a general concern with gender equality (e.g., Riegle-Crumb et al. 2012, 1049) – could be made in an identical fashion with regard to men and their severe underrepresentation in female-dominated health and social care fields (see, e.g., World Health Organisation (WHO) 2013). By framing research on the gender gap in education mainly as a lack of women in STEM fields, sociologists risk (unintentionally) reinforcing the view of gender segregation as mainly a "woman's problem". Instead, we argue that improving both social policy interventions as well as our sociological understanding of gender segregation processes requires equal empirical interest in both women's and men's gender-atypical enrolment patterns.

Against this background, we thus examine the following research questions:

1. Does take-up of gender-atypical fields vary between levels of education, and can it be explained by social background differences between students entering vocational, polytechnic and university education?

2. How does the role of social origin for gender-atypical enrolment vary between levels of education?

3. Do discrepancies between mothers' and fathers' social position matter for the role of children's social origin with respect to entering gender-atypical fields?

We restrict our empirical attention to Finland, a country with medium to high levels of gender segregation by field of study according to international comparisons (Barone 2011; Smyth 2005), but also low levels of social inequality as measured by income or access to education (Jerrim and Macmillan 2015). For this reason, we expect that any class-specific differences in gender segregation detected in this national context should be at the lower end of the spectrum as compared to countries with more pronounced class differentials in education. The Finnish education system also offers an interesting case due to its relative openness in terms of educational pathways. On the one hand, students completing vocational upper secondary education are equally eligible place as high school graduates to apply for a higher education study place. On the other hand, a substantial proportion of high school graduates opt to continue their studies not in the tertiary system, but within the vocational branch of the upper secondary system. The data on which our analyses are based consists of a register-based panel of over 90,000 children born in Finland between 1983 and 1992, whose family circumstances and educational enrolment history we follow from their early childhood up until the year they turn 22 years of age.

Background and expectations

Social origins as sources of socialization: differences in gendered interests across the educational hierarchy

In the context of a gender segregated educational system, entering a field of study where one's own gender is significantly underrepresented is by definition an unconventional choice that goes against the grain of social expectations. What keeps men and women from crossing these thresholds? Socialization patterns during childhood may be one important source for this division, as parents' and teachers' gender stereotypes tend to reinforce gender-typical behavior, interests and self-conceptions of one's abilities (Cech 2013; Eccles, Jacobs, and Harold 1990; Eccles et al. 2000). But gender socialization tends to vary by social background, with gender egalitarianism found to be more prevalent among young people with employed and highly educated mothers (Davis 2007; Davis

and Greenstein 2009). Any field of study preferences arising from such differences in gender socialization may be further exacerbated by differential resilience in the face of personal risk. In strongly gender-typed fields, stereotypes about typically male or female abilities and behavior may single out gender-atypical newcomers and burden them with increased expectations or outright challenges to their competence as well as to their gender and sexual identity (Bosson, Taylor, and Prewitt-Freilino 2006; Floge and Merril 1986; Greed 2000; Simpson 2004). This stereotype threat may in in turn negatively affect their performance (Steele 1997).

The degree to which men and women are willing and able to cope with such risks may vary by social background. Children from more advantaged social origins may be more open towards gender-atypical fields because of a higher level of resilience concerning the risks related to it (Rydell and Boucher 2010). This may be due to class differences in childhood context. Lower levels of education, economic deprivation and precarious employment contexts have been shown to increase parenting stress and marital discord and lead to lower parental warmth (Conger, Conger, and Martin 2010; Cooper et al. 2009; Menaghan 1991). As such, children from less affluent families are more likely to encounter authoritarian parenting styles (Aunola et al. 1999; Kiernan and Mensah 2011). Parents with higher levels of resources, on the other hand, tend to be more successful in applying approaches that develop children's sense of self-realization and self-esteem (Milevsky et al. 2007). Thus, defiance of gender stereotypes may pose less of a threat or a risk to children of advantaged social backgrounds.

Furthermore, children's own educational attainment appears to affect their gender ideology (Bolzendahl and Myers 2004; Davis 2007) as well as their preferences for gender-typical occupations (Busch-Heizmann 2014). However, class differentials in education mean that this exposure to education varies by social background (Breen and Jonsson 2005). In Finland, young people from advantaged social backgrounds tend to be overrepresented in high schools (as the most typical track leading to higher education) and underrepresented in the vocational branch of Finnish upper secondary education (Kilpi-Jakonen, Erola, and Karhula 2016). Given their lower exposure to general education and the earlier age at which they on average decide on field-specific and occupationally relevant education, Finnish children from lower social backgrounds may

thus succumb to more strongly gender-typed field of study choices compared to children who enter the academically oriented high schools (see also Charles et al. 2001). Previous research on gendered field of study choices or occupational aspirations have thus interpreted the role of social background mainly in terms of a vehicle for gender-egalitarian socialization (e.g., Dryler 1998; Polavieja and Platt 2014). Furthermore, the rare studies on gender segregation patterns that consider institutional differentiations suggest that the extent of gender segregation by field of study is more pronounced at lower levels or less-prestigious types of education (Barone 2011; Prix 2012). Against this background, we first focus on the distribution of gender-atypical field choices across the educational hierarchy and formulate the following expectations:

Hypothesis 1: Higher and more prestigious types of education are characterized by a higher share of students selecting gender-atypical fields of study compared to lower levels and less prestigious types of education.

Hypothesis 2: Level-specific differences in the take-up of gender-atypical fields should be less pronounced among students who completed high school.

Hypothesis 3: The social origin composition of the student body explains differences in the take-up of gender-atypical fields of study between lower and higher levels of education.

In order to explore to which extent these patterns might be unique for gender-atypical fields, we also examine these expectations for the case of gender-balanced fields.

Social origins at different educational levels: Does class maintenance trump socialization?

The literature reviewed in the previous section suggests that children from advantaged social backgrounds will be more likely to enter gender-atypical fields due to social differentials in socialization. What this socialization-based interpretation of social background also implies is that the assumed lower threshold of men and women from more advantaged background should remain the same, regardless as to the level of education these children enter. After all, socialization-based processes should have

formed interests already in childhood, and while children's own exposure may somewhat approximate their gender-specific orientations, an overall difference is likely to persist. In other words, from the perspective of this this cultural (socialization-based) account described in detail in the previous section, we would expect the following association between social background and gender-atypical field choice:

Hypothesis 4: The more ample children's family resources in terms of parental education, occupational class and family income are, the more likely they are to enter gender-atypical fields of study, regardless of the level of education.

However, there may be plausible reasons to believe that considerations related to class and status attainment may be stronger influences on the choice of gender-atypical fields of study than culturally-based factors such as differences in gender socialization and gender egalitarianism. In the account of relative risk aversion theory, the common denominator for all social classes is their interest in avoiding downward mobility. Against this background, a risk aversion perspective expects families to prefer such educational pathways for their children which reproduce parents' social class position. This is mainly because entering higher levels of education but failing to successfully complete them may leave working class children in an even more vulnerable socioeconomic position than if they had embarked on a more predictable educational pathway aimed at reproducing their parents' social position (Breen and Goldthorpe 1997; Goldthorpe 1996). Distinctions *within* different levels of education, such as field-specific prestige and labor market outlooks (Davies and Guppy 1997; Prix 2013), may further differentiate trade-offs in risk and returns associated with educational qualifications (Hällsten 2010). For the upper segment of the social hierarchy, these horizontal differences may be ever more important in preserving their status and class position, as access to educational qualifications has become more open (Lucas 2001). Differences between fields of study like these are important also from the perspective of gender, as women tend to cluster in fields that are associated with lower prestige and remuneration on the labor market compared to male-dominated fields (Bobbitt-Zeher 2007; Davies and Guppy 1997).

From a risk aversion perspective, we thus expect the role of social background for entering gender-atypical fields of study to vary not only by gender, but also by the level

of education that students have entered. For women, our expectations remain broadly in line with those predicted by hypothesis 4. In addition to the possible buffer with regard to stereotype threat and the greater access to second chances that higher levels of parental resources may afford, gender-atypical fields may also have greater significance for women from affluent rather than working class backgrounds in terms of their social mobility strategies. The strongest effect of high class background should be visible among female university students, as the greater prestige of male-dominated fields may provide a means to further consolidate and secure the class position of women from affluent backgrounds (see also England 2010). Similarly, male-dominated fields may compensate some of the status loss entailed when higher class women enter educational levels associated with social downward mobility.

Hypothesis 5a: Higher parental resources should increase women's entry into gender-atypical fields at all levels, with the strongest association expected among female university students.

For men, on the other hand, a high level of social resources may make entry into gender-atypical fields *less* rather than more likely. For men on an educational trajectory to reproduce their parents' high education and social class position, we expect that status considerations will on average lead them away from female-dominated fields, despite any cultural openness regarding gender roles that may have characterized their childhood socialization. At the same time, if male students from working class backgrounds enter universities, they may be less constrained by such status considerations when choosing their field of study compared to their advantaged peers, as *any* higher education degree already constitutes a clear socially upward move for them. In addition, the lower prestige of female-dominated fields may even make these fields appear as the less risky and less elitist road to attain a higher class and status position, especially those female-dominated fields linked to clearly defined occupational roles (e.g., subject teachers in high school).

If men from advantaged social origins defy social expectations and enter vocational upper secondary rather than higher education, this may indicate their greater concern with intrinsic over status considerations. As such, we expect this may be also make them more likely than their working class peers to enter female-dominated fields at the vocational

level. In contrast to working class men, the greater resources of men from advantaged family backgrounds may not only afford them experimenting with a (for them) less prestigious educational pathway, but also make them less averse to gender-atypical field choices, given that their social origin may still provide them with second chances in the case of failure or a change of heart. In other words, we expect the following:

Hypothesis 5b: At the universities, men from the higher service classes should be less *likely than men from working class backgrounds to enter gender-atypical fields of study. At lower educational levels, we expect these patterns among men to be reversed.*

Overall, we assume that different elements of social background may vary in the extent to which they mediate the influence of conflicting motives and resources associated with gender-atypical fields. In this context, we expect economic dimensions of social origin, such as parents' occupational class position and family income, to be more strongly related to considerations of social class reproduction and status, whereas parents' education may have a greater impact on fostering children's cultural resources in the form of gender socialization and intrinsic motivations with regard to learning and work.

Discrepancies between mothers′ and fathers′ social position: who matters more?

What this discussion has so far ignored is the fact that it is not self-evident which parent determines a child's social background. In terms of both economic security as well as exposure to cultural resources, for instance, it could make a difference whether it is both or just one parent who has attained high levels of education and an advantaged occupational class position. Indeed, research on intergenerational social mobility has found that both mothers' and fathers' social position play a role for children's outcomes (Beller 2009), with high family resources affecting children's social position more strongly if both parents are equal in terms of their education and occupational class position (Korupp, Ganzeboom, and Van Der Lippe 2002). As a consequence, pressures of status and class maintenance may be stronger for children whose parents have equal social resources compared to those whose parents differ in their occupational class or educational attainment. Especially for children from high class backgrounds, we thus

expect the equality of their parents' resources to intensify the propensity for men to avoid and for women to enter gender-atypical fields of study at the universities. Similarly, for the downwardly mobile, the cultural resources that may lead to gender-atypical choices should be more secure if both parents are in advantaged social positions. This leads us to the following expectation:

Hypothesis 6: The relationship between entering gender-atypical fields and high social background should be more pronounced for those who have both rather than just one parent with university education or a service class position.

From a gender socialization perspective, however, it may also make a difference whether it is the father or the mother who commands higher levels of social resources, although the likely direction of effects is not immediately clear. Men who earn a lower share of the family income than their female partners have been found to be more egalitarian in their gender ideology compared to men in traditional breadwinner positions (Zuo and Tang 2000), although other studies suggest that such couples may also tend to neutralize their non-traditional socioeconomic arrangements with a more gender-traditional division of housework tasks (Greenstein 2000). In sum, however, men whose mothers have a higher occupational position or more education than their fathers may be more likely to enter gender-atypical fields compared to men from families with socioeconomically dominant fathers. On the other hand, fathers with high levels of resources have been found to engage in a greater share of childcare (Craig and Mullan 2011) as well as in activities that support their children's academic success (Yeung et al. 2001). In turn, daughters who have spent more childhood time with their fathers have been reported to aspire to less gender-typical occupations, while the opposite is the case for sons (Lawson, Crouter, and McHale 2015). It may thus be the case that women are more likely to take up gender-atypical fields if not their mother, but their father was the parent with the higher level of education or occupational class position. To sum up, then, we expect the following pattern:

Hypothesis 7: Men and women will be more likely to take up gender-atypical fields of study if their opposite-sex parent rather than their same-sex parent had a higher level of educational attainment or occupational class position.

Data and methods

Finland constitutes the empirical context for our study for two reasons. First, differentiated fields of study exist in Finland not only at the level of higher education, but also within the context of a standardized vocational segment of upper secondary education. Despite the school-based nature of vocational education (VET), the different fields of study offered at this segment are aimed at developing skills with direct relevance for concrete occupations, typically skilled working class positions. In 2017, basic qualifications offered at vocational schools in Finland were divided into over 50 different fields of study with standardized curricula, many of which include further areas of specialization (Finnish National Agency for Education 2018). Given the social gradient regarding entry into vocational upper secondary and higher education, comparing gender-atypical field of study choices at different levels of the Finnish educational system thus allows us a view on the intersection of class and gender in education.

Second, our focus on gender-*atypical* fields also means that the phenomenon we study is by definition very rare. Any analysis of such unconventional patterns thus requires extensive data in order to arrive at any generalizable conclusions. We are able to meet this criterion with large-scale data provided by Statistics Finland, which is based on a 10% sample of the population resident in Finland in 1980. The original sample persons of this data were matched with their spouses as well as their children and followed yearly from the mid-1980s up until the year 2014 (Statistics Finland 2017a). We limit our analyses to the biological children of these original sample persons, more precisely, to those of them who were born between 1983 and 1992 and never had an adoptive parent. The sample is further restricted to children who entered either vocational upper secondary school or a form of higher education when they were between 16 and 22 years old. This excludes 13,010 children from the sample who have only ever entered general education (compulsory schooling or the academic high schools) during this period.[1] After listwise

[1] Preparatory courses for exams aimed at recognizing skills obtained at work (*ammattitutkinto, erikoisamattitutkinto*) were excluded from this study, which further deletes 1,251 students from the sample. Also excluded were 84 individuals whose type of education was coded as "unknown" or who were enrolled in an (during this period) already defunct form of vocational post-secondary education (*opisto*).

deletion of cases with missing values on our independent variables (5,613 cases), our final sample comprises 98,355 young people.

We model entry into gender-atypical fields of study as linear probability models, as the resulting coefficients can be readily interpreted as average marginal effects. Compared to logistic regression models, this method circumvents both the scaling problem inherent in logistic regression (Mood 2010) as well as the conceptual difficulties related to interaction effects in a logit context (Karaca-Mandic, Norton, and Dowd 2012). The downside of modelling probabilities as linear is the risk of predictions out of the [0,1] range. For our models, the share of such out-of-range predictions has remained low, affecting at lowest none and at highest 2.2% of observations of a given model (all of which had predicted probabilities lower than 0). We estimate cluster-robust standard errors in our models, which accommodate both the dependence between observations (due to some children having the same mother) as well as the heteroscedasticity introduced to the model due to applying an ordinary least squares model to a binary outcome variable.

Variables

Dependent variables

The point of departure for our analyses is the field of study in which students enrolled when they first entered their highest educational level during the time they are 16 to 22 years old. Entering a *gender-atypical field* means entering a male-dominated field for women and entering a female-dominated field for men. In defining fields as male-dominated, gender-balanced, and female-dominated, we rely on the extensive and detailed official educational enrolment statistics published by Statistics Finland and the Finnish National Agency for Education. The Finnish national classification of educational programs (using a 6-digit code) for distinguishing educational programs was first mapped into a national classification of 100 detailed fields of study (Statistics Finland 2017b), which is closely based on the field of study classification developed by the International Standard Classification of Education (ISCED) in the revision of 2011 (Unesco Institute for Statistics 2015). For each year from 2001 to 2014, we calculated the odds for male

and female students within each level of education to be majoring in a given field at this level. Odds ratios were calculated for fields with a minimum number of 30 students during a given year. Subsequently, we defined fields as male-dominated if men's odds of having entered this field are more than three times greater than women's odds to be a student in this field. Conversely, female-dominated fields are ones where women's odds of having chosen the field are more than three times greater than men's. Fields that fit into neither category are considered as gender-balanced. By basing our definition of gender-typed fields on the odds ratio rather than the percentage share of women in a field on a given level, we follow Grusky and Charles' (1998) call for margin-free methods of measurement, which are robust towards variations in the overall gender proportion of students between different educational levels or different years.

In principle, fields of study can vary yearly with regard to whether they are defined as gender-balanced, male-dominated or female-dominated. In this study, we are most interested in those fields of study that have a fairly stable gender profile over time. For this reason, our analyses treat as male- or female-typed only those fields of study that fulfil the criterion for this definition for at least 75% of the measurement points in the official statistics between 2001 and 2014. Allowing a small degree of yearly variation among this value is intended to soften the inevitable arbitrariness involved in applying cut-off values. Any field that straddles the border of gender-typing more often will be counted as a gender-balanced field.

Overall, only around 6% of women and 5% of men selected a gender-atypical field between age 16 and 22 (Table 1). The largest detailed fields encompassed by this label are presented in Figure 1, separately for each level of education included in our study.

--- FIGURE 1 about here ---

Key independent variables

The categorical variable *educational level* records the highest level of education that students in our samples have entered (but not necessarily completed) when they were at

least 16 and at most 22 years of age. In this context, we distinguish programs offered at the three main types of institutions that grant field-specific (as opposed to general) qualifications: vocational upper secondary schools, polytechnic higher education institutions and universities.

After 9 grades of comprehensive school, typically coinciding with the year they turn 16 years of age, students in Finland have completed the end of their compulsory schooling. At this stage, they are faced with a decision between attending high school *(lukio)* or instead opt for a vocational school *(ammattikoulu)* or indeed to not continue with their education at all. Both a high school diploma and the basic vocational qualification requires typically three years of full-time study to complete and both grant eligibility for applying to higher education in Finland. Higher education in Finland is characterized by a dual structure, with institutions divided into polytechnics (*ammattikorkeakoulut*, also translated as `university of applied sciences') and the traditional universities *(yliopistot)*. Polytechnics place a greater emphasis on applied skills with more concrete labor market relevance, whereas university programs have a stronger orientation towards research training. Both types of higher education degrees are classified in group 5A of the International Standard Classification of Education (ISCED-97). Nevertheless, polytechnics and universities differ with respect to their historical roots as well as the average labor market prospects of their graduates. In addition, only universities are currently allowed to grant PhD degrees in Finland (Kilpi 2008). Due to these differences in prestige, we rank polytechnics below universities in the educational hierarchy for the purposes of this study. Figure 2 serves to illustrate where the levels of education included in this study are located within the Finnish educational system. Furthermore, an alternative education variable used to answer research question 1 also takes into account whether entrants gained a high school diploma prior to entering their currently highest level of field-specific education.

We consider three dimensions of social background in this study, which we first define on the basis of the parent with the highest level of resources. *Parents' education* takes as its reference period the time when children in our sample were at most 15 years of age. Three categories of parental education are distinguished: secondary education or less, post-secondary qualifications and university degrees. Note that Finnish polytechnics were

created only in the mid-1990s by reforming and upgrading post-secondary vocational colleges *(opistot)* to the level of higher education. The intermediate category of parental education is thus dominated by qualifications from these post-secondary vocational colleges, but includes the few parents who graduated from polytechnics up until the year their child turned 15 years of age.

Parental occupational class is measured using a modified version of the Erikson-Goldthorpe-Portocarero (EGP) class scheme, which differentiates groups of occupations on the basis of their typical employment contracts and their related labor market relationships (Erikson and Goldthorpe 1992). We condense the original 11-category class scheme into four categories, consisting of the higher service class (EGP 1), lower service class (EGP 2), skilled (manual or non-manual) occupations (EGP 3-6) and a category combining both low-skilled occupations (EGP 7) and those parents not in work. The basis for assigning a class position is the occupation a parent held most frequently up until the year their child turned 15 years of age.[2] As the self-employed (EGP 4) are not easily classified according to these broad groups, we add a separate dummy variable recording whether a *parent was ever self-employed* during the period in question.

--- FIGURE 2 about here ---

Family income in our analyses refers to the sum of deflated, annual gross income from employment, self-employment and capital sources among the members of the child's household. Intended as a measure of a family unit's economic well-being, it is equivalized using the square root of household size and averaged over the years the target child was of school age (from age 7 until age 15). We then convert this variable into percentiles and use it as a continuous variable in our models.

[2] Occupational information in our data refers to the occupation held at the end of a calendar year and is available for the years 1985, 1990, 1993, 1995, 2000 and yearly from 2004-2014. Due to these gaps in our time series, the reference period for measuring occupational class refers to the whole of children's childhood, rather than being restricted only to the years when the child is of compulsory school age (age 7-15) as is the case for other variables in this study.

While research questions 1 and 2 refer to parental education and occupational class position as a seemingly homogeneous measures, differences between a child's mother and father in terms of social resources are of central interest for research question 3. We thus differentiate which of the child's parent, if any, had an advantaged position in terms of education and occupational class, respectively. The possible values for these categorical variables (w*hich parent in higher service class, which parent university degree)* are "only mother", "only father", "both parents", or "neither parent".

Control variables

In addition to these direct measures of social background, we add a number of variables that are suspected to capture other aspects of social origin but may also relate to gendered field choices.

Grade point average (GPA) at the end of lower secondary education is primarily intended to purge our main social background measures from confounding with class-specific differences in scholastic success.[3] We use this variable in our level-specific models in the form of GPA deciles drawn separately for students at each level of education.

As gendered self-conceptions may vary with age, the time at which students enter a given level of education may also affect the degree to which gendered conceptions affect their choice of field. In our field-specific models, we apply a control variable indicating whether the educational level in question was *entered at the standard age or later*. For the case of vocational upper secondary education, we define age 16-17 as the typical age of entry and students aged 18-22 as later entrants. In the context of higher education, entering either a polytechnic or a university when aged 19-20 years will count as the standard age of entry, while late entrants will be those starting their studies aged 21-22.

As another measure of children's differences in social and economic circumstances, we include two dummy variables recording parental long-term unemployment. *Mother ever*

[3] The grades on which the GPA score is based reflects individual teachers' grading decisions rather than standardized tests. However, teachers are bound by national grading guidelines.

long-term unemployed and *father ever long-term unemployed* refer to parental unemployment of a whole calendar year while the children in our study were between 7 and 15 years old. We expect that the experience of parental unemployment as an economic and possibly social-emotional strain may lead children to avoid fields related to the gender of the affected parent, especially the same-sex parent. This may in turn encourage them towards taking up gender-atypical fields of study.

Parents' own educational field specialization may affect the interests and inclinations of their children, be it through socialization or by children taking parents as their role models (Dryler 1998). We differentiate *mother's field of education* and *father's field of education* into female-dominated, gender-balanced and male-dominated fields. The assignment of these categories follows the definition of children's educational gender profile (outlined above) and is based on the average odds ratios for men's and women's enrolment during the years 1991, 1995 and 1999 according to student enrolment statistics published by Statistics Finland. For parents who only ever completed general- rather than field-specific education, we impute these values using their occupational gender profile (similarly defined on the basis of gender-specific odds ratios) during the 1990s.

Other aspects of family life may further affect children's gendered self-conceptions. Previous studies found indications that children of employed mothers as well as those of single-parent mothers may be less gender-typical in their conceptions and behaviors compared to children from intact families or those with homemaker mothers (reviewed in McHale, Crouter, and Whiteman 2003). For this reason, we control whether *parents separated* by the time the child was 15 years of age and add a variable indicating whether children had a *stay-at-home-mother* when they were between 13 and 15 years old (defined as being at least two years out of the labor force without being retired, on sickness or disability benefit or a registered student).

As a coarse control for variations in gender-specific norms and expectations between urban and rural areas as well as regional differences in available study places, we add an indicator variable for whether children *lived in a rural area at age 15.*

Finally, to accommodate overall cohort differences in the propensity to enter gender-atypical fields, we include a variable for *birth cohort*, which groups children according to their year of birth in three categories (1982-1985, 1986-1989, 1990-1992).

Table 1 lists all variables used in this study and their key distributional features.

Results

Does take-up of gender-atypical fields vary between levels of education, and can it be explained by social background differences between students entering vocational, polytechnic and university education?

As can be seen in Model 1 of Table 2, educational levels differ in the share of students entering gender-atypical fields, but the patterns deviate from our initial expectations. Both among women and men, polytechnic students are the ones most likely to enter gender-atypical fields (with a percentage point difference of 2 percentage points among women and 4 percentage points among men compared to the reference group of vocational schools). Given that entry into atypical fields is thus not highest at the top of the educational hierarchy, the findings contradict hypothesis 1. Among women, university students are just as likely to study for gender-atypical fields as vocational school students, despite the difference in level and prestige between these forms of education. For men, on the other hand, university students are about 2 percentage points more likely to enter gender-atypical fields than their peers at vocational schools. While these absolute differences may appear small, they are relatively large in relative terms, given that the phenomenon in question is a rare event as such and concerns only 5% of students overall (see Table 1).

--- TABLE 1 about here ---

To contextualize these findings, we added a perspective on entry patterns into gender-balanced fields (see Model 1 on the right side of Table 2). In contrast to our findings regarding gender-atypical fields, the highest and most prestigious level of education is indeed the sector with the highest take-up of gender-balanced fields. But only among men does the relationship between educational level and take-up of gender-balanced fields assume a linear form. For women, on the other hand, the polytechnic sector seems to play a polarizing role, to the extent that it is characterized by the highest share of both gender-atypical gender-typical fields among women.[4]

We also expected that students' own cultural resources, acquired via exposure to high school education, may enlarge their vision of gender-specific norms and roles and thus potentially lower the threshold to take-up gender-atypical fields compared to students whose pathways through education did not include high school completion. The results in Table 2, however, present only partial support for this expectation (Model 2). For women, a high school diploma makes entry into gender-atypical vocational education not more, but *less* likely, and has no further effect on women's gender-atypical enrolment at the polytechnic level. Men, on the other hand, more consistently conform to our expectations, with high-school graduates more likely to enter gender-atypical fields at both the vocational and the polytechnic level. Similar patterns arise in this respect also when focusing on gender-balanced fields, with women being less rather than more likely to enter integrated vocational fields if they graduated from high school, while the opposite is true for men. The results thus support hypothesis 2 for men, but not for women.

--- TABLE 2 about here ---

[4] The positive effect of polytechnic education on gender-typical field choice is not shown but can be derived from the fact that coefficients sum to zero across models, i.e., the polytechnic vs. vocational contrast among women in gender-typical fields (Model 1) can be calculated as 0.020 - 0.126=0.106.

But does the social background and other differences in the composition of the student body explain this variation in gender-atypical field choices between distribution vocational schools, polytechnics and universities? To answer this question, we added three dimensions of social background to our models (Model 3 of Table 2): parents' education, parents' highest EGP class, and average equivalized family income (including its square term). Neither among women nor among men do differences in the social background across educational levels seem to explain differences in take-up of gender-atypical fields, with virtually no change between Model 1 and Model 3 (left side of Table 2). Adding further controls to the model (Model 4) leaves this discrepancy intact, but reveals a small suppression effect for women (driven mainly by GPA differences across levels, not shown). Similarly, among men, social background components do not seem to explain the higher share of atypical take-up among students in higher education compared to vocational schools (Model 3), instead other differences in student body composition (chiefly GPA, not shown) explain differences between vocational and university students (Model 4). By contrast, differences in the rate of enrolment in gender-balanced fields across levels (right-hand side of Table 2) are more clearly linked to differences in the social composition of these different levels of education, especially among men (see Model 1 and Model 3). To sum up, the findings lend no support for hypothesis 3.

How does the role of social origin for men's and women's gender-atypical enrolment vary between levels of education?

The lacking explanatory role of students' social background for differences in gender-atypical enrolment rates across levels suggests two possible conclusions: either students' social origin does not matter for entering gender-atypical fields, or the direction and strength of this association varies between different levels (as suggested by our hypotheses 5a and 5b). The models in Table 2 (Model 3-4) contained statistically significant associations with social background measures (not shown), and tests of interactions (using omnibus Wald tests, not shown) further indicated that social origin indeed varies in its association with gender-atypical enrolment between levels of education. To further examine these patterns, we next model men's and women's entrance into gender-atypical fields of study separately for each level of education (Table 3).

The findings from our level-specific models of gender-atypical field choice suggest that at the universities, women from higher service class backgrounds are indeed more likely than their peers on a social upward trajectory (i.e., from working class backgrounds) to enter gender-atypical fields. While this finding is in line with our expectations (hypothesis 5a), the results observed at the polytechnic and vocational level deviate from the second part of hypothesis 5a. Parental class, education and family income do not have any clear relationship with gender-atypical field choice among women studying at polytechnics. Moreover, instead of the expected benefit of a socially downward mobile trajectory at the vocational level, the results in Table 3 show that women with university-educated parents are not more, but less likely (-1.4 percentage points) to enter male-dominated fields compared to their peers set to reproduce their parents' upper secondary level of education. In other words, hypothesis 5a is supported with regard to women at the universities, but not for female polytechnic or vocational students.

For men, we assumed that high levels of parental resources may increase the probability of gender-atypical fields only for downwardly mobile men, but not those set to reproduce their affluent family background via university education. Table 3 largely supports this expectation. Among men entering universities, those from higher service class backgrounds are roughly 3 percentage points less likely to select a gender-atypical field than men whose parents work in routine non-manual and skilled working class positions (EGP 3-6). Again, given the low incidence of gender-atypical field choice, this is a fairly large effect size in relative terms. The role of social origin appears to be mainly socioeconomic, given that it is social class background, but not parents' education, which affects gender-atypical entry among male university students. At the lower end of the educational hierarchy, we expected that men from advantaged social backgrounds may be more likely than their peers with lower levels of parental resources to enter female-dominated fields. The patterns in Table 3 support this view, but only with regard to parental education, not family income or parents' social class. In other words, men on an educational downward trajectory (i.e. vocational entrants with highly- educated parents) choose female-dominated vocational fields more often than men whose parents attained at most upper secondary education. In the polytechnics, caught in the middle as the more vocational and less prestigious form of higher education, both of these contravening trends seem to combine, at least for men: parental education increases men's probability

of entering a gender-atypical polytechnic field, while a higher class background and higher family income make this same outcome less likely.

--- TABLE 3 about here ---

Figure 3 summarizes these findings by plotting men's and women's predicted probability of entering gender-atypical fields by parental education (upper panel) and parental social class (lower panel), separately for each level of education (predictions are based on the models in Table 3).

--- FIGURE 3 about here ---

Overall, the results thus provide a closer fit to our hypotheses formulated from a perspective of class reproduction and risk aversion compared to the socialization-based accounts. Note that children's experiences of economic affluence or deprivation, as measured by equivalized family income, appear to have no direct effect over and above parental education and class position. Unemployment of the same-sex parent, however, seems to encourage particularly women's entry into male-dominated fields at both higher and lower levels of education. Among men, parental unemployment appears to affect gender-atypical field choice particularly at the level of higher education: mother's unemployment seems to work as a deterrent from female-typical fields at the universities, while father's unemployment seems to encourage take-up of female-dominated fields particularly among male polytechnic students. However, our findings also reveal that more directly measured cultural resources have a role to play, with both parents' fields of study appearing to affect men's and women's choice in a similar fashion at all educational levels, although the same-sex parent's field choice seems to weigh somewhat more strongly than that of the opposite-sex parent (Table 3).

Do discrepancies between mothers' and fathers' social position matter for the role of children's social origin with respect to entering gender-atypical fields?

Hypothesis 6 expects that the relationship between entering gender-atypical fields and high social background should be more pronounced for those who have both rather than just one parent with university education or a higher service class position. To examine this, we re-run our models with variables that distinguish which parent is the source of students advantaged background with regard to parental education and occupational class (Table 4).

Our previous models (Table 3) suggested that entering a downward educational trajectory relative to one's parents discourages women's entry into gender-atypical fields at the vocational level. Differentiating between fathers' and mothers' educational level (Table 4) does not provide any definite clues as to which parents' education drives this negative association among women at vocational schools. Women with highly educated parents appear to avert gender-atypical vocational fields somewhat more strongly if only one rather than both of their parents (particularly their father) has a university degree, but none of these associations are statistically significant by conventional standards. As such, these results provide no support hypotheses 6 or 7. At the universities, on the other hand, where we previously (Table 3) found a service class family background to encourage women's entry into male-dominated fields, the disaggregated results in Table 4 provide further detail to this relationship. The positive association between social class origin and women's take-up of male-dominated university fields unfolds only if either both of women's parents or their father belongs to the service class, but not if mothers are the only source of women's service class background. These results thus follow exactly the patterns predicted by both hypotheses 6 and 7. At the polytechnics, a similar picture emerges, despite the fact that our previous models of gender-atypical field choice (Table 3) did not find any statistically significant associations with social origin at this level. Once we distinguish between mother's and father's position, however, it appears that an advantaged social class background also encourages women's take-up of male-dominated fields at the polytechnics, provided that both parents belong to the service class (Table 4). At the polytechnics, thus, the findings in Table 4 support hypothesis 6 but contradict our expectations formulated as hypothesis 7.

While the previous section found parents' university education to promote men's inroads into gender-atypical fields if they entered educational levels lower compared to their parents (vocational school or polytechnics), Table 4 further relativizes this view: it does not apply to men who have only one university-educated parent, but only to those who have both a mother and a father with a university degree (Model 1). These results for men's entry into atypical fields at the vocational and polytechnic level are in line with our hypothesis 6. On the other hand, any one parent with a service class background (EGP 1-2) suffices to discourage men's entry into gender-atypical university fields compared to men with both parents in lower social class positions (Model 2). This finding thus contradicts our hypothesized stronger aversion of gender-atypical fields among men with both rather than just one parent from the service class. In other words, equality of parents' social position is important for situations where advantaged family background encourages rather than diverts men's take-up of gender-atypical fields, resulting in partial support of hypothesis 6 in the case of men. At the same time, our models did not find any statistical significant differences between father's and mother's resources with regard to men's gender-atypical field choice, which leads us to reject hypothesis 7 for men.

Discussion and conclusion

To what extent does social origin matter for gender-atypical field choices, and what can it tell us about the mechanisms that help or hinder such defiance of gender-normative educational expectations? One common view is that social background affects gender-atypical educational choices or occupational aspirations mainly through the less restrictive gender socialization experienced by children from advantaged social origins (Dryler 1998; Polavieja and Platt 2014).

In this study, based on large-scale Finnish register data involving both vocational upper secondary and two types of higher education institutions, we showed the limits of this narrative. If selecting gender-atypical fields was primarily a matter of cultural resources – such as a gender-egalitarian outlook acquired through socialization in high-resource families and through longer exposure to education – we would expect higher levels of social resources to uniformly increase the probability of entering atypical fields of study

among both men and women. In addition, we argued that this interpretation would also require the share of students from advantaged social background to explain possible differences in the take-up rates of gender-atypical fields between educational levels. However, results from our analyses did not substantiate either of these expectations. Instead, we found the relationship between the same social origin and gender-atypical enrolment to vary not only between levels of education, but also between men and women and different dimensions of social origin. Being able to detect such variation in the first place required departing from much previous research in the area of field choice and the gender gap in STEM education, which has tended to restrict itself to higher education only and to treat gender and social background as additive effects rather than in their intersection.

If social background varies in its relationship with gender-atypical field choice, what does this tell us about the possible mechanisms driving these patterns? We argue that risk considerations as part of status and class reproduction and mobility strategies (Goldthorpe 1996) may at times trump any culturally based convictions about gender-normative roles. If a given educational level constitutes a trajectory of social upward mobility with regard to a students' background, low-prestige fields may lower rather than increase the threshold of entering such educational institutions in the first place. For students entering educational levels set to reproduce their advantaged social origins, on the other hand, low-prestige rather than high-prestige fields are a greater risk, as such devalued fields may represent an instance of downward mobility which risk aversion theory assumes all social classes aim to avoid. Given that fields dominated by women are typically lower in prestige and average returns than gender-balanced and male-dominated fields, we expected that social origin should matter in different ways for men and women with regard to gender-atypical choices. Especially among men, our findings very closely matched these expectations: working class men, who by entering higher education could be considered as having embarked on an upward social mobility trajectory, entered female-dominated university fields at a higher rate than their male peers from advantaged class backgrounds. Although it may be the case that "men lose money and suffer cultural disapproval when they choose traditionally female-dominated fields" (England 2010, 155), this could still be a smaller cost to pay for working class men aiming at upward social mobility. For them, female-dominated university fields may constitute a pathway

to a middle-class occupation with relatively safe and concrete labor market prospects, such as subject teacher in high schools (languages and literature) or psychologist. Alternatively, it may simply be the case that working class men make more intrinsically motivated decisions at university concerning their field of study compared to their peers from advantaged backgrounds. For these upwardly mobile men, attaining a university degree may in itself confer enough status and assumed future class mobility that field-specific earnings and prestige differences may simply be less pressing to them, whereas such horizontal differences may play a greater role for men for whom university education represents a strategy to reproduce their higher service class social origins.

The fact that we found reverse patters in the vocational segment of upper secondary education – with men from highly-educated social origins more likely to enter female-dominated fields than those from less-educated families -- does not contradict this interpretation based on risk aversion theory. Rather, we propose that those men who enter vocational upper secondary education despite their highly-educated family background may constitute a segment of students that are guided more strongly by intrinsic motivations rather than status and prestige considerations. The selectiveness of this group was further revealed by our last set of analyses, which showed that this relationship between parental education and men's gender-atypical vocational field choice was restricted to men who had not one, but two parents with university degrees. Put differently, defying gendered expectations appeared to be easiest for those men who most clearly defied expectations of social status reproduction, at least in the short term.

Among women, results provided mixed support for our hypotheses derived from risk aversion theory. As expected, male-dominated university fields, typically higher in prestige and returns than female-dominated fields at this level, were the more likely choice for women from the higher service class rather than working class women. But when women from high-resource families entered a downwardly mobile pathway, we found no such beneficial relationship of social origin, especially not at the vocational upper secondary level. Once we took the parental source of class or educational background into consideration, a more differentiated pattern arose: class background mattered for women's entry into male-dominated fields both at the polytechnics and universities, but only as long as both parents had a service class position (EGP 1-2). If

only one of the parents had a service class occupation, fathers rather than mothers appeared to be more consequential with regard to male-dominated field choice. What this latter finding suggests to us is that class reproduction motives may themselves be tied to socialization-based mechanisms accounts when it comes to women's take-up of gender atypical fields: if, as previous research suggests, fathers with higher levels of resources tend to spend more time with their children compared to fathers in less privileged positions, daughters may to a greater extent engage with culturally male-dominated activities but also more actively consider their father as a role model. In these contexts, male-dominated rather than female-typical domains within occupational classes and status groups may more strongly affect the frame of reference for women aiming at reproducing their family's class and status.

However, limitations to our analyses and conclusions need to be acknowledged. Overall, social background variables in our models were better able to predict men's rather than women's gender-atypical enrolment. Women may thus choose gender-atypical fields less on the basis of social mobility strategies, particularly on lower levels of the educational hierarchy, but benefit more strongly from direct role models in the immediate family. In addition, the low incidence of gender-atypical employment also poses some challenges to the statistical power required to detect other than large associations. Although the absolute size of statistically significant social background associations in this study appeared low, ranging between 1 and 3 percentage points, the fact that only around 5-7% of students enter gender-atypical fields at different educational levels in the first place means that what our models did detect were large effects in relative terms (amounting to a change of 20%-50% relative to the overall gender-atypical enrollment rate). To detect also smaller effects on the rare choice of gender-atypical field choice, an even larger sample may be required. In particular, our models were comparatively weak in distinguishing differences between social origins with regard to gender-atypical enrolment in vocational schools among both men and women. In part, this may be due to the significant overrepresentation of students whose parents have at most secondary education (65% of vocational students, compared to a share of 21% among university students) or are working in skilled and low-skilled working class occupations (75% of vocational students, compared to 33% of university students). In other words, greater sensitivity to within-working-class heterogeneity may be required to adequately model

entry into gender-atypical fields at the vocational level. Given that women are in general less likely than men to opt for a vocational upper secondary education rather than the academic high schools, this may have additionally lowered the statistical power of our analyses of women's field choice at the vocational level.

To conclude, our findings suggest that considerations concerning social status and class reproduction may in some contexts have a greater influence on educational choices than gender attitudes. In this sense, our findings strike a chord with class-based incongruities between gender-egalitarian attitudes and behavior reported by qualitative research (Usdansky 2011). Nevertheless, our aim is not to deny that cultural aspects of social background can affect gender-atypical choices. Instead, our results show that socioeconomic contexts, structured by social class and status, are likely to affect the degree to which convictions regarding gendered domains are able to inhibit or promote such gender-atypical educational decisions. Further, cross-national research is needed to better understand the ways in which overall levels of social inequality and national institutional structures, such as the educational system and its links to the labor market, shape the relationship between social stratification and gender segregation.

Research ethics

The research reported in this article is based on de-identified register data. No informed consent was obtained or is required for this type of research according to the Finnish Personal Data Act (523/1999). Reported results have been cleared with Statistics Finland to ensure that no subjects can be identified in this article.

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Tables and Figures

Table 1. Dependent and independent variables by gender. Percentage distribution (unless stated otherwise).

Variables	Women	Men
Gender-atypical field	6.11	5.10
Gender-balanced field	50.50	32.40
Highest level of education entered (age 16-22)		
vocational school	45.20	56.40
polytechnics	32.16	25.27
university	22.64	18.33
Pathway into highest entered education (age 16-22)		
vocational school without high school diploma	36.83	53.48
vocational school after high school diploma	8.37	2.92
polytechnics without high school diploma	4.63	6.45
polytechnics after high school	27.53	18.82
university	22.64	18.33
Parents' highest education		
upper secondary (high school/vocational school) or less	48.87	49.11
post-secondary	34.95	34.80
university	16.18	16.09
Parents' social class (EGP)		
higher service class (EGP 1)	15.81	15.83
lower service class (EGP 2)	23.93	23.61
skilled (EGP 3-6)	48.14	48.07
low-skilled (EGP 7) or none	12.11	12.49
Which parent in service class (EGP 1-2)		
neither	60.26	60.56
only mother	9.51	9.35
only father	18.35	18.36
both	11.88	11.74
Which parent with university degree		
neither	83.82	83.91
only mother	4.98	5.02
only father	5.61	5.59
both	5.59	5.48
Average family income age 7-15	28,441.27	28,559.54
(mean, standard deviation in parentheses)	(23,855.85)	(24,615.63)
Father's field of study		
male-dominated	64.76	65.18
balanced	29.98	29.54
female-dominated	5.26	5.28
Mother's field of study		
male-dominated	4.68	4.68
balanced	39.44	39.6
female-dominated	55.89	55.72
Father long-term unemployed	10.27	10.28
Mother long-term unemployed	11.47	11.53
Father ever self-employed	26.01	25.58
Mother ever self-employed	17.31	17.27
Parents separated	30.50	30.50
Lived in rural area at age 15	19.26	19.74
Later entry into highest level of education	27.99	20.37
GPA in lower secondary school (mean, standard deviation in parentheses)	7.96 (1.03)	7.35 (1.09)
Stay-at-home mother when aged 13-15	3.08	3.18

Birth cohort		
born 1983-85	31.09	30.67
born 1986-89	38.51	38.94
born 1990-92	30.40	30.38
Number of observations	48,274	50,081

Table 2. Coefficients from linear probability models of women's and men's entry into gender-atypical and gender-balanced fields (cluster-robust standard errors in parentheses).

	Gender-atypical field				Gender-balanced field			
Women	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4
Level of education (ref. = VET)								
polytechnic	0.020***		0.020***	0.026***	-0.126***		-0.137***	-0.136***
	(0.003)		(0.003)	(0.003)	(0.005)		(0.005)	(0.006)
university	0.001		0.001	0.007	0.112***		0.085***	0.056***
	(0.003)		(0.003)	(0.004)	(0.006)		(0.007)	(0.008)
Pathway into education (ref. = VET without high school)								
VET after high school		-0.024***				-0.050***		
		(0.003)				(0.009)		
polytechnic w/o high school		0.018**				-0.190***		
		(0.006)				-0.011		
polytechnic after high school		0.015***				-0.126***		
		(0.003)				(0.006)		
university		-0.003				0.103***		
		(0.003)				(0.006)		
Social background[a]	no	no	yes	yes	no	no	yes	yes
Controls	no	no	no	yes	no	no	no	yes
Intercept	0.054***	0.059***	0.050***	0.037***	0.520***	0.529***	0.492***	0.504***
	(0.002)	(0.002)	(0.002)	(0.004)	(0.003)	(0.004)	(0.005)	(0.009)
N	48,274	48,274	48,274	48,274	48,274	48,274	48,274	48,274

	Gender-atypical field				Gender-balanced field			
Men	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4
Level of education (ref. = VET)								
polytechnic	0.039***		0.038***	0.025***	0.024***		-0.002	-0.061***
	(0.003)		(0.003)	(0.003)	(0.005)		(0.005)	(0.006)
university	0.022***		0.019***	0.000	0.285***		0.224***	0.125***
	(0.003)		(0.003)	(0.005)	(0.006)		(0.007)	(0.009)
Pathway into education (ref. = VET without high school)								
VET after high school		0.100***				0.332***		
		(0.009)				(0.013)		
polytechnic w/o high school		0.024***				-0.069***		
		(0.004)				(0.007)		
polytechnic after high school		0.052***				0.079***		
		(0.003)				(0.006)		
university		0.027***				0.302***		
		(0.003)				(0.006)		
Social background[a]	no	no	yes	yes	no	no	yes	yes
Controls	no	no	no	yes	no	no	no	yes
Intercept	0.037***	0.031***	0.037***	0.047***	0.265***	0.248***	0.229***	0.346***
	(0.001)	(0.001)	(0.002)	(0.004)	(0.003)	(0.003)	(0.004)	(0.008)
N	50,081	50,081	50,081	50,081	50,081	50,081	50,081	50,081

Notes: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. [a]Parents' education, parents' EGP class, family income (deciles), family income^2

Table 3. Coefficients from linear probability models of entry into gender-atypical fields of study, by gender and highest entered level of education (cluster-robust standard errors in parentheses).

	Women			Men		
	VET	Polytechnic	University	VET	Polytechnic	University
Parents' education (ref.=sec. or lower)						
post-secondary	-0.001	0.008	-0.004	0.007*	0.004	0.001
	(0.004)	(0.005)	(0.006)	(0.003)	(0.006)	(0.008)
university	-0.014*	0.002	0.001	0.022**	0.026**	0.013
	(0.007)	(0.008)	(0.007)	(0.007)	(0.009)	(0.010)
Parents' EGP class (ref.= skilled (EGP 3-6))						
higher service class (EGP 1)	-0.008	0.005	0.015*	-0.000	-0.021**	-0.028**
	(0.007)	(0.008)	(0.007)	(0.006)	(0.008)	(0.009)
lower service class (EGP 2)	-0.005	0.004	0.010	0.007	-0.009	-0.019*
	(0.005)	(0.006)	(0.006)	(0.004)	(0.006)	(0.008)
low-skilled/none (EGP 7/none)	-0.004	0.008	0.011	0.001	-0.013	0.023
	(0.005)	(0.009)	(0.012)	(0.003)	(0.011)	(0.017)
Family income (equiv., percentiles)	0.000	0.000	0.000	-0.000	-0.000**	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Family income^2	0.000*	-0.000	0.000	-0.000	0.000	-0.000*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Control variables						
Mother's field of study (ref=balanced)						
male-dominated	0.029**	0.052***	0.039**	0.002	-0.007	-0.021*
	(0.009)	(0.014)	(0.015)	(0.005)	(0.011)	(0.009)
female-dominated	0.001	-0.011*	-0.005	0.009***	-0.001	0.005
	(0.003)	(0.005)	(0.004)	(0.003)	(0.005)	(0.006)
Father's field of study (ref.=balanced)						
male-dominated	0.009*	0.014**	0.022***	-0.006*	-0.005	-0.012*
	(0.004)	(0.005)	(0.005)	(0.003)	(0.005)	(0.005)
female-dominated	-0.001	-0.007	-0.013	0.008	0.048***	0.010
	(0.007)	(0.009)	(0.008)	(0.006)	(0.014)	(0.013)
Mother long-term unemployed	0.010*	0.008	0.021*	-0.000	-0.001	-0.035***
	(0.005)	(0.008)	(0.011)	(0.003)	(0.009)	(0.008)
Father long-term unemployed	0.000	-0.002	-0.002	0.002	0.022*	0.007
	(0.005)	(0.008)	(0.010)	(0.004)	(0.011)	(0.013)
Parents separated	0.006	0.006	0.008	0.006*	0.006	0.009
	(0.004)	(0.005)	(0.006)	(0.003)	(0.006)	(0.007)
GPA (deciles within level, centered)	-0.002**	-0.001	0.002**	0.002***	0.005***	0.001
	(0.001)	(0.001)	(0.001)	(0.000)	(0.001)	(0.001)
GPA^2	0.000	-0.000	-0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Later than standard entry (ref.=no)	-0.002	-0.010*	-0.024***	0.078***	0.063***	0.053***
	(0.004)	(0.005)	(0.005)	(0.006)	(0.005)	(0.007)
Intercept	0.034***	0.086***	0.041***	0.021***	0.041***	0.077***
	(0.006)	(0.008)	(0.009)	(0.004)	(0.009)	(0.011)
N	21,819	15,524	10,931	28,247	12,655	9,179

Note: [a]Further control variables included in all models are birth cohort, mother's and father's long-term unemployment, parents' self-employment, stay-at-home mother, lived in rural area at age 15. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 4. Coefficients from linear probability models of gender-atypical field choice by gender and level of education, with parent-specific social origin measures (cluster-robust standard errors in parentheses)

	Women						Men					
	VET		Polytechnic		University		VET		Polytechnic		University	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Which parent univ. degree (ref=both)												
neither	0.007		0.012		-0.019*		-0.062**		-0.054***		-0.016	
	(0.014)		(0.011)		(0.008)		(0.019)		(0.014)		(0.008)	
only mother	-0.005		0.010		-0.030**		-0.056**		-0.043**		-0.008	
	(0.016)		(0.014)		(0.009)		(0.021)		(0.016)		(0.010)	
only father	-0.010		0.009		-0.011		-0.052*		-0.039*		-0.001	
	(0.015)		(0.013)		(0.009)		(0.021)		(0.016)		(0.009)	
Parents' EGP class (ref.=3-6)												
higher service (EGP 1)	-0.009		0.008		0.012		0.001		-0.021**		-0.029***	
	(0.007)		(0.008)		(0.007)		(0.006)		(0.008)		(0.008)	
lower service (EGP 2)	-0.005		0.007		0.011		0.010**		-0.006		-0.019*	
	(0.004)		(0.006)		(0.006)		(0.003)		(0.006)		(0.007)	
low (EGP 7)/none	-0.004		0.007		0.012		-0.000		-0.013		0.022	
	(0.005)		(0.009)		(0.012)		(0.003)		(0.011)		(0.017)	
Parents' education (ref.=sec. or lower)												
post-secondary		-0.000		0.007		-0.006		0.007*		0.005		0.001
		(0.004)		(0.005)		(0.006)		(0.003)		(0.006)		(0.008)
university		-0.014*		-0.002		0.001		0.019**		0.022*		0.010
		(0.007)		(0.008)		(0.007)		(0.007)		(0.009)		(0.010)
Which parent EGP 1-2 (ref.=both)												
neither		0.006		-0.018*		-0.017*		-0.010		0.007		0.021*
		(0.008)		(0.009)		(0.008)		(0.007)		(0.009)		(0.009)
only mother		0.009		-0.025**		-0.025***		-0.003		0.004		0.004
		(0.009)		(0.010)		(0.007)		(0.008)		(0.010)		(0.009)
only father		-0.003		-0.013		0.003		-0.007		-0.009		-0.007
		(0.008)		(0.008)		(0.007)		(0.008)		(0.008)		(0.007)
Intercept	0.027	0.028**	0.078***	0.104***	0.056***	0.058***	0.085***	0.031***	0.095***	0.033**	0.093***	0.059***
	(0.015)	(0.009)	(0.013)	(0.011)	(0.011)	(0.011)	(0.020)	(0.008)	(0.016)	(0.012)	(0.012)	(0.013)
N	21,819	21,819	15,524	15,524	10,931	10,931	28,247	28,247	12,655	12,655	9,179	9,179
BIC	-2,730.6	-2,742.2	2,629.0	2,611.8	-10,72.6	-10,83.5	-14,773.5	-14,766.4	2,217.3	2,220.4	-476.6	-482.5

Note: Models also include family income, family income^2, and all control variables. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Figure 1. Share of (the five largest) detailed educational fields among men and women enrolled in gender-atypical fields of study at vocational upper secondary institutions (VET), polytechnics and universities.

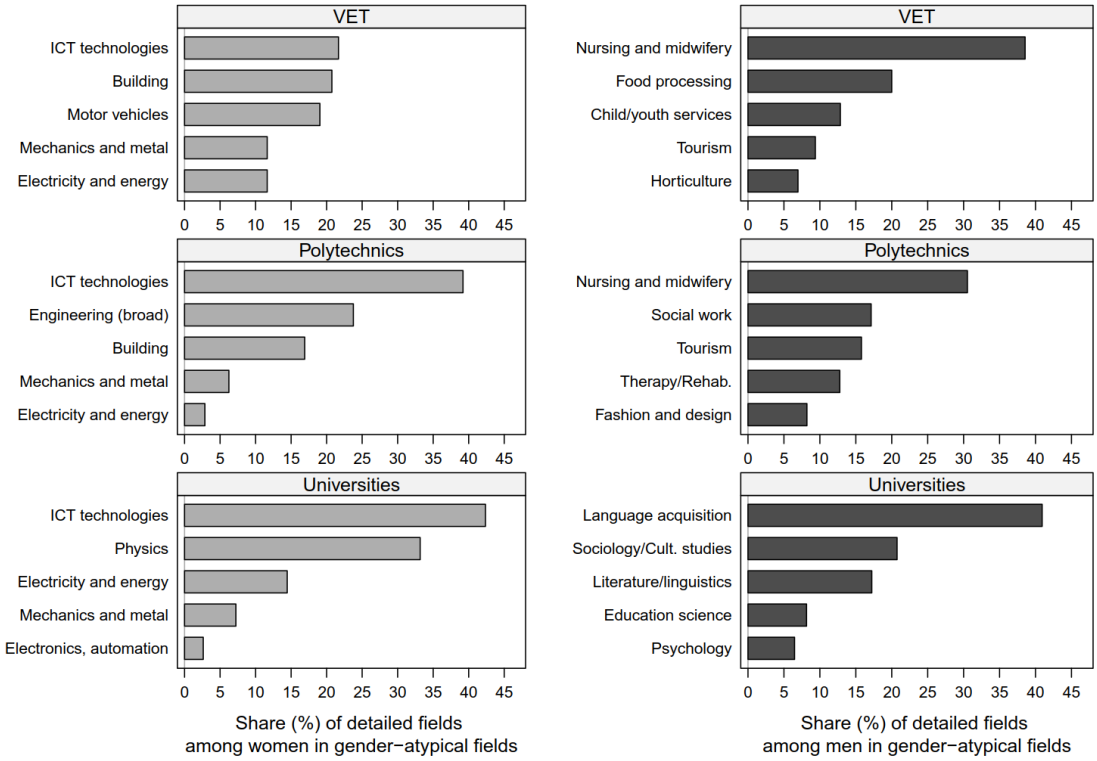

Figure 2. Schematic overview of the Finnish educational system.

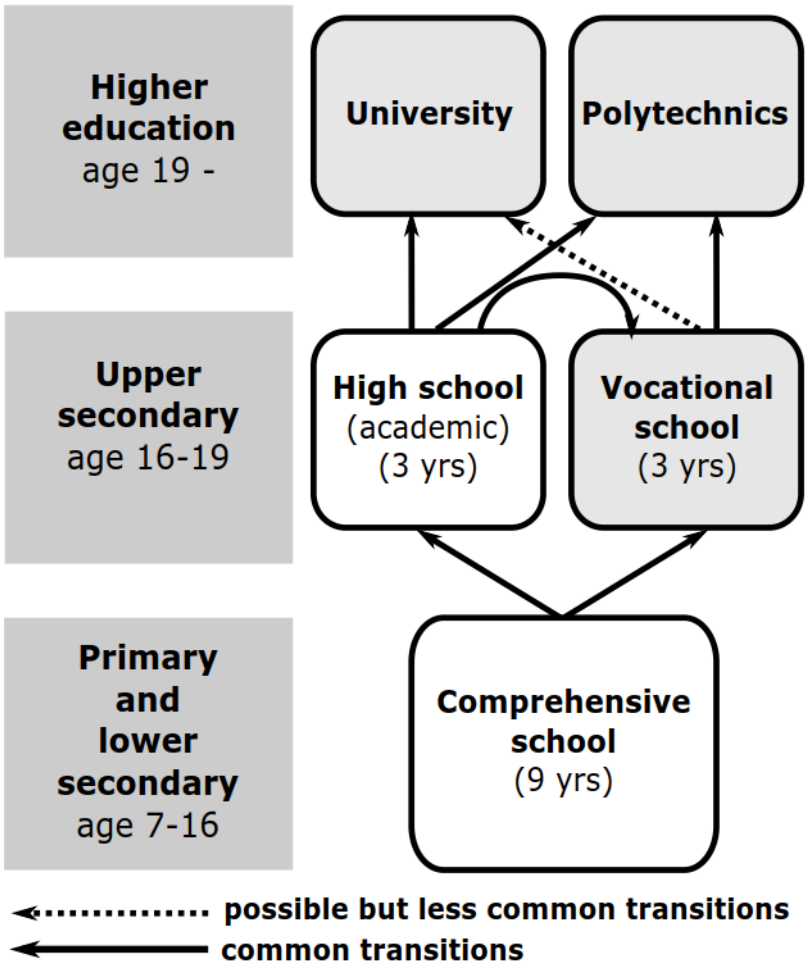

Figure 3. Predicted probabilities of entering gender-atypical fields by parents' highest education (upper panel) and parents' social class (lower panel). Predictions based on models in Table 3, with control variables set at their means.