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Stratified strategies? Gender, social background and access to selective fields in Norway

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ABSTRACT

Fields of study are segregated along the lines of social class and gender. The most prestigious and selective professional fields, such as medicine or law, are persistently dominated by socially privileged students but have undergone a pronounced feminization in recent decades. We first investigate gender and SES differences in strategies, in admission chances and whether strategies mediate these differences. Second, we explore how gender and SES interact in shaping applicants' strategies and their admission chances. Third, we consider the role of students' GPA and how different social groups use compensatory strategies to enhance their chances of admission. The Norwegian context is well suited to study this topic because of its comprehensive education system and its field-specific selectivity in higher education, which is mainly based on candidates' grade point average (GPA), but also offers opportunities to invest in certain strategies to gain access to the most prestigious fields of study. Using full population register data and discrete survival models, we find that high-SES candidates and women have a greater chance of getting admitted, which is mainly explained by their higher GPA. High-SES and male applicants are somewhat more likely to use strategies to meet admission criteria that the Norwegian admission system offers, especially if they have low GPAs, indicating a system of compensatory advantage. However, these overall small differences in strategies seem to perpetuate already existing inequalities rather than increasing or alleviating them.

1. Introduction

In the course of the 20th century, higher education (HE) systems worldwide have expanded tremendously (Schofer & Meyer, 2005) and both vertical and horizontal stratification within the HE system became increasingly important for social status, labor market outcomes, and social reproduction. Accordingly, fields of study are segregated along the lines of social class and gender. Research consistently shows that the most prestigious fields are dominated by students with a high socio-economic status (high-SES students) since such fields secure status reproduction even in the light of educational expansion (Lucas, 2001). Gender segregation of fields of study is even more pronounced (Charles & Bradley, 2009), contributing to gender inequality in the labor market (Bobbitt-Zeher, 2007; Wagner, 2020). However, some of the most prestigious and high-paying professional degrees, such as medicine or law, experienced a pronounced feminization in many countries and are today gender neutral or even female dominated (Boulis and Jacobs, 2008; Goldin and Katz, 2011; Hansen and Strømme, 2021).

One reason for the advantage of certain social groups in access to prestigious fields of study might be differences in the likelihood to apply for programs that are known to be very selective and rewarding. However, on top of these self-selection processes institutional selection practices might also play a decisive role for inequality in admission chances of *applicants*. Prestigious study programs are naturally very competitive and thus selective; access is restricted and bound to certain criteria, which are often “merit-based” as this is seen as efficient and legitimate (Furuta, 2017). In many countries, a summary measure of students' school grades—their grade point average (GPA)—is a crucial admission criterion. Well known SES and gender differences in school grades are thus one reason for unequal admission chances to prestigious study programs (DiPrete and Buchmann, 2013; Zwick and Greif Green, 2007, see also Xu & Wu as well as van Hek & Geven in this special issue). However, most admission systems do not base their student selection solely on school grades, but combine them with further criteria, ranging from test scores, advanced courses, or essays, to job experience or even “age.” This provides access opportunities for those without top grades.

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Which students take advantage of these opportunities to increase their admission chances to prestigious (professional) programs, degrees and labor market positions?

Group differences in strategic behavior (“gaming the system”) and in meeting admission criteria have been extensively studied to understand social (class-based) inequality in access to HE, especially to the most selective institutions (Alon, 2009; Berggren, 2007; Buchmann et al., 2010; Mbekeani, 2023; Thomsen, 2018; Zimdars et al., 2009). However, such mechanisms have less often been studied with regard to gender, perhaps because questions of social reproduction and resources vary much more between high-SES and low-SES students than they do between boys and girls. Yet studying gender differences in application strategies and admission chances is highly relevant since such differences might contribute to gender (in)equality in HE and the labor market. Furthermore, it seems important to consider the interplay between gender and SES to understand the complexity of application strategies, unequal access opportunities as well as the gender and class-based (de-)segregation of fields of study and occupations.

Against this background, we examine the role of admission criteria and related strategies in creating (or reducing) gender and SES-based inequalities in access to the most prestigious fields of study in Norway. More specifically, we first analyze gender and SES differences in strategies, in admission chances and whether strategies mediate these differences. Second, we explore how gender and SES interact in shaping applicants’ strategies and their admission chances. Third, we consider the role of students’ GPA and how different social groups use compensatory strategies to enhance their chances of admission.

To tackle these questions, we draw on Norwegian register data that cover the whole population of students who graduated from upper secondary school between 2009 and 2016. So far, research on social inequality in application strategies and admission criteria has mainly focused on the US case (e.g. Alon, 2009; Buchmann et al., 2010; Hoxby & Avery, 2013), which is known for its highly stratified HE system, high costs and unstandardized admission processes, which amplify differences in economic and informational resources. However, certain admission rules have been shown to contribute to unequal access also in social-democratic Scandinavian countries (Berggren, 2007; Thomsen, 2018). The Norwegian case adds another insightful perspective to this pattern. On the one hand, Norway is known for egalitarian structures: many HE programs are non- or mildly selective, mostly free of charge and the state offers grants and loans to every student (Thomsen et al., 2017). Furthermore, admission procedures are centrally defined and transparent. Thus, considerations of direct costs and information barriers are unlikely to be the main driver of unequal access to HE as is the case in more market-driven HE systems (Dynarski et al., 2023; Hoxby and Avery, 2013). On the other hand, certain professional fields of study, instead of institutions, are very selective and lead to highly rewarded and highly paid positions (Borgen and Mastekaasa, 2018; Kirkeboen et al., 2016). Graduating from these fields requires a substantial investment and commitment from students and is also riskier since rewards can only be reaped after a prolonged duration of training. Moreover, access to these fields is very competitive and applicants’ GPA is the most important criterion. However, admission decisions are also based on further criteria and related strategies (Sandsør et al., 2022)—which makes Norway a particularly interesting case to examine whether related strategies might be stratified along the lines of gender and social background. Interestingly, admissions in Norway are not based on test scores, which are essential to get access to elite programs or institutions in many other countries (e.g. Alon & Tienda, 2007; Finger & Solga, 2023; Kwon et al., 2015; Tiffin et al., 2014), but on other, partly nonmerit-based criteria. As admission systems are under critical scrutiny and reforms are being called for and implemented in many countries (including Norway) (Finger et al., 2024; Hovdhaugen et al., 2020; Soares, 2020; Yu and Su, 2024), understanding how the Norwegian system shapes inequality in access to HE will not only contribute to our theoretical understanding of gender and social inequality in HE, but also

to policy debates on fair student admissions.¹

2. Previous research and theoretical perspectives

In the following, we review previous research and theoretical perspectives on SES and gender differences in access to prestigious fields of study and discuss the role of admission criteria and strategies for inequality in admission chances. We will not only focus on gender and SES as single determinants of inequality, but also consider their interplay in shaping strategies as well as the (mediating and moderating) role of prior school achievement in this process.

2.1. Gender, SES and access to prestigious study programs

As increasing shares of young adults enter and graduate from HE, stratification within the HE system becomes increasingly important for labor market attainment and social positioning (Lucas, 2001). Depending on the institutional diversification of the HE system, it is either the vertical dimension—institutional type or elite institutions (for instance in the US, UK, or France)—or the horizontal dimension of fields of study (in many European countries, including the Nordic ones) that are strongly linked to labor market returns. Why are fields of study segregated along the lines of social class and gender?

Despite educational expansion and the influx of students from lower social classes into the HE system, children of privileged social origins have secured their advantages in access to the most lucrative options within HE. One central argument to explain social inequality in education is that members of all social classes try to avoid social downward mobility leading to more ambitious, or riskier, educational choices of students from privileged backgrounds (Breen & Goldthorpe, 1997). Moreover, due to increasing student numbers, graduating from any HE program might not be sufficient for high-SES students to ensure status maintenance. They thus attempt to enter the most lucrative educational options at a certain level, leading to inequality being effectively maintained (Boliver, 2011; Hällsten, 2010; Lucas, 2001; Reimer and Pollak, 2010; Thomsen, 2015)—a pattern that has also been observed for Norway, albeit with decreasing social gaps (Thomsen et al., 2017). Furthermore, the anticipation of high costs (in terms of fees and longer durations) and challenging curricular as well as the perceived elite culture of institutions and fields at the top of the educational hierarchy contributes to the “self-elimination” of low-SES students (Bourdieu and Passeron, 1990; Reay et al., 2010). As suggested by the literature on academic mismatch, this might even apply to high-achieving students who would be likely to graduate successfully from prestigious programs (e.g., Campbell et al., 2019; Hansen, 2011).

In contrast to persistent socio-economic inequalities, the underrepresentation of women in HE reversed over the last decades—today’s young women constitute the majority of HE students and graduates in many countries (Charles, 2011; DiPrete and Buchmann, 2013). Yet, gender segregation of fields of study remained pronounced, especially in the most advanced industrial societies, with women being particularly underrepresented in technical and (“hard”) science fields and overrepresented in the humanities and social fields (Barone, 2011; Charles and Bradley, 2009). Gender-essentialist preferences for certain job attributes and lifestyles, perceived and actual strength in certain academic domains, or perceptions of discrimination have been discussed and tested as reasons for gendered field of study choices in numerous studies (e.g., Barone & Assirelli, 2020; Morgan et al., 2013; Ochsenfeld, 2016).

Yet, since male-dominated fields are typically associated with higher earnings—be it because of the devaluation of female-typed occupations

¹ During the work on this article, the Norwegian government implemented a reform of the admission system, so that the maximum number of extra points available is reduced, and some of the criteria, which were still in place in the years we cover, are removed.

and tasks (England et al., 2007) or differences in productivity (Tam, 1997)—gender segregation of fields of study contributes to gender inequality in the labor market (Bobbitt-Zeher, 2007; Seehuus and Strømme, 2025; Wagner, 2020), for gender differences in college premium see Mandel in this special issue). However, some of the most prestigious and high-paying professional degrees, such as medicine or law, experienced a pronounced feminization in many countries (Bolton and Muzio, 2007; Goldin and Katz, 2011; Jefferson et al., 2015; Magness, 2016). Reasons for this trend might be that especially middle-class women have had large incentives to enter male-typed educational fields and occupations with high prestige to ensure upward mobility, which would rarely have been possible without pushing gender boundaries (England, 2010; for Norway: Seehuus, 2019). Furthermore, with the abolishment of formal entry restrictions and the delegitimization of overt gender discrimination, women increasingly entered some professional fields that—despite having been dominated by men and cultivated a masculine culture (Adams, 2010)—adhere to their gender essentialist preferences (e.g. caring and social contact) (Charles & Bradley, 2009). Men, in contrast, might find feminized professions decreasingly attractive and select out of related study programs (England & Li, 2006).

Overall, one important reason for gender and SES-based inequality in access to prestigious HE programs might relate to self-selection processes. As argued above, low-SES students, even high-achieving ones, might be less likely to apply to prestigious programs than their high-SES peers in the first place due to differences in risk aversion, cost and success considerations as well as perceptions of cultural (mis)fit. Regarding gender inequality, arguments of self-selection are less conclusive. While some professional degrees apparently became more attractive for young (high-SES) women, gender differences in the decision to apply to a prestigious program is likely related to its actual gender composition.

Our central aim in this article is to understand the role of strategies and admission criteria for gender and SES differences in admission chances among *applicants*. However, we acknowledge the important role of differential self-selection for inequality patterns among applicants. To draw a comprehensive picture, our empirical examination will include some descriptive evidence on gender and SES differences in the likelihood to apply to prestigious programs and in the likelihood to get access among all upper secondary school graduates (unconditional on their application decision).

2.2. Admission criteria and students' strategies

Access to prestigious fields of study is not only linked to gendered and SES-based decisions to enter such fields. Beyond such self-selection processes, institutional selection practices are crucial to maintain or create advantages (Alon, 2009; Boliver, 2011; Karabel, 2005; Strømme and Hansen, 2017; Thomsen, 2018). Prestigious study programs are naturally very competitive and thus selective; access is restricted and bound to certain criteria. Apart from affirmative action policies that give explicit advantage to disadvantaged groups, university admission is nowadays not based on ascribed, but on achieved, “merit-based,” characteristics to ensure efficiency and legitimacy (Furuta, 2017). This appears fair because all eligible students “face the same academic barriers because exclusionary rules are universal” (Alon, 2009: 736). Yet, restricting access to prestigious (professional) HE programs and binding it to certain criteria also serves as a means to monopolize societal privileges, as argued by social closure theory (Collins, 1979; Murphy, 1988; Parkin, 1979). Even if admission criteria and procedures are perceived as neutral and fair, privileged groups can benefit from their resources and familiarity with the educational and professional field and adopt more easily to what is required in the admission process (Alon, 2009; Karabel, 2005).

In many countries, including Norway, the most important merit-based admission criterion is students' GPA. Since high-SES students

and girls have on average higher GPAs than low-SES students and boys (DiPrete and Buchmann, 2013; Zwick and Greif Green, 2007), they thus have an advantage in the admission process to prestigious study programs. However, admission decisions, especially concerning the most selective programs, are commonly not only based on applicants' GPA, but supplemented with further criteria and procedures. These criteria are often “merit-based” as well and include admission tests or further examinations and grades in specific subjects. Especially admission tests are widespread in many countries and determine admission chances to the most selective institutions and fields (Alon and Tienda, 2007; Kwon et al., 2015; Saygin, 2020). Moreover, some countries or institutions (increasingly) rely on a more holistic assessment of applicants and consider essays, interviews, extra-curricular activities, further life/work experiences (Furuta, 2017; Rosinger et al., 2021; Thomsen, 2018; Yu and Su, 2024; Zimdars et al., 2009), or even waiting time or age (Finger et al., 2024; Sandsør et al., 2022). This provides access opportunities for those without top grades. Which students take advantage of these opportunities?

2.3. SES differences

Group differences in strategic behavior and in meeting admission criteria have been extensively studied to understand social (class-based) inequality in access to HE, especially to the most selective institutions (Alon, 2009; Ayalon, 2007; Berggren, 2007; Buchman et al., 2010; Finger et al., 2024; Hoxby & Avery, 2013; Thomsen, 2018). Previous research finds that high-SES applicants and their families exploit their resources to be optimally prepared for the “application gauntlet” (Holzman et al., 2020). High-SES applicants have access to information from their social networks or an internalized understanding of the system to navigate complex admission rules (Dynarski et al., 2023; McDonough, 1997). Accordingly, several empirical studies have shown that high-SES students are more likely to exploit various application strategies to increase their chance of entering the most prestigious HE programs. First, these strategies refer to how students apply and include multiple and repeated applications (Ayalon, 2007; Heiskala et al., 2023), applying not only to close, but also to more distant institutions (Finger et al., 2024; Hällsten, 2010), and applying according to counselors' advice (Hoxby & Avery, 2013).

Second, high-SES students are more likely to engage in activities to meet admission criteria, such as extracurricular activities (Park et al., 2023), course taking during high school (Kolluri, 2018), and test preparation or repeated test-taking (Berggren, 2007; Buchmann et al., 2010; Mbekeani, 2023). Furthermore, a more qualitative “holistic” assessment of applicants during the admission process, for instance in interviews, seems to advantage those with a middle-upper class habitus (Rosinger et al., 2021; Thomsen, 2018; Zimdars et al., 2009). Even age or waiting period—a non-meritocratic criterion, that is also relevant in the Norwegian context (Sandsør et al., 2022)—might increase social inequality in access to selective HE programs. As “waiting” for several years is associated with opportunity costs and requires resources, this might be a strategy that does not appeal to low-SES students. In their analyses of access to the highly selective medical programs in Germany, Finger et al. (2024) indeed show that some poor performing high-SES students took advantage of the so-called “waiting quota.” However, overall this quota reduced inequality in admission chances, because especially low-SES students who already left the HE pathways to pursue a (medical) apprenticeship used it as a re-entry opportunity later in their lives.

2.4. Gender differences

Compared to students' social background, there is less research, both theoretical and empirical, on gender differences in application strategies and admission chances to selective university programs. However, some studies have focused on gender differences in access to (prestigious) HE programs and linked them to admission criteria and related strategies (e.

g., Bielby et al., 2014; Finger & Solga, 2013; Kaufman and Gabler 2004). Other studies with a focus on SES differences have also discussed or examined gender as another inequality dimension, however, without providing much theoretical discussion (e.g., Ayalon, 2007; Berggren, 2007; Yu & Su, 2024; Zimdars et al., 2009).

Which gender differences might be expected? First, and just as for high-SES students, women's higher GPAs might secure them an important advantage in admissions to selective programs (DiPrete & Buchmann, 2013). Men might try to compensate for their on average lower GPAs by using further strategies more frequently to improve admission chances. However, in contrast to SES, it is less plausible to assume that men have an advantage regarding (almost) all further admission criteria or that they use (almost) all available strategies more frequently than women. Regarding curriculum choices in upper secondary school, empirical evidence from several European countries shows that boys are more likely to opt for science courses (Jacob et al., 2020). In the US, in contrast, girls choose equally advanced math courses in high school, and a higher number of advanced language and college preparatory courses (Buchmann et al., 2008; Cho, 2007; Conger et al., 2009). Likewise, girls are more likely to participate in extra-curricular activities than boys (except for sports) (Dumais, 2002; Kaufman and Gabler, 2004). On the other hand, a delayed HE entry and thus strategies that involve waiting might appeal less to young women in anticipation of a necessary postponement of family formation because of long and challenging study programs, often accompanied with a prolonged labor market placement (e.g. due to mandatory practical years). Descriptive evidence from Germany and Norway points towards this pattern (Finger & Solga, 2023; Sandsør et al., 2022).

Further research has been done on the role of admission tests and gender inequality in admissions to (selective) HE. Several studies in different contexts show that these competitive, high-stakes situations advantage male students and thereby increase their admission chances (Berggren, 2007; Bielby et al., 2014; Finger and Solga, 2023; Jurajda and Münich, 2011; Ors et al., 2013; Saygin, 2020; Yu and Su, 2024; Zhang and Tsang, 2015). One argument is that women are more likely than men to withdraw from engaging in certain strategies (such as test taking) because of gender differences in competitiveness and confidence. While men seem to over-estimate their actual abilities (Niederle & Vesterlund, 2011), women's self-assessment is more likely downwardly-biased, especially when gender is a salient status characteristic and the domain is stereotypically male (Correll, 2001, 2004; Penner & Willer, 2019). If certain strategies are linked to competitive settings, such as admission tests, men might thus be more likely to participate and outperform women.

Overall, while (almost) all advantages in the admission process seem to point into the same direction regarding applicants' SES, it seems less likely that this is the case for gender (Zwick, 2019): While women enter the competition with on average higher GPAs, men might try to compensate for this by investing in further (but maybe not all) strategies more frequently.

2.5. Interactions between gender and SES

Historically, especially high-SES women have integrated previously male-dominated professional programs, such as medicine or law, as a means of social mobility and have thus led to their "feminization" (England, 2010; Seehuus, 2019). As argued above, not only the abolishment of formal entry restrictions but also the increasing reliance on academic (school) achievement in the admission process might have contributed to this development and likely advantages especially high-SES women if the positive effect of being female and from a socially privileged background on school grades multiply.

But are high-SES women also most likely to engage in further strategies to enhance their admission chances even further? Given the extensive theoretical arguments and empirical findings cited above, a privileged social background likely increases the likelihood of both men

and women to engage in strategies to increase admission chances. However, it is a well-established finding that a high social status and being male both contributes to a stronger feeling of entitlement (in education, the labor market and society in general), that is, the "judgement that a person should receive a particular set of outcomes by virtue of who they are or what they have done" (O'Brien et al., 2012; Ciani et al., 2008; Moore, 1991; Piff, 2014). Thus, especially high-SES men might feel particularly entitled to access fields that lead to society's leading positions (and, beyond that, used to be a male-dominated bastion). If they know of the difficulties to get admitted to the most selective fields—which can be expected, given their advantaged social background—they might be especially likely to invest in further strategies. On the other hand, this might rather apply to high-SES women who enter professional elite fields to secure status maintenance, while high-SES men might be more likely to consider less selective STEM fields that also secure a good labor market positioning as well as high wages. They might thus feel less obliged to invest in further strategies. However, empirical evidence from Sweden and Denmark backs the former argument. Within the group of high-SES applicants, especially men make use of admission opportunities beyond GPA, (interviews, admission tests, adult education) to increase their admission chances (Berggren, 2007), especially to highly prestigious, professional programs (Thomsen, 2018).

2.6. Interactions with GPA

So far, applicants' GPA has mainly been treated as mediator of SES and gender differences in admission chances to prestigious fields of study. However, SES and gender differences in further strategies might also depend on students' GPA.

It has been suggested and shown that, if a person lacks one resource, this is compensated by other resources if the person can access them (and knows how to use them effectively) (Erola & Kilpi-Jakonen, 2017). For educational attainment, some studies have shown that educational transitions of high-SES students depend much less on their grades than transitions of low-SES students (Bernardi & Boado, 2014; Bernardi & Triventi, 2020). In other words: poor performance is compensated by high socio-economic resources.

However, it has been argued that the shape of the interaction between SES and previous grades depends on the selectivity of the transition students are to make. Heiskala et al. (2021) argue and find for the Finnish context that compensatory advantage (largest SES differences among poor performing students) applies for less selective transitions whereas in the case of selective transitions different advantages (high SES and high performance) multiply.

The arguments of compensatory and multiplicative advantage have rarely been combined with gender differences in education. At first glance, they do seem less appropriate to explain gender differences because young men and women (today) do on average not differ in their endowment with socio-economic resources. As argued above, however, men are more often over-confident and competitive, given their actual performance (Correll, 2001; Correll, 2004; Niederle and Vesterlund, 2011). Moreover, they might feel more entitled to access fields that are most likely to lead to positions of power and privilege even if their previous performance was not among the best (potentially again amplified by a high socio-economic background) and invest in further strategies to achieve this. Accordingly, the findings that male applicants are more likely to participate in admission tests to German medical programs is mainly observable among applicants with a medium GPA—those for whom the "compensatory potential" of admission tests is highest (Finger & Solga, 2023).

Yet, in very selective settings, over-confidence and its gendered effect on engaging in strategies might also show another pattern: Men with rather high GPAs might over-estimate their chances and might thus miss to see the need to invest in further strategies to secure a place in a selective program. Thus, among high-performing students, it might

actually be women who are more likely to engage in strategies and thus have the highest admission chances (Ayalon, 2007).

Most studies that test the compensatory or multiplicative advantage mechanism for educational outcomes interact SES (and to a lesser extent gender) with previous performance without further examining how resources are actually invested to increase educational opportunities. We will go beyond these studies and analyze not only how applicants' GPA moderates SES and gender differences in admission chances, but also where on the GPA distribution SES and gender differences in strategies are most pronounced.

In the following, we will present information on the Norwegian context with a focus on how admission to HE is organized. Based on this, we will draw hypotheses on gender and SES differences in strategies and admission chances to selective fields of study.

3. Institutional context

3.1. The Norwegian (higher) education system

The Norwegian education system is characterized by late tracking, it is a comprehensive and centralized system, and a mass system at higher levels. After 10 years of compulsory school, candidates choose between vocational and academic tracks. Academic tracks lead to the immediate possibility of entering HE after three years, students enrolled in a vocational track are typically eligible to access HE if they redirect to the academic track (with an intensive last year) or opt for an extra year of schooling after finishing vocational training. As a Nordic HE system, the Norwegian system is part of a social democratic welfare system, with generous social transfers and relatively low levels of inequality (Esping-Andersen, 1990; Thomsen et al., 2017). The HE system is characterized by state funded institutions, universal government grants and loans, and it is tuition free so that direct cost considerations might play a minor role for post-secondary educational decisions (Strømme & Wiborg, 2024). It consists of universities, offering long professional degrees (such as medicine and law) and general bachelor's and master's degrees, and more applied university colleges. However, compared to the strongly stratified HE systems in the US or UK, prestige differences between institutions are not pronounced. In contrast, fields of studies constitute prestige and later income differentials, with the long professional degrees leading the ranks (Ahola et al., 2014; Borgen and Mastekaasa, 2018; Kirkeboen et al., 2016).

Both women and low-SES students have increasingly entered the HE system in the course of educational expansion. However, the most prestigious fields of study continue to display pronounced inequalities and a high degree of occupational inheritance (Strømme and Hansen, 2017; Strømme and Wiborg, 2024; Thomsen et al., 2017), which contributes to stratification in the labor market. Previous research into upper-class reproduction in Norway has shown capital-specific reproduction to be important—parents' economic capital is more strongly related to their offspring's income and parents' education (and cultural capital more generally) to their offspring's level of education (Flemmen et al., 2017; Strømme and Wiborg, 2024). The most selective fields in HE are often considered as both high in cultural and economic capital, where self-recruitment is particularly pronounced, and parents tend to have both relatively high income and high education (Strømme & Hansen, 2017).

Gender segregation within the HE system and in the labor market remains pronounced, despite certain desegregation tendencies (Barone, 2011; Støren and Arnesen, 2007), with women moving into some higher paying fields (Hermansen & Penner, 2022). Moreover, while the proportion of women in HE has increased to about 60 percent, the vocational education at upper secondary level is dominated by men (about 60 percent).² This is consistent with the largest female-dominated

occupations typically requiring bachelor-level (e.g. nurse, social worker, kindergarten teacher), whereas the largest male-dominated occupations typically require a vocational upper-secondary education (e.g. plumber, carpenter, electrician). Importantly, the differences in pay between female- and male-dominated fields of study are substantial at all levels with female-dominated fields paying less than male-dominated fields, for men and women alike. Considering the consistent gender segregation, it thus seems more rational for women to pursue HE because higher levels of female-dominated fields of education are necessary to gain similar rewards available at lower levels of male-dominated fields (Seehuus and Strømme 2025).

In this article, we will consider access to the six most selective and professional fields: medicine, dentistry, psychology, law, civil engineering and Master of Science in Business Administration (siviløkonom). While we include all available programs of medicine, dentistry, psychology, and law, we include only certain programs of civil engineering and Master of Science in Business Administration that are particularly prestigious and lead to protected titles (five-year programs of civil engineering at the Norwegian University of Science and Technology and five-year programs of Master of Science in Business Administration leading to the protected title 'Siviløkonom'). During our observation period (2009–2020), engineering and business have been male-dominated (with approximately 40 % female students) and the other four fields female-dominated (share of female students approximately 70 % for medicine and law and 80 % for psychology and dentistry). High-SES students are overrepresented in all of the elite fields but especially in medicine, psychology and engineering (see figure A1 and A2 in the online supplement).

All six fields are the most difficult to access, with the highest GPA requirements, and there are no alternative routes to the professions (e.g. switching majors), at least not within the Norwegian HE system. Students might, however, study a certain professional program abroad—an opportunity mainly taken up by high-SES students, and most common for candidates in medicine (Serediak & Helland, 2023). In addition to their selectivity, the six fields pertain to “long” programs (5 years, 6 for medicine), leading to professional degrees that secure highly paid and prestigious labor market positions. However, in order to reap these rewards, an extended period of internships and licensing tests is often required making these fields a particularly risky and costly (in terms of opportunity costs) option. Thus “self-elimination” mechanisms (see Section 2.1) might be especially pronounced and contribute to their socially selective student body, also because other programs, such as computer science and “short” engineering and business programs are less selective, less risky, but also financially rewarding. Yet, it has been shown that the most selective educational fields are particularly effective in sorting students to elite occupations (Mastekaasa, 2004), and often lead to high wages, even when accounting for selection bias, quality of institutions and peer groups (Kirkeboen et al., 2016).

3.2. The Norwegian higher education admission system

The admission system in Norway is centralized and includes most university programs since 1997. After some regulatory changes, the rules have remained fairly stable since 2009 (Sandsør et al., 2022). Applicants submit a preference ranking of up to ten field-university combinations and receive one offer to their highest possible rank. Some fields are highly selective, while others only require completion of an academic track in upper secondary school. The most prestigious fields are also most selective.

Table 1 summarizes the admission system for selective programs. If the demand for a certain program exceeds its supply, admission is based on two quotas in which applicants are ranked according to ‘points,’ gathered mostly from grades from upper secondary school. The points threshold for entry depends on the number and profile of applicants and therefore varies from year to year but for the most prestigious fields the variation is low (Sandsør et al., 2022). The thresholds of the previous

² See [last access: January, 27, 2025]

Table 1
Norwegian admission system for selective higher education programs.

	Quota 1	Quota 2
Share of places	50	50
Eligibility criteria	- Upper secondary diploma - Younger than 21 - Only for medicine and civil engineering: science courses in upper secondary school	- Upper secondary diploma - No age restriction - Only for medicine and civil engineering: science courses in upper secondary school. In quota 2 it is possible to retake these courses after having left school
Ranking criteria		
Grade point average (GPA) from upper secondary school	Between 20 and 60 points (original GPA ranges from 1 to 6, with 1 and 2 meaning “failed”. This is multiplied by 10)	Original GPA can be improved to the maximum value of 60 points by retaking exams
Subject points	1 or 2 STEM points: Elective science courses from upper secondary school, including math, physics, chemistry, biology 1 or 2 language points: elective language courses in upper secondary school	1 or 2 STEM points: Science courses from upper secondary school, including math, physics, chemistry, biology 1 or 2 language points: additional language courses in upper secondary school In quota 2 it is possible to retake these courses after having left school Up to 8 age points: 2 per year, starting at the age of 20 (by the age of 23 applicants reach the maximum number of age points) Up to 2 points for either: - one year of military service - one year of ‘Folk high school’ - university enrolment (30 ECTS = 1 point, 60 ECTS = 2 points)
Extra points		
Gender points		1 or 2 points: Psychology in 2019–2020 for men in some institutions. Civil engineering in 2009–2020 for women
Maximum number of points (“competition points”)	64	74 (up to 76 if gender points are considered)
Admission thresholds * (in 2020)	GPA + 4 subject points of last admitted	Competition point of last admitted
Medicine	62	69
Civil engineering	61.1	64.8
Dentistry	57.9	66.1
Psychology	58	66.8
Law	56	63
Master of Science in Business Administration	54.6	57.8

* Source: samorndaopptak.no

years as well as information on further criteria considered during the admission process are published online and thus accessible to all applicants. However, it is unclear how well-informed potential applicants are and how strongly this depends on (parental) resources.

For admission via the first quota (50 percent of all available places) only applicants younger than 21 are considered. They compete with a maximum number of 60 GPA-points (corresponding to the highest GPA possible). It is furthermore possible to collect up to four extra points for taking certain elective science and language courses in upper secondary

school (“subject points”). To enter medicine and civil engineering, science courses are a requirement for admission and applicants who meet these requirements automatically compete with two extra points.

In the second quota all candidates irrespective of age are considered. As in quota 1, candidates compete with their GPA-points and up to four subject points (maximum 64 points). Additionally, they have the opportunity to enhance their admission chances by applying different strategies. In contrast to many other countries, these strategies do, however, not involve admission tests (except for arts programs and architecture). First, applicants have the possibility of improving their GPA from upper secondary school to the maximum of 60 points by retaking exams, often after preparatory courses in private schools (Hovdhaugen & Salvanes, 2024). They can also take new exams in language and science subjects to acquire subject points or to meet entry requirements.³ Attending a private course for one school subject costs around NOK 17,000 (USD 1600). It is not mandatory to take courses before (re)taking exams, but they are widely used as course providers often guarantee improved grades.

Second, it is possible to collect up to ten further extra points (leading to a maximum of 74 “competition points”): Candidates can collect up to eight age points (two per year, starting at the age of 20, ending at the age of 23), making this a crucial strategy to boost admission chances. Moreover, candidates can add up to two extra points either by attending one year of military service or education. Military service has been voluntary since 2002, although 30 % of a cohort are called in for a validation based on a mandatory form with self-reported information on motivation, health and education. The validation tests include physical and theoretical tests, and since 2015, women are also called upon (they could participate voluntarily before that). Two extra points for education can either be achieved by collecting university credits (30 or 60 ECTS to receive 1 or 2 extra points respectively) or by attending a “Folk high school.” The latter is a boarding school offering various subjects on, for instance, culture, arts, or sports. There are no entry requirements (except for a motivation letter in some cases), grades, or exams, but students receive a certificate upon completion (typically after nine months). Attending a Folk high school costs between NOK 85,000 and 170,000 (USD 8000 and 16,000 respectively), including board and lodging, but it is possible to get a student loan covering the costs. Collecting extra points for education is more resource intensive than military service and—in the case of receiving up to 60 ECTS points—also riskier. Lastly, to counterbalance a too skewed gender distribution, it is possible to get ‘gender points’ in some fields for belonging to the under-represented gender. Of the fields included in our study, one gender point is granted for men applying to psychology (in 2019 and 2020), and two for women applying to civil engineering (whole observation period).

The most commonly used strategies by applicants to elite fields is retaking exams to improve GPAs (69 % of our sample, see Table 2 in Section 5) and to collect extra points from HE (90 %). Collecting points from military and Folk high school is less common (13 and 7 %, respectively). The maximum number of age points is achieved by 24 percent of elite applicants.

In 2020, admission thresholds of the most selective fields ranged from 54.6 to 62 points in the first quota and from 57.8 to 69 points in the second quota (see Table 1). Medicine is typically the most selective field, with thresholds close to the maximum values. This implies that applicants are not competitive in quota 2 without having accumulated a substantial number of extra points even if they achieved the highest grades in school. On the other hand, also applicants without the highest GPA have a chance to access the most selective field through quota 2 if

³ Candidates who take science exams after upper secondary education to meet admission requirements for medicine and civil engineering automatically compete only in quota 2 with their “improved transcript.” It is possible that applicants actually decrease their GPA if they have to take new science exams (with poorer results) to become eligible.

Table 2
Descriptive statistics.

	HE-eligible graduates from upper secondary school N: 501,938	Elite applicants N: 57,211 (16.37 % of all eligible graduates)
Parents' level of education		
Lower/upper secondary (low-SES)	40.15	23.60
Short higher (medium-SES)	41.04	42.59
Long higher (high-SES)	18.81	33.80
Gender		
Female	57.68	54.85
Male	42.32	45.15
Mean GPA (unstandardized)		
All	42.45 (6.71)	47.08 (5.68)
Female	43.14 (6.55)	47.56 (5.53)
Male	41.46 (6.80)	46.50 (5.82)
Low-SES	40.58 (6.31)	45.37 (5.83)
Medium-SES	42.82 (6.53)	47.06 (5.55)
High-SES	45.37 (6.64)	48.30 (5.43)
Strategies		
Improved GPA (%)		84.16
If yes: mean improvement		3.87 (2.55)
Mean age points (range 0–8)		4.13 (2.88)
Mean subject points from upper secondary (range 0–4)		0.94 (1.55)
HE credits, 1 point/2 points (%)		4.91 / 12.88
Folk high school, 2 points (%)		7.48
Military points, 2 points (%)		13.18

Notes: The numbers in the first column pertain to all HE-eligible upper-secondary graduates who graduated at the age of 19 (graduation year: 2009–2016) and the second row to the subgroup of those who applied to an elite field at least once between 19 and 23.

they compete with the maximum number of extra points (Sandsør et al., 2022). Thus, accumulating extra points, especially up to eight age points, seems to be a crucial strategy to gain admission and “creates a waiting game” (Sandsør et al., 2022: 380).

Overall, access to prestigious professional fields in Norway is very selective. Applicants' GPA is the most central criterion for admission. Thus, (young) candidates with very high GPAs can be rather optimistic to receive an offer. However, those without very high GPAs can increase their admission chances by retaking exams and collecting extra points. In the next section, we will derive hypotheses on gender and SES differences in meeting admission criteria and related strategies and admission chances based on the theoretical accounts discussed in Section 2 and the description of the Norwegian context in Section 3.

4. Hypotheses

As described in Section 3, the Norwegian HE system is characterized by a low degree of stratification, low costs, rather transparent admission rules and thresholds and it offers many mildly selective programs. However, the most prestigious, professional fields, which we consider in this article, stand out in that they are highly rewarding in the labor market, very selective, longer (and thus costlier) and riskier so that selection into applying can be expected to be socially stratified. However, even within the pool of applicants to prestigious fields of study we expect social inequality in admission chances. The following hypotheses are denoted with “S” if they refer to SES and “G” if they refer to gender.

SES and gender differences in admission chances: As argued above, for applicants to prestigious fields of study in Norway, two characteristics are crucial to increase admission chances: their GPA as most important admission criterion (in both quota) and their engagement in strategies to

meet further admission criteria (mainly in quota 2). Given the centrality of students' GPA in the Norwegian admission system those groups with typically higher GPAs should be more likely to receive an offer. Thus, we expect high-SES applicants to have higher admission chances than low-SES applicants (*hypothesis S1*) and women to have higher admission chances than men (*hypothesis G1*) (with high-SES women having the highest chances overall).

SES and gender differences in strategies: As described in Section 3, the Norwegian admission system offers various opportunities beyond GPA that applicants can make use of. We expect such strategies to vary with applicants' SES and their gender. Conditional on GPA, we expect high-SES applicants to be more likely than low-SES applicants to take advantage of these opportunities because of differences in resources, navigation skills, and risk aversion (*hypothesis S2*). Likewise, conditional on applicants' GPA and because of gender differences in entitlement men might be more likely to invest in strategies than women to secure a place in a lucrative program (*hypothesis G2*). Together, such strategies might be especially likely for high-SES men if they feel particularly entitled to access fields that lead to society's leading positions and changed from being a male-dominated bastion to being gender-balanced or even female-dominated.

We acknowledge that the different strategies available in the Norwegian context might be more or less attractive for members of different social groups. While we expect most available strategies to be more frequently used by high-SES than low-SES applicants (with the potential exception of age points, if used by low-SES applicants as re-entry opportunity, and the low risk and low resource option of collecting military points), the pattern might look more diverse if we look at gender differences. We will examine these patterns in an explorative way.

The mediating role of strategies: Overall, we expect that the SES differences in admission chances, that we expected above, should be reduced after controlling for strategies (*hypothesis S3*) and—given the importance of applicants' GPA for admission—even more so if we control for GPA (*hypothesis S4*). However, the female advantage in admissions should even increase after controlling for strategies (*hypothesis G3*), if men invest more often in strategies. If we control for GPA, however, we expect the female advantage to be largely mediated, because of their, on average, higher GPAs (*hypothesis G4*).

The moderating role of GPA: As argued in Section 2, applicants' GPA might not only mediate group differences in admission chances, but group differences in strategies and their impact on admission chances might also depend on applicants' GPAs. Given the rules of the Norwegian admission system with its strong focus on GPA, we consider compensatory advantage to be more likely than multiplicative advantage, but only up to a certain point. This is because, for applicants with a very poor GPA, using strategies might not always be sufficient to secure a place in a selective program. In the end, they compete with their competition points that are a combination of their original GPA, its potential increase, and extra points. Thus, those with very low original GPAs might simply not have high enough competition points even if they invested heavily in strategies to receive an offer. Therefore, we expect stronger SES differences among applicants with medium GPAs than among those with high GPAs (because these applicants have comparatively high chances of admission irrespective of further strategies and potential SES differences herein) and with low GPAs (because of potentially low admission chances despite strategies) (*hypotheses S5*). A similar compensatory pattern might apply with regard to gender. We expect gender differences (to the advantage of men) in admission chances to be more pronounced among applicants with medium GPAs than among very high-achieving and very poor-achieving applicants (*hypothesis G5*).

5. Data and methods

5.1. Data and sample selection

To test these hypotheses, we rely on Norwegian full population administrative data, which include individual- and family-level information from censuses and educational registers. We have also used data from the Norwegian University and College Admission Service (available for the years 2009–2020), which contain information on some extra points used to enter a HE program, on who applied to different programs, and who received an offer.

We focus on eight cohorts of upper secondary school graduates, who gained HE eligibility between 2009 and 2016. We restrict the sample to those who graduated from upper secondary school at the age of 19, which is the majority among HE-eligible graduates (81 %). Since some extra points are bound to age this step seems necessary for a proper comparison of individuals within the sample. We observe them for four years, until they are 23, because at this age they had the chance to collect the maximum number of extra points. We use this sample for all analyses that pertain to “all upper secondary school graduates” (e.g., in Fig. 1) and when we discuss selection into elite application (see Section 5.4). For our main analyses, however, we focus on elite applicants. Thus, we narrow our sample further down to those who applied to an elite program at least once during the four years (16.37 % of all HE-eligible upper secondary graduates, see Table 2 below). In order to be categorized as an elite applicant, an elite program as defined in Section 3 must have been listed on rank one, which is necessary to have a chance of admissions in such selective fields.

5.2. Variables

We have two sets of dependent variables: First, we measure whether applicants received an offer to an elite field until they turned 23. Second, we measure whether the candidates have used various strategies to increase their chances of getting access. To this end, we first, created a summary measure of all strategies that applicants have accumulated by subtracting their GPA obtained from upper secondary school from their competition points (we call this measure “overall strategy”). We also created variables for the different strategies, including collecting age points, collecting credits from other HE courses, completing military service, completing Folk high school, taking science and language courses in upper secondary school (or afterwards), and improving grades. The information about these strategies are available through the data from the Norwegian University and College Admission Service, except for information about improved grades and HE credits. Information about improved grades have been calculated based on the differences between competition points and GPA from upper secondary school, after other sources of extra points have been excluded. Information about HE credits are taken from merged data on HE courses completed before candidates applied for an elite program.⁴

Our main independent variables are gender and SES (and their interaction). SES is approximated via parental education and measured as the highest achieved education by one of the parents when the child was 16 years of age (low-SES: upper secondary or below; medium-SES: short HE graduate (ISCED-level 6); high-SES: at least long HE graduate (ISCED-level 7 or 8)).⁵ We include students' original GPA as either mediator or moderator. To account for grade inflation, GPA is

standardized within year of graduation from upper secondary school, and in some of the analyses measured as deciles constructed within the pool of applicants (to elite fields). In some analyses, we also include the strategy variables described above as mediators.

Table 2 shows the descriptive statistics of our independent and explanatory variables for all HE-eligible upper secondary school graduates (who graduated at the age of 19), and only for those who applied to an elite field (until the age of 23). First, the table shows that selection into the pool of elite applicants strongly relates to students' SES, but gender-based selection is much less pronounced. The table also reveals that elite applicants have on average clearly higher GPAs than all upper secondary school students (approximately one standard deviation). It further shows some clear differences in GPA levels by SES and gender, with women and high-SES applicants generally achieving the highest levels. However, SES differences are stronger than gender differences. Finally, the lower part of the table shows the share of elite applicants who use certain strategies to increase admission chances. They are especially likely to retake exams.

5.3. Analytical strategy

Most strategies, which applicants can use to increase admission chances, require a certain amount of time. This is most obvious with regard to age points, but also improving grades and accumulating further extra points requires time. Thus, it is necessary to use a technique that accounts for the timing of events when estimating admission chances. We use discrete time-event history models (Allison, 2014; Singer and Willett, 2003). The data are organized in a person-period format, and every person is measured once a year, as they can apply to university once a year (our study sample of elite applicants comprises 224,899 person-years). The data are thus discrete in nature.

In a first step, we start descriptively by visualizing hazard ratios and survival ratios with receiving an offer for an elite program as the ‘failure’ event, differentiating by gender and SES (descriptive evidence on hypotheses S1 and G1). As explained in Section 5.1, we, first, show this for the full cohorts of HE-eligible graduates from upper secondary school to get a better sense of the overall inequality and selection processes, and, second, for elite applicants only as this is the group actually at risk to receive an offer. Moreover, for those who do not apply to HE, we are unable to observe strategies with our data (and indeed this group is rather unlikely to use strategies in any case). The former enter the risk set when they gained HE eligibility (with 19) and we follow them until they experience the event of receiving an offer to an elite program.⁶ Cases that do not do so after four years are right censored. Thus, among this group, admission chances and related inequalities include both differences in the probability to apply and differences in strategies and admission chances (conditional on applying). For elite applicants, the clock starts to tick when they first applied for an elite program (30.52 % with 19, 22.99 % with 20, 18.65 % with 21, 15.67 % with 22, and 12.17 % with 23) and we again follow them up to four years. Thus, for those who did not apply immediately after graduating from upper secondary school, right censoring may occur already after 1–3 observation periods.

In a second step, we proceed with some descriptive OLS analyses where we describe gender and SES differences in strategies (hypotheses S2 and G2), on average and across the GPA distribution. To do so, we rely on a cross-sectional data set in which we observe the same cohorts of elite applicants as in the proceeding analyses, measuring all relevant strategies that applicants have accumulated up to the age of 23. The reason for the descriptive, cross-sectional approach is that the admission system requires applicants to invest in strategies only until they receive

⁴ We had to use different sources to calculate this information and can thus not guarantee the accuracy of these two measures. We, however, only use them for additional analyses reported in the online supplement.

⁵ We acknowledge that this is a simplified measure of SES, compared to, for example, class background. Robustness checks including parents' income, however, show this to be less important and insignificant once GPA is controlled. Results are available upon request.

⁶ This means that we do not include most of those students that did a vocational track in upper secondary school, as they are either not HE-eligible, or will be so later (mostly after one year).

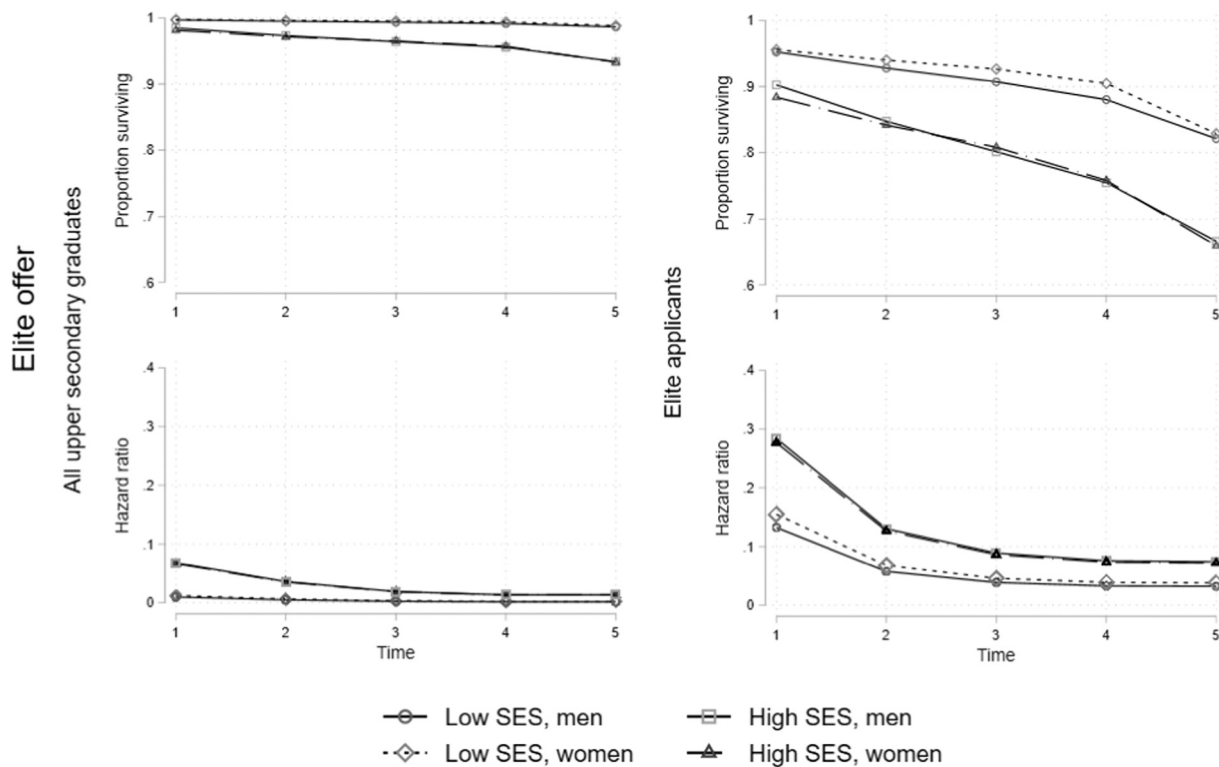


Fig. 1. Survival and hazard rate for all HE-eligible upper secondary graduates and for elite applicants. Note: Sample “elite applicants” = elite applicants, who graduated from upper secondary school at the age of 19 between 2009 and 2016. Observed until the age of 23. Sample “all upper secondary graduates” = all HE-eligible upper secondary school graduates, who graduated at the age of 19 between 2009 and 2016. Observed until they are 23.

an offer. More concretely, applicants can use multiple strategies over years to increase their admission chances, but collecting further extra points, for instance, is only necessary if they did not (yet) receive an offer. Thus, successful applicants, who might have invested in strategies if necessary, are per construction of the admission system (and our sample) not considered anymore. It is thus difficult to capture the different strategies along with the applications and potential offers in a survival framework. We do, however, account for this complex pattern by controlling for how often they have applied since they graduated from upper secondary school (1–5 times), as well as whether and at which age they have received an offer in the previous year(s) because this determines if applicants (need to) continue to collect extra points. Thus, we only compare the amount of strategies of applicants with the same number of applications and the same (timing of) success. Reapplication behavior after unsuccessful attempts might also be an important and socially stratified strategy to receive an offer (as has been shown by Heiskala et al. 2023 for Finland), which is, however, not the focus of this article.

In a third step, we first apply logistic discrete time hazard models to estimate the probability of receiving an offer for one of the elite fields, and how this correlates with gender and SES, again for all HE-eligible upper secondary graduates and for elite applicants (hypotheses S1 and G1). Second, we continue with the sample of elite applicants and add a time-variant measure of applicants’ strategies and their GPA to the logistic discrete time hazard models to test whether they mediate inequality in admission chances (hypotheses S3/G3 and S4/G4 respectively). Finally, we assess whether applicants’ GPA moderates SES and gender differences in receiving an offer, by including an interaction term with GPA deciles (hypotheses S5 and G5). In all models, we control for fields, to avoid some fields to matter more than others, and for gender points, since we do not count this as a strategy in the same sense as the other available options.

5.4. SES and gender-based selection into applying for elite fields

Before we present our findings, we briefly discuss gender and SES differences in applying to an elite field and thus how selective our main analytical sample of elite applicants is. To this end, we run logistic discrete time-event history models to estimate the probability of applying to an elite field by gender and SES, first, controlling for GPA and, second, across the GPA distribution (Figure A3 and A4 online supplement). The findings again highlight that selection into the pool of elite applicants strongly relates to students’ SES: only two percent of low-SES students, but more than seven percent of high-SES students apply. Gender differences are negligible overall, but—as could be expected—women are more likely to apply for female-dominated elite fields (medicine, psychology, dentistry, and law) and men are more likely to apply for male-dominated ones (business and engineering) (available upon request). However, if we control for students’ GPA, SES differences decrease, but gender differences emerge to the advantage of men (figure A3), indicating that, high-SES and female applicants have higher GPAs on average, which will likely translate into higher admission chances.

High-SES students are more likely to apply than low-SES students across the whole GPA distribution, except for the lowest GPA decile (figure A4). Within the 10th GPA decile, 20 percent of high-SES students apply whereas only 12 percent of low-SES students do the same, despite their high admission chances. High-SES students’ overrepresentation among the top GPA deciles (both in terms of absolute numbers and application probabilities) likely contributes to unequal admission chances. Men are more likely to apply for elite fields if they are medium- to high-performing. However, gender differences are smaller than SES differences and fewer men than women are among top performing students so that this pattern is less likely to translate into a male advantage in admission chances. Yet, these patterns are in line with previous findings on academic mismatch that high achieving low-SES and female

students are less likely to apply for selective programs (e.g., Campbell et al., 2019).

6. Findings

6.1. Descriptive evidence on inequality in admission chances

We first show descriptive evidence on our first set of hypotheses expecting higher admission chances for high-SES and female applicants (hypotheses S1 and G1). Fig. 1 shows the hazard and survival rates for all HE-eligible graduates from upper secondary school (right panels) and for applicants to elite fields (left panels), by SES and gender (life tables are available in the online supplement, tables A1 and A2). The event is receiving an offer for one of the elite fields until applicants turn 23 and thus had the opportunity to invest in all available strategies. The survival curves show the proportion of candidates who have not yet experienced the event in a given year, and the hazard rate is the proportion experiencing the event conditional on not having experienced it in the previous year(s).

As can be seen in the right part of Fig. 1, it is a rare event to receive an offer to any of these fields, as the survival rate is very high in the whole period (between 93 % and 99 %), and the hazard is equivalently low. Some SES differences (but no gender differences) are visible, with seven percent of high-SES graduates having experienced the event at the end of our observation period and one percent of low-SES graduates. Note that this difference includes both: differences in the likelihood to apply (as described in Section 5.4) and differences in the likelihood to receive an offer conditional on applications. When only considering elite applicants in the left part of Fig. 1, the event is still quite rare, with still negligible gender differences but pronounced SES differences (with 18 % of low-SES applicants having experienced the event and 34 % of high-SES applicants). Thus, these prestigious fields of study in Norway seem to be segregated mainly by SES, not by gender (at least not on average, even though single elite fields are likely gender segregated, see Section 6.3). This lends initial support only to hypothesis S1.

6.2. SES and gender differences in strategies

We now provide descriptive evidence on whether high-SES and male

applicants are more likely to use strategies to increase their admission chances than low-SES and female applicants (hypotheses S2 and G2). As described in Section 5, we apply OLS models with a cross-sectional sample of all applicants who applied to an elite field at least once until the age of 23, and control for how often they applied and whether and at which age they received an offer (before the age of 23). Fig. 2 shows the linear prediction of our “overall strategies” measure (difference between competition points and GPA from upper secondary school) by gender and SES. Men are more likely than women to use strategies. This difference is, however, reduced when controlling for GPA indicating that men compensate for their on average lower GPA by investing in strategies. Conditional on GPA, we do not find significant gender differences anymore (against hypothesis G2). Their remaining size is also marginal: the gender difference of approximately 0.1 points in strategies, which is left in Fig. 2 after controlling for GPA, is associated with a 0.25 percentage points increase in admission chances (because one point increases admission chances by 2.5 percentage points). In contrast, SES differences are still observable, and indeed somewhat stronger when controlling for GPA, indicating that high-SES applicants are more likely to invest in strategies despite their on average higher grades (in support of hypothesis S2). However, the difference is also not very substantial (approximately 0.3 points). Moreover, both inequality dimensions do not seem to interact regarding the usage of strategies to increase admission chances.

Additional analyses show that gender differences in strategies are somewhat stronger among applicants for female-dominated than for male-dominated fields, suggesting that male applicants who want to assess a prestigious professional field that is now dominated by women (but used to be male-dominated) are somewhat more likely to invest in strategies. SES differences are also stronger (approximately 0.5 points) among applicants to female-dominated fields which include the very prestigious professions of medicine and law (figure A5, online supplement).

Fig. 3 shows SES and gender differences across the GPA distribution. Overall, the association between GPA and our strategy measure is mainly negative, with the highest predicted values between GPA deciles 1 and 4. Among (very) well-performing students, the usage of strategies drops continuously. This general pattern looks similar for all groups.

SES differences and, to a lesser extent, gender differences mainly

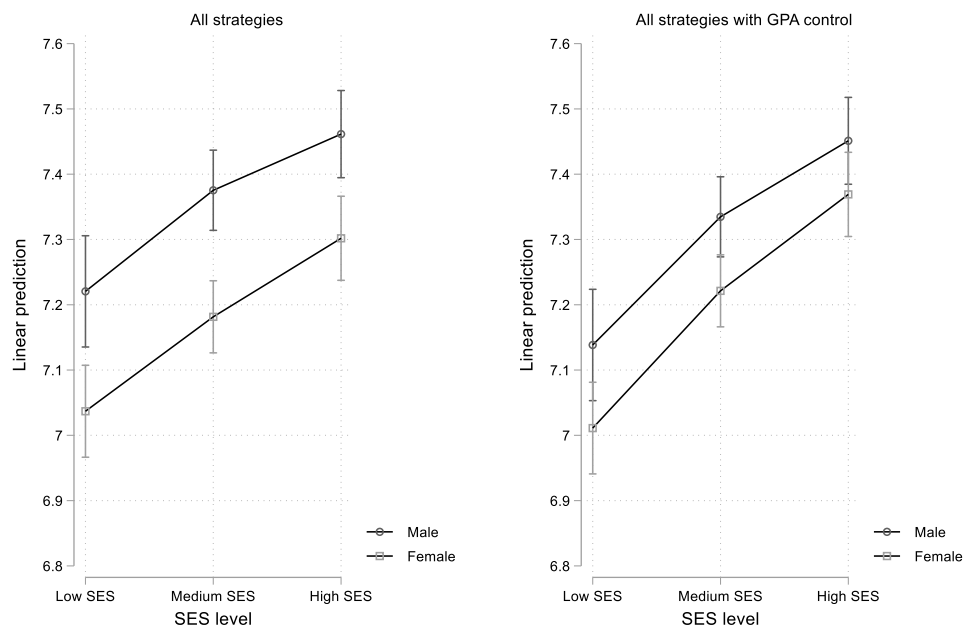


Fig. 2. Linear prediction of overall strategies (OLS), without and with control for GPA, by gender and SES. Note: Sample = elite applicants, who graduated from upper secondary school at the age of 19 between 2009 and 2016. Observed at the age of 23. Controls included: field, how often they applied, whether and when they received an offer (before 23).

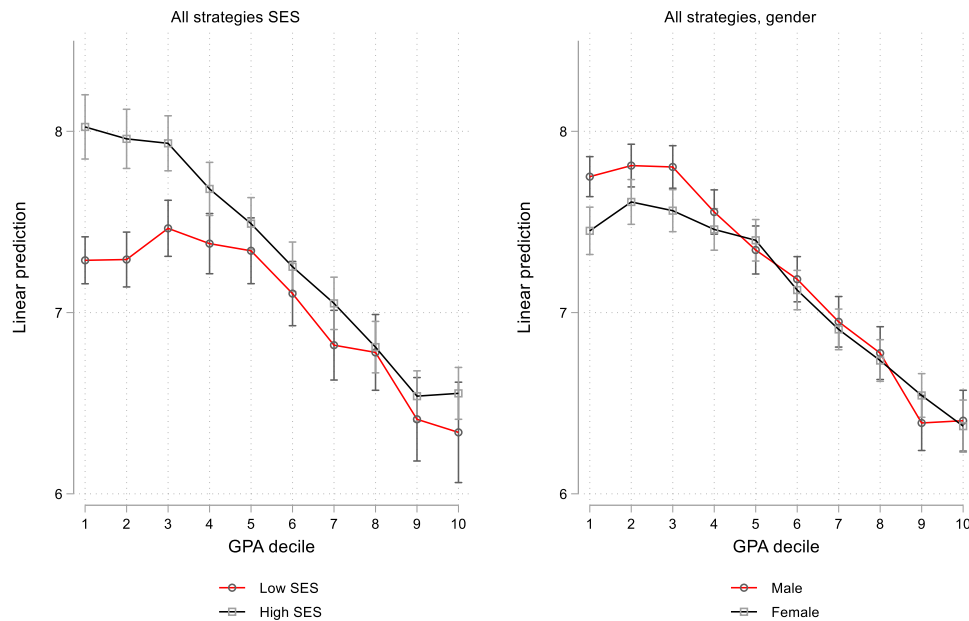


Fig. 3. Linear prediction of overall strategies (OLS) across the GPA distribution, by gender and SES. Note: Sample = elite applicants, who graduated from upper secondary school at the age of 19 between 2009 and 2016. Observed at the age of 23. Controls included: field, how often they applied, whether and when they received an offer (before 23).

occur among poor performing applicants and are most pronounced among the lowest deciles. This pattern remains if we show SES differences separately for men and women and by male- or female-dominated field, again with more pronounced differences among applicants to female-dominated fields (see [figure A6 and A7](#), online supplement). Thus, high-SES and male applicants seem to invest in strategies to compensate not only for medium school performance (as also low-SES

and female applicants do) but especially if they have very low levels of previous performance. However, because applicants' original GPA is crucial in the admission process, these strategies and corresponding group differences among low-achieving applicants might in the end not translate into enhanced and unequal admission chances.

We also explored which of the different strategies are used differently frequently by male or female and high-SES or low-SES applicants

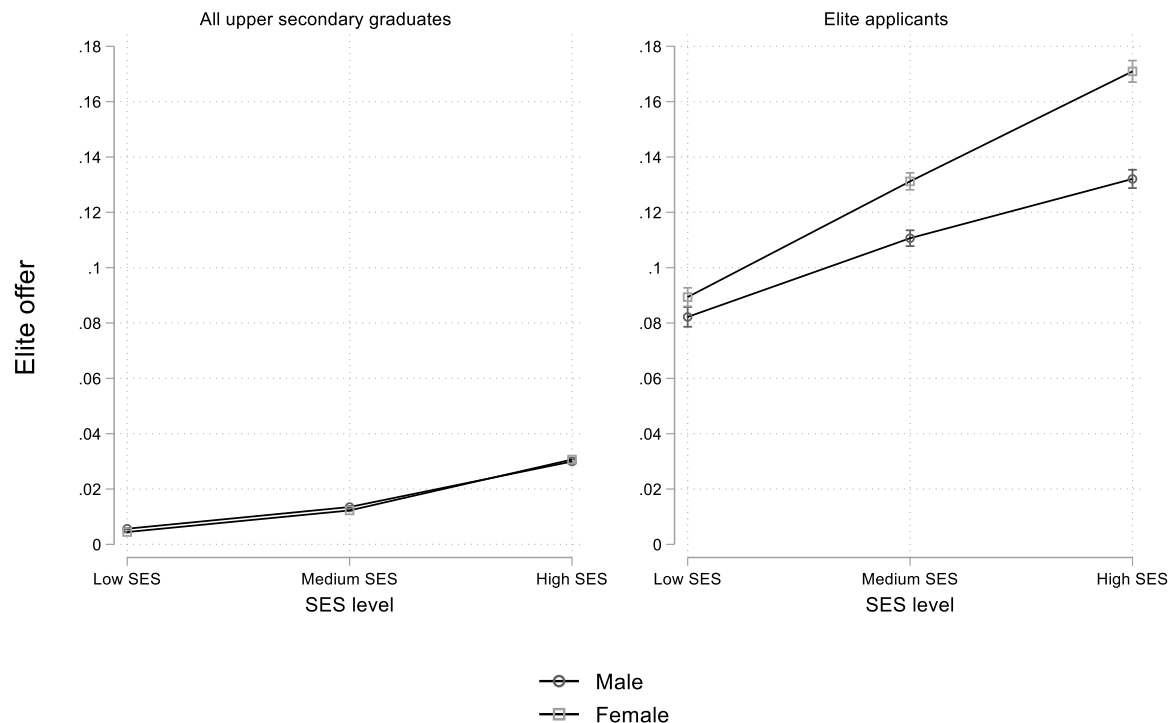


Fig. 4. Predicted probabilities of receiving an offer to an elite program (discrete survival analysis) for elite applicants and all HE-eligible upper secondary graduates. Note: Sample “elite applicants” = elite applicants, who graduated from upper secondary school at the age of 19 between 2009 and 2016. Observed until the age of 23. Controls included: field, gender points. Sample “all upper secondary graduates” = all HE-eligible upper secondary school graduates, who graduated at the age of 19 between 2009 and 2016. Observed until they are 23. Controls included: field, gender points.

(see [table A3](#) in the online supplement). High-SES applicants are more likely to use all strategies than low-SES applicants (with the exception of extra points from higher education credits). Regarding gender, the patterns are more mixed (with men being more likely to retake exams and collect military points whereas women are more likely to collect points from upper secondary courses, from HE and from attending a Folk high school).

6.3. Discrete survival analyses of receiving an offer: The mediating role of strategies and GPA

We now apply discrete event history models to test our first set of hypotheses expecting higher admission chances for high-SES and female applicants (hypotheses S1 and G1) and whether these advantages changes after controlling for strategies (hypotheses S3 and G3) and GPA (hypotheses S4 and G4).

[Fig. 4](#) shows, again for all upper secondary school graduates and for elite applicants, the predicted probability of receiving an offer for men and women with different levels of SES. As already shown in [Fig. 1](#), the probability of receiving an offer is very low among all upper secondary graduates and mainly stratified by SES—a finding that mirrors SES differences in the probability to apply for elite programs that have been discussed in [Section 5.4](#). If we only consider elite applicants (left panel of [Fig. 4](#)), SES and gender differences are visible, supporting hypotheses S1 and G1. However, SES differences are more pronounced and occur more strongly among women (admission chances are about double as high for high-SES than low-SES women).

Exact numbers are available in the online supplement ([table A4](#)).

To understand how strategies and GPA matter for SES and gender differences in receiving an offer, we rely on the same model presented in [Fig. 4](#) (left panel) and include, first, our measure of all strategies, and second, applicants' GPA. As can be seen in the second panel, the strategies do change gender and SES differences only marginally. Thus, they neither mediate SES differences in admission chances (against hypothesis S3), nor do they suppress gender differences (against hypothesis G3). One explanation for this finding is that gender and SES differences in strategies were most pronounced among the lowest GPA deciles, where strategies are often not sufficient to secure a place in an elite field.⁷ After controlling for GPA, SES differences decrease substantially and gender differences decrease and partly reverse, with low- and medium-SES men showing a higher probability of receiving an offer than their female counterparts. Moreover, the advantage of high-SES women is largely reduced and insignificant. This suggests that differences in GPA are an important mediator of gender and especially of SES differences in admission chances (supporting S4 and G4).

We again divide applicants into those applying to female-dominated and male-dominated fields (online supplement, [figure A8](#)) and find that gender differences in admission chances are smaller in the female-dominated fields (also if we do not control for GPA). The pronounced advantage of high-SES women without controlling for GPA (first panel in [Fig. 5](#)) is mainly driven by applicants to the male-dominated elite fields, suggesting that quite a few (high-SES) men with rather poor school performance try to enter these fields.

Exact numbers are available in the online supplement ([table A4](#)).

We additionally include the strategies stepwise ([online supplement table A6](#)) and find that competing with the maximum number of age points is a crucial strategy to gain admission (it increases admission chances by almost 40 percentage points). However, none of the single strategies seems to have much explanatory power for SES and gender differences in admission chances.

6.4. The moderating role of GPA

As a final step, we examine whether SES and gender differences in admission chances differ across the GPA distribution. We expected that these differences are most pronounced among medium-performing applicants (hypotheses S5 and G5). [Fig. 6](#) shows that, unsurprisingly, GPA is strongly related to receiving an offer for all groups, with low-achieving applicants having almost zero admission chances. Except for very low-achieving applicants, SES differences in receiving an offer are visible across the whole GPA distribution. In absolute terms they are most pronounced among top-performing students (4 percentage points; 46 % admission chance of high-SES applicants and 42 % of low-SES applicants). However, relative to the baseline admission rate of each GPA decile, SES differences are higher among medium performing students.⁸ Thus, if we consider absolute differences, we need to reject hypothesis S5. If we consider relative differences, the findings tentatively support hypothesis S5.

Gender differences are small with medium-performing men having somewhat higher admission chances than medium-performing women (deciles 7 and 8). However, top-performing women stand out with a higher admission probability than respective men (47 versus 40 %). Thus, we do not find much support for hypothesis G5.

How can we reconcile these patterns with those on gender and SES differences in strategies reported in [Section 6.2](#)? Here, we found that differences mainly emerge among applicants with low GPAs. As assumed, these differences in strategies do not seem to translate into unequal admission chances, because, as shown in [Fig. 6](#), applicants with very low GPAs have very little chances of receiving an offer for one of the very selective elite fields irrespective of further strategies (they are unable to increase their competition points, for which their original GPA is central, enough to be competitive). Yet, why do we find SES differences in admission chances among medium- to high-performing applicants? One explanation could be that for those applicants, even small SES differences in strategies (see [Fig. 3](#)) contribute to unequal admission chances (however, if we include the measure for strategy, the pattern rarely change). Yet, application patterns could differ: Low-SES applicants, who are not admitted immediately, might stop trying (as reported for Finland by [Heiskala et al., 2023](#)) after their first attempt while high-SES applicants might try again. We do indeed find these patterns descriptively: 45 percent of low-SES elite applicants, who are not admitted after their first attempt, do not apply again to an elite field. This applies to only 34 percent of high-SES applicants.

The female (and also high-SES) advantage among the highest GPA decile might be due to yet another strategy that the Norwegian admission system offers, that is, applying immediately after high school graduation when applicants are eligible to compete in quota 1 – only with their very high GPA. However, high-achieving male and female and low-SES and high-SES applicants apply at similar rates when they are 19 or 20 and thus compete at similar rates in quota 1. Yet, what we do find are group differences in “subject points” (up to four extra points obtained via course taking in upper secondary school, see [Section 3.2](#)) among high-achieving applicants. These are the only extra points that also count in quota 1. Thus, for those applicants who apply at the age of 19/20 and thus compete in quota 1, these extra points might make a difference. And indeed, we find that female applicants in the highest GPA decile have on average 0.95 subject point, while their male counterparts only have 0.62 (high-SES: 0.88, low-SES: 0.78).

To get a better understanding of the patterns, we additionally reproduced [Fig. 6](#) only for those applicants competing in quota 2 ([figure A9](#), online supplement). Among these applicants, gender differences in

⁷ If we exclude 19 years old applicants, who compete via the solely GPA-based quota 1, the mediation is slightly larger (available upon request).

⁸ For instance, high-SES applicants in the fifth GPA decile have a 60 % higher admission probability than low-SES applicants, given the baseline admission rate of 5 % among decile 5 applicants. Among decile 10 applicants the relative difference is only 11 %.

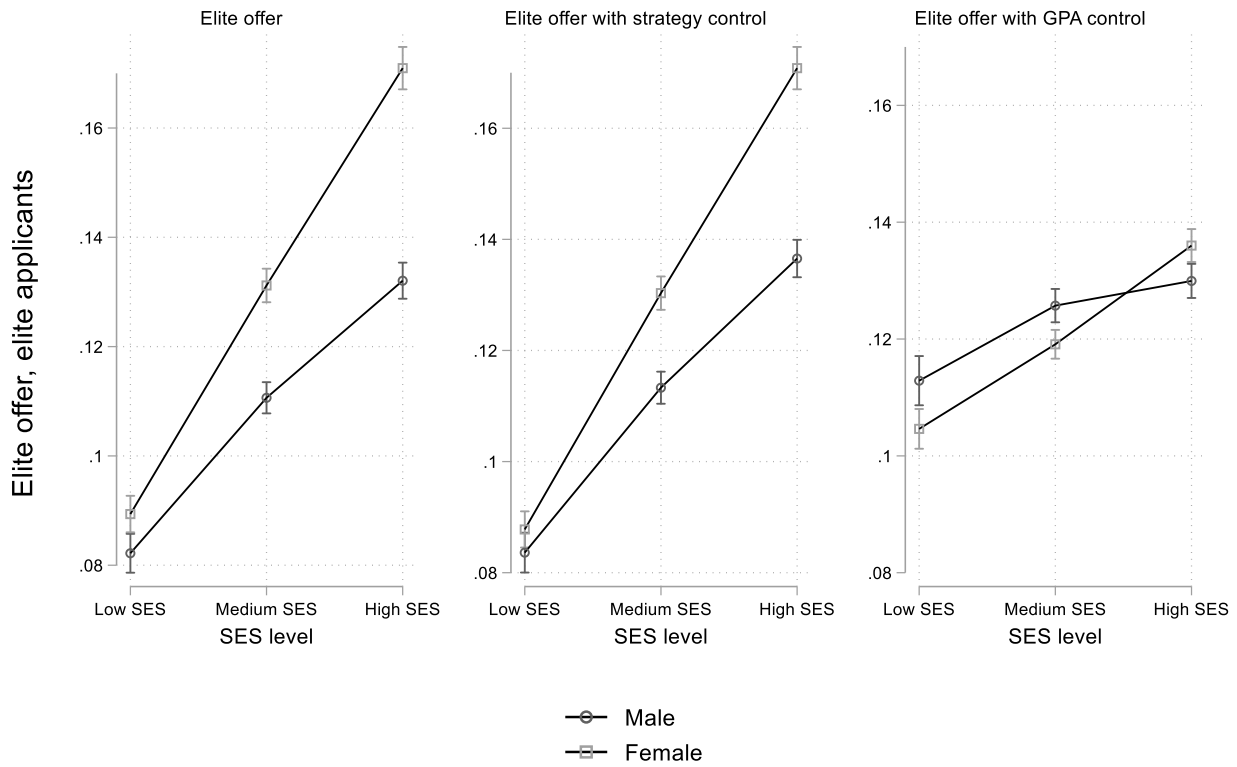


Fig. 5. Predicted probabilities of receiving an offer to an elite program (discrete survival analysis) for elite applicants, by gender and SES. Different model specification. Note: Sample “elite applicants” = elite applicants, who graduated from upper secondary school at the age of 19 between 2009 and 2016. Observed until the age of 23. Controls included in all models: field, gender points.

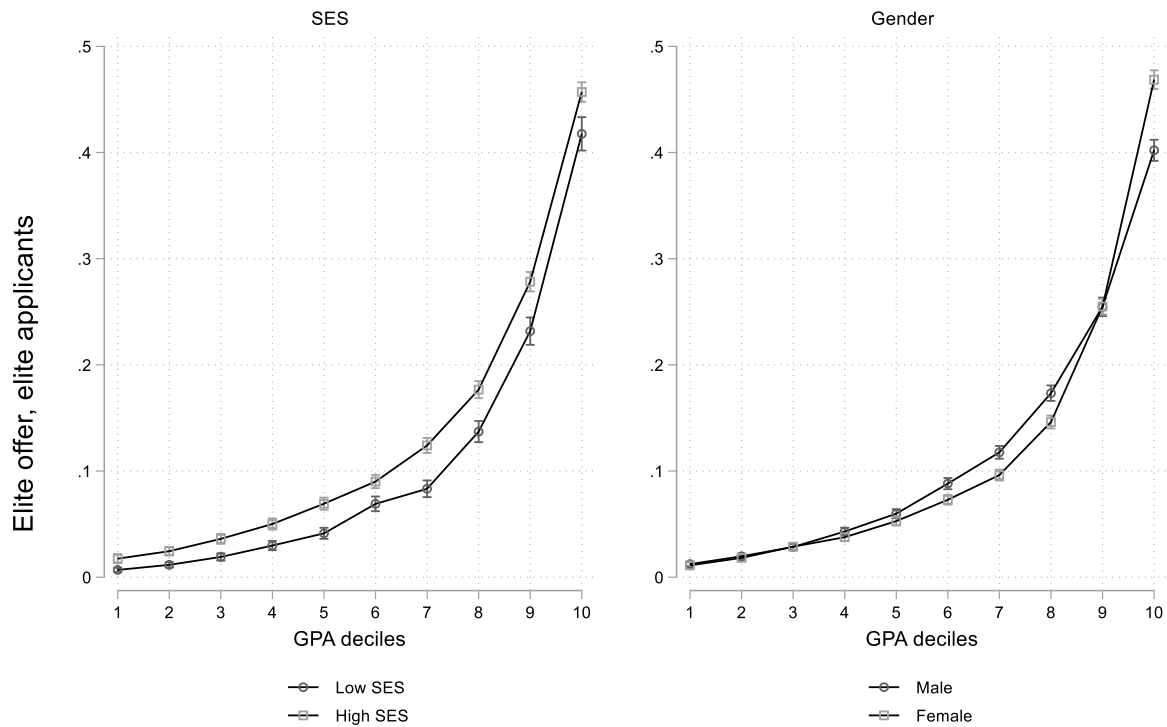


Fig. 6. Predicted probabilities of receiving an offer to an elite program (discrete survival analysis) for elite applicants across the GPA distribution, by gender and SES. Note: Sample “elite applicants” = elite applicants, who graduated from upper secondary school at the age of 19 between 2009 and 2016. Observed until the age of 23. Controls included in all models: field, gender points.

admission chances are lower at all GPA levels and SES differences are higher across the GPA distribution, except for the top GPA level, indicating that SES differences in strategies among poor and medium performing quota 2 applicants matter for unequal admission chances. Finally, a figure that replaces GPA deciles by competition point deciles shows no SES differences and small gender differences (figure A10, online supplement), suggesting that unequal admission chances are the results of strategies.

7. Discussion and conclusion

Fields of study are segregated along the lines of social class and gender and thus contribute to inequality in the labor market. In this article, we have, based on Norwegian register data that cover the HE-eligible population of upper secondary school graduates between 2009 and 2016, examined whether admission criteria and related strategies contribute to gender and SES-based inequalities in access to the most prestigious fields of study in Norway. We follow 19- to 23-year-old graduates from upper secondary school and find, first, that gender-based selection into the pool of elite applicants is marginal on average. However, we observe established patterns of gender segregation with female graduates being more likely to apply for female-dominated elite fields and male graduates being more likely to apply for male-dominated fields. In contrast, SES-based (self-)selection is pronounced with high-SES graduates being much more likely than their low-SES peers to apply for prestigious HE programs. Moreover, low-SES graduates are less likely to apply even if they achieved very high grades in school and would thus have rather high chances to access elite fields.

Second, on top of these self-selection processes, we find social inequality in admission chances among the highly pre-selected group of elite applicants: women and high-SES candidates have a higher likelihood of receiving an offer, with high-SES women leading the rank. Here again, SES differences are more pronounced indicating that SES-based inequality in access to elite fields (and related professions) is due to mechanisms of self-selection *and* institutional selection.

Third, applicants' GPA is the main driver of unequal admission chances. High-SES and female applicants, and high-SES women in particular, have a clear advantage in the admission process and conditioning on GPA reduces gender and SES differences substantially. Thus, in a system in which school performance is the most important criterion to gain access to higher education, SES and gender inequalities that develop (or are not mitigated) in school are reproduced (as has also been shown in the German case, for instance (Finger et al., 2024)).

Fourth, on average high-SES and male applicants are somewhat more likely to use strategies to meet admission criteria that the Norwegian admission system offers, but these overall small differences do not mediate unequal admission chances. This is different to admission systems in which resource intensive and competitive (and potentially stereotyped) elements, such as admission tests, are more relevant (Berggren, 2007; Bielby et al., 2014; Finger and Solga, 2023; Yu and Su, 2024). Moreover, gender and especially SES differences mainly occur among applicants with the lowest GPAs, indicating a system of compensatory advantage at the lower end of the GPA distribution. However, since the potential to compensate for low GPAs is clearly limited, this does not translate in group differences in admission chances for poor-performing applicants. Models run solely on candidates competing in quota 2 suggest that especially high-SES applicants with low to medium GPAs use strategies to increase their admission chances (figures A9 and A10, online supplement).

Lastly, our findings are not in line with our expectations that especially high-SES men benefit from the opportunities the Norwegian admission system offers. In contrast, high-SES women are the main beneficiaries of the centrality of school performance in the admission process and high-SES men are not significantly more likely than high-SES women to use further strategies when GPA is controlled for. This stands in contrast to findings from Sweden (Berggren, 2007) and

Denmark (Thomsen, 2018), where admission tests and interviews seem to advantage especially high-SES men and might be due to the overall more gender neutral (but not SES neutral) strategies beyond GPA that are available in Norway. Moreover, high-SES women and men seem to reproduce their social status in gender-segregated ways. High-SES men are particularly likely to apply to the male-dominated elite fields of business and engineering, which lead to highly paid and prestigious professional titles. High-SES women, on the other hand, appear to be especially likely to apply to female-dominated prestigious fields, such as medicine and law. These fields have been male-dominated until recently and high-SES women in particular have contributed to their feminization and continue to do so. Whether this pattern reflects gender-essentialist preferences (Charles & Bradley, 2009) or a (perceived) devaluation of feminized professions (England & Li, 2006) is a still not finally resolved, but an important question for future research, which would, however, require a longer time horizon than the years that we were able to cover.

Regarding the main concern of our study—the role of admission criteria (beyond school grades) and related strategies for inequality in prestigious fields of study—we need to conclude that, in the Norwegian system, such strategies perpetuate already existing inequalities rather than increasing or alleviating them. Yet, there are further potential strategies that applicants can use. They can, for instance, respond to the distinction between the mainly GPA-based quota 1 (which requires immediate application) and quota 2, in which further compensatory strategies are available. Another source of inequality might lie in reapplication decisions after unsuccessful attempts: High-SES students seem to continue to apply to selective programs at higher rates (Heiskala et al., 2023). Or they might use their resources to study abroad if they are unable to access their preferred elite field in Norway (Serediak & Helland, 2023). In this article, we were unable to cover further strategies within and outside the Norwegian HE system but (further) investigating them seems a promising avenue to arrive at a more complete understanding of the reasons for inequality in access to prestigious fields of study. Moreover, to homogenize our sample (to those graduating at the age of 19, mainly from academic school tracks), we did not cover the whole cohort of upper secondary school graduates and thus probably underestimate the full extent of inequality in the transition to prestigious fields of study. We also only follow students until they turn 23 and thus had the chance to collect the maximum number of extra points. However, if certain social groups (potentially high-SES and male students) are more likely to (re)apply even later our conclusions might change. Examining long-term processes of trying to access elite professions is a relevant topic for future research.

The intake system of higher education and its consequences for efficiency and student diversity has been frequently discussed and reforms have been implemented in many countries. In Norway, recent changes have been decided by the current government, which will remove most options to gather extra points while keeping the opportunity to increase grades from upper secondary school—a costly option that seems more attractive to high-SES applicants. Gender points are exchanged for gender quotas, and the possibility of obtaining military points are kept, suggesting a focus on reducing skewness related to gender, but not to SES. In combination with keeping the importance of applicants' GPA, this will probably further increase the advantage of (female) high-SES applicants in the admission process and do little in reducing social inequality in access to prestigious fields of study.

CRedit authorship contribution statement

Claudia Finger: Writing – original draft, Methodology, Conceptualization. **Thea Bertnes Strømme:** Methodology, Formal analysis, Data curation, Conceptualization.

Declaration of Competing Interest

There is no conflict of interest to declare that could have biased our work on the submitted manuscript.

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Appendix A. Supporting information

Supplementary data associated with this article can be found in the online version at doi:10.1016/j.rssm.2025.101061.

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