Persistent university intentions: Social origin differences in stopping applying to university after educational rejection(s)

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A B S T R A C T

Re-applying after an educational rejection is a considerable but understated part of access to selective educational institutions. We study social inequalities in stopping applying to university after an educational rejection to identify the extent to which educational intentions are more constrained among students from the lower social strata. We explore applications to universities in Finland, where student selection takes place at the gates of the institutions and in which around two-thirds of the applicants are rejected on their first attempt. With full population register data and discrete-time event-history models, we show that around 40% of rejected applicants stop applying to university each year with substantial social origin differences. Previous national examination grades and various life-course changes after the rejection, such as entering the labor market and having children, account for the social origin gap in stopping applying only partially. We argue that the socially selective queue, in which all students do not have the same incentives or possibilities to stand waiting, reinforces social inequalities in university admissions.

1. Introduction

Educational transitions can be conceptualized as consisting of two processes: individuals' applications to educational institutions and the institutional decisions regarding those applications. When making an application to an educational institution, individuals have come a long way from being eligible to apply in the first place, as well as having educational expectations high enough to apply. Following the individual's application, the institutional decision completes it as an educational transition (access) or an unsuccessful attempt to access (rejection).

Educational expectations and intentions, key elements in application behavior, refer to educational attainment individuals realistically expect to achieve taking into account all the individual and structural-level constraints (Kerckhoff, 1976). These expectations are not constant but may change as a response to academic signals that may engender (dis) belief about future success along the educational pathway (e.g., Andrew & Hauser, 2011; Karlson, 2015). The tendency to react to such signals may also vary in socially stratified ways. Previous studies have shown that failures along educational pathways tend to be less negatively consequential for students from high social origins (e.g., Bernardi & Triventi, 2020; Herbaut, 2021). This asset, often referred to as compensatory advantage, can be due to poorly performing high social origin students receiving additional support from their families after 'false steps' (Bernardi, 2012) or high social origin students being generally less responsive to academic signals such as poor grades compared to their low social origin peers (Bernardi & Valdés, 2021; Holm et al., 2019).

Our contribution to the burgeoning literature on social origin differences in how educational false steps differentially impact the ensuing educational pathways of young people is to highlight the role played by re-application behavior after experiencing an educational rejection. We do this by exploring social origin differences in reacting to unsuccessful attempts to enter university degree programmes, in an institutional context in which the number of re-applications is not limited and intake relies heavily on success in annually renewed, programme-specific intake exams rather than primarily on success at the lower levels of education. We thus focus on young people who we know have a strong intention to study at university (through their application behavior), but who are rejected at least once, and ask whether there are social origin differences in their reaction to this event.

We also test whether possible social origin differences in continuing

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to apply despite previous failure can be explained by other overlapping life-course changes that can intervene the university re-application process. Various life-course events taking place during early adulthood may encourage individuals to give up on university plans, some in socially stratified ways (Johnson & Reynolds, 2013). These life-course changes include starting studies at lower-level higher education (HE) institutions, becoming integrated into the labor market, and having children. We test whether these changes account for the possible social origin differences in re-applications and whether the consequences of these life-course changes are similar for low and high social origin applicants.

Using full population register data with annual information on successful and unsuccessful university applications, we study cohorts born in 1987–1990 who applied to a Finnish university at least once between the years 2006–2013 without being accepted (N = 53,462). Thus, our conclusions apply to a specific, albeit a relatively large, group of youngsters: rejected university applicants (two-thirds of all university applicants in Finland). Using discrete-time event history models, we examine re-application behavior in the year immediately following the (first) rejection and do so for a maximum of four successive years. Our main focus, however, is not to distinguish at which stage the possible social origin gap is the largest – after the first or the fourth rejection. Instead, this four-year follow-up allows us to have a sufficient time window to analyse the potential life-course changes that may influence application behavior. What is more, while re-application behavior is common, only a small minority of applicants continue to re-apply after four rejected applications.

To preview our results, we find a large social origin gap in persistent university intentions: children whose parents do not have a university degree are more likely to stop applying to university after being rejected compared to children whose parents have a university degree, independent of prior school performance. Low rather than high earnings, having a first child and starting studies at another type of HE institution (polytechnics in the Finnish case) are associated with a higher probability to stop applying to university. However, life-course changes during the application period do not fully account for the social origin gap in stopping applying. Furthermore, the associations between these life-course events and the probability to stop applying are rather similar for low and high social origin applicants. Altogether, high social origin applicants persist in their university intentions after being rejected, despite the other overlapping changes in their lives, to a greater extent than their low social origin counterparts. In the following sections, we present how the socially stratified decision of stopping applying after an educational rejection deepens the social origin gap in university enrolment. This contributes to the literature on compensatory advantage showing how second chances, following educational rejections, mainly benefit those from high social origins, as well as unravels the socially selective application process to university by highlighting the previously neglected role of re-applications.

2. Theoretical framework and hypotheses

Individuals' educational aspirations, referring to the educational attainment an individual hopes to achieve, and expectations, referring to the education an individual realistically expects to achieve, tend to go hand-in-hand. However, high educational aspirations do not always lead to high educational expectations. The mismatch between aspirations and expectations is shown to be socially stratified: compared to upper-class children in the US context, lower-class peers are more likely to expect to achieve a lower educational level than they aspire to, and lower their educational expectations over time (Hanson, 1994). One possible mechanism contributing to this socially stratified aspiration-expectation mismatch is anticipation of competitive admission barriers. Competitive access has an important role in producing intergenerational educational inequalities as high admission barriers have been shown to disproportionately benefit advantaged students

(Alon, 2009). Studying German HE, Finger (2022) recently showed that high social origin youngsters are more likely to compromise their aspired field of study, when faced with competitive access, whereas their low social origin peers tend to give up on their university aspirations in general. Also other institutional constraints, such as geographical distance, may lead to students' self-exclusion from college intentions even if they had college aspirations at some point during their educational career (Finger, 2016).

Thus, eligible students (with university aspirations) may self-exclude themselves prior to the university application, but this can also take place during the application process. Rather than the process of realizing university aspirations into university intentions, this study focuses on young people with these intentions, as evidenced by their university applications. After translating educational expectations into concrete university applications, students face access barriers with two potential outcomes: successful access or rejection. At this point, applicants have surpassed all the constraints concerning the decision to apply. If the outcome of an application is rejection, students have to re-evaluate their plans and make the application decision again. According to the theory of compensatory advantage, 'false steps' in educational pathways are less negatively consequential for students from high social origins as they have sufficient resources for overcoming these failures (Bernardi, 2012) or their educational decisions are less responsive to academic signals (Holm et al., 2019). Previous studies of compensatory advantage have included, for example, analyses of social origin differences in transitioning to the next educational level or using alternative and less-demanding pathways after poor performance (Bernardi & Triventi, 2020; Bernardi & Valdés, 2021; Yastrebov et al., 2018), and overcoming academic failure in the first year of HE studies (Herbaut, 2021).

Explanations of these social origin differences in educational decision-making have largely relied on assumptions of relative risk aversion (Breen & Goldthorpe, 1997), which argues that families consider the costs, benefits, and probability of success in educational decisions but prioritize avoiding downward mobility for their offspring over other criteria. Similarly, we expect that applicants from high social origins have a higher incentive to keep applying in order to avoid downward mobility (in this case, achieving a lower level of education than their parents) and are thus less responsive to being rejected compared to their peers from lower social origins. In addition, they may have more resources to cover the direct and indirect expenses of the application process, which lowers their threshold for further attempts:

H1. *After being rejected and thus failing to enter university, high social origin applicants are less likely to stop applying compared to low social origin applicants.*

Differences in application behavior may be explained by factors preceding the application period or events occurring after the first rejection. First, we take into account prior school performance. Previous studies have shown that among university applicants, those accepted score higher in matriculation exams compared to those rejected (Kupiainen et al., 2018), indicating a correlation between performance in high school exit exams and university intake exams. Among those rejected, we expect those with better school performance to continue re-applying, as they are most likely closest to access. Applicants are likely to acknowledge this themselves too, which is why prior performance may work as a subjective encouragement that helps the applicant overcome disappointment after being rejected. High social origin students tend to perform better at school compared to low social origin students due to the unequal distribution of resources between families (so-called primary effects) (Boudon, 1974; Jackson, 2013; for Finland: Heiskala et al., 2021). Nevertheless, previous research has also found there to be persistent social origin differences in educational transitions even after accounting for previous educational performance (so-called secondary effects) (Boudon, 1974; Jackson, 2013; for Finland: Heiskala et al., 2021). Thus, we expect that:

H2a. *The social origin gap in stopping applying is partly accounted for by previous school performance.*

Second, as we consider this educational transition containing re-applications as a dynamic process, various life-course events taking place *after* the rejection may also engender social origin differences in re-applications. We consider three life-course changes relevant for applicants in their early adulthood: other HE studies, labor market success without a university degree and having a child. Previous studies have shown that in Finland, especially among well-performing students, polytechnics as lower-threshold HE institutions are an attractive option for low social origin students (Heiskala et al., 2021) and that such students are likely to enter polytechnics as part of their route to university (Kilpi-Jakonen et al., 2016). Thus, we expect low social origin students to enter lower-threshold HE institutions more often compared to high social origin students, explaining part of the social origin gap in university re-applications. In addition most applicants, and especially those from low social origins, may not have the possibility to spend the gap year preparing for the next exam without working at the same time. Thus many of the rejected applicants enter the labor market, which may attract them away from re-applying to university and limit their possibilities for the time-consuming entrance exam preparation. Third, having children also limits the time that can be used for preparing for entrance examinations, but re-applying can also be seen to postpone family formation. As previous studies have shown, there are large social origin differences in the timing of family formation and early-adulthood life-courses in general, with those from low social origin having children earlier in life (e.g., Nisén et al., 2014; Sirniö et al., 2017). These differences may thus account for the social origin gap in re-applications. Altogether, we expect that these various life-course changes may play a role for the social origin differences in re-applications after rejection:

H2b. *The social origin gap in stopping applying is partly accounted for by concurrent life-course changes related to other HE studies, employment and childbearing.*

In addition to explaining social origin differences, these factors may also differentially influence the re-application behaviors of students depending on their social origin. Previous studies lead us to expect that the re-application behavior of lower social origin students is more strongly tied to their prior educational performance as high social origin students are likely to stick with their high educational expectations regardless of poor school performance (e.g., Bernardi & Valdés, 2021). The concurrent life-course changes may also change the educational expectations of students to a different extent and thus lead to differences in re-applications. More specifically, the dual model of HE may tempt low social origin students away from higher-threshold institutions by providing an option with generally easier access (polytechnics) and thus 'cooling out' their university intentions (Brint & Karabel, 1989; Clark, 1960). Despite previous research finding smaller social origin differences among students entering universities via polytechnics rather than directly (Kilpi-Jakonen et al., 2016), we expect the more immediate consequence of polytechnic access to reduce re-applications more among low social origin students than their high origin counterparts. This is largely because applying to university is resource-consuming and a polytechnic degree is likely to be sufficient for low social origin students to avoid downward mobility. This also applies to well-paid positions in the labor market: we expect them to reduce university intentions of low origin applicants who do not necessarily need university education to avoid downward mobility. Altogether, we expect that:

H3a. *Previous school performance, other HE admission, and success in the labor market moderate the association between social origin and re-applying after rejection so that the social origin gap is larger the lower the school performance, among applicants who have started studies at polytechnics, and the better the success in the labor market.*

Finally, even though we expect childbearing to interrupt the re-application process more often for applicants from lower social origins as they are more likely to have children at a younger age compared to applicants from higher social origins, we expect childbearing to have similar consequences for university intentions for all applicants. This is because we assume newborns to be equally time-consuming for all young parents regardless of social origin (though with notable differences by sex):

H3b. *There are no social origin differences in the association between childbearing and stopping applying.*

3. Applying to university in Finland

We next turn to the Finnish institutional context, which offers an excellent opportunity for studying these hypotheses. After nine years of comprehensive school and three years of general upper secondary or vocational education, students are eligible to apply to HE. The HE sector consists of two types of institutions: polytechnics and universities. Studying is free at all levels and HE students are eligible to receive state-funded monthly student stipends and loans, which in principle should be sufficiently large to cover living costs. The only requirement for applying to university is an upper secondary qualification and thus applying is formally possible also for those from the vocational track. Nevertheless, this route is rarely used (Kilpi-Jakonen et al., 2016).

With a centralized application process taking place each spring, students may apply to several university- and field-specific programmes (up to nine in 2006–2013), which each have their own entrance procedures. Students may be admitted to several programmes but can accept only one study place per year. During our observation period, intake was mainly based on field- or programme-specific entrance exams, which change every year and in which the (pre-announced) study materials consist of subject-specific readings, or a combination of these exams and grades from national (matriculation) examinations. More recently, this has been reformed so that around half of students are selected based only on matriculation exam grades, replacing the combination of matriculation exam grades and the entrance exam. The analyzed population in this study was not affected by the reform, and thus for our study population re-application implies retaking the entrance exam each application year.

Each programme has a predetermined number of study places restricting the number of admitted students (also referred to as *numerus clausus* in Latin). As recent country-comparative reports have observed, Finland has one of the most selective HE systems among the OECD countries that impose specific entry criteria, with more than 60% of applicants rejected each year, compared with an OECD average of 30% (OECD, 2018, p. 197; OECD, 2019, p. 55). In other words, most students do not gain access to university the first time that they apply, leading to a transition process with a high number of rejections and re-applications. Rejected applicants, as all upper secondary graduates, may also apply to foreign HE institutions, and Finnish citizens studying abroad are eligible for state-funded student stipends and loans. In our study period, 3–7% of Finnish HE student stipend receivers started their full degree studies abroad annually (Finnish National Agency for Education, 2023). A third of those studying abroad had applied to HE in Finland without being accepted, whereas 56% had not applied to Finnish HE institutions at all (Finnish National Agency for Education, 2018). Comparing those studying abroad to those studying in Finland, high social origin youngsters and non-Finnish speakers are over-represented among leavers (Finnish National Agency for Education, 2017).

Applying to university can be a resource-consuming process, as preparing for entrance exams (or nowadays retaking matriculation exams) requires time and possibly money. Recent studies have shown that private preparatory courses, which can cost up to several thousand euros and are mostly used by young people from high social origins, have become an essential part of the application process (Kosunen,

2018; Kosunen et al., 2021). In sum, student selection happens at the gates of the institutions rather than in the previous stages of education. With the exception of having a limited – though nevertheless relatively lengthy – time to complete one's degree, Finnish universities do not force students out of degree programmes after they have been admitted (i.e. students may be enrolled in university even if failing courses or exams or not attempting to complete them at all). This institutional setting enables us to focus precisely on social inequalities in university enrollment stemming from the (re-)application process to university, as tuition fees or selection during studies, factors relevant in many other country contexts for completing a university degree, have only a marginal role in the Finnish HE system.

4. Data, sample, and methods

We use full population register data from Statistics Finland to test our hypotheses. These data come from administrative datasets that include information on socioeconomic characteristics, including family linkages, matriculation exam data, application registers to universities, and educational enrollment data. High-quality register data are particularly well-suited for exploring this topic as they do not suffer from non-response bias and have information also on unsuccessful applications. We chose four cohorts for this study and compiled our sample by including all individuals born in 1987–1990 who lived in Finland when they turned eighteen, were alive in 2015, and had information on at least one parent in the Finnish registers (N = 257,138). We then restricted the sample to those who had applied to university at least once between the years 2006–2013 (N = 91,111) and then further to those whose first application within this time window was unsuccessful (23% of all, N = 58,375) and finally to those who graduated with a general upper secondary (matriculation) qualification before their first application to university during our observation period.[1] This constitutes our analytical sample (21% of all, N = 53,462).[2]

The data are organized in a person-period format. The metric for time is year as the event is discrete by nature: individuals can apply to university only once a year during late winter/spring. Individuals are followed annually for a maximum of four years between 2006 and 2014 and the data contains yearly information on whether an individual applied to any university programme in Finland or not. The event of interest (i.e. destination state) is to stop applying to university. The clock starts ticking from the first unsuccessful application to university. Being at risk of making the application decision in year (spring) *t* is conditional on being rejected in year (spring) *t-1*. Individuals leave the risk set when they get accepted to university or when they stop applying (i.e. experience the event of interest). In other words, an individual who is accepted to university is removed from the risk of stopping applying the following year and is thus censored. We examine only the first transitions, i.e. the first time an individual stops applying to university after being rejected. After one or more gap years in applying, 11% of individuals in our sample within the time-frame started applying to university again, with no statistically nor substantially significant differences by social origin (see Table A1 and Figure A1 in the Appendix).

In terms of independent and control variables, we use the following:

Parental education (time-constant covariate) is used as our measure of social origin and is the main independent variable of the study. It is a time-constant binary variable that gets the value 1 if either of the parents had a HE degree (Bachelor's level or above) when the child turned 18 and value 0 if neither of the parents had a HE degree.

Matriculation examination grade (time-constant covariate) is an average of the grades of (usually four) mandatory matriculation exams.[3] Matriculation exams are the first and only central examinations in the Finnish education system. We give numerical values to the seven Latin names with which the matriculation exams are graded (from the lowest to the highest: improbatum=1, approbatur=2, lubenter approbatur=3, cum laude approbatur=4, magna cum laude approbatur=5, eximia cum laude approbatur=6, laudatur=7).

Started studying in polytechnics (time-varying covariate) is a binary variable that gets the value 1 when an individual starts studying at a polytechnic in autumn *t-1* or in spring *t*. In contrast to the yearly cycle of university applications, polytechnics have application and entrance cycles in both spring and autumn.

Earnings (time-varying covariate) measures income relative to one's age group and is calculated by dividing an individual's annual earnings with age-specific median earnings. It is based on the sum of wage income and entrepreneurial income and it is inflation adjusted based on the 2014 euro.

First biological child born (time-varying covariate) is a binary variable that gets the value 1 when the first biological child is born (0 otherwise).

In addition to these, we control for sex (male/female), year of birth (1987–1990), whether the application year *t-1* was the year the individual graduated from general upper secondary school or not, and unemployment status in year *t* (received at least 3 months of unemployment benefits in year *t* or not). Adjusting our models to unemployment status aims to capture applications made solely to receive unemployment benefits as all Finnish residents under the age of 25 have to apply to a few educational institutions, not delimited to or necessarily including universities, to be eligible to receive unemployment benefits.

Table 1 describes the distribution of the time-constant covariates (for time-varying categorical covariates see Appendix Table A2). Out of all young people in the included cohorts, 35% applied to university at least once between the years 2006–2013 and 64% of them were rejected the first time they applied, underlining the prevalence of rejection. Females are overrepresented among university applicants and especially among those who were rejected the first time they applied. Among those applying to university, children of university-educated parents are overrepresented and they have higher exam grades on average. Those who were rejected the first time they applied less often have university-educated parents compared to all university applicants but more often than in the entire cohort. As most vocational upper secondary graduates do not take matriculation exams and are less likely to apply to university, the exam grade is missing for more than half of the whole cohort but only for around 6% of university applicants. Those who failed to access university the first time they applied have on average lower exam grades compared to all university applicants, but the difference is only 0.3 which is approximately a third of the standard deviation (and the scale being 1–7).

We use discrete-time event history models and start by describing the patterns with life tables showing hazard functions, survival functions and cumulative failure functions. As we are interested in social origin differences, we show hazard rates also by parental education. We then continue with logistic discrete-time hazard models. As we have no theoretical assumptions about the shape of the baseline hazard, we use a non-parametric baseline hazard by including a dummy for each

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[1] As the main route to university is through general upper secondary education (see for example Kilpi-Jakonen et al., 2016), we restrict our sample to those with a matriculation qualification (which are awarded in general upper secondary schools). We do include vocational upper secondary graduates who have a so-called 'double degree' including both a matriculation qualification and the vocational qualification in the sample.

[2] In the analytical sample, 98% of individuals have a Finnish background, 1.9% have a foreign background and are born abroad, and 0.1% have a foreign background and are born in Finland. With a foreign background, we refer to individuals whose both parents or the only known parent have been born abroad.

[3] Grades from re-sits before graduation are included but after-graduation re-sits are not taken into account. In our study period, students had one attempt to re-sit a passed exam and two attempts to re-sit a failed exam.

Table 1
Descriptive statistics of the sample and the time-constant independent variables.

		Cohorts 1987–1990	Applied to university at least once, 35% of all	Failed to access university at least once, 64% of applicants, 23% of all	Analytical sample, 92% of 'first-time failures', 59% of applicants, 21% of all
Sex	Female	49%	58%	62%	62%
	Male	51%	42%	38%	38%
University educated parent	Yes	21%	38%	33%	34%
	No	79%	62%	67%	66%
Matriculation exam grade	Mean	4.2	4.6	4.3	4.3
	SD	1.1	1.0	1.0	1.0
	Missing for:	48%	6%	7%	0%
N		257,138	91,111	58,375	53,462

application year (excluding the first year and including the constant). We relax the proportional hazards assumption by interacting the time dummies and parental education. We display all the estimates from the logistic discrete-time hazard models as average marginal effects (AMEs) or predicted probabilities for their ease of interpretation and comparability between models. As we are aware of the potential frailty bias, arising from successful applicants being removed from the risk set, we ran an additional random effects model. According to the likelihood ratio test, there is no significant unobserved heterogeneity that should be accounted for.[4] Thus, we only report the estimates from the non-frailty models.

5. Results

We start by showing the cumulative distribution of applicants accessing, stopping applying and applying without access among those with and without parental university education, including the ones who were accepted with their first application (Fig. 1). Over time, more and more people either access university or stop applying, whereas there are fewer and fewer individuals applying without access. Social origin differences in accessing university emerge already in the first application year, as those applicants with no university educated parent are less likely to gain access. During the observed time period, the social origin gap in accessing university expands from 12% points (pp) in the first application year (33% vs 45%) to 16 pp in the fifth application year

Fig. 1. Cumulative proportions of university applicants with general upper secondary qualification accessing, stopping applying and applying without access by parental education groups (N = 85,216).

(49% vs 65%). At the same time, the proportion of individuals applying without access decreases rather fast. What is more, in the first year, there is a large social origin gap in applying without access, but this gap diminishes over time. Low social origin applicants more often stop applying to university compared to high social origin applicants. Thus, the largest differences between the parental education groups can be found for those accessing and stopping applying. In other words, among those who re-apply, we do not see a large social origin gap in being successful or not, but the main difference by parental education is in stopping applying. As students without highly educated parents seem to be more likely to stop applying, the cumulative social origin gap in accessing university expands over time. Thus, the descriptive results suggest that the re-application opportunities mainly benefit the applicants from high social origin. A descriptive figure displaying the conditional proportions of all university applicants can be found in the Appendix (Figure A2).

We now shift our focus from all the university applicants to those who were rejected at least once, which constitutes our analytical sample as described in the previous section. Table 2 displays the life table with hazard rates, survival rates and cumulative failure rates for this sample. Being at risk of stopping applying is conditional on being rejected the previous year and thus in the first interval, the risk set includes all of those who were rejected the first year they applied (N = 53,462). After the first rejection, 44% of individuals stop applying to university (N = 23,720). Censored refer to those who accessed university the previous year and thus are removed from the risk set. The hazard rate stays surprisingly stable from the first year to the fourth year after the first application. Every year, 42–44% of individuals who are at risk of stopping applying to university after rejection in the previous year indeed stop applying. After four consecutive rejections, 11% of the rejected applicants are still applying to university for the fifth time, while 89% of rejected applicants, who have not been able to access university, have stopped applying to university.

As we are interested in social origin differences in stopping applying, we display the hazard rates by parental education in Table 3. After the first rejection, young people with university-educated parents have a substantially lower (conditional) probability of stopping applying to university (0.38) compared to those without (0.47). We consider this 9 pp difference in re-applications a large gap given that it amounts to approximately a fifth of the total share of re-applications. The differences by parental education are larger after first rejections and the (remaining) groups become more similar over application years, with no difference in stopping applying after four rejections.

In Table 4 we test whether this parental education difference can be accounted for by our main independent variables: matriculation exam grades, polytechnic studies, earnings and birth of the first child. We display the estimates from the logistic discrete-time hazard models as average marginal effects to be able to compare the coefficients between models. Model 1 presents a baseline model including parental education, time dummies (not shown in the table) and the control variables (not shown in the table). To follow the change in the parental education coefficient, we add each of these independent variables individually in
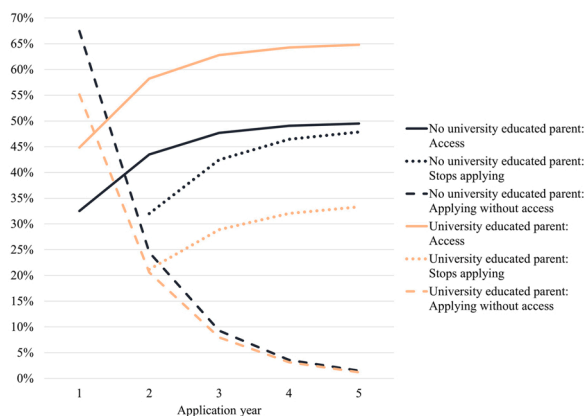
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[4] Assuming the unobserved heterogeneity is constant over time and uncorrelated with our independent variables. Test statistics for comparison of models (based on the full model, see Model 6 in Table 4): LR = 0.01, 1 df, p-value = 0.458.

Table 2
Life table for stopping applying to university: hazard rates, survival rates and cumulative failure rates.

Years since first application	At risk	Event occurred	Censored	Hazard rates	Survival rates	Cumulative failure rates
1	53462	23720	10554	0.44	0.56	0.44
2	19188	8015	3933	0.42	0.32	0.68
3	7240	3142	1374	0.43	0.18	0.82
4	2724	1139	1585	0.42	0.11	0.89

Table 3
Conditional probability (hazard rates) of stopping applying to university by parental education with 95% confidence intervals.

Years since first application	No university educated parents	University educated parent
1	0.47 [0.4671, 0.4815]	0.38 [0.3748, 0.3928]
2	0.44 [0.4259, 0.4491]	0.38 [0.3658, 0.3955]
3	0.45 [0.4290, 0.4673]	0.41 [0.3838, 0.4334]
4	0.42 [0.3877, 0.4483]	0.42 [0.3798, 0.4609]

Models 2–5. Model 6 includes all the independent variables. The social origin gradient in conditional probabilities (Table 3) motivated us to relax the proportional hazards assumption for parental education and thus an interaction effect is included between the time dummies and parental education in all the models in Table 4 but it is not shown as the coefficients are converted into average marginal effects. In line with this, the likelihood ratio test comparing models with and without the interaction term assured us to use the relaxed models ($p < 0.001$).

Model 1 is broadly in line with the descriptive figures discussed above: the average difference in stopping applying to university between children with highly educated parents and those with lower educated parents is eight percentage points (per year), with children from highly educated families more often re-applying to university after failure(s) to access. The higher the previous exam grades, the lower the probability to stop applying (Model 2): as the matriculation exam average increases by one, the probability to stop applying decreases by 6 pp among the rejected, adjusting for parental education and the control variables. The association between parental university education and stopping applying is accounted for only to a relatively minor extent by school performance as the coefficient is reduced by slightly less than 1.5 pp.

Starting to study in polytechnics in autumn *t-1* or in spring *t* increases the probability to stop applying to university in spring *t* by 31 pp among the rejected, adjusting for the other covariates. The parental education coefficient does not decrease substantially (less than 1 pp) after including studies at polytechnics. What is more, the parental education estimate does not change substantially (the difference still being around 8 pp) when earnings and the birth of the first child are added to the models (Models 4 and 5). The higher the earnings relative to one's age-

specific median earnings, the lower the probability to stop applying. In other words, rather than enticing young people away from re-applying to university, labor market integration among the rejected is associated with a stronger commitment to continue applying, in contrast to what we expected. The small increase in the parental education coefficient between Models 1 and 4 (from 7.5 to 8.2 pp) is due to applicants with university educated parents having higher earnings and a lower probability to stop applying. Having a child increases the probability to stop applying to university by 25 pp. Contrary to our expectation, early family formation among the rejected applicants does not explain social origin differences as the parental education estimate does not change at all (with no major sex differences in how this influences the social origin gap despite the substantial difference in how this influences application behavior overall, see Tables A3 and A4 in the Appendix). It is worth noting that entering parenthood after being rejected is a rare event and only very few experience it in our sample (see Appendix Table A2). Consequently, family formation seldom interrupts the re-application process to university in Finland, but if it happens, it notably increases the probability to stop applying, especially for women.

Finally, in the last model (Model 6), all independent variables are included and the difference between applicants with and without university educated parents is reduced from 8 pp (Model 1) to 6 pp. Thus, our results show substantial social origin differences in re-applications that are accounted for only to a rather limited extent by differences in school performance and life-course events taking place during the application years, supporting our *Hypotheses 1 and 2a* as well as *2b* with regard to polytechnic studies but not labor market integration or childbirth.

Lastly, we explore whether the independent variables of interest moderate the associations between parental education and stopping applying to university. The four panels in Fig. 2 display the results in terms of the predicted probability of stopping applying for the two parental education groups depending on matriculation exam grades (upper left), polytechnic studies (upper right), earnings (bottom left) and having a child (bottom right). As can be seen, we do not find any substantial differences in the associations by parental education but rather that, on the whole, the associations are similar for both those with a university educated parent and those without. The better the average grade from matriculation exams (included as both the linear and the squared term in the model), the lower the probability to stop applying
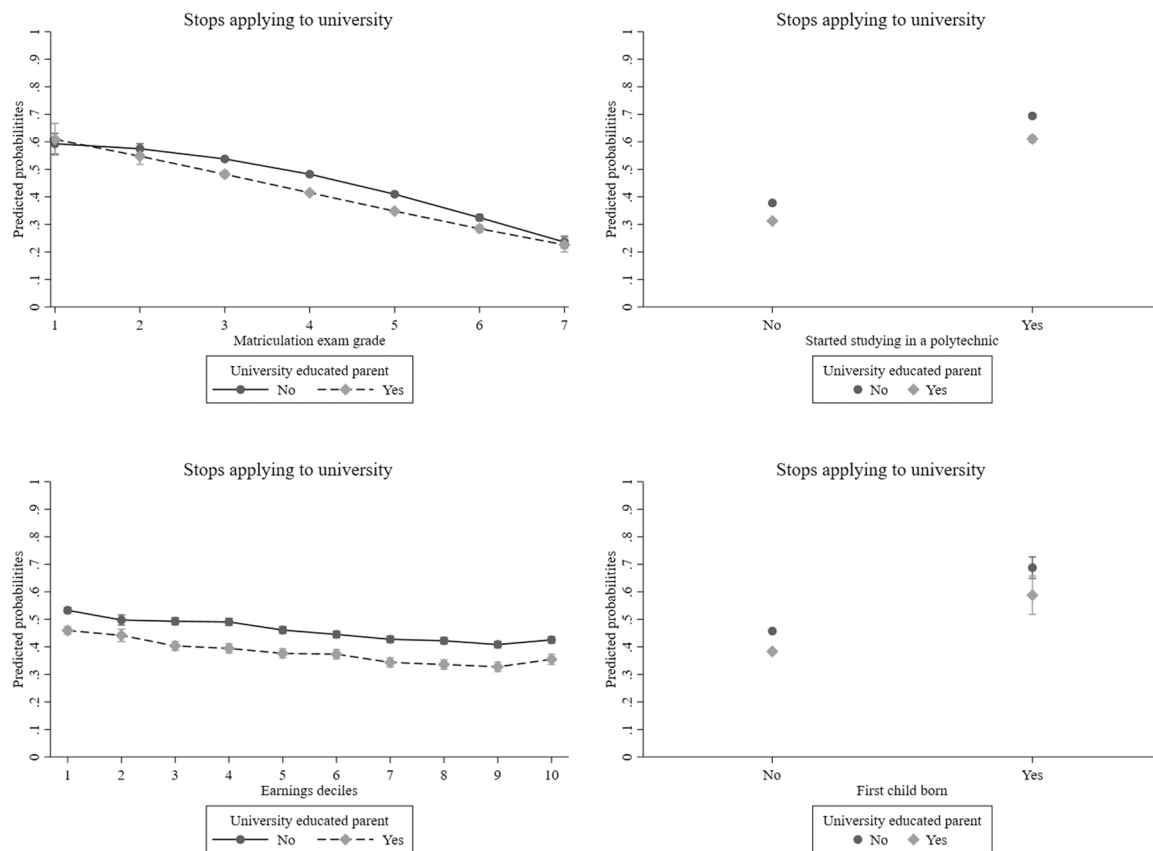
Table 4
Stops applying to university in *t*, conditional on a rejection in *t-1*. Average marginal effects after logistic discrete-time hazard models.

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
University educated parent (ref. No)	-0.075 *** (0.004)	-0.061 *** (0.004)	-0.069 *** (0.003)	-0.082 *** (0.004)	-0.075 *** (0.004)	-0.057 *** (0.003)
Matriculation exam grade		-0.062 *** (0.002)				-0.066 *** (0.002)
Started studying in a polytechnic			0.314 *** (0.004)			0.308 *** (0.001)
Earnings				-0.043 *** (0.002)		-0.027 *** (0.001)
First child born					0.246 *** (0.018)	0.224 *** (0.018)

All models control for sex, year of birth, a dummy for whether an individual received at least 3 months unemployment benefits in the application year and a dummy for whether the previous application year was the year the individual graduated from general upper secondary school. Time dummies not presented in the table.
Standard errors in parentheses. *p < 0.05, * *p < 0.01, * **p < 0.001
Number of individuals: 53,462. Number of person-years: 82,614.

Fig. 2. Social origin differences in the way different predictors are associated with stopping applying to university, conditional on rejection in *t-1*. Predicted probabilities based on interactions added to Model 6 (Table 4). 95% confidence intervals around the estimates.

after rejection, the differences by parental education groups being the largest among the average performers of those rejected, contrary to our expectations in *Hypothesis 3a*. This might be partly due to the selection into the analytical sample of rejected applicants. In other words, it might be that poorly performing students with a university educated parent have accessed university already with their first attempt more often compared to such students without a university educated parent, even though this is not very likely in the Finnish case as there are very few poorly performing students accessing university overall (Heiskala et al., 2021, p. 182). Starting studies in polytechnics substantially increases the probability to stop applying to university after a rejection. The association is very similar in size for both parental education groups, indicating that there are no substantial social origin differences in using polytechnics as a stepping stone while continuing with university applications, contrary to what was expected in *Hypothesis 3a*. Polytechnic studies increase the likelihood to stop applying by 31 pp for young people with a university educated parent, and by 30 pp for those without.

Continuing with the bottom panels, we find that the higher the earnings relative to one's age-specific median earnings (divided into deciles and analyzed as a categorical variable in Fig. 2 to capture non-linearities), the lower the probability to stop applying to university among the rejected (bottom left). The differences by parental education are relatively constant across the earnings range and thus the results are contrary to our *Hypothesis 3a*.

Finally, having a child seems to produce a similar increase in the probability to stop applying by parental education (bottom right) as was expected in *Hypothesis 3b*. As the number of cases for those having a first child during the time observed is very low, the difference between parental education groups among those who have a first child is not statistically significant.

6. Discussion

With this research, we have identified the relevance of re-applications in the university admission process for intergenerational educational inequality. Our results show that low social origin applicants have a higher probability to self-exclude themselves after being rejected and thus the re-application process deepens the social origin gap in university enrolment. Using high-quality Finnish register data with discrete-time event history models, we are able to show that children from higher social origins are more persistent in their university intentions and have a lower probability to stop applying after one or even several rejections. Differences in prior school performance and various life-course events taking place after the rejection, such as having children or starting studies at a lower-level higher education institution, account for the social origin gap only partially.

What is more, the consequences of these life-course changes and prior performance are surprisingly similar for low and high social origin rejected applicants. In other words, the life-course changes that we have studied do not tend to divert students from low social origins away from re-applying more often than their high social origin peers. We do acknowledge a possibility for reverse causality, in which case these intervening life-course changes would be due to lowered educational intentions and not vice versa. Disentangling whether stopping applying to university is due to intervening life-course changes or whether these changes, such as entering the labor market or parenthood, take place because the applicant has decided to stop applying is outside the scope of this paper. We argue that the university re-application process and its correlates can be studied without knowing whether the decision of stopping applying precedes the life-course changes or the other way around: in both cases, these applicants have found an alternative option away from university studies and our interest is in their social origin

implications.

Rather than studying anticipation of admission barriers prior to the application process (Finger, 2016, 2022), we explore facing and overcoming these barriers in terms of re-application behavior. Individuals who have faced failure to access university have at least once tried to realize their educational intentions until access barriers force them to re-evaluate their plans. Andrew and Hauser (2011) have shown that to change adolescents' educational expectations the new signal of academic achievement has to be very strong. We argue that educational rejection is a feasible example of such a strong signal and, what is more, applicants from low social origins are found to be more responsive to this. Interpreting rejection only as a signal, however, understates its role as a life-course event shaping applicants' forthcoming years above all. At worst, these rejections may lower individuals' meritocratic beliefs or disconnect them from societal norms altogether as society encourages individuals 'to live up to their dreams' whilst limiting the necessary opportunity structures (Clark, 1960; Isopahkala-Bouret, 2020).

Although our research concerns Finland – and even in this country context the entrance system has been reformed to some extent recently – we do not think our main argument is limited to this specific institutional context. Re-applications to higher education feature in other systems too even if their extent is rather stark in the Finnish context. Retaking high stakes centralized examinations that are a gateway to higher education is one relevant aspect of this transition in some countries (and is now becoming more prominent in Finland). For example in the US, low-income students have a lower probability to retake SAT exams, leading to a 10 pp gap in four-year college enrollment among high school graduates (Goodman et al., 2020).

Also, it is worth noting that our results apply to a selective group of youngsters, rejected university applicants. However, in our case concerning Finland, this group is by no means marginal as it includes around two-thirds of the university applicants and a quarter of the whole cohorts. Moreover, the highly selective intake in which case rejections affect most applicants rather than very specific groups (see Table 1 and Figure A4) reduces some of the concerns about selection. Some implications of the selection bias, however, are worth noting. First of all, to be concerned about the 'bias', we have to have an idea of what the 'real' effect we aim to capture is (Mare, 2011). If we would have been interested in the social origin effect on overall university intentions (measured by applications), our analytical sample based on those who had applied and failed to access would have led us to downwardly biased results. In other words, as those from privileged backgrounds compared to others apply to university more often, access with their first attempt more often, and even further keep applying after the rejections more often, the results we show underestimate the overall social origin effect on university intentions. Regarding the analytical sample of rejected applicants in the light of our independent variables, we discuss the implications of selection while interpreting the results of prior school performance as this can be associated both with the initial rejection and the decision to stop applying. We do not believe that the time-varying variables, employment, other HE studies, and childbearing, substantially influence selection to the analytical sample of rejected applicants as these take place after the first application. Altogether, we acknowledge the non-random selection into the analytical sample and interpret the results accordingly, referring to the rejected applicants rather than the whole population. Another concern that might arise from the selection to the risk group (net of selection to the analytical sample of rejected applicants) related to the dynamic selection bias prevalent for educational transition models is that we follow the applicants over multiple years (see e.g., Mare, 2011). However, what we show in this paper is the average marginal effect of parental education on stopping applying *over time* rather than across application years. Thus, we do not aim to compare whether the social origin gap is larger after the first or the second rejection, even though we show this descriptively in Table 3, or argue that the descriptively shown diminishing social origin gap would be a sign of an equalizing effect of the further attempts.

Some consequences of rejected educational applications have not been explored in this paper. First, using Finnish register data, we do not know whether students apply to a foreign higher educational institution after a rejection. However, moving abroad for studying is more common among young people with high social origin (Finnish National Agency for Education, 2017; Lörz et al., 2016), leading at most to conservative social origin estimates in our case. In other words, as the leavers are often from a high social background, we underestimate the proportion of such students (re-)applying to university in total. Second, as our interest has been in stopping applying to university, we have not included the field(s) of studies individuals applied to (in previous years) in our setting. However, cumulative failure rates of stopping applying by grouped fields of study replicate our main findings (Appendix Figure A3): re-applications are common in all fields of studies, not only in the ones that can be considered as the most prestigious, and especially among high social origin applicants. With this research, we cannot distinguish whether high social origin applicants compromise their preferred field of study (Finger, 2022) and adapt by lowering their possibly ambitious choices when re-applying, or whether they are more persistent with their applications to a specific field of study, compared to their low social origin peers. Altogether, elaborating social origin differences in various navigation strategies into and through higher education will remain a fascinating avenue for future research.

7. Conclusion

Our aim with this paper has been to extend the literature on social inequality in educational transitions by focusing on dynamic processes of educational rejections and re-applications. As we expected based on relative risk aversion theories (Breen & Goldthorpe, 1997), high social origin applicants are more persistent with their university intentions compared to their low social origin peers. Standing in the queue is a prominent part of the admission process into Finnish universities, and it clearly excludes university applicants in a socially stratified way. If second chances in educational pathways are mainly used by children from high social origins, a selective intake including several repeated attempts may even reinforce social inequalities. This also has some policy implications. As institutional barriers often unevenly affect children from different backgrounds, changing these barriers will have heterogeneous effects on applicants (Espadafor, 2023, p. 227). Increasing the number of student places in higher education, in which case applicants face rejection less often, may diminish the social origin gap in university enrolment as the expansion would not only increase the proportion of accepted applicants but would also decrease the number of applicants who have to make the – socially stratified – decision of re-applying or stopping applying. This also adds to the literature on (non-)persistent inequalities (e.g., Breen et al., 2009; Raftery & Hout, 1993) by introducing a mechanism for how educational expansions can increase equality of educational opportunity. Focusing only on first applications, enrollment or completed degrees, we lose important information on the mechanisms producing intergenerational educational inequalities.

In addition, the rules governing intake may also influence the social stratification of selection, both at the first attempt and in subsequent re-applications. As mentioned above, the Finnish system has recently been changed so that a larger share of places is allocated on the basis of matriculation exam grades. This means that fewer students need to prepare for the potentially time-consuming entrance exams, which also reduces the market for private preparatory courses (albeit with the possibility that they will increasingly target students preparing for the matriculation exam). It may also divert unsuccessful students more quickly away from re-applications. Research examining the immediate changes caused by the reforms have not found significant impacts on social origin differences in accepted applicants (Karhunen et al., 2022), but future research examining these reforms in more depth will certainly shed more light on the role of the rules of intake.

Appendix A. Supporting information

Supplementary data associated with this article can be found in the online version at doi:10.1016/j.rssm.2023.100801.

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