Educational Review

ISSN: (Print) (Online) Journal homepage: https://www.tandfonline.com/loi/cedr20

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To cite this article: Liza Reisel & Sara Seehuus (2023): Unpacking the logics of gendered educational choices: 10th graders' evaluation of appropriate educational tracks, Educational Review, DOI: 10.1080/00131911.2023.2182762

To link to this article: https://doi.org/10.1080/00131911.2023.2182762

EDUCATIONAL REVIEW
https://doi.org/10.1080/00131911.2023.2182762

RESEARCH ARTICLE

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Unpacking the logics of gendered educational choices: 10th graders' evaluation of appropriate educational tracks

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ABSTRACT

This study aims to unpack one element of the logics of gendered educational choices, namely how cultural beliefs about gender can shape young people's judgements about gendered educational tracks. Through a survey experiment conducted among secondary school students in Oslo, Norway, we assess respondents' judgements about fictitious students' "appropriate" educational choices presented through short vignettes. The study investigates how judgements vary according to the gender of the fictitious students, as well as respondents' gender and their gender essentialist beliefs. The results indicate that devaluation of female-typed work play a role in young people's judgements about educational tracks. Boys and girls alike seem to award male-typed vocational education and general college preparatory education higher status than female-typed vocational education. Nonetheless, vignette boys are more strongly advised against choosing female-typed vocational programmes than vignette girls with the same characteristics. This pattern is evident regardless of respondents' essentialist beliefs. Thus, both devaluation and gender stereotypical expectations pull in the same direction for boys, against entering female-typed education in upper secondary school. Furthermore, the findings indicate that gender essentialism works asymmetrically. Respondents with gender essentialist beliefs are more likely to advise girls not to choose male-typed vocational programmes. However, we did not find evidence that respondents, including those who otherwise express gender essentialist beliefs, believe that female-typed vocational educational choices are appropriate for women simply because they are women.

ARTICLE HISTORY
Received 25 May 2022
Accepted 15 February 2023

KEYWORDS
Devaluation; educational attitudes; experimental design; gender segregation; sex stereotypes; social status

Introduction

Gendered educational choices are among the most important factors perpetuating gender segregation in the labour market (Østbakken et al., 2017), which has persisted in industrialised nations throughout the twentieth century and into the present. Policy makers and scholars alike have endeavoured to understand why new generations

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Supplemental data for this article can be accessed online at https://doi.org/10.1080/00131911.2023.2182762.

continue to choose gendered educational trajectories, despite gains in gender equality in other areas of employment, politics, and the family, yet the puzzle remains unsolved.

One reason for this persistent puzzle is that conducting empirical research exploring such matters is challenging. Gender is a social process where expectations, preferences, desires, and behaviours are an integral part of becoming a gendered member of society (Ridgeway, 2011). Consequently, it is difficult to distinguish between gendered individual preferences and the independent impact of cultural beliefs about gender on educational choices.

We aim to unpack one element of the logics of gendered educational choices by using a factorial survey experiment among Norwegian 10th graders. Rather than investigating actual educational choices, we focus on the way gender may shape educational choices through cultural beliefs by examining the influence of status and gender essentialist beliefs on students' judgements about various educational tracks.

Earlier studies using experimental designs have examined the role cultural beliefs about gender play in influencing men and women's individual performance and preferences (Correll, 2004, 2001). However, to our knowledge, we are the first to use an experimental approach to examine how cultural beliefs about gender affect judgements about educational tracks, and the first to do so in a Nordic context.

Using a factorial survey approach, we provide a new piece of the puzzle for understanding the role of cultural beliefs in influencing educational choices. We asked 10th grade students to evaluate the educational choices of fictitious peers, whose gender and personal characteristics are experimentally varied through short vignettes. Respondents were asked to what extent they would recommend the various educational tracks to fictitious male or female peers. The design allows us to analyse systematic variation in respondents' judgements when the gender of the fictitious individuals is changed, and according to the gender typing of the educational choice being evaluated.

In the following, we start by laying out the theoretical framework, and previous research on gender stereotypes, gender essentialist beliefs, and devaluation of female-typed work, from which we derive our expectations. We then briefly introduce the Norwegian context, and the data and analytical strategy we have used in the study, before presenting our results. Finally, we discuss the implications and limitations of our findings. Our results suggest that devaluation of female-typed tracks and gender essentialism might be among the mechanisms reproducing gendered educational choices. The patterns emerging from this experimental study indicate that the two mechanisms of devaluation and gender essentialism particularly reinforce boys' reluctance to choose female-typed vocational tracks.

Theory and previous research

Gender can be viewed as a multitier system with connections between different levels; the individual level; the micro context of personal interactions and exchanges; and the structural level of culture, economics and politics (Riegle-Crumb et al., 2012). Many of the perspectives used when analysing gendered educational and occupational choices can be categorised as individual-level explanations in the sense that they point to the way in which gender differentiated preferences and orientations lead boys and girls down different educational paths (Thébaud & Charles, 2018; Tellhed et al., 2018; Dekhtyar

et al., 2018). They typically address gender differences in terms of psychological traits, such as agency and communality (Croson & Gneezy, 2009; Falk & Hermle, 2018; Flory et al., 2014; Abele, 2003; Tellhed et al., 2017; Andersen et al., 2013), and the relative advantages associated with gendered orientations and academic strengths and weaknesess (Becker, 1985; Polachek, 1981; Jonsson, 1999; Ochsenfeld, 2016; Riegle-Crumb et al., 2012). Most of these perspectives do not reject the notion that gender differences in preferences can be cultural products, but their influences are typically analysed as individual gendered traits.

Others emphasise that pursuing goals like agency and communality is motivated by role congruity, aligning behaviour to gender stereotypes or gendered societal expectations (Diekman et al., 2010; Eagly et al., 2000). Importantly, gender stereotypes are employed by both men and women, and can be effective even when people do not explicitly agree with them.

Given how gender stereotypes could potentially override conflicting evidence, we may expect to find a pattern where male students are more likely to be recommended to apply for male-typed educational programmes and female students are more likely to be recommended to apply for female-typed ones, all else being equal. Because gender incongruent behaviour may elicit unfavourable judgement and both men and women who violate stereotypical expectations run the risk of being disliked as a result (Ellemers, 2018), we may also expect to find a pattern where male students are more likely to be discouraged from applying for female-typed educational programmes and female students are more likely to be discouraged from applying for male-typed ones, all else being equal, This would be the case if respondents directly associate the vignette person's gender with the gender typing of the educational programme, disregarding other dimensions in the vignette that should be relevant for their educational choice.

Moreover, a substantial body of research indicates that men feel more pressure to conform to gender role expectations than women, and that transgressions of gender role expectations are more severely sanctioned for men than for women (Feinman, 1981; McCreary, 1994; Sirin et al., 2004; Nielson et al., 2020). We may therefore expect that negative recommendations for gender incongruent choices are stronger for male than for female students.

Gender essentialist beliefs

A prominent part of the literature linking gender stereotypes to educational and occupational choices point to *gender essentialism* as a significant mechanism perpetuating gendered educational choices in post-industrial societies (Charles & Bradley, 2002, 2009; Charles & Grusky, 2004; Moskos, 2019). This term denotes the commonly held belief that men and women are fundamentally different, and that the gendered division of labour is natural. A key part of this argument is that gender segregation should be recognised as two-dimensional, constituted by vertical and horizontal segregation. The two forms of gender segregation are argued to be generated and sustained by two distinct cultural logics: while vertical segregation is argued to be underpinned by the idea of *male primacy*, i.e. the belief in men as more status worthy than women, horizontal segregation is argued to be underpinned by gender essentialism. While the belief in male primacy and the vertical segregation it sustains is argued to have weakened over the

past decades, the support for gender essentialism persists, resulting in resilient levels of horizontal gender segregation. Based on an analysis of cross-national data from ten post-industrial nations, Charles and Grusky (2004) argue that horizontal gender segregation tends to be viewed as legitimate, since gender essentialism is not at odds with gender egalitarianism. It is thought that this legitimacy explains not only the inertia in horizontal gender segregation, but also the lack of political resistance to the inequality produced by the division of labour.

However, critics of the explanatory power of gender essentialism claim that occupational gender segregation can be maintained *despite* the attenuation of essentialist beliefs. In the Nordic context, horizontal gender segregation is typically viewed as a challenge to gender equality, much in the same way as vertical segregation (Ellingsæter, 2014; Reskin & Maroto, 2011). It is therefore an open question whether essentialist beliefs are among the driving forces behind the perpetuation of gendered educational choices in the Nordic context.

To investigate whether gender essentialist beliefs are associated with judgments about appropriate educational choices we examine if those who express gender essentialist beliefs differ in their recommendations from those who do not. We expect to find stronger associations between vignette gender and gendered educational programmes among respondents who hold gender essentialist beliefs. More specifically, we expect these respondents to recommend gender congruent choices, and refrain from recommending gender incongruent choices, all else being equal.

Devaluation of female-typed work

The essentialism perspective does not capture contestations over the structural inequalities ensuing from horizontal gender segregation, nor the status differences associated with female-typed and male-typed work. Contrary to the general expectations derived from theories about gender stereotypes and gender essentialist beliefs, gendered status beliefs explicitly attach valuation to feminine and masculine traits, as well as female- and male-typed work. Research from Germany and the United States indicates that men and women share cultural repertoires about the value and attractiveness of activities stereotypically associated with each gender (Auspurg et al., 2017; Ridgeway, 1991). In contrast to the gender essentialist perspective, gendered status beliefs have embedded in them assumptions that men and activities associated with men have higher status than women and activities associated with women, precluding a clear distinction between vertical and horizontal gender divides (Ellemers, 2018; Ridgeway, 2011, p. 27).

Historically, women's labour has been subordinate to men's – first within the household economy of the more patriarchal pre-industrial societies, and subsequently, with the advent of capitalism, through the gendered separation of production and reproduction, and (married) women's limited access to private ownership (Solheim, 2007). As such, gender and social status are inseparably entwined (Ridgeway & Correll, 2004). Female-typed work and work traditionally done by women continue to be culturally and economically devalued (England, 2010). This devaluation remains particularly effective insofar as it is rooted in structural inequalities (Ridgeway, 2011). Devaluation of female-typed work is typically reflected in lower economic returns for female-typed occupations. While this may perpetuate the lower status of these occupations, it may also deter

students from choosing them based on their expected economic returns, regardless of their gender typing. This would be in line with a rational choice theoretical framework, where utility maximising cost–benefit analyses influence individual choices (Breen & Goldthorpe, 1997). At the same time, rational incentives are unlikely to be gendered neutral, given the gendered expectations, stereotypes and sanctions associated with gender typical and atypical occupational choices outlined above (cf. Gabay-Egozi et al., 2015).

Previous research has demonstrated the devaluation of skills and work associated with women, both among adults and young children (Liben et al., 2001; Yavorsky et al., 2021). A distinguishing feature of status beliefs is that both those advantaged by the status belief, *and* those disadvantaged by it, tend to accept it (Ellemers, 2018, p. 290). Consequently, gendered devaluation is typically consensual, meaning that not only men, but also women, would deem female-typed work as lower in status than male-typed work. That status beliefs are beliefs about what "most people" think about the status worthiness and competence of different groups gives status beliefs *social validity*; "the collective dimension of legitimacy that is captured by the sense that others will accept something in a situation, whether or not the actor approves of it" (Ridgeway & Correll, 2006, p. 436). This implies that even when an individual does not personally endorse a given status belief, they will still expect others to believe it to be true, and thus expect others to act according to this belief. In line with this theoretical framework, we assume that female-typed educational choices are awarded lower status than male-typed and gender-neutral educational choices. Consequently, we expect lower recommendation scores for female-typed educational tracks than for all other types of tracks.

The Norwegian context

The Norwegian school system is uniform until upper secondary level, when students choose between academic or vocational tracks, at age 16. Approximately 50 percent of Norwegian students are enrolled in vocational educational programmes, but the proportion is lower in Oslo than in the rest of the country. In 2016, when the data in our study was collected, 31 percent of adolescents in Oslo were enrolled in vocational educational programmes, including apprentices.[1] Eight vocational programmes were available in 2016, two of which had a high share of girls ("Health, childhood and youth development" and "Design, arts and crafts") and three of which had a high share of boys ("Electricity and electronics", "Construction", and "Technical and industrial production"). The remaining programmes, "Service and transport", "Restaurant and food processing", and "Agriculture", were more gender balanced with more than 30 percent of each gender enrolled nationally. The academic track includes a general academic preparatory programme, which is relatively gender balanced, as well as some specialised programmes in fields such as music, sports and arts. Thus, our study focuses on the transition to upper secondary school, where horizontal segregation between vocational programmes is particularly persistent within the Norwegian context. Two aspects of the Norwegian educational system should be noted here. First, teachers and advisors have no official say in the students' choice of upper secondary school track or programme. Secondly, the vocational track has a bifurcation option, allowing students to qualify for tertiary education in their final year if they wish to enrol in higher education instead of (or in addition to) getting their vocational certificate.

Norway is typically ranked highly on international indices of gender equality, women's labour market participation, gender balance in political bodies, and women's educational attainment (World Economic Forum, 2018). The Norwegian context has moreover been described as a "dual earner/state carer" system, where men and women are expected to work, while the state cares for children and the elderly (Crompton, 1999). In theory, this should provide a foundation for men and women's equal participation in work and care, and more gender equal educational and occupational choices than in less gender equal contexts. At the same time, the Norwegian labour market is still gender segregated. In 2016, only 15 percent of the labour force worked in gender balanced occupations, with more than 40 percent of both genders (Østbakken et al., 2017). Due to the compressed wage structure and widespread unionisation, as well as the Norwegian wage bargaining system, skilled workers without tertiary education in male dominated vocational fields have relatively high wages (Reisel, 2013). Female-dominated occupations employing skilled health care, children and youth workers typically have lower status and wages than the male-dominated skilled vocational occupations, and they are typically associated with high levels of part time work (Ellingsæter & Jensen, 2019). In sum, despite many advances towards gender equality in the labour market in Norway over the past half-century, occupational gender segregation and associated gender differences in wages are still prevalent. Vocational education is relatively common, strongly gender segregated, and the female-dominated programmes are associated with lower status and pay than the male-dominated programmes. It is against this contextual backdrop that our study was carried out.

Data and methods

The design used in this study

To test investigate the influence of stereotypes, gender essentialism and devaluation on young people's judgements about educational tracks, we have conducted a factorial survey (FS) experiment among 10th grade students in Oslo. One main advantage of the FS approach is that FS experiments make it possible to disentangle the effects of dimensions that are highly correlated in the real world (Auspurg & Hinz, 2014). Moreover, since respondents are not fully attentive to the experimental manipulation of the vignettes, the data generated by FS experiments are less prone to social desirability bias compared to responses to conventional survey items (Wallander, 2009). Moreover, because individuals are not always aware of the influences certain factors have on their judgements, they might not be able to explicate these influences when asked directly. FS experiments are thus well-suited to investigating implicit cultural beliefs.

Our design asked respondents to evaluate several short descriptions of hypothetical situations (vignettes), consisting of multiple dimensions that vary experimentally across the vignettes (Auspurg & Hinz, 2014). In order to increase the probability that respondents take all the varying dimensions into account in their judgements, and increase reliability, each respondent was presented with six consecutive vignettes. The vignettes were generated by varying the six factors (dimensions) in Table 1.

We chose the six dimensions listed below to examine whether any of these other dimensions, which are theoretically thought to influence educational choices, and with

Table 1. Vignette dimensions and levels.

#	Dimension	Level	Text
1	Gender	1	Boy's name (Random assignment of most common names)
		2	Girl's name (Random assignment of most common names)
2	Personality/interests	1	is a social person who would like to work with people.
		2	is an active person who would like to work with something technical.
			He/she likes
3	Hobby	1	to dance.
		2	to play video games.
		3	to swim.
			In 10th grade he/she has mostly received the grades
4	School grades	1	2 and 3,
		2	3 and 4,
		3	5 and 6,
			and performs better in
5	Best subjects	1	Norwegian and social studies than in other subjects.
		2	mathematics and science than in other subjects.
			He/she is considering applying to
6	Education programme	1	technical and industrial production.
		2	health, childhood and youth development.
		3	service and transport.
		4	electricity and electronics.
		5	design, arts and crafts.
		6	general studies.

which gender is often correlated, impact on recommendations independent of gender. (1) Gender was implied by the name of the person in the vignette. (2) Personality types/interests were intentionally gendered, in the sense that they corresponded to stereotypical notions of male and female characteristics. This enabled us to examine whether these characteristics played an important role in the evaluations, independent of the gender of the person in the vignette. (3) Hobby was thought to strengthen or weaken the image of a gendered personality type, by indicating an interest in male-typed activities (computer gaming) or female-typed activities (dancing), or more gender-neutral activities (swimming). (4) School grades and (5) favourite subjects are strong predictors of educational choice, and were therefore included. They also differ systematically according to gender, and are thought to contribute to gendered educational choices. (6) The education programmes that the person in the vignette is considering applying to were selected based on their gender typing. Programmes such as "health, childhood, and youth development" and "design, arts, and crafts" are female typed, and "technical and industrial production" and "electricity and electronics" are male typed, whereas "general studies" and "service and transport" are not associated with a clear gender typing. The proportion of men taking "health, childhood, and youth development" and "design, arts, and crafts" was less than 20 percent, whereas the proportion of women taking "technical and industrial production" and "electricity and electronics" was less than ten percent in 2016 when the survey was conducted (Statistics Norway, 2019a).

This design enabled us to create hypothetical scenarios in which boys and girls had the same attributes, thereby allowing us to observe whether gender in and of itself plays a

role in educational recommendations, and whether it intersects with the other dimensions included in the vignettes. It also enabled us to investigate whether the evaluation of the various dimensions varied according to characteristics of the respondent. However, the design did not allow us to distinguish between the impact of the gender composition of the educational programme, the gendered associations related to the content of the educational programmes, or their typical occupational destinations.

Vignette sampling strategy

Each dimension had between two and six categories (levels), resulting in 432 possible combinations. We extracted our vignette sample using a D-efficient design that minimises the inter-correlation between the vignette dimensions while maximizing the variance of vignette levels, as recommended for multifactorial survey experiments (see Supplemental Material for more information about the D-efficient sampling technique employed) (Auspurg & Hinz, 2014; Auspurg et al., 2017; Kuhfeld, 2010). We employed the same technique to divide (i.e. block) the vignette sample consisting of 192 vignettes into 32 individual decks, each consisting of six vignettes. The order of vignettes within decks was randomly varied for each individual questionnaire to avoid order effects. The correlation matrix and descriptive statistics for the vignette dimensions are reported in Tables A1 and A2 in the Supplemental Material. As expected, the correlations between the dimensions are low, indicating that the sampling strategy was successful.

The respondents were asked to rate six vignettes based on to what extent they thought the person in the vignette should apply to a given programme on an 11-point scale from zero (no, absolutely not) to 10 (yes, definitely). The respondents also answered a range of ordinary survey questions about their parents' education and occupations, their own educational preferences and choices, and their explicit beliefs about the significance of gender in choosing an occupation. This enabled us to estimate the effects of respondent-level variables on evaluations, and cross-level interactions between the respondent-level variables and vignette characteristics. The questions about parents' education and occupations, the respondents' own educational preferences and choices, and their explicit beliefs regarding the significance of gender in occupational choices, were asked after the vignette module to minimise the risk of priming effects.

Respondent sample

The factorial survey experiment was conducted among 226 10th grade students at five different schools in Oslo. The study was approved as complying with standards for the ethical treatment of human participants by Norwegian Centre for Research Data (project no. 47457). All respondents provided written informed consent before participating in the study.

We strategically chose schools from different parts of Oslo, which, due to a relatively high level of residential segregation, vary in ethnic and socioeconomic composition. In the Norwegian context, ethnic composition refers to the proportion of immigrants and children of immigrants in the population. Among children of immigrants, the largest groups are descendants of those from Pakistan, Somalia and Poland. These three groups of descendants comprise 25 per cent of the total population of children of immigrants in Norway (Statistics Norway, 2019b). We measure socioeconomic composition by parental education, distinguishing between students whose parents have completed a

higher education degree and those whose parents have not. Although this strategic sample is relatively small, it is quite representative of the Oslo youth population in terms of basic demographic traits (Table 2). However, like other experiments, FSs do not necessarily require representative respondent samples to ensure internally valid results (Auspurg & Hinz, 2014; Mutz, 2011).

Analytic strategy

The dependent variable in the analyses is the vignette rating. We transformed the scale from 0 to 10 to −5 to +5, with 0 as the midpoint to ease interpretation. A rating higher than zero indicates a positive recommendation, whereas a rating lower than zero indicates negative recommendations.

The vignette dimension *education programme* was grouped into three categories according to gender profile. We combined the male-typed programmes "technical and industrial production" and "electricity and electronics" into one category, and the female-typed programmes "health, childhood, and youth development", and "design, arts, and crafts" into another. Combining "general studies" and "service and transport" into a gender-neutral category made it difficult to interpret the results, since general studies is the main college preparatory track, which is of significance beyond the fact that it is gender neutral. Therefore, rather than combining a vocational and a non-vocational programme into one category, "service and transport" was excluded from the analyses to provide us with a clear category for comparison. Alternative analyses, where "service and transport" is included alongside general studies, are reported in Figure A2 in the Supplemental Material. We assume that the recommendation ratings for the general track are primarily a function of its key role as a college preparatory track and not because it is gender neutral. As such, it functions as a benchmark track in terms of gender and status. It should be noted, however, that although the gender composition in general studies is balanced on average students continuing on to higher education might still choose gender-typical fields of study later on.

Because each respondent rated a number of vignettes, the data structure is hierarchical, and ordinary least square (OLS) regression models will therefore yield biased standard

Table 2. Respondent characteristics (percent).

	Respondents	Oslo total[a]
Gender		
Boy	48.7	52.3
Girl	51.3	47.7
	100.0	100.0
Parental educational level		
Low (high school or lower)	38.9	44.5
High (any higher education degree)	61.1	55.5
	100.0	100.0
Ethnic background		
Majority	66.4	63.5
Immigrant background	33.6	36.5
	100.0	100.0
N	226	5 796

[a]Statistics about Oslo are retrieved from http://statistikkbanken.oslo.kommune.no/webview/.
Gender is calculated among 16 year olds only. Parental education level is indicated by the education level of 40–49 year olds in Oslo in 2016. Ethnic background is calculated based on statistics for 16–19 year olds in Oslo in 2016.

errors. Although the intraclass correlation is relatively low in our case (cf Table A5), indicating that only a small share of the variance can be explained by variation in rating between respondents, the potential bias resulting from the hierarchical data structure was accounted for by employing multilevel regression with a random intercept specification and cluster-robust standard errors. Random intercept models assume that the threshold of evaluations may differ between respondents, even if the effects of the different vignette variables on the outcome are identical. In other words, the random intercept specification enables us to model the shared part of the evaluations, which is suitable when examining cultural beliefs.

To investigate the impact of vignette dimensions on recommendations by educational programme type, we estimated the interaction effects for each vignette dimension (gender, personality type/interests, hobby, school grades, best subject) and educational programme type. The interaction between respondent-level and vignette-level variables was analysed by splitting the sample by respondent gender and gender essentialist beliefs. To test whether subgroup differences are statistically significant, we ran models with three-way interactions between each respondent variable, educational programme type and the other vignette dimensions. In the analysis of gender essentialist beliefs, we split the respondent sample by a dummy variable derived from a survey question asking the respondents to what extent they agree with the statement that boys and girls are innately different and therefore suited to different types of work. The original question could be answered by ticking one of four alternative answers on a scale from completely agree to completely disagree. The dummy variable was created by coding "somewhat agree" and "completely agree" as 1, and "somewhat disagree" and "completely disagree" as 0. We also checked for interactions with parental education and immigrant background. However, the results of these analyses are not reported because none of the interactions was substantially or statistically significant.

Since all our results are based on the combination of main effects and interaction effects as well as cross-level interaction effects, the interpretation of regression coefficients is not straightforward. To ease interpretation, the results are presented as predicted recommendation scores based on the coefficients reported in Table A5 in the Supplemental Material. The average predicted recommendation scores (aps) are estimated using STATA's margins command. To test whether differences in aps are statistically significant, we employed the margins command with the contrast option to produce contrasts of predictive margins (Jann, 2013), which are reported in Table A4 for vignette gender and Table A6 for all other vignette dimensions. We also estimate contrasts of predictive margins based on the aforementioned models with three-way interactions to test whether differences in aps between subgroups of respondents are statistically significant (Table A4).

Results

Gender congruent recommendations?

To disentangle the influence of gender from the influence of other, possibly correlated, factors, we estimated the effects of all the dimensions included in the vignettes, and the interaction between each dimension and programme type. Figure 1 shows the results based on evaluations of whether the person in the vignette "should apply" for a specific study programme.

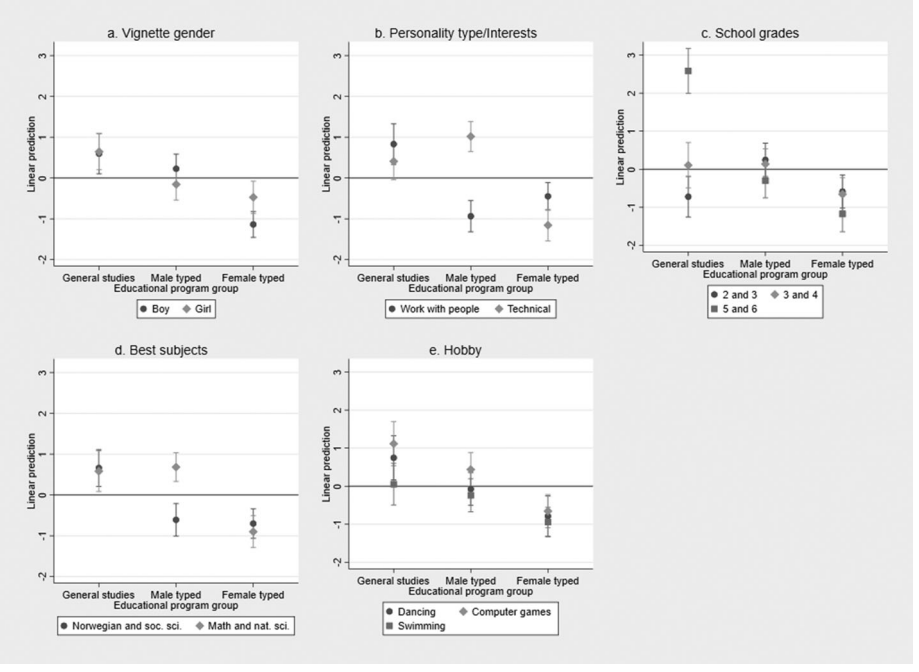

Figure 1. Predicted recommendation scores for whether vignette persons "should apply", by vignette dimensions. 95% confidence intervals. Note: The predicted recommendation scores are based on estimates from Table A5a in the Supplemental Material.

The main finding regarding recommendations according to vignette gender and the type of education programme (Figure 1a) partly supports the assumption that vignette boys and vignette girls, whose other characteristics are identical, will be given gender congruent recommendations. Whereas the average predicted recommendation scores for female-typed vocational tracks for vignette girls was negative and statistically significant (−0.47, $p = 0.012$), vignette boys were given significantly more strongly negative recommendations for female-typed vocational tracks compared to vignette girls (diff = 0.666, $p < 0.01$, see Table 4a). In other words, both girls and boys were on average recommended not to choose female-typed tracks, but when experimentally replacing a girl's name with a boy's name, the recommendation scores were significantly lower for vignette boys.

The average predicted recommendation scores for male-typed vocational tracks for vignette boys was positive, without reaching statistical significance (0.23, $p = 0.214$) (Table A3 in Supplemental Material). This means that on average, the respondents were neither positive nor negative towards gender congruent choices for vignette boys. There was no significant gender difference in the recommendation scores for male-typed vocational tracks or general studies.

Vignette gender is our main dimension of interest, and the other vignette dimensions are primarily included in the experiment to allow for the testing of the independent influence of gender on recommendations. However, it is useful to also consider what role the other dimensions in the experiment play relative to gender in affecting recommendations for gender typed educational tracks. Figure 1 shows predictable patterns

between the various vignette dimensions and educational programme types. For instance, whether the person in the vignette is more "technically oriented" or wants to "work with people" is irrelevant to recommendations for general studies, but respondents are much more inclined to recommend that technically oriented vignette persons choose male-typed programmes, compared to female-typed ones, as well as compared to people in the vignettes who "want to work with people" (Figure 1b).

The strongest effects of vignette dimensions on educational programme types are those of grades on general studies (Figure 1c), and of personality type (Figure 1b) and best subjects (Figure 1d) on male-typed programmes. Vignette persons with good grades (mostly 5 and 6 on a 1–6 point scale) are recommended to take general studies to a much higher degree than those with poorer grades, whereas individuals in the vignettes who would like to work with something technical, and those who perform better in math and science compared to other subjects, are more readily recommended male-typed vocational programmes, all else being equal.

Hobbies follow the pattern of the average recommendations, where all hobbies are negatively associated with female-typed educational tracks and cluster around the midpoint for male-typed educational tracks (Figure 1e). According to the contrast of predictive margins (Table A6), playing computer games stands out as significantly positively associated with general studies and male-typed vocational programmes, compared with the more gender-neutral activity swimming.

Do gender essentialist beliefs inform recommendations for educational tracks?

Table 3 shows the proportion of respondents who agreed with two different statements about innate gender differences and work. On the one hand, almost half the respondents agreed with the gender essentialist notion that boys and girls are innately different and therefore suited to different types of work. On the other hand, most respondents also agreed with the opposite, but more openly worded statement that gender is irrelevant for what type of work a person can be suitable for. It is worth noting, however, that the results show substantially weaker approval for the gender essentialist statement than the opposite one. Whether this is a reflection of the respondents' beliefs or a result of what they feel expected to answer, this does indicate that gender essentialism may not be as socially acceptable as some of the literature in the field seems to suggest (cf. Ellingsæter, 2014).

Contrary to what may have been expected, we found no systematic difference in the responses to these statements according to parental education. We found, however that boys were substantially and significantly more likely to endorse gender essentialist beliefs

Table 3. Share that agrees with statement. Percent.

	Respondent gender		Parental education		
	Boys	Girls	Lower Educ.	Higher Educ.	Total
Boys and girls are different from birth, which means they are best suitable for different types of work.	53	36*	49	41	44
Whether you are a boy or a girl makes no difference as to what kind of job you are suited for.	74	89*	85	79	81

* = significant difference by demographic category at $p < 0.05$ (Pearson's chi^2).

than girls. While more than half of the boys agree with the statement that boys and girls are different from birth, which means they are best suitable for different types of work, this applied to just over one third of the girls. And whereas only about three quarters of the boys agreed with the statement that whether you are a boy or a girl makes no difference as to what kind of job you are suited for, this applied to almost 90 per cent of the girls. We interpret this as an indication of the narrower boundaries of male gender roles versus female gender roles, in line with previous research (Nielson et al., 2020; Sirin et al., 2004).

Next, we investigate to what extent gender essentialist beliefs are associated with judgements about gendered choices of educational tracks. We used the first of the two questions in Table 3 to measure explicit gender essentialist beliefs, both because it addresses essentialism more directly, and because it provides more variation in responses compared to the alternative wording.

Our results show that respondents who explicitly expressed gender essentialist beliefs only partly gave more gender congruent recommendations than those who did not express such beliefs. The negative recommendation against choosing female typed vocational programmes was significantly stronger when the vignette person had a boy's name than when they had a girl's name, regardless of whether respondents held essentialist beliefs or not (diff = 0.918 and 0.572 respectively, $p < 0.05$, Table 4c).

However, we found significant gender differences in recommendations for male-typed vocational education only among respondents who express gender essentialist beliefs (Table 4c). The results reported in Figure 2 indicate that respondents who expressed explicit gender essentialist beliefs did not recommend male-typed vocational programmes to persons in the vignettes with girls' names, whereas those who did not express gender essentialist beliefs are more neutral to girls' choice of male-typed programmes, all else being equal. It is worth noting, that even respondents who explicitly expressed gender essentialist beliefs refrained from recommending female-typed vocational tracks, regardless of the vignette persons' perceived gender (Figure 2).

When formally testing for group differences among respondents by computing contrasts of predictive margins based on a model in which a cross-level interaction is included, the differences in recommendation ratings across the two groups reach statistical significance only at the .90 level ($p = 0.0857$, Table A4). However, given that the patterns are different and the gender gap in recommendation scores of respondents with gender essentialist beliefs is large and statistically significant, gender essentialist beliefs

Table 4. Contrasts of predictive margins for whether vignette persons "should apply", full sample, by respondent gender and essentialist beliefs.

	(a) Full sample		(b) Resp. Gender			(c) Resp. Essentialist beliefs			
			Male		Female	Not ess. Different		Ess. Different	
Vignette gender									
Contrasts of vignette gender over programme group									
(Girl vs Boy) General studies	0.050		−0.067		0.154	−0.323		0.670	
(Girl vs Boy) Female-typed	0.666	**	0.815	*	0.508	0.572	*	0.918	*
(Girl vs Boy) Male-typed	−0.382		−0.208		−0.602	−0.085		−0.947	*

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ (based on chi2).

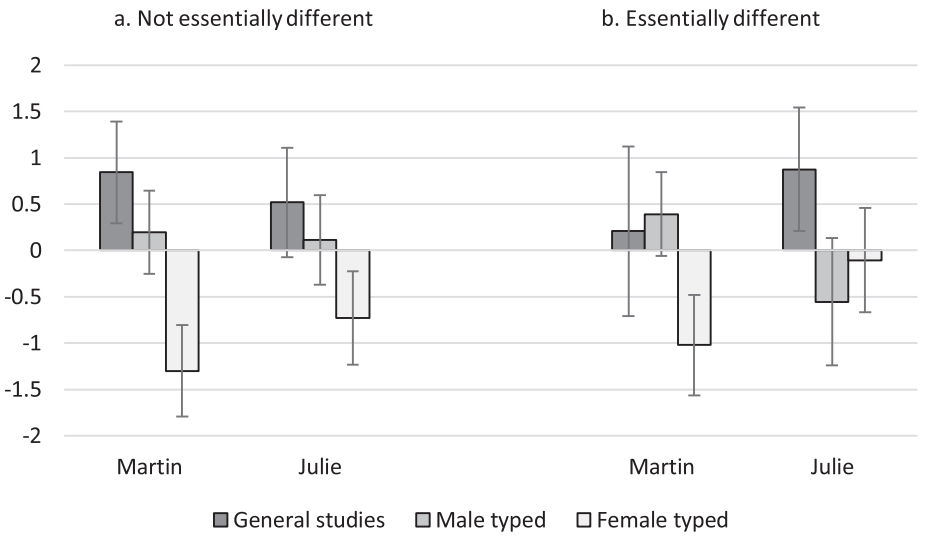

Figure 2. Predicted recommendation scores by vignette gender, education programme group and respondent essentialist beliefs. 95% confidence intervals. Note: The predicted recommendation scores are based on estimates from Table A5c in the Supplemental Material.

likely play a role in the judgements about educational choices, even though they are far from universally held by the respondents (cf. Table 3).

Devaluation of female-typed tracks?

We interpret the differences in average predicted recommendation scores (aps) as indicating differences in the status attributed to each type of educational programme. As we have already seen, Figure 1a, as well as Table A3 in the Supplemental Material, show the recommendation scores for general studies (gender neutral), and female-typed and male-typed vocational tracks, and how these vary according to vignette gender. We find that general studies clearly have the highest status and is positively recommended to the same extent regardless of whether the vignette person has a boy's or girl's name, all else being equal (aps = .60 ($p = 0.018$) and .65 ($p = 0.004$) respectively). Female-typed vocational tracks have the lowest status, and such programmes have negative recommendations for vignette boys and girls alike (aps = −1.14 ($p = 0.000$) and −0.47 ($p = 0.019$) respectively). In fact, respondents do not seem to think that their (hypothetical) peers should choose female-typed vocational tracks, regardless of vignette gender (Figure 1a), or any of the other vignette dimensions (Figure 1b–e). Finally, male-typed tracks are located between general studies and female-typed tracks in status, with recommendations around the scale's midpoint, indicating neither positive nor negative sentiments (aps = 0.23 ($p = 0.214$) for vignette boys and −0.15 ($p = 0.430$) for vignette girls).

Figure 3 shows that the negative recommendation for female-typed vocational tracks is evident across respondent gender. Moreover, the stronger negative recommendation for vignette boys than vignette girls that we saw in Figure 1a is largely driven by the answers of the male respondents in our sample (Table 4b diff = 0.815 $p < 0.05$ for male respondents). At the same time, the recommendation patterns for female-typed

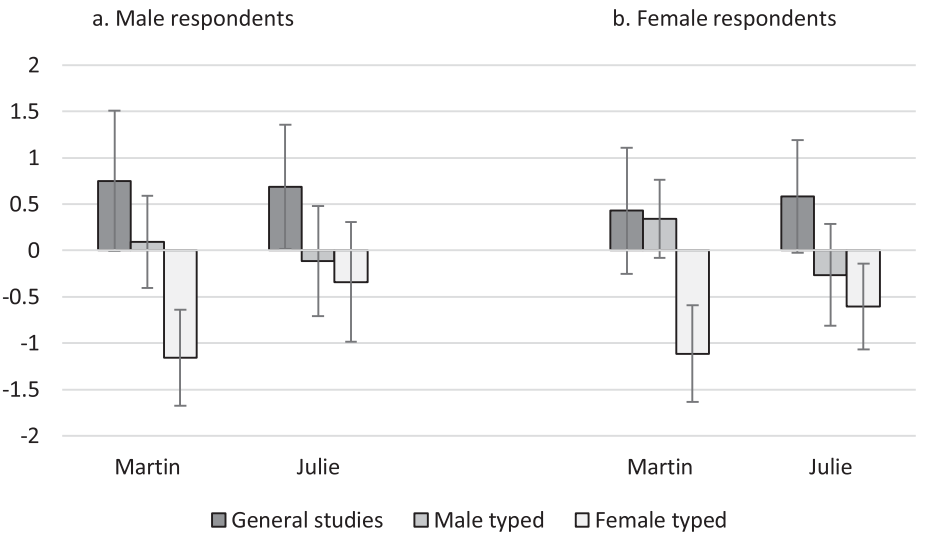

Figure 3. Predicted recommendation scores by vignette gender, education programme group and respondent gender. 95% confidence intervals. Note: The predicted recommendation scores are based on estimates from Table A5b in the Supplemental Material.

programmes across respondent gender are still quite similar and do not differ significantly (diff = −0.308, p = ns, see contrasts of predictive margins in Table A4 in Supplemental Material). In other words, respondent girls also give negative recommendations for female-typed vocational tracks to both vignette boys and girls (Figure 3, diff = 0.508, p = ns). This underscores that the negative judgements about female-typed educational choices are shared by male and female respondents and in this sense, devaluation seem to be consensual across genders.

Discussion

In this article, we have attempted to unpack the influence of cultural beliefs on judgements about gendered educational choices using a survey experiment. The factorial survey design has allowed us to assess the respondents' judgements about hypothetical students' "appropriate" educational choices, and how these vary according to the gender of the hypothetical peers, as well as the respondents' own gender and explicit gender essentialist beliefs. We find weak support for the expectation that respondents would give gender congruent recommendations based on stereotypical gender role expectations, everything else equal. On average, neither vignette boys nor vignette girls receive positive recommendations matching their gender to the gender typing of the educational programme. Both vignette boys and vignette girls consistently receive negative recommendations for choosing female-typed vocational programmes. The main gender difference is that vignette boys are even more strongly advised against choosing female-typed vocational programmes than vignette girls with the same characteristics. This stronger negative recommendation against female-typed programmes is mainly driven by the male respondents. In line with this, our findings indicate support for a general devaluing of female-typed vocational programmes within this sample of urban

Norwegian teenagers. By contrast, male-typed vocational educational choices are generally evaluated in more positive or neutral terms.

In addition to the general devaluation of female-typed programmes, we find that gender essentialist beliefs likely also affect students' judgements. Among respondents who express explicit gender essentialist beliefs, there are significant differences in recommendations for vignette boys and vignette girls, with the same characteristics. This group of respondents stand out in that they give negative recommendations to vignette girls against choosing male-typed vocational tracks. In other words, respondents who hold gender essentialist beliefs are less likely to think that male-typed vocational programmes are appropriate choices for girls, even when all else is equal. Among respondents who do not express explicit gender essentialist beliefs, we do not find this pattern.

Previous research has relied heavily on notions of gender essentialism to explain why horizontal gender segregation is so pervasive in post-industrial societies (cf. Charles & Grusky, 2004). Our study indicates that gender essentialism works asymmetrically. Based on our findings, it does not seem like young people, including those who otherwise express gender essentialist beliefs, believe that female-typed vocational educational choices are appropriate for women simply because they are women. In other words, we found no evidence that gender essentialist beliefs are positively associated with recommending girls' female-typed educational programmes.

Rather than identifying a pattern of gendered recommendations in line with stereotypical gender role expectations, we found consistent evidence of a devaluation of female-typed educational programmes. This indicates that even in a country like Norway, where many external barriers have been removed, both with regard to gendered life choices, and educational choices more generally, the devaluation of female-typed activities persists. At the same time, respondents who express gender essentialist beliefs are significantly more negative to vignette girls choosing male-typed programmes than they are to boys making this choice. Combined with a devaluation of female-typed tracks, this arguably leaves general studies as the most culturally acceptable choice for girls. This may be among the reasons why girls believe that trying hard at lower secondary school is more important, and have higher educational aspirations, than their male peers (cf. Borgonovi et al., 2018, p. 49 and 58; Hadjar et al., 2014). Moreover, the negative attitude towards girls choosing male-typed vocational programmes may further limit the range of relevant alternatives for girls whose choices may already be constrained by low grades or other disadvantages. This prompts us to suggest that choice constraints and compromises may be driving some of the gender-typical educational choices of girls (Hodkinson & Sparkes, 1997; Lupton, 2006).

In addition, our findings confirm the expectation from previous studies that gender role expectations are more pronounced for boys than for girls. Negative recommendations associated with female-typed educational programmes may be explained along the lines of rational choice theory, as young people are likely aware of the lower status and wages associated with female-typed work. Yet, this cannot fully explain the difference in negative recommendations given to male and female vignette persons. Given what we know about young people's imperfect information about future earnings (Almås et al., 2012; Baker et al., 2018), it is unlikely that the stronger negative recommendation for boys can be explained by a rational evaluation of gender specific returns to alternative educational choices. This would require the respondents to consider that boys may

receive greater payoff than girls to choosing something other than female-typed educational tracks. Rather, it seems likely that weak labour market returns to female-typed vocational programmes interact with (boys') negative judgements about boys choosing female-typed vocational programmes, further discouraging boys from making non-traditional educational choices in the transition to upper-secondary school within the Norwegian context. Men's resistance towards female-typed work has been recognised as a key barrier to further declines in occupational gender segregation (England, 2010; Moskos, 2019; Yavorsky & Dill, 2020).

According to our findings, devaluation and gender stereotypical expectations pull in the same direction for boys, against entering female-typed education in upper secondary school. By contrast, while devaluation potentially discourages girls from choosing female-typed vocational programmes, gender essentialist beliefs also discourage girls from choosing male-typed vocational programmes. This double negative judgement regarding girls' choice of gendered vocational programmes in upper secondary school may be a contributing factor to the gender gap in educational achievement at the end of lower secondary school, if it disproportionately incentivises girls to try harder in school to avoid vocational education altogether.

Limitations and future research directions

Based on our research design, we cannot use statistically insignificant results to conclude that there are in fact no effects or differences, as pre-study power calculations are required to rule out that such null findings are not caused by a low number of observations. An additional limitation is that we cannot extrapolate from our findings how students evaluate and think about their own choices. Our study is also based on a relatively small urban sample within one country; this may preclude its generalizability to other education systems or welfare state types. The data was collected in 2016, so the findings cannot address possible changes in attitudes that may have occurred following the Covid-19 pandemic's augmented focus on the significance, and exposure, of health and care workers. Finally, our study looks only at the first transition from lower secondary to upper secondary education. Many choices are made after this, especially among the relatively large group of students who choose general education programmes, and who eventually enrol in higher education. These later educational choices should be the topic of future research using experimental designs.

In combination, our findings can help explain the under-representation of boys in female-typed vocational programmes. However, our findings do not help explain why so many girls continue to choose female-typed vocational programmes. We would suggest that choice constraints and compromises may be important aspects to examine in future research.

Conclusion

A central motivation for this study was to unpack some of the normative logic influencing gendered educational choices among youth, to better understand the perpetuation of gender segregation in the labour market. The results indicate that devaluation of female-typed work play a role in young people's judgements about educational tracks.

Boys and girls alike seem to award male-typed vocational education and general college preparatory education higher status than female-typed vocational education. This may be directly or indirectly influenced by the lower rewards in the labour market for female-typed labour. Although we did not find gender congruent recommendations in line with stereotypical gender role expectations, male respondents were particularly negative to gender incongruent educational choices among their male peers. Our findings thus suggest that both devaluation of female-typed vocational programmes and gender stereotypes may discourage boys from pursuing female-typed vocational education. In addition, respondents who expressed gender essentialist beliefs were particularly negative towards gender incongruent educational choices among their female peers. These findings underscore the relevance of cultural beliefs about gender in judgements about educational programmes, over and above individual students' abilities and preferences.

Note

1. Data derived from Statistics Norway Table 09378: Elever i videregående opplæring, etter region, studieretning / utdanningsprogram, statistikkvariabel og år [Pupils in upper secondary school by region, study programme, statistical variable and year].

Disclosure statement

No potential conflict of interest was reported by the author(s).

Funding

This work was supported by the Research Council of Norway - grants no 236770 and 283603, and CORE - Centre for Research on Gender Equality.

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