

Article

Skill requirements versus workplace characteristics: exploring the drivers of occupational gender segregation

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Abstract

What role do skill requirements play in gendered occupational preferences? Previous research has emphasized workplace characteristics such as salaries and family-friendly work hours. Less attention has been paid to skill requirements, even though they are an important part of job descriptions and serve as reference points for individuals' assessment of their suitability for occupations. Using a choice experiment among Swiss adolescents who are in the process of choosing their vocational training occupation, this article demonstrates that women and men have surprisingly similar preferences for workplace characteristics. In contrast, skill requirements are better predictors of gender differences in occupational preferences. We find that technical skills are critical in explaining gendered occupational preferences, with occupations that rely more heavily on new technologies attracting fewer women. At the same time, both genders prefer occupations that emphasize social interactions, suggesting that the prominent 'people' versus 'things' distinction does not adequately capture gendered occupational preferences.

Key words: gender; gender inequality; occupations; skills; vocational education and training; youth; survey experiment.

JEL classification: D91 role and effects of psychological, emotional, social, and cognitive factors on decision making; I24 education and research institutions; J71 discrimination

1. Introduction

Occupational gender segregation remains persistently high (Su et al. 2009; Cortes and Pan 2018). For instance, according to recent worldwide estimates, men account for 92 per cent of total employment in the construction sector. In comparison, 71 per cent of all workers employed in health and social care activities are women (OECD 2023a: 63). This horizontal segregation has significant consequences. Jobs in sectors in which women are concentrated tend to have lower entry requirements and, therefore, offer lower salaries (OECD 2023a: 65), perpetuating gender wage inequality. It is thus essential to improve our understanding of the mechanisms that drive horizontal occupational gender segregation.

Previous research predominantly examined the role of individuals' characteristics (e.g. school grades) in explaining gendered occupational preferences. However, empirical studies show that individuals' characteristics (such as their grades) explain only a small part of gendered occupational preferences with the exception of their occupational interests and their self-concepts (Cech 2013; Morgan et al. 2013; Wiswall and Zafar 2015; Ochsensfeld 2016; Anni et al. 2025). We argue that it is also important to consider occupational characteristics. In line with our research interest, we understand adolescents' choices as a process that matches individuals' preferences (comprised of self-concepts, interests, values, etc.) with the characteristics of an occupation, such as required skills or workplace characteristics (Holland 1997; Cortes and Pan 2018; Hustad et al. 2020).

Only few articles have investigated the role of occupational characteristics in gender segregation. These studies have tended to predominantly focus on the role of *workplace characteristics* (e.g. salary level or options for part-time work) in case of field of study choices, analyzed among academic-track high school students (Seehuus 2023; Combet 2024), university students (Zafar 2013; Wiswall and Zafar 2018; Non et al. 2022; Burbano et al. 2024), or young professionals (Jost and Möser 2023). Examining field of study choices, Combet (2024) additionally considered *skill requirements* (e.g. affinity for technics and technology versus compassion and social skills), which showed large gender differences. However, in this study, the respondents were upper-secondary students in general education. Hence, their actual occupational choices would not be made for several years. In short, while there is some evidence that workplace characteristics such as salary level or flexible working hours affect occupational preferences, our knowledge about the role of skill requirements is much more limited.

The goals of this article are (1) to analyze the role of different skill requirements and related tasks in gendered occupational preferences and (2) to assess their importance relative to the more extensively studied workplace characteristics. There are two reasons for this focus on skill requirements. First, skill requirements are an important part of job descriptions alongside other characteristics such as experience, educational requirements, or work context (Buchmann et al. 2022; O*NET Resource Center 2023). Second, these factors are essential in the choice process as individuals choose jobs not only according to their interests and work values, but also assess whether they have the skills to successfully perform respective occupation-specific tasks (Holland 1997; Cortes and Pan 2018). However, individuals' competence beliefs regarding specific skills (self-concepts in the social cognitive theory, expectation success in the expectancy-value theory) might be inaccurate due to gender stereotypes, as described in various motivational theories (e.g. expectancy-value theory, Wigfield and Eccles 2000; social cognitive theory, Bandura 1997) and as shown empirically (e.g. Correll 2004; Cech 2013; Plante et al. 2013; Wang et al. 2013).

The required skills examined in this article were selected based on [Holland's \(1973, 1997\)](#) RIASEC model. This model predicts career choices by relating different interest-based personality types (*Realistic*, *Investigative*, *Artistic*, *Social*, *Enterprising*, and *Conventional*) to specific occupational tasks—tasks that require a specific skill set. Mapping onto the *Realistic* and *Social* types, we thus also examine the importance of the “people” versus “things” dimension. However, instead of two opposing ends of the same dimension (e.g. [Barone 2011](#); [Barone and Assirelli 2020](#); [Kuhn and Wolter 2022](#); [Combet 2024](#)), we operationalize working with people and working with things as two separate skill requirements to account for the possibility that adolescents might not perceive a trade-off between the two. Moreover, as previous research has shown that investigative interests are generally predictive for academic tracks ([Hirschi 2009](#); [Jüttler et al. 2021](#)), we decided not to incorporate the *Investigative* type in our experiment because this article focuses on a group of young people who are mostly choosing vocational training positions.

In addition to these skill requirements, we consider three workplace characteristics that are closely related to the idea of gendered labor market specialization (e.g. [Polachek 1981](#); [Becker 1991](#)) and corresponding work values (e.g. [Beutel and Marini 1995](#); [Marini et al. 1996](#)) and that have been identified as important predictors in previous research: salary level and part-time work opportunities (e.g. [Non et al. 2022](#); [Jost and Möser 2023](#); [Seehuus 2023](#); [Burbano et al. 2024](#); [Combet 2024](#)) as well as meaningfulness of the occupation (e.g. [Diekmann et al. 2017](#); [Wegemer and Eccles 2019](#); [Burbano et al. 2024](#)).

As mentioned, existing research on gendered occupational preferences has typically focused on field of study choices or on job choices. Many of these studies share the problem of not being able to rule out an endogeneity bias, as they analyze individuals who have already chosen a career path, either by studying a particular field or by already participating in the labor market. In contrast, we analyze the gendered preferences of lower secondary school students for their future training occupations in vocational education and training (VET).

Focusing on this group offers three distinct advantages: First, their occupational choices will be made within the next year and therefore, occupational preferences are less aspirational and more concrete compared to field of study choice ([Kuhn and Wolter 2022](#)). Second, these early occupational choices in VET systems have far-reaching consequences because labor market segmentation complicates later occupational changes through the life course as standardized occupation-specific training limits access to other occupations ([Allmendinger 1989](#)). Third, human behavior during adolescence is particularly affected by gender role stereotypes, and it is during this period when occupational aspirations become more concrete ([Armstrong and Crombie 2000](#)). VET systems are thus particularly likely to promote gender-typed occupational decisions ([Imdorf et al. 2014](#)).

Empirically, we leverage the Swiss case, which has a vibrant and well-reputed VET system, offering more than 230 training occupations (see [Supplementary Appendix 1c](#) for a short introduction to the Swiss educational system). About 65 per cent of an age cohort choose VET at upper-secondary level rather than the general education system ([Swiss Statistical Office 2019](#): 12). The selection process for training occupations within the VET system usually starts at the age of 14. Most students start their training in the VET system at the age of 15 or 16 years.

Examining the importance of specific skill requirements to determine occupational preferences poses analytical problems because gender-stereotyped characteristics are often

clustered in occupations. For this reason, we follow recent contributions (Non et al. 2022; Jost and Möser 2023; Seehuus 2023; Combet 2024) and rely on a choice experiment embedded in an online survey. In choice experiments, occupational characteristics are randomly combined to generate two different profiles, from which respondents are asked to choose. By combining occupational characteristics in different combinations, choice experiments indicate the importance of these characteristics in relation to other characteristics and allow for comparisons between subgroups. Thus, unlike regular survey questions, choice experiments allow for the measurement and ranking of occupational characteristics despite the possible clustering of characteristics.

Our analysis shows that young men prefer training occupations with tasks that correspond to the *Realistic* type and thus require technical skills, while young women prefer training occupations without these tasks. At the same time, we observe that both genders favor occupations that require social skills (*Social* type), although young women show a significantly stronger liking. Therefore, this article challenges the notion that the “people” versus “things” dimension is an adequate way to describe gender differences in occupational preferences, as young men value working with people *and* things, while young women express an aversion to technical tasks. Regarding the other skill requirements, we find that young women value both creativity (*Creative* type) and routine tasks (*Conventional* type) in their work, whereas young men’s occupational preferences seem to be unaffected by these factors. There are no gender differences in entrepreneurial work involving risk-taking (*Enterprising* type), reflecting previous findings (e.g. Su et al. 2009). In terms of workplace characteristics, our results indicate that both young men and women value family-friendly work hours, meaningful work, and high pay, although women tend to value part-time work opportunities and meaningful work more, while we do not find any gender differences in salary preferences.

Comparing the impact of skill requirements and workplace characteristics in the occupational decision-making process, we find that young women’s occupational preferences are more influenced by skill requirements than young men’s. Specifically, young men and women show minimal differences in their preferences for workplace characteristics, while a gender difference emerges in their preference for skill requirements, with women showing clear (dis)likes and men often being indifferent. Hence, occupational gender segregation seems to be mainly the result of young women’s gendered preferences for skill requirements in training positions. Young men, on the other hand, focus mainly on workplace characteristics when making occupational decisions.

2. Theory

Sociological theories suggest that two interacting forces are driving occupational gender segregation: individual preferences, which are the focus of our study, and employer preferences. Individuals’ behavior is either the result of cultural forces shaping individuals’ choices (e.g. stereotypes about one’s ability based on gender) or the product of rational considerations (e.g. optimizing the probability of success based on one’s ability) (Kriesi and Imdorf 2019). In our theoretical model, we combine the culturalist and the rational choice perspectives by assuming that although individuals’ occupational preferences are the result of optimization, these preferences are shaped by gender stereotypes and gender roles—deeply rooted societal beliefs and norms about the capabilities and expected behaviors of

men and women. These dynamics are mutually reinforcing, internalized through socialization, and maintained by cognitive biases that privilege stereotype-confirming evidence while discounting contradictions (Ellemers 2018; Balducci 2023). Both dynamics influence preferences for tasks and skill requirements by affecting competence beliefs, self-concepts, and interests (Eccles and Wigfield 2002). At the same time, preferences for workplace characteristics are a consequence of individuals acting upon gender stereotypes and socially prescribed behavioral expectations for the gender with which they identify (Akerlof and Kranton 2000). These socialized preferences even influence choices in societies committed to gender equality, particularly in economically advanced societies where post-materialist values encourage men and women to pursue careers that reflect their gender identities (Charles and Bradley 2009).

In this article, we model occupational preferences as a decision in which individuals select an occupation that promises the highest congruence between their socially influenced gendered preferences and the characteristics of an occupation. Our model predicts that individuals will, therefore, try to optimize (1) the fit between skill requirements and related tasks of an occupation, matching them with their (gendered) self-concepts about their own abilities and (2) the fit between workplace characteristics and their socialized work values (see Fig. 1). In the following subsections, we elaborate more on the mechanisms behind these two dimensions of occupational characteristics.

2.1. Preferences for skill requirements and related tasks

Motivational theories state that curricular and occupational choices are a function of individuals’ actual abilities, their (potentially biased) self-assessment of these abilities (termed self-concepts), and their interests (depending on the specific motivational theory, these factors are named differently, see Eccles and Wigfield 2002). Furthermore, research shows that individuals may have a distorted view of their own competence due to societal gender stereotypes about innate ability differences between women and men. More specifically, these cultural forces portray men as being more analytical and technically oriented, while women are better at communication, nurturing, and caring, and, thus, better suited for caregiving roles, both inside and outside the family (Ellemers 2018).

Previous research has repeatedly shown that individuals’ self-concepts have a strong influence on their curricular and occupational choices (e.g. Cech 2013; Plante et al. 2013), even though the self-assessment that informs their self-concept is often inaccurate (Pallier 2003; Sikora and Pokropek 2012). These gender stereotype-confirming self-concepts develop from an early age (Herbert and Stipek 2005) and have far-reaching consequences on

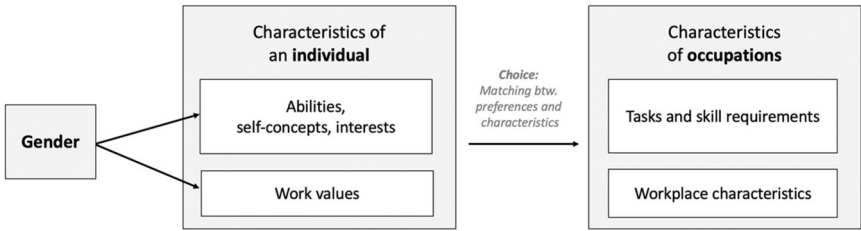


Figure 1. Relationship between gendered occupational preferences and occupational characteristics.

individuals' life trajectories. For example, male high school students overestimate their mathematical competence and therefore are more likely to pursue advanced mathematics courses and quantitative degree programs (Correll 2001).

It is likely that gendered self-concepts translate to different preferences for tasks and required skills. Holland's RIASEC model (Holland 1973, 1997) describes this process by linking different personality types (*Realistic*, *Investigative*, *Artistic*, *Social*, *Enterprising*, and *Conventional*) and their associated self-concepts of competence with occupational tasks and required skills. Using Holland's model has the advantage that it explicitly connects the RIASEC types to work-related activities, which corresponds to our interest in explaining preferences for skill requirements in occupations.

Starting with the *Realistic* type, it describes "realistic" individuals who enjoy working with tools and machines (e.g. as carpenters). The *Social* type captures "social" individuals who might work in nursing professions because they like helping people and enjoy social interactions (Holland and Gottfredson 1992). According to the RIASEC theory, these two types are to some extent mutually exclusive, so that individuals with a high preference for one activity are likely to avoid the other (Holland 1973). The idea of opposites aligns with gender stereotypes claiming that women are better at empathizing while men have an advantage at systemizing (e.g. Billington et al. 2007). Previous research has repeatedly shown that occupational interests are highly gendered (e.g. Su et al. 2009; Ochsenfeld 2016) and that women's preference for working with people and men's preference for working with things is a predictor of occupational and major choices (Cech 2013; Su and Rounds 2015; Ochsenfeld 2016; Hägglund and Lörz 2020; Kuhn and Wolter 2022; Combet 2024). While previous research has analyzed these two interests as two opposing dimensions, we test whether there truly is a trade-off between these interests, thus allowing for the possibility that adolescents prefer both technical and social tasks. We therefore formulate two hypotheses:

H1: Young men prefer training occupations with a strong technical profile, whereas young women are less influenced by how technical a profile is.

H2: Young women prefer training occupations that promises a lot of social interaction, whereas young men are less influenced by social interactions.

Two other types represent opposing interests: the *Artistic* type and the *Conventional* type. The first type prefers to work with ideas rather than data, often using their imagination and creative self-expression through the arts, for example, by training in floristry or graphic design. The second type prefers to work with data in a structured and systematic way, following process-based routines with clear instructions and avoiding unstructured, ambiguous activities such as finding new solutions (Holland 1973, 1997; Prediger 1982), a description often associated with training as a commercial clerk. The stereotypes about the underlying abilities are not clearly gendered. Creative activities related to domestic tasks (e.g. decorating and pottery) or appearance (e.g. jewelry and fashion design) are associated with women, but famous artists are often male due to the genius stereotype (Buckley 1986). Indeed, exceptional creativity is often associated with men because it requires challenging the status quo, predisposing an assertive personality (Hora et al. 2022). Similarly, a meticulous and highly structured way of working could be described as masculine as it requires the ability to think systematically (Billington et al. 2007), while its opposite, the ability to

find new solutions to problems, is also considered masculine typed because it requires the ability to think outside the box (Hora et al. 2022). Nevertheless, a meta-analysis showed that both interest types are preferred by women (Su et al. 2009), while Ochsenfeld (2016) found that conventional interests do not predict field of study choice at all and artistic interests explained women's preferences to the same extent as social interests. Given the divergent results for these two characteristics, we follow the results of the meta-analysis (Su et al. 2009):

H3: Young women prefer training occupations that require creativity for tasks, whereas young men are less influenced by the degree of required creativity.

H4: Young women prefer training occupations that indicate more highly structured and routinized work, whereas young men are less influenced by such considerations.

The *Enterprising* type enjoys taking on leadership roles and has strong communication skills to influence others and promote products and ideas. They tend to embrace challenges and take risks and, therefore, favor business development and management careers. While a sales training occupation would be desirable for this type, it is likely that, regardless of their occupational preferences and educational background, *Enterprising* types aim to move into management positions or start their own business. In labor markets like Switzerland's, many VET graduates work as self-employed by founding sole proprietorships to offer their services—over a third of new Swiss company founders have a VET background (Strohmeier and Leicht 2000; Meyer and Meyer 2020: 20; Paulini-Schlottau 2004). Scholars further found that the assertiveness and higher risk-taking preferences associated with the *Enterprising* type fit the male gender stereotype (Eagly and Karau 2002; Corell 2004; Eagly and Sczesny 2009; Croson and Gneezy 2009). However, in the meta-analysis on gender differences in RIASEC interests (Su et al. 2009), there are no gender differences in entrepreneurial interests, mirroring the findings of Ochsenfeld (2016). Following these results, we formulate the following hypothesis:

H5: Young women and young men do not differ in their preference for training occupations with some entrepreneurial work that may involve risk.

2.2. Preferences for workplace characteristics

Gender stereotypes suggest that men embody agentic qualities, including traits such as assertiveness, control, and confidence, while women are communal, characterized by traits such as affection, nurturance, and kindness (e.g. Eagly and Karau 2002). These ideas about innate differences in ability are translated into social norms and gender role expectations for both sexes. Specifically, according to gender roles, men should strive for high-status roles in society by pursuing better-paid careers and materialistic status symbols, while women should promote the well-being of others by prioritizing caregiving and pro-social work over high salaries (Beutel and Marini 1995; Marini et al. 1996). As a result, gender roles influence individuals' work values and thus result in a gendered labor market specialization, with men seeking high salaries and women preferring occupations that facilitate caring for family members (e.g. Polachek 1981; Becker 1991). In this article, we analyze one lifestyle value (work–life balance), one extrinsic value (salary level), and one intrinsic value (meaningfulness), all of which correspond to workplace characteristics such as work

policies (e.g. flexibility of working hours), employee benefits (e.g. salary level), and occupational culture (e.g. presence of sustainability missions).

In the context of socially conservative institutions in Switzerland, which encourage part-time work for mothers due to expensive childcare with insufficient childcare subsidies, it can be assumed that workplace characteristics influence occupational choice even more. However, despite the notion of the male breadwinner role, the evidence is unclear as to whether men show a stronger preference for higher-paid occupations (e.g. Wiswall and Zafar 2018; Burbano *et al.* 2024; no gender difference: Zafar 2013; Ochsensfeld 2016; Non *et al.* 2022; Jost and Möser 2023; Seehuus 2023; Combet 2024). Regarding women's preferences for family-friendly workplace characteristics, the evidence is equally mixed. Some studies suggest that beliefs about the feasibility of combining work and family influence career and field of study choices (Weisgram and Diekmann 2017; Wiswall and Zafar 2018; Jost and Möser 2023; Combet 2024; Burbano *et al.* 2024), while others do not confirm these findings (Zafar 2013; Seehuus 2023). Given the heterogeneous results, we formulate the following hypotheses:

H6: Young women and young men do not differ in their preference for training occupations that promise a high salary.

H7: Young women and young men do not differ in their preference for training occupations that allow them to reconcile work and family life.

More recent work has addressed the influence of workplace characteristics that reflect more idealistic preferences, such as the meaningfulness of work (e.g. Rosso *et al.* 2010; Cassar and Meier 2018). Individuals perceive their work to be meaningful when they derive a sense of purpose from it (e.g. by feeling competent or experiencing autonomy) or when they feel it has a pro-social impact or is beneficial to others (e.g. Cassar and Meier 2018). The latter characteristic is particularly prevalent in female-dominated occupations, with midwifery and nursing showing the highest levels (Burbano *et al.* 2022). Research finds that both male and female MBA students (Burbano *et al.* 2024) and students at technical universities (Non *et al.* 2022) prefer to work in mission-driven companies (non-profit, focused on innovation, or focused on social responsibility and sustainability, Non *et al.* 2022), companies with a high level of corporate social responsibility, or where one's daily work "has an impact" (Burbano *et al.* 2024), this is even more the case for female students.

H8: Young women prefer training occupations that offer meaningful work with a positive impact on society, whereas young men are less influenced by such considerations.

3. Analytical approach

Occupational preferences result from intricate, interconnected processes that are challenging to disentangle with conventional survey methods. Previous research discerning underlying individual preferences has leaned heavily on observational survey data. However, traditional survey-based approaches often struggle with capturing the interdependent nature of occupational characteristics that constitute such preferences. Since occupational characteristics often overlap or influence each other, it is nearly impossible to pinpoint their specific effects on occupational preferences and resulting choices. In contrast, experimental

designs are better equipped to address the multidimensionality of choice situations and inherent trade-offs in a systematic way (Street and Burgess 2007). Thus, we employ a pre-registered, survey-based choice experiment to answer our research question (see [Supplementary Appendix 1a](#) for more information on the pre-registartion).

Choice experiments are gaining traction in survey research, notably in studies about educational and occupational choices (Jost and Möser 2023; Seehuus 2023; Combet 2024). In these experiments, individual choices constitute the outcome variable while underlying preferences for choice characteristics take on an explanatory role. Hence, their strength is that they can account for knowledge gaps among respondents or social desirability biases, while addressing collinearity issues (Street and Burgess 2007). They achieve that by simulating real-world choices, ensuring high external validity. In particular, paired choice-based conjoint analysis is considered to have high external validity (Hainmueller et al. 2015).

In our paired forced-choice experiment, we presented respondents with randomly generated occupational profiles in tabular format (see [Supplementary Appendix 2a](#) for respondents' view of such a profile). After presenting the participants with these profiles, we prompted them to choose between two juxtaposed profiles (conjoint pairs). These profiles are composed of a random combination of occupational characteristics. To avoid cognitive fatigue, we limited the number of choice tasks to four per respondent. In total, respondents evaluated 17,152 profiles. An attribute of a characteristic has two different levels, following the logic of “high” versus “low.” Hence, we present participants with generic occupations instead of existing occupations (e.g. nurse), because (1) individuals' knowledge of occupations is likely to be inaccurate due to stereotypical representations of occupations (Cheryan 2012; Cheryan et al. 2013; Wiswall and Zafar 2015, 2018; Thébaud and Charles 2018) and (2) occupational characteristics of existing occupations are rarely ever independent of each other. Presenting attribute levels in each profile in a randomized sequence allows us to separate the attractiveness of the different attributes. Thus, our methodological approach enables us to consider the multidimensionality of the characteristics to test our hypotheses.

To measure respondents' preferences, we rely on five characteristics describing skill requirements (based on Holland's RIASEC model) and three workplace characteristics. These measures were further refined by means of two pre-tests with Swiss 8th graders. Our main challenge was to avoid strong associations with existing occupations. Therefore, we used broader descriptions of skill requirements that would not automatically evoke associations with specific male and female training occupations. We operationalize the *Realistic* type as “working with information technology” because many occupations require the use of computers rather than the narrower “working with machines”. Additionally, the latter would evoke strong associations with male-dominated craftsman apprenticeships (Swiss Statistical Office 2019), which we wanted to avoid. Similarly, we use social interactions to describe the skills associated with the *Social* type rather than anything related to caring. For the *Artistic* type, we omit references to any art form and describe the required skill as creativity at work. For the *Conventional* type, we emphasize the aspect of routine work following clear instructions, as opposed to occupations that require an unstructured approach to work, such as finding new solutions to problems. Finally, we describe the *Enterprising* type as having entrepreneurial skills and a willingness to take risks—an attribute often seen as male-connotated (Croson and Gneezy 2009). However, other research points out that risk aversion is domain-specific (Weber et al. 2002), and recent experimental evidence found no gender differences in risk preferences (Combet 2024).

Table 1. Dimensions, attributes, and levels.

Dimension	Attributes	Levels
Skill requirements	1) IT reliance (Realistic type)	I. Strong IT reliance, use of new technologies II. Weak IT reliance, use of standard applications
	2) Social interactions (Social type)	I. Many social interactions in this occupation II. Few social interactions in this occupation
	3) Creative tasks (Creative type)	I. Creativity required for work tasks II. Creativity rarely required for work tasks
	4) Routinized tasks (Conventional type)	I. Routine work, clear instructions for tasks II. Requires to constantly find new solutions
	5) Entrepreneurial tasks (Enterprising type)	I. Entrepreneurial work, can involve risks II. Dependent employment, no entrepreneurial risk
Workplace characteristics	6) Salary expectations	I. Very important, the higher the better II. Not so important, as long as it is enough
	7) Family friendliness	I. Part-time work is possible and common II. Full-time work is expected, overtime can occur
	8) Meaningful work	I. Very important, makes contribution to society II. Not so important, the work needs to suit me

For the first workplace characteristic, we operationalize *salary expectations* as the relevance of monetary compensation, which can be high or low. The *family friendliness* of a workplace is operationalized as the possibility of part-time work, as this is very common among mothers with young children in Switzerland (Häusermann and Bürgisser 2023). Finally, *meaningful work* is described as work that contributes to society. Table 1 shows the eight characteristics, each with two levels.

The Swiss educational system offers an excellent setting for our analysis. In Switzerland, about 65 per cent of all members of a cohort enter the VET system (Swiss Statistical Office 2019). Regarding occupational gender segregation, VET is an under-researched area because most studies so far have focused on major choices at the tertiary level or occupational choices of adults. We focus on 8th graders (mostly 14-year-olds) who are expected to make their occupational choices within the next year. By the end of the 8th school year (June), most adolescents have formed their occupational preferences in the surveyed schools. However, preliminary choices are often made earlier, with most trial apprenticeships starting in the middle of the school year (from February onward). Hence, we collected our data in the first part of the 8th school year, from October to December 2022.

Our study takes place at lower-secondary schools in two German-speaking cantons, Luzern and St.Gallen, which are both comparatively diverse in terms of economic structures and combine rural and urban areas. Additionally, both regions exhibit rather conservative gender norms and are thus representative of Switzerland. Moreover, Switzerland is an ideal location for this study because, from a school perspective, there are no formal admission restrictions to apprenticeships, allowing us to examine the full range of options available to the respondents. That said, although there are no de jure application restrictions, many training occupations prefer applicants from higher ability tracks. However, our robustness

checks show that young people's preferences do not differ by track (see [Supplementary Appendix 2f](#)). In both cantons, VET is a popular choice for upper-secondary education. The school model at the lower secondary level is similar in both cantons, and we have fielded the survey during the compulsory school subject ("Media and Information"). Additionally, this ensured that participating adolescents had access to a computer, reducing biases due to differences in access to technology, for example, at home. Overall, our study offers a unique opportunity to experimentally examine occupational preferences of 8th graders about to select a training position ($N = 2144$).

In our analysis of the forced-choice experiment, we follow the approach by [Hainmueller et al. \(2014, 2015\)](#) and [Leeper et al. \(2020\)](#) for full-factorial conjoint designs, wherein no profiles are excluded. In this specific case, given that certain technical assumptions hold (see [Supplementary Appendix 2c to 2f](#) for a discussion of assumptions, diagnostics, and robustness tests), we can estimate the relative effect of an attribute level on the overall probability of a profile being selected, *ceteris paribus*. The causal quantities of interest are the average marginal component effects (AMCEs). They are regression coefficients estimated with Linear Probability Models (LPM). It is possible to interpret them as independent probabilities because attribute levels are randomly assigned to each profile. The advantages in terms of implementation and interpretation of the AMCEs outweigh the potentially more precise estimation using logistic regressions ([Deke 2014](#)). Thus, regressing a binary outcome variable with ordinary least squares (OLS) is justified (see [Supplementary Appendix 2c](#) for estimated AMCEs). Hence, we apply OLS regressions (see equation below) while clustering by respondents to derive the relative quantities of interest.

Despite their explanatory power, the regression-based estimates have the disadvantage of being sensitive to the choice of reference categories in the experiment. This can lead to inaccurate interpretations of AMCEs, particularly when scholars use visual presentations of them for subgroup comparisons ([Leeper et al. 2020](#)). For this reason, we present our outcomes as marginal means, which, given our design, are equivalent to AMCEs. Technically, they are "standardized" versions of AMCEs based on averaging and therefore, they are descriptive estimates insensitive to reference categories. Thus, differences between two marginal means for a given attribute (e.g. strong and weak IT reliance), estimated based on a full or subgroup sample (e.g. between female and male respondents), have a direct causal interpretation ([Leeper et al. 2020](#)).

$$\begin{aligned} \text{Choice} = & \beta_0 + \beta_1 \text{ITReliance} + \beta_2 \text{SocialInteractions} + \beta_3 \text{CreativeTasks} + \\ & \beta_4 \text{RoutinizedTasks} + \beta_5 \text{EnterprenurialTasks} + \beta_6 \text{FamilyFriendliness} \\ & + \beta_7 \text{SalaryExpectations} + \beta_8 \text{MeaningfulWork} + \varepsilon \end{aligned}$$

We estimate marginal means with Leeper's (2018) R-package "cregg." They are centered at 0.5 since the grand mean in two-alternative forced-choice designs always leads to 50 per cent of the profiles being chose and 50 per cent not. If there is no difference between the two attribute levels, then the average value for each level is 0.5, also indicating that the attribute, overall, does not affect choices ([Leeper et al. 2020](#)). Since all the attributes consist of two levels, we can directly compare them in size and direction (see [Supplementary Appendix 2g](#) for a discussion of power calculations). Values above 0.5 indicate an increase in the choice probability, vice versa for values below 0.5. To test whether a variable creates statistically relevant subgroups, [Leeper et al. \(2020\)](#) prescribe an omnibus *F*-test, comparing

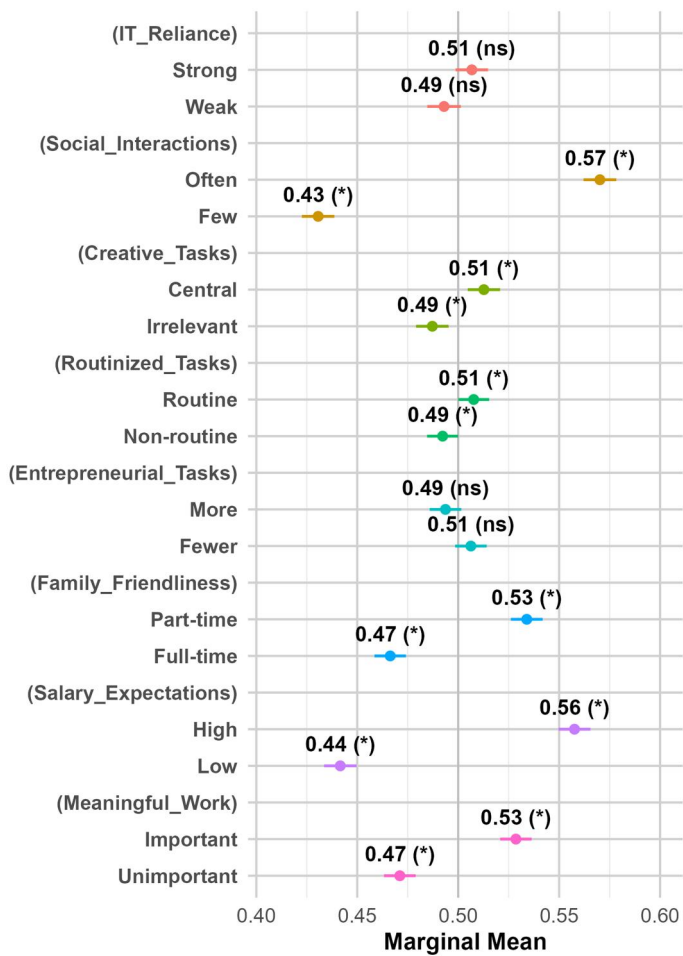


Figure 2. Occupational preferences of Swiss 8th graders.
Notes: Figure 2 shows the β -coefficients of the different occupational characteristic levels with 95 per cent confidence intervals as marginal means (full sample; effects of profile levels on probability of choice). Rounded coefficients based on OLS regression are plotted as marginal means, * $P < 0.05$, ns = not significant. For full tables presenting the marginal means in detail, see [Supplementary Appendix 2b](#).

interactions (effect for ♀: +18 p.p., $P < 0.001$; ♂: +10 p.p., $P < 0.001$), while at the same time the gender difference in their preference is less nuanced compared to technical skills ($\Delta_{\text{♂-♀}} = -0.04$, $P < 0.001$). Thus, hypotheses 1 and 2 are only partially confirmed, as young men unexpectedly also prefer training positions that require social skills, although to a lesser extent than young women. Consequently, the idea that a preference for things excludes a preference for people, as implied in the prominent “people” versus “things” framework (e.g. [Prediger 1982](#)), cannot be upheld based on our results.

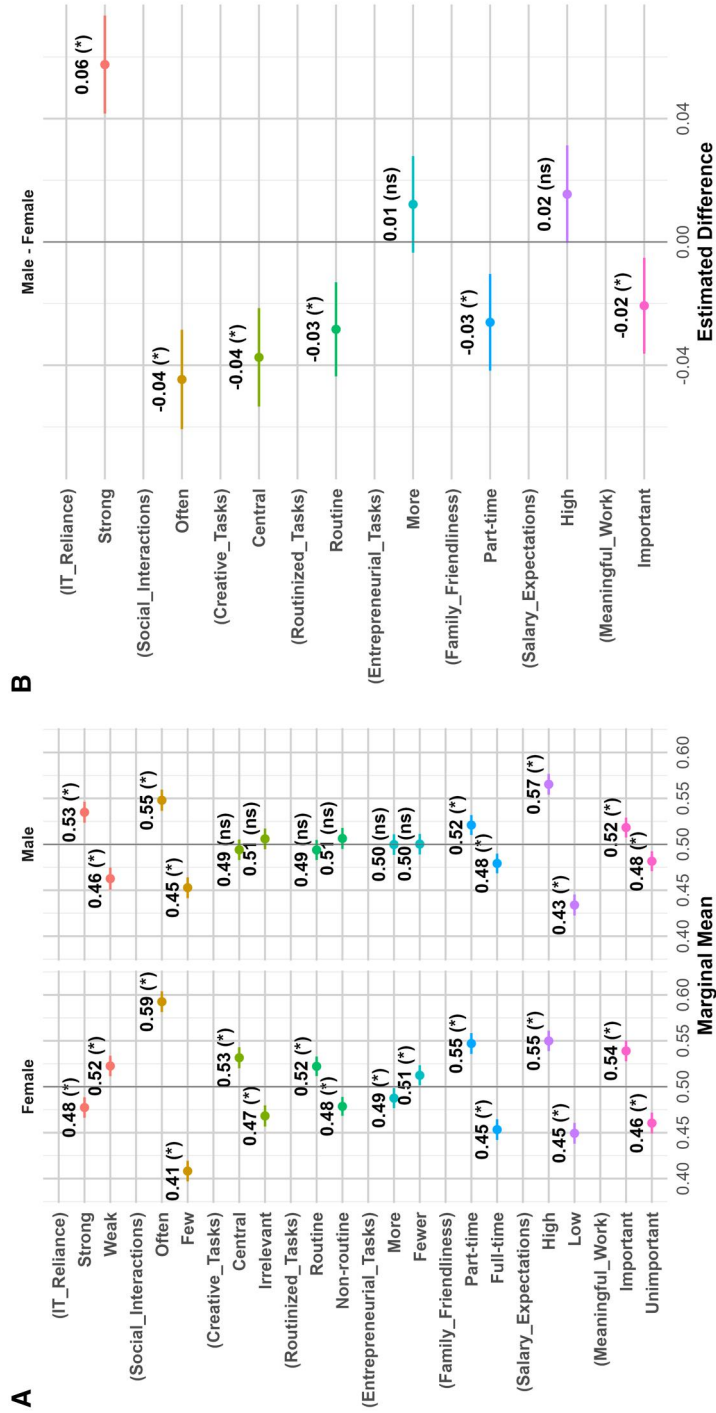


Figure 3. Occupational preferences among adolescents by gender.

Notes: Figure 3 shows the rounded β -coefficients of the different occupational characteristic intervals with 95 per cent confidence intervals as marginal means (full sample; rounded effect/difference sizes of a level on probability of choice). * $P < 0.05$, ns = not significant. The marginal mean for the male subgroup is 0.53 instead of 0.54 due to rounding by cregg (for full tables presenting the marginal means in detail, see [Supplementary Appendix 2b](#)).

Regarding *creative tasks*, young women show a clear preference for this skill (+6 p.p., $P < 0.001$), while male students do not consider it in their choice ($P = 0.3$), resulting in a significant gender difference that confirms our hypothesis ($\Delta_{\text{♂-♀}} = -0.04$, $P < 0.001$). We also hypothesized that young men would prefer *routine tasks* less than young women, while we did expect no gender differences for *entrepreneurial tasks*. As Fig. 3 shows, these expectations are largely confirmed. Among young women, both high routinization and low levels of entrepreneurial work increase the attractiveness of occupations (routinization: +4 p.p., $P < 0.001$; entrepreneurial work: -2 p.p., $P = 0.026$). However, young men's occupational preferences seem to be unaffected by these two characteristics (routinization: $P = 0.27$; entrepreneurial work: $P = 0.97$). Overall, we find a significant gender difference only in the preference for routinized ($\Delta_{\text{♂-♀}} = -0.03$, $P < 0.001$) but not for entrepreneurial tasks ($\Delta_{\text{♂-♀}} = -0.01$, $P = 0.12$).

In terms of workplace characteristics (hypotheses 6–8), Fig. 3 suggests that young women anticipate potential work–family conflicts by showing an aversion to profiles that indicate *full-time employment* (compared to part-time work, +10 p.p., $P < 0.001$). Interestingly, however, this is also true for young men (+4 p.p., $P < 0.001$), suggesting that they may also anticipate potential work–family conflicts, albeit to a lesser extent ($\Delta_{\text{♂-♀}} = -0.03$, $P = 0.001$), thereby partially confirming our hypothesis and being in line with the mixed results of previous research (Zafar 2013; Wiswall and Zafar 2018; Jost and Möser 2023; Seehuus 2023; Burbano et al. 2024; Combet 2024). Of course, a preference for part-time work without overtime can also occur among individuals with a high preference for leisure. However, in the survey, both male and female adolescents indicated that having time for family is more important in their occupational choice than having time for hobbies (Wilcoxon test of difference: women: $P = 0.004$; men: $P = 0.002$).

Looking at material and post-material returns, our results imply that these characteristics are important for both genders. Both young women and men consider monetary compensation a key factor (♀: +10 p.p., $P < 0.001$; ♂: +14 p.p., $P < 0.001$) and they prefer *meaningful work* over *unmeaningful work* in their training positions (♀: +8 p.p., $P < 0.001$; men: 5 p.p., $P < 0.001$). In line with theoretical expectations and previous results (e.g. Non et al. 2022; Burbano et al. 2024), young women prefer meaningful work slightly more than young men ($\Delta_{\text{♂-♀}} = -0.2$, $P = 0.009$). In contrast, young men are not more concerned about monetary compensation than young women ($\Delta_{\text{♂-♀}} = +0.3$, $P = 0.055$), which is in line with our hypothesis and supports previous findings (Non et al. 2022; Jost and Möser 2023; Seehuus 2023; Combet 2024). Overall, hypotheses 6–8 are largely supported as young women's and men's occupational preferences only weakly align with the expectations based on conservative gender roles.

Finally, we also examine whether skill requirements or workplace characteristics are more important for adolescents' preferences for training positions. Regarding the question of which matters more, the results are inconclusive, because the differences in explanatory power and measures of model fit, respectively, are rather small. When considering the test statistics regarding the size of the two variable groups, we find that workplace characteristics matter slightly more for both genders (difference of the averaged effects of the two dimensions for females = -0.01, Wald test: $P < 0.05$; difference of the averaged effects of the two dimensions for males = -0.04, Wald test: $P < 0.01$). However, when considering measures of model fit (R^2 adjusted values, AIC for the logistic models), we find that for young women, skill requirements play a more important role (R^2 adj. = 0.042/

AIC = 12 033) than workplace characteristics (R^2 adj. = 0.025/AIC = 12 184). In contrast, for young men, workplace characteristics (R^2 adj. = 0.020/AIC = 12 340) matter more than skill requirements (R^2 adj. = 0.014/AIC = 12 394), which is in line with our finding that most skill requirements (three out of five) do not significantly influence occupational preferences among young men. These results suggest that occupational gender segregation may emerge due to young women taking skill requirements more into account than young men, while preferences for workplace characteristics do not differ as much by gender. In sum, we can show that skill requirements matter, but they do so differently across gender.

5. Conclusion

Occupational gender segregation remains a persistent phenomenon, despite the convergence of men's and women's preferences and behaviors in many other areas. Recent research using experiments has begun to shed light on the reasons for these persistent differences. This research (Non *et al.* 2022; Jost and Möser 2023; Seehuus 2023; Combet 2024; Burbano *et al.* 2024) has provided evidence that both men and women value workplace characteristics, although it remains unclear whether men or women show a stronger preference. In contrast, skill requirements have not received much attention, although Combet (2024) found the largest gender differences in this dimension.

In this article, we therefore (1) analyzed the role of different skill requirements and related tasks in gendered occupational preferences and (2) assessed their importance relative to the more extensively studied workplace characteristics. In our choice experiment, respondents were asked to choose between two occupational profiles, each with eight different characteristics—five related to skill requirements (measured with the RIASEC scheme, Holland 1973) and three related to workplace characteristics (salary importance, part-time opportunities, and meaningful work). Our respondents were 2144 students in the 8th grade who were in the process of choosing a training occupation in the Swiss VET system within the following year.

Our analyses have shown that while male adolescents consider workplace characteristics more important than skill requirements in their occupational preferences, female adolescents have an equally strong focus on skill requirements and workplace characteristics. Additionally, we have found the largest gender differences in preferences in the skill requirements dimensions: While women have clear likes and dislikes for all five skill requirements, men seem to care only about technical and social skills. In fact, the key attribute in explaining gender differences in occupational preferences is technical skill requirements, operationalized as IT dependency and use of new technologies in the training occupation, with men showing a preference and women a clear dislike. In contrast to technical skill requirements, female and male adolescents mostly share the same preferences. They both prefer training positions that require social skills (young women more than men), pay high wages (no significant gender difference), provide meaningful work (young women more than men), and offer part-time opportunities (young women more than men). Regarding the other three skill requirements, young men are neutral, whereas young women show a significantly stronger preference for training positions that require creativity, structured work, and less entrepreneurial skills (although we observe no significant gender difference for the last characteristic).

Our finding thus suggests that gendered occupational choices are mostly the result of gendered preferences for skill requirements, while women and men have surprisingly similar preferences for workplace characteristics. Young women appear to be more inclined to prefer skill requirements that are in line with gender stereotypes about ability—particularly in their aversion to technical skills and their preference for social and creative skills. In contrast, young men's choices seem to be less affected by skill requirements and more so by workplace characteristics. This finding broadens our understanding of the occupational choice process by demonstrating not only the importance of occupational characteristics in the choice processes in general, but also the importance of gender-stereotyped skill requirements in particular.

Furthermore, there are two other important take-home messages. First, our findings are not in line with the prominent “people” versus “things” framework (e.g. [Prediger 1982](#)). We find that male adolescents prefer technical skill requirements, while female adolescents dislike them. However, both genders prefer training occupations that require social skills. This finding suggests that a multidimensional understanding of these preferences may improve our understanding of real-world gender differences in occupational preferences. More generally, future research should investigate whether certain sub-dimensions of “people” and “things” preferences are particularly important for these choices. For example, young women may be particularly put off by the idea of having to use technical equipment, but not by a high proportion of mathematics.

Second, this study also replicates the previous finding that our current theories are better at explaining women's compared to men's choices ([Combet 2024](#)). It is possible that men's preferences are more in line with the stereotypical (male) image of blue-collar workers, such as craftsmanship, working outdoors, or using physical strength—characteristics that we have avoided in our vignettes so as not to evoke associations with typically male training occupations. Future research should investigate whether these types of occupational characteristics are better at explaining men's occupational choices.

Our analysis suffers from two typical limitations of choice experiments. First, there may be other occupational characteristics that influence gendered occupational preferences (e.g. the gender composition of an occupation). However, the choice of the number of attributes in the profiles is the result of a trade-off between the number of respondents available and the precision of the estimates. Including more attributes would require either a higher number of respondents or a smaller profile sample, which would result in a lower precision of the estimates ([Auspurg and Hinz 2015](#)). Second, the scenarios assessed are hypothetical. It is, therefore, not possible to infer from the ratings which occupations respondents actually prefer. However, the reported results do indicate whether and in what contexts respondents would consider occupations with similar characteristics to those presented, which is a prerequisite for actual occupational choice. At the same time, previous research has shown a high external validity of choice experiments (e.g. [Reuben et al. 2017](#); [Quaife et al. 2018](#)).

In addition, this article has focused only on the preferences of adolescents who are in the process of choosing their vocational training occupation. Occupational choices in VET systems have been overlooked in the existing literature, which typically examines the choice of field of study, despite the fact that in many countries the majority of students enter a VET program at the upper secondary level ([OECD 2023b](#)). Moreover, as [Contini and Cugnata \(2020\)](#) show, most countries rely on tracking at the age of 16 years or earlier. The Swiss case is thus quite typical in terms of the overall size of the VET system and the use of early

tracking. We nonetheless caution against hasty generalizations from VET students to the entire student population. However, we argue that the choice of VET occupations offers some important advantages for the analysis of gendered occupational preferences. In particular, the choice of VET occupations is less aspirational and more concrete than the more commonly analyzed choice of field of study.

This article highlights that the largest gender differences lie in preferences for skill requirements, which particularly affect the occupational preferences of young women. Notably, the only characteristic where female and male adolescents exhibit opposing preferences is in technical skill requirements. In a society where new technologies and digital skills become increasingly important across all occupations, with important implications for gender pay gaps and access to leadership positions, it is critical to increase the interest and confidence of young women in these skills (OECD 2018). Therefore, introducing IT skills early in school and familiarizing children with new and changing technologies could be an effective strategy to achieve this objective. To be clear, converging interests in new technologies and digital skills will not eliminate occupational gender segregation, as women and men with a preference for technical occupations may still tend to sort into different occupations. However, we believe that addressing gendered preferences for skill requirements can go a long way toward reducing gender inequalities in the labor market.

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Supplementary data

[Supplementary data](#) is available at *Socio-Economic Review Journal* online.

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Data Availability

The dataset and a replication file will be made available in a public repository.

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