

The Long Shadow of Social Origin. Subjective Expectations in Lower-Secondary Education and University Enrolment in Switzerland

David Glauser* and Rolf Becker**

Abstract: We examine how subjective expectations at the lower-secondary level shape social stratification in university enrolment. Using panel data and drawing on subjective expected utility theory, we show that the perceived utility of vocational and tertiary education varies by social origin. The direct effect of social origin on university enrolment is mediated by primary and secondary effects of stratification. Class-related differences in the perception of educational motivation and investment risk result in socially stratified educational pathways.

Keywords: Subjective expectations, social origin, university enrolment, education, inequalities

La longue ombre de l'origine sociale. Attentes subjectives au secondaire I et entrée à l'université en Suisse

Résumé: Nous examinons comment les attentes subjectives au secondaire I influencent l'accès à l'université. À partir de données de panel, nous montrons sur la base de la théorie SEU que l'utilité perçue des formations professionnelle et tertiaire varie selon l'origine sociale. L'effet direct de l'origine sociale sur l'accès à l'université est médié par des effets primaires et secondaires de stratification. Les différences sociales dans la perception de la motivation éducative et du risque d'investissement conduisent à des parcours stratifiés.

Mots-clés: Attentes subjectives, origine sociale, entrée à l'université, éducation, inégalités

Der lange Schatten der sozialen Herkunft. Subjektive Erwartungen in der Sekundarstufe I und die Aufnahme eines Universitätsstudiums in der Schweiz

Zusammenfassung: Wir untersuchen, wie subjektive Erwartungen in der Sekundarstufe I soziale Ungleichheiten beim Universitätszugang prägen. Mit Paneldaten zeigen wir auf Basis der Subjective Expected Utility Theorie, dass der wahrgenommene Nutzen von Berufs- und Tertiärbildung nach sozialer Herkunft variiert. Der direkte Effekt der sozialen Herkunft auf den Universitätszugang wird durch primäre und sekundäre Herkunftseffekte mediert. Unterschiede in der Wahrnehmung von Bildungsmotivation und Investitionsrisiko führen zu sozial stratifizierten Bildungsverläufen.

Schlüsselwörter: Subjektive Erwartungen, soziale Herkunft; Aufnahme Universitätsstudium, Bildung, Bildungsungleichheit

* University of Applied Sciences and Arts Northwestern Switzerland FHNW, School of Education, <https://orcid.org/0000-0002-8903-4973>, david.glauser@fhnw.ch.

** University of Bern, <https://orcid.org/0000-0001-9574-1669>, rolf.becker@unibe.ch.

1 Introduction

Educational attainment and credentials are pivotal regarding individual life chances over the life course (Müller & Jacob, 2008). A university degree is associated with a comparatively low risk of becoming unemployed and downward social mobility, while university graduates are more likely to gain access to qualified jobs, earn high salaries, or enjoy better health compared to persons without tertiary education credentials (Blommaert et al., 2020; Gebel & Heineck, 2019; Korber & Oesch, 2019; Rözer & Bol, 2019). The resulting favourable social positions are reproduced across generations (Jann & Combet, 2012; Mastekaasa & Birkelund, 2023; Nennstiel & Becker, 2023), thereby maintaining social stratification and inequality in educational opportunity (IEO). This is because the children of highly educated parents tend to outperform their peers from less privileged backgrounds long before they start school (Dräger & Pforr, 2022; McGinnity et al., 2022; Skopek & Passaretta, 2020), and because socially privileged parents and their children tend to prioritise certain factors differently when making educational decisions compared to parents from less privileged backgrounds (Becker, 2024).

Social stratification and IEO are observed at different educational levels in many European countries (Barone et al., 2018; Becker, 2003; Blossfeld et al., 2016; Hällsten, 2010; Müller & Pollak, 2007; Schindler & Bittmann, 2021; Triventi, 2013). Evidence of social stratification in education within the Swiss education system is apparent at both the lower (Beck, 2015) and upper-secondary levels (Becker, 2024; Becker & Glauser, 2018; Buchmann et al., 2016; Combet, 2013; Combet & Oesch, 2021; Glauser, 2015; Jäpel, 2017), as well as in tertiary education (Becker et al., 2010; Becker & Hecken, 2009; Combet & Oesch, 2021; Glauser et al., 2019; Griga, 2014; Murdoch et al., 2016). The social stratification of educational attainment is often explained by the primary and secondary effects of social stratification (Boudon, 1974). While the primary effect of social stratification, the correlation between social origin and achievement, explains a substantial part of variation in the early trajectory from primary school to lower-secondary education, the secondary effect of stratification, the association between social origin and educational decision-making when controlling for achievement, has been proven to influence decisions and trajectories to upper and tertiary education (Blossfeld et al., 2016; Jackson, 2013).

Existing literature on primary and secondary effects of social stratification mainly focuses on specific trajectories in an education system or whether a specific educational degree is attained (Barone et al., 2018; Bittmann, 2022; Breen et al., 2014; Busse et al., 2023; Hillmert & Jacob, 2003; Need & de Jong, 2001; Neugebauer et al., 2013; Stocké, 2007; Zimmermann, 2020). This paper aims to contribute to the understanding of whether and to what extent subjective expectations, as measured in Grade 9, statistically mediate the association between social origin and later enrolment at academic universities, net of prior achievement and the school track attended. To our knowledge, this is the first paper to analyse enrolment at academic

universities using information on the subjective expected utility of different educational options among lower-secondary school students, thereby contributing to sociological life course research and analytical sociology.

For our analysis, we use prospective panel data from the graduation cohort in German-speaking Switzerland from summer 2013 (Becker et al., 2020). The dataset includes measures of individuals' perceptions of costs, benefits, status maintenance, and the probability of successfully completing a university degree. In line with the theoretical arguments of Esser (1999) and previous empirical applications (Becker, 2024; Becker & Glauser, 2018), the present study examines the subjective net utility of educational options (vocational training; university) by measuring perceived educational motivation and investment risk. This is achieved by employing a direct testing strategy and the reformulated Karlson-Holm-Breen (KHB) decomposition method (Breen et al., 2018) to analyse individuals' propensity to enrol at a university ten years after completing compulsory education.

The remainder of the article is structured as follows: First, we provide a summary of the main features of the Swiss education system, which are crucial for understanding how social inequalities emerge through early educational decision-making at different levels of education. Next, we review the research linking social stratification at university level to the mechanisms that bring about social inequalities in tertiary education. In the empirical section, we describe our data, the operationalisation, and our analysis strategy before presenting our results. Finally, we conclude with a discussion of the main findings and the limitations of our study.

2 Features of the Education System and University Admission in Switzerland

The Swiss education system is characterised by a high degree of stratification and vocational specificity (Allmendinger, 1989; Buchmann et al., 2007; Buchmann et al., 2016; Kerckhoff, 2001), resulting in a comparatively low proportion of students holding a tertiary education entrance qualification within the age-specific population (Kriesi & Leemann, 2020; OECD, 2013). This is because educational decisions must be made at a young age, and there is limited permeability between academic and vocational tracks at subsequent levels, which fosters social inequalities in educational attainment and pathways (Burger, 2021; Dräger et al., 2023; Kost, 2013; Nikolai & Ebner, 2011; Pfeffer, 2008).

In Switzerland, students attend a comprehensive primary school, typically up to Grade 6. They are then assigned to different tracks in lower-secondary education based on their prior achievement. These tracks differ in terms of their respective cognitive demands, curricula, and attainable school-leaving certificates. Lower-secondary level tracks are commonly referred to as those with basic requirements, advanced requirements, or the pre-gymnasium (see Edudoc.ch, 2014; SCCRE, 2014; 2023).

The set of educational alternatives at upper-secondary level is closely linked to the track attended during compulsory schooling. In Switzerland, according to institutional regulations, admission to the gymnasium is granted to students who have attended a school track with advanced requirements or a pre-gymnasium and who have achieved the required grade point average or have passed an entrance examination. The same applies regarding access to specialised middle schools, where students can attain a Specialised Baccalaureate (SB), which provides access to specific programmes at universities of applied sciences or universities of teacher education. In addition to these academically oriented, school-based tracks, the Swiss education system is characterised by a highly differentiated VET system (Gonon, 2012, Cedefop, 2021), which provides around 250 different apprenticeship programmes (SERI, 2022). These programmes last either two years (leading to a Federal VET Certificate) or three to four years (leading to a Federal VET Diploma). Around 50–60 percent of school-leavers start a VET programme (Switzerland: FSO, 2023).¹ A Federal Vocational Baccalaureate (FVB) can be obtained either during (FVB1) or after (FVB2) completing basic VET. Holders of an FVB gain access to specific degree programmes at universities of applied sciences.

The percentage of students with a matriculation certificate increased from 36.3 percent in the year 2013 to 42.9 percent in the year 2023 (FSO, 2025a). While the average proportion of students earning a baccalaureate at a gymnasium remained relatively stable within the reference population of the same age (2013: 19.9%; 2023: 23.2%), as did the proportion earning an FVB (2013: 14.1%; 2023: 15.5%), the proportion earning an SB doubled from 2.4 percent in 2013 to 4.2 percent in 2023, though it remains comparatively low.²

At the tertiary level, it is important to distinguish between universities, universities of applied sciences (UAS), and universities of teacher education (UTE), as admission criteria vary depending on the type of institution (Buchmann et al., 2007).³ In the following, the term “tertiary education” is used as an umbrella term encompassing universities, UAS, and UTE, while “university enrolment” refers specifically to enrolment at academic universities, which is the main outcome of interest in the analysis. Admission to academic universities is granted to students holding a baccalaureate from a gymnasium. Students who obtain a Specialised Baccalaureate (SB) at upper-secondary specialised schools (Fachmittelschulen, FMS) or who earn

1 The proportion of learners in the VET system is roughly 50 percent in the French- and Italian-speaking regions, while in the German-speaking area, the proportion is about two thirds and over 70 percent in the more rural cantons (FSO, 2023; Glauser, 2015; Schmutz, 2024).

2 In French-speaking cantons, the proportion of students earning a SB or a baccalaureate at a gymnasium is higher than in German-speaking cantons, while the opposite holds in case of the FVB.

3 Tertiary degrees can also be attained at Colleges of Higher Education (Höhere Fachschulen, HF) or via exams (Höhere Fachprüfung, HFP) both leading to an Advanced Federal Diploma of Higher Education. Unlike the tertiary institutions mentioned above, admission to HF or HFP requires normally a Federal VET Diploma, but not a vocational baccalaureate.

a Federal Vocational Baccalaureate (FVB) in addition to basic vocational training are also admitted to academic universities if they successfully complete a supplementary examination called the *Passerelle*. Although there is formal permeability between the different tertiary education institutions, factual trajectories depend heavily on the track attended at the upper-secondary level (FSO, 2018; Kost, 2013). On average, 45 percent of students who received a matriculation certificate in 2019 transitioned to tertiary education within 54 months. However, while only 6 percent of students with an FVB (SB: 8 percent) enrolled at an academic university, 79 percent of gymnasium students did so (FSO, 2025b). These transitions are characterised by social inequality of educational opportunity. Overall, children from higher social classes (e.g. the offspring of academics) have an advantage when it comes to accessing academic universities, while those from lower social classes are diverted from the direct path to academic universities (Becker, 2025; Schindler & Bittmann, 2021).

3 Explaining Differentials in University Enrolment

Many scholars have made theoretical and empirical contributions to explaining IEO in terms of social origin in educational decisions and pathways (Becker, 2022). A fundamental premise is that the educational differentials observed at the macro-level are the aggregated result of educational behaviour at the micro-level. However, educational behaviour depends on the given opportunity structure related to both the social stratification (macro-level), the educational system, and the constraints of the labour market (meso-level). In other words, IEO is essentially the unintended consequence of an individual's school performance and educational decisions, which vary according to social origin (Becker & Schulze, 2013; for an overview of how expectations are associated with educational decisions and trajectories see: Ahearn, 2021; Bernardi & Valdés, 2021; Buchmann & Park, 2009; Burger, 2023; Forster, 2021; Forster & van de Werfhorst, 2020; Karlson, 2015; Ortiz-Gervasi, 2020; Zimmermann, 2020).

To explain educational differentials, several authors have proposed theoretical developments and mathematical adaptations in the context of rational action theory (RAT) and a sophisticated theory of subjective expected utility (SEU), with reference to Boudon (1974). The theoretical and formal model proposed by Breen and Goldthorpe (1997) is based on the recurring and sequential educational decisions that actors must make (BG-model). Actors have three options: they can leave the education system and enter the labour market; continue in the education system and successfully attain a degree; or stay in the education system and fail. Actors' decisions are influenced by the expected cost of continuing in the education system, the subjectively perceived probability of successfully attaining a degree, and the expected benefits of each of the three outcomes. The model assumes that more

privileged social classes opt to remain in the education system for longer, as this strategy minimises the risk of downward social mobility. On average, those in the higher social classes perform better at school than those in the lower classes. They are therefore more likely to successfully obtain a higher-level degree, and their parents are better able to compensate for the costs incurred while they remain in education.

However, as outlined in the previous section, actors in the Swiss and other non-comprehensive education systems with a highly developed vocational training system do not have to choose between continuing their education or leaving the education system and entering the labour market. Instead, they decide at an early age whether to pursue an academic or vocational pathway, considering the specific opportunities and constraints for further education and subsequent career prospects that each alternative offers. This decision can be suitably modelled, both theoretically and empirically, using Esser's (1999) SEU model.⁴

For our purposes, the SEU model by Esser has been modified. We differentiate between two alternatives for individuals at the end of compulsory schooling: commencing vocational training (A_{VET}), which offers a relatively smooth transition to skilled employment when entering the labour market as well as a potential route to UAS or UTE; or commencing academic education (A_{ACADEMIC}) at a gymnasium, which also leads to a higher education entrance qualification, but offers direct access to different study programmes at academic universities. The subjectively expected utility of each alternative i is modelled separately as follows:

$$\text{SEU}_i = B_i + c_i \text{SM}_i - C_i/p_i, \quad (\text{Eq. 1})$$

where B_i (benefit) represents the expected return on the respective educational option (e.g., income, job security, etc.) and c_i refers to the subjective assessment of the probability to maintain parental social status with a given alternative, and SM_i refers to the weight individuals attribute on maintaining parental social status. Taken together, these parameters correspond to what Esser (1999) refers to as "educational motivation" (EM). Additionally, the utility of an alternative depends on the expected costs (C_i) and on the expected probability (p_i) of successfully completing the alternative. These two components equal to the "investment risk" (IR) of an educational alternative. The decision in favour of a particular educational alternative is based on the relationship between EM and IR for a given alternative, as well as the relationship between educational alternatives. Actors usually opt for an educational alternative if the net utility for alternative i is subjectively perceived as higher than of alternative j (for details see: Becker, 2024; Becker & Glauser, 2018). Various empirical analyses

⁴ The model has been successfully applied to empirically explain social inequalities regarding the trajectory from primary to lower-secondary education (Beck, 2015), to educational alternatives at upper-secondary education (Becker, 2024; Becker & Glauser, 2018; Glauser, 2015), the decision between VET and FVB (Jäpel, 2017), or access to universities in Germany (Becker & Hecken, 2009; Müller & Pollak, 2007).

consider measurements of single SEU-parameters. However, referring to the theory of subjective utility (von Neumann & Morgenstern, 1944), it is more plausible to consider the net utility of alternatives rather than single parameters, since the central axioms of the theory of subjective expectations (order, completeness, ordinal preference structure, and the transitivity assumption) relate to net utility of action alternatives. Furthermore, focusing on single SEU parameters is unsatisfactory from an empirical perspective, as it necessitates numerous comparisons between parameters across social groups, while the net utility – which is ultimately central to decision-making – recedes into the background (for details: Becker, 2024, p. 168).

When applied to the research question at hand, it can be assumed that students from socially more privileged backgrounds show a higher propensity for university enrolment for reasons that have already been addressed in the BG-model. Firstly, due to the *primary effect of social stratification* (Boudon, 1974, p. 29), namely the class-specific impact of cultural background, socialisation, and nurture on children's academic performance and school achievement, and due to the admission regulations within the education system, students from the cognitively less demanding tracks do not have access to all educational alternatives (Dräger et al., 2023; Engzell & Raabe, 2023; Strello et al., 2022; van De Werfhorst & Mijs, 2010). Even if these students perceived the benefits of academic education as high, this alternative would seem “unattainable” to them due to the low probability of success based on their academic performance to date. Overall, the primary effect may directly influence the educational decision, as previous achievement correlates with individuals' subjective expected probability of succeeding in subsequent stages of their educational career (Dochow & Neumeyer, 2021).

Secondly, class-specific educational decisions, independent of prior achievement, are referred to as the *secondary effect of social stratification* (Boudon, 1974, p. 28). Accordingly, disparities in educational decisions are evident among the different social classes, even in the absence of differences in academic performance. In line with the social position theory by Keller and Zavalloni (1964), the more socially privileged classes will show a higher EM in favour of academic education, as they anticipate that it will best maintain their parents' social status (see also: Boudon, 1974). Although this goal can be achieved through tertiary education after obtaining a VET qualification, those in the more privileged classes are less familiar with paths leading from VET to tertiary education, whereas the opposite is true for the path to academic universities via the gymnasium. Furthermore, these students are likely to face a lower investment risk because, on the one hand, their parents are better able to bear the direct and indirect costs of an academic education, regardless of their offspring's achievement and the expected probability of success. On the other hand, they know from their parents that although gaining admission to a gymnasium is challenging, successful completion does not require above-average performance (Erikson & Jonsson, 1996; Forster & van de Werfhorst, 2020).

In contrast, students from less privileged social backgrounds perceive EM to be higher and IR to be lower regarding VET, and vice versa for academic education. Regarding the EM, students from lower social classes can maintain their parents' social status by choosing vocational training. If they perform well at school, they may even be able to access tertiary education through an FVB. For these social classes, VET acts as a 'safety net' as it is considered a low-risk, low-cost strategy of maintaining social status (Müller & Pollak, 2007; Shavit & Müller, 2000). While the empirical evidence is mixed, one might also expect young people from lower social classes to rate the benefits of vocational training more highly given their high time discount rate in educational planning and their desire to achieve economic independence quickly (Breen et al., 2014). As the proportion of students in school-based VET is rather low in German-speaking Switzerland, the direct costs of VET are perceived as lower than those of academic education. Furthermore, apprentices in dual VET receive a wage, which not only reduces direct educational costs, but also enables them to earn an income during their training. Students may also consider their probability of successfully completing a VET programme to be comparatively high. Consequently, the IR for VET is likely to be perceived as lower by students from lower social classes than an academic alternative.

Based on the outlined theoretical assumptions, we assume that class-based differences in university enrolment are explained completely by the primary and secondary effects of social stratification. Due to the high degree of stratification, university enrolment is likely to be strongly associated with prior academic performance in compulsory education and the type of school attended. Therefore, part of the direct effect of social origin on university enrolment is mediated by the primary effect of social stratification (*hypothesis 1*). However, given the importance of the decision to pursue vocational training or an educational path leading to tertiary education in the context of the relatively low permeability of the Swiss education system and its significant influence on one's future educational career, it is likely that secondary effects will have an important indirect effect on the outcome, mediating part of the direct effect of social background on university enrolment (*hypothesis 2*). This is because students from lower social classes perceive the net utility of VET to be higher than students from higher social classes do, while the latter perceive the net utility of tertiary education to be higher than their peers from lower social classes.

4 Data, Operationalisation, and Analytical Strategy

4.1 Data and Sample

Our analysis is based on data from the DAB Panel Study ("Determinanten der Ausbildungswahl und der Berufsbildungschancen"; DAB, 2024), a school-leaver survey.

The sample covers students in German-speaking Switzerland who were born around 1997/98 and left compulsory education in summer 2013 (see: Becker et al., 2020). The stratified random sample contains information on the educational pathways of these students from compulsory school to tertiary education until 2023, when the respondents were approximately 26 years old. The analysis sample is restricted to respondents who participated in the eleventh wave of the DAB Panel Study, collected in May/June 2023 ($N = 1818$). Missing information on independent variables was imputed through chained equations (White et al., 2011). Based on the procedure proposed by von Hippel (2018), we set the number of imputed datasets to 25 for the analyses. Descriptive statistics for the variables used in our analysis are provided in the Appendix (see Table 3).

4.2 Variables

Our main *dependent variable* is university enrolment. As the average age of the sample is 25.2 and many respondents have not yet completed their studies, we have chosen not to use university degree as a dependent variable. We distinguish between respondents who have ever enrolled at a university ($= 1$) and those who have not ($= 0$). To describe the path dependency of educational trajectories in the Swiss education system, we distinguish between enrolment at a university, a UAS/UTE, a HF/HFP or whether any tertiary education episode is recoded. Additionally, we use information on educational attainment at upper-secondary level, differentiating between those who have attained a baccalaureate at a gymnasium, an FVB or basic VET, and those who have attained any degree.

Our main *independent variable*, social origin, is measured using information provided by the respondents. Socio-economic status is measured using the International Socio-Economic Index of Occupational Status (ISEI), developed by Ganzeboom et al. (1992), which is based on the ISCO08 coding of parental occupations. We consider the highest ISEI of the parents and categorise individuals according to whether they belong to the lowest ($ISEI \leq 36.92$), middle ($37.22 \leq ISEI \leq 68.7$), or highest ($68.77 \leq ISEI \leq 88.96$) ISEI tertile. Additionally, we consider the highest level of education attained by the parents, as defined by the International Standard Classification of Education (ISCED 2011, UIS, 2012). We categorise parents having attained a tertiary level degree ($= 1$) or not ($= 0$). The former includes degrees from universities, universities of applied sciences, and universities of teacher education; professional examinations (Federal and Advanced Federal Diploma of Higher Education Examinations) and degrees from higher technical colleges (ISCED levels 6–8). Respondents whose parents have attained at most an ISCED level 5 qualification (ISCED levels 1–5) are coded as zero.

To consider students' prior achievement and educational attainment at the lower-secondary level, we use information on grade point averages in languages and

mathematics as well as the track attained in grade 8. Grades range from 1 to 6, with 6 being the highest in Switzerland. Grades are utilised in standardised form in the analysis. Standardisation is based on the type of school that has been attended. With regard to school types, we distinguish between those who have attended a school with basic requirements, those who have attended a school type with extended requirements, and those who attended a pre-gymnasium in the middle of the 8th grade. Considering school grades as an operationalisation of the *primary effect of stratification* is only feasible to a limited extent. This is due to significant differences in learning environments between school types and the social selectivity of the tracking process, which is likely already influenced by secondary effects of social stratification. The data contains information on school grades reported by teachers but does not include standardised performance measures.

The DAB Panel Study has repeatedly measured respondents' expectations and values regarding social origin-related educational decisions (*secondary effect of social origin*).⁵ We used the expectations measured in the second wave at the beginning of grade 9. The questionnaire surveyed the single parameters that are used to operationalise the alternative specific components of EM and IR as well as the net utility. In the analysis, the subjective perceptions of these two educational alternatives are considered: VET and tertiary education (University, UAS, UTE).⁶ Educational motivation (EM) consists of the material benefits of the educational alternatives and is measured in relation to income prospects (*b1*: "How do you assess the probability of getting a well-paid occupation based on the following degrees?") and the unemployment risk (*b2*: "How do you assess the probability of becoming unemployed based on the following degrees"). The importance of status maintenance (*SM*) was measured using a question suggested by Stocké (2007): "Thinking about what your family can afford (vacation, apartment, free time, clothes, car, computer, etc.), how important is it to you that you will in no way be worse off later on in life?" The response scale ranges from 1 for "very unimportant" to 5 for "very important". The expected likelihood (*c*) of maintaining the social status by pursuing a specific educational alternative as follows: "How helpful are the following degrees in order to be in no way worse off than your family is now". The response scale ranges from 1 for "not helpful at all" to 5 for "very helpful".

The investment risk (IR) is formed using the expected probability of success (*p*). Respondents were asked: "How likely is it, in your opinion, that you will successfully complete the following degrees?" The range of values runs from 1 for "very unlikely" to 5 for "very likely". The expected cost (*C*) of educational alternatives

5 Codebooks of the DAB Panel Study are available from the data repository SWISSUbase (see DAB, 2024).

6 Respondents were asked questions about the SEU parameters separately for each of the following options: vocational training (VET), vocational training with a vocational baccalaureate (FVB), baccalaureate at a Gymnasium (BAC), and tertiary education (university, UAS, UTE).

is indicated by effort, time and expense (“Educational degrees vary in their costs (e.g. commuting, relocation/move, school costs, learning effort etc.). All in all, how costly would it be for you to complete the following degrees?”).

Respondents were asked to rate the expected benefits and costs of each educational alternative on a scale from 1 to 5, where 1 indicates low benefits/costs and 5 indicates high benefits/costs.⁷ To overcome the ordinal scale level, the initial ordinal values of c and p were converted into probabilities, ranging from “.1” to “.9” (Becker & Glauser, 2018, p. 18; for critics, see Kahneman 2011, p. 383).⁸ EM and IR were generated and standardised according to equation 1 using the components described above. Imputation is based on the standardised values of EM and IR. The net utility of the two alternatives is equal to the difference between EM and IR.

4.3 Analytical Strategy

Before presenting the multivariate results, we graphically illustrate the path dependency of educational attainment in the Swiss education system from lower secondary to tertiary education and present findings on the social stratification of educational attainment at these levels. Next, we graphically describe differences in the perceived educational motivation, the investment risk, and the net utility for VET and tertiary education by parental social background. Additionally, we highlight differences in these subjective perceptions and the net utility according to whether individuals have ever been enrolled at an academic university.

Our main focus is on the direct effect of social origin on university enrolment, and on the extent to which this effect is mediated by the indirect effects of prior achievement and attainment (primary effect of stratification) as well as by subjective expectations, operationalised as the net utility of VET and tertiary education (secondary effect of stratification). Following Breen et al. (2018), we predict rescaled logit coefficients of nested models using the reformulated KHB method, adapted from the linear predictor method. In this approach, the binary dependent variable (university enrolment) is regressed on all X variables, including the mediator variables Z (in our case, prior achievement and the net utility derived from subjective expectations), using binary logistic regression. Based on this model, the latent index xb is saved and used as a new dependent variable using ordinary least squares (OLS), while covariates and mediators are included stepwise to estimate the extent of mediation.

In a first step, a regression model is estimated that only contains the social origin variables (ISEI, ISCED) as the key variables (reduced model). In a second

7 The items measuring the unemployment risk for the education alternatives is used in reversed form in the analysis.

8 In case of c , the expected likelihood of maintaining the social status, this transformation imposes a cardinal structure on actors' subjective beliefs reflecting relative differences in perceived utilities, rather than subjective probabilities.

step, a model is estimated that also contains the mediator variables (full model). The idea behind the KHB decomposition is to estimate the difference in the regression weights of the key variables (here: social origin) between the reduced (*total effect*) and full (*direct effect*) model. The difference between the regression weights equals the *indirect effect* of social origin on the selected educational alternative, which is mediated by GPA and perceived net utility, while the regression weights of social origin in the full model equal the direct effect. Applying the KHB method calculates the proportion of the association between social origin and university enrolment that is mediated by the primary and secondary effects of stratification, informing their contribution to the educational outcome (indirect effect) net of social class (direct effect) (Breen et al., 2018; Kohler et al., 2011). In our analysis, we report the bootstrapped standard errors of the nested models and the indirect effects, and we provide information on the percentage mediated. As we are using imputed data, we adapted the supplementary Stata code proposed by Breen et al. (2018) following the routine suggested by Little and Rubin (2002, p. 87) to calculate the bootstrap standard errors.⁹ In our analyses, we use design and longitudinal weights to account for the sampling design as well as panel attrition.

5 Results

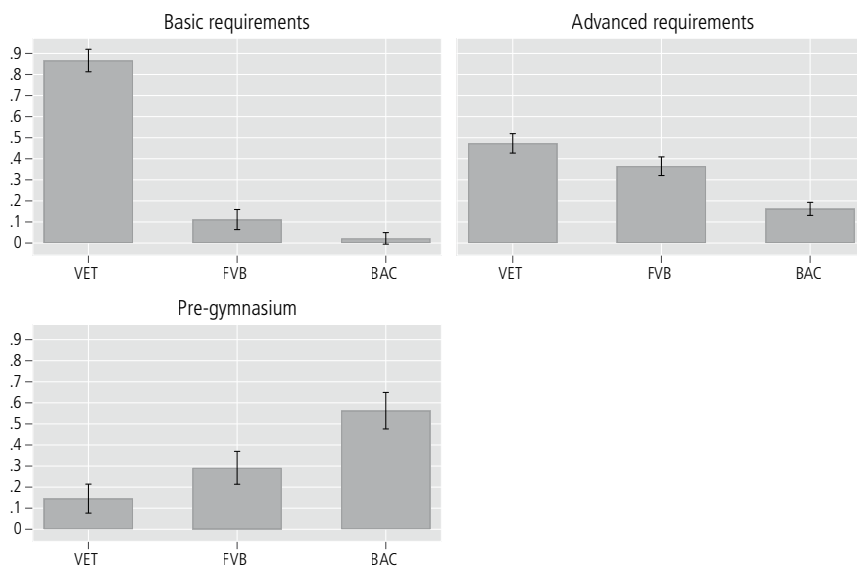
5.1 Path Dependency of Trajectories from Lower-Secondary Education to Tertiary Education

As can be seen from Figure 1 and Figure 2, the educational trajectories from lower-secondary to tertiary education are highly path dependent. Students who attend a school type with basic requirements usually attain a basic VET degree (87%). Only a small proportion of these students attain an FVB (11%) or a baccalaureate at a gymnasium (2%). This is in stark contrast to students who attended a pre-gymnasium in Grade 8. Only 15 percent of these students attain a VET degree, while around 30 percent attain an FVB and 56 percent attain a baccalaureate. Students in the school type with advanced requirements lie somewhere in between. They are more likely to attain a baccalaureate than a basic VET degree, while their likelihood of attaining an FVB differs only marginally from that of students who attended a pre-gymnasium.

The pattern of path dependency in educational trajectories becomes apparent when transitions to tertiary education following the completion of upper-secondary education are considered (see Figure 2). As the path from VET to universities is

⁹ We would like to take this opportunity to thank Ben Jann for his support in implementing the Stata routine proposed by Breen et al. (2018) for applying the reformulated KHB method with imputed data.

Figure 1 Educational Pathways from Lower-Secondary to Upper-Secondary Education



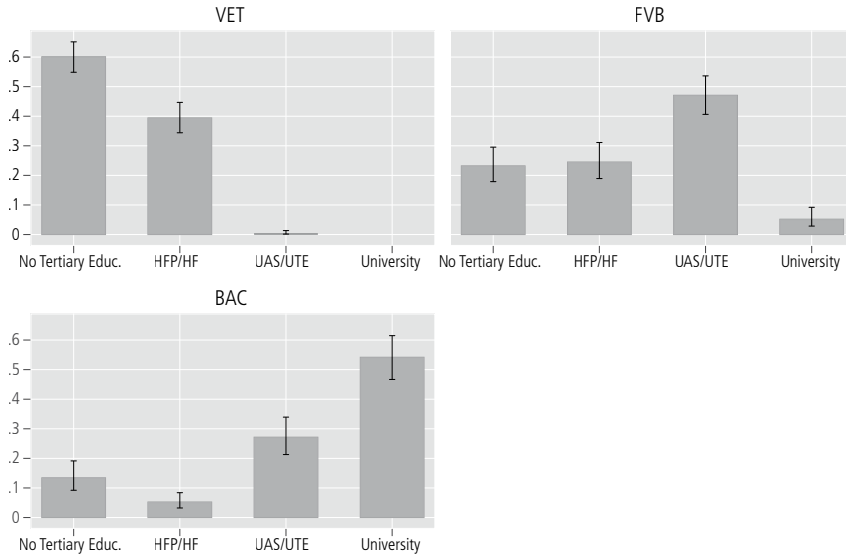
Note: Proportions based on 25 imputed data sets using survey weights. VET = Federal VET Diploma; FVB = Federal Vocational Baccalaureate; BAC = Baccalaureate School. Data: DAB-Panel Study, own calculations. Reading Example: About 87 percent of students from the school track with basic requirements have attained a Federal VET Diploma.

only possible upon completion of an FVB and the *Passerelle*, we observe no such trajectories for individuals who attained VET as their highest level of education. However, a small number of individuals have enrolled at UAS/UTE, as this path is possible.¹⁰ The most common path for holders of a Federal VET diploma is to not progress to tertiary level (60%), while around 40 percent have enrolled in short tertiary level programmes (HFP, HF).¹¹ The educational trajectories of individuals who have completed the FVB differ considerably. While more than five percent of this group have enrolled at a university, which is consistent with official statistics, 47 percent have enrolled at a UAS/UTE. This is the most frequently chosen pathway in this group, while around a quarter have enrolled in short tertiary programmes

10 This path usually requires the completion of VET and several years of professional experience. Often, the successful completion of an additional or entrance examination is required.

11 As the respondents are at the age of 25, we may underestimate the proportion of persons enrolled at vocational professional education and training (VPET) due to right-censoring of the observed data.

Figure 2 Educational Pathways from Upper-Secondary Education to Tertiary Education



Note: Proportions based on 25 imputed data sets using survey weights. VET = Federal VET Diploma; FVB = Federal Vocational Baccalaureate; BAC = Baccalaureate School. No tertiary educ. = no episode in tertiary education observed; HFP/HF = Höhere Fachprüfung, Höhere Fachschule (leading to an Advanced Federal Diploma of Higher Education); UAS/UTE = Universities of applied sciences, Universities of teacher education; University = academic universities. Data: DAB-Panel Study, own calculations. Reading Example: For about 60 percent of the students, who have attained a Federal VET Diploma, any episode at the tertiary level is observed.

(HFP, HF) or have not progressed to tertiary level. Finally, the results for students who attained a baccalaureate at a gymnasium indicate that 54 percent have enrolled at a university and 27 percent at a UAS/UTE. This results in a proportion of 81 percent of these students enrolling at a university, UAS or UTE. Short tertiary programmes (5%) are less common, while only 13 percent remain without a tertiary level episode until the age of 25.

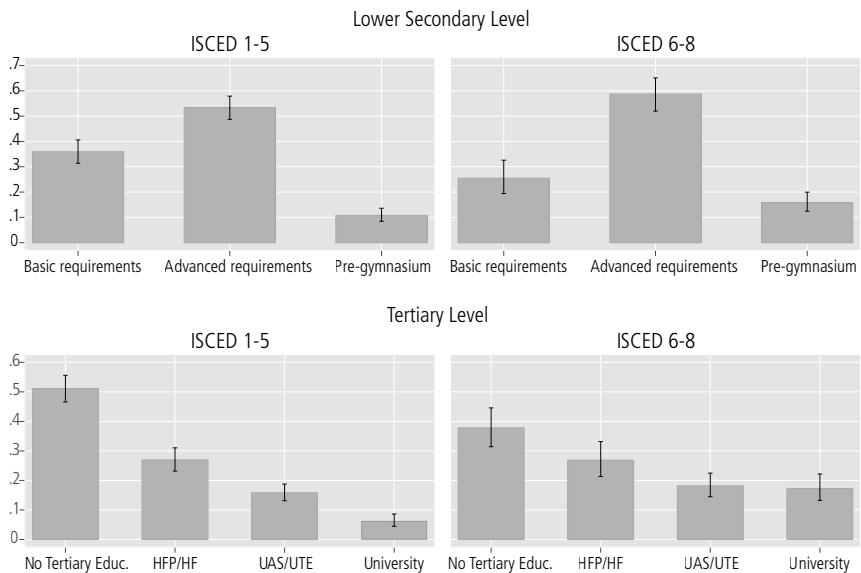
The results are consistent with previous findings and emphasise that subsequent educational pathways are determined by the institutional context. Educational decisions made at a young age, channel the further educational career, determining whether tertiary education is pursued and, if so, whether access to universities, universities of applied sciences or teacher training colleges is possible.

5.2 Social Stratification at Lower-Secondary and Tertiary Level

In Switzerland, low-SES students are overrepresented in cognitively less demanding lower-secondary level tracks but underrepresented in academic tracks leading to tertiary education, compared to students from more privileged social backgrounds (Becker & Glauser, 2018; Becker & Schoch, 2018; Glauser & Becker, 2023; Gomen-soro & Bolzman, 2019; Hunkler, 2014; Hupka-Brunner & Kriesi, 2013; Leemann & Makarova, 2023). However, our findings (see Figure 3) suggest that, at the low-er-secondary level, there are minor differences in terms of school type attended and parental education. Students whose parents belong to the highest ISEI tertile are underrepresented in the school type with basic requirements, but overrepresented in pre-gymnasium, compared to their peers from the lowest ISEI tertile.

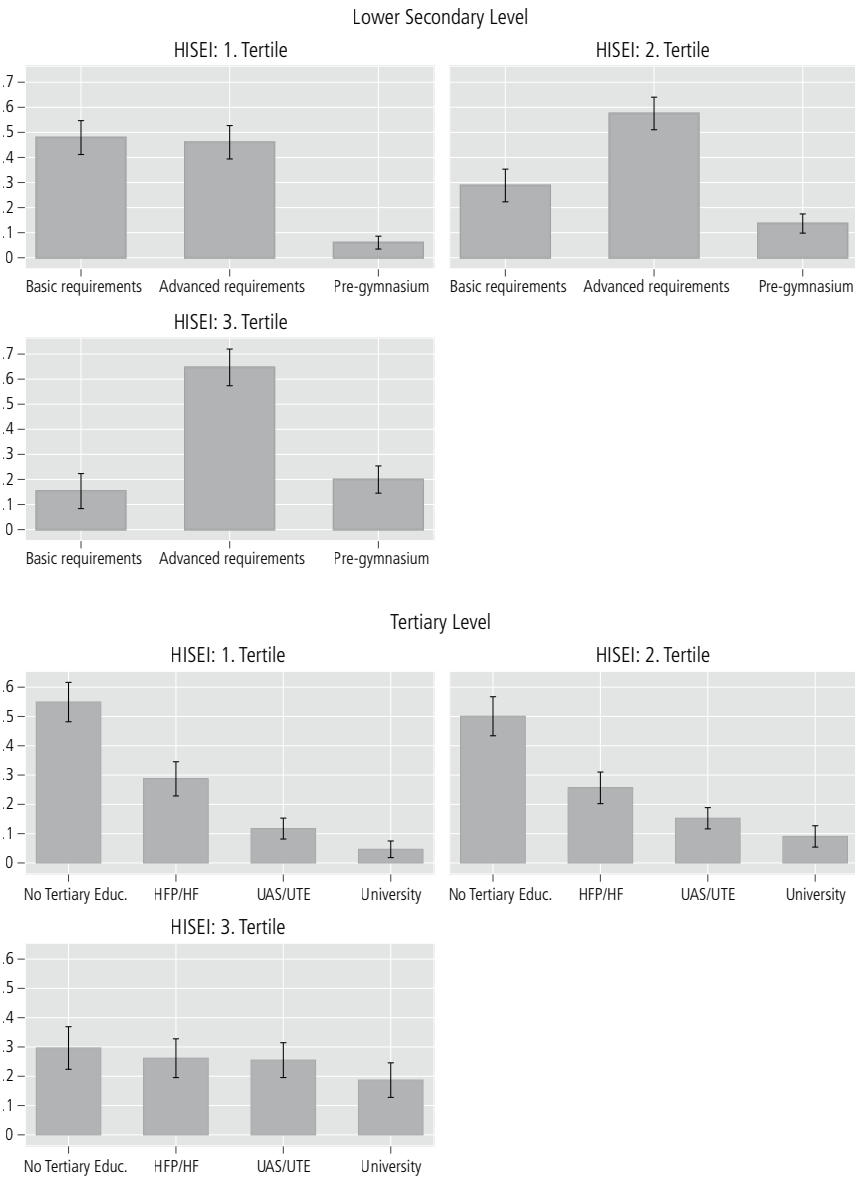
Regarding enrolment at the tertiary level, we observe a comparatively high proportion of students enrolled at a university whose parents belong to the highest ISEI tertile (see Figure 4). These students also account for the highest proportion of those attending a UAS/UTE. There are no differences between students from different

Figure 3 Social Stratification at Lower Secondary and Tertiary Level by Parental ISCED Level



Note: Proportions based on 25 imputed data sets using survey weights. Data: DAB-Panel Study, own calculations.

Figure 4 Social Stratification at Lower Secondary and Tertiary Level by Parental ISEI



Note: Proportions based on 25 imputed data sets using survey weights. Data: DAB-Panel Study, own calculations.

ISEI tertiles and attending a short tertiary programme (HFP, HF). Finally, students from socio-economic privileged backgrounds are the least likely to remain without a tertiary education episode. This pattern is substantiated by the findings regarding parental education. We observe the highest proportion of university enrolment and the lowest proportion of individuals remaining without a tertiary education qualification among those whose parents have obtained a tertiary degree. There are no differences in enrolment at UAS/UTE or HFP/HF based on parental education.

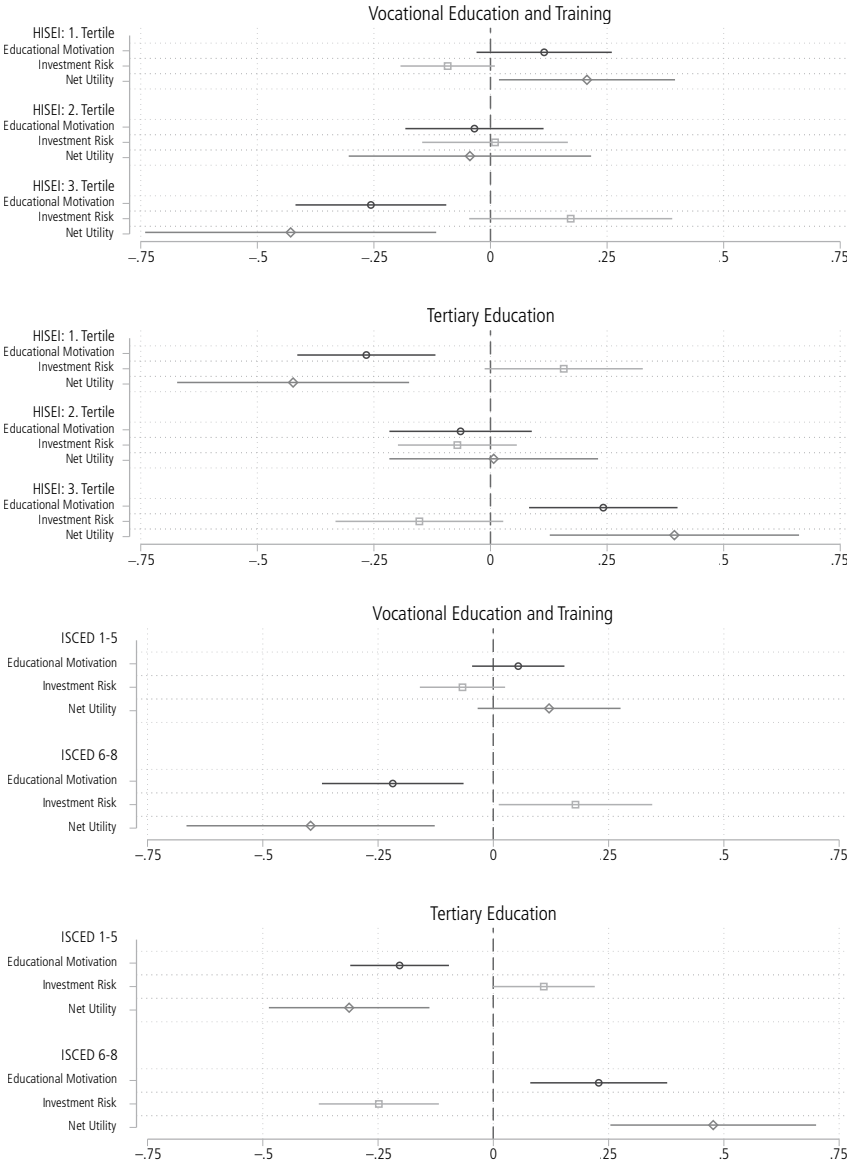
5.3 Differences in Subjective Perceptions by Social Origin and Enrolment Status

In line with our theoretical assumptions, our findings underscore differences in subjective perceptions by social origin. At the end of compulsory school, students from socio-economically less privileged families weight the educational motivation (EM) for tertiary education lower than children from socially more privileged parents, while their perceived investment risk of tertiary education is highest (see Figure 5). In consequence, the subjectively perceived net utility for tertiary education is considerably lower for children whose parents belong to the lowest ISEI tertile. For the socially more privileged students, not only is their EM higher for tertiary education, but they also give less weight to the IR, which is negative on the standardized scale. Overall, this results in a comparatively high perceived net utility for tertiary education, which applies to the children of parents in both the middle and highest ISEI-tertiles.

The observed patterns regarding the two components, EM and IR, as well as the perceived net utility are reversed regarding VET. Students from the lowest ISEI-tertile are the only group for whom the net utility is positive, whereas for students whose parents are in the middle or highest ISEI-tertile, the perceived net utility is negative. The same applies to parental education. Children from parents who have attained a tertiary degree place a higher value on EM for tertiary education than those from parents who have not attained a tertiary degree. The opposite is observed regarding the IR, which is perceived as lower among students whose parents have attained a tertiary degree.

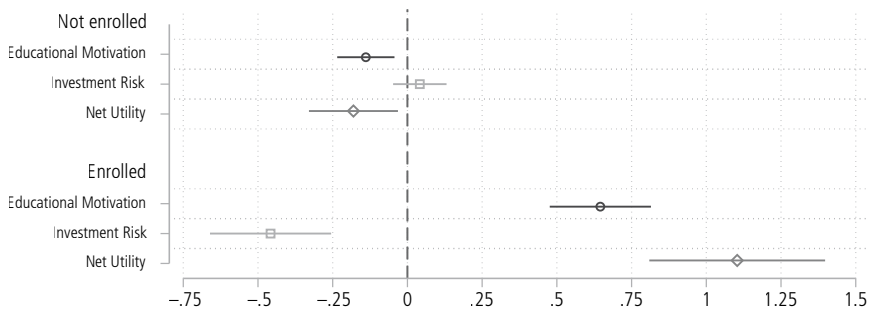
Differences in the two components, EM and IR, and in net utility for tertiary education are also evident when subjective perceptions are examined according to whether individuals were ever enrolled at a university (see Figure 6). Those who were enrolled at a university show a higher EM and lower IR towards the end of compulsory education, resulting in an overall positive and high perceived net utility of tertiary education. In contrast, those who have not enrolled at university show negative net utility for tertiary education, as they comparatively weigh the EM lower and the IR higher.

Figure 5 Subjective Perceptions of Educational Motivation, Investment Risk, and Net Utility for VET and Tertiary Education by Parental ISEI and ISCED Level



Note: Estimates (mean of standardised scores) based on 25 imputed data sets using survey weights. Data: DAB-Panel Study, own calculations.

Figure 6 Subjective Perceptions of Educational Motivation, Investment Risk, and Net Utility for Tertiary Education by University Enrolment Status



Note: Estimates (mean of standardised scores) based on 25 imputed data sets using survey weights. Data: DAB-Panel Study, own calculations.

5.4 Explaining Social Differentials in University Enrolment

Around ten percent of respondents in the DAB-sample have enrolled at a university. The multivariate results concerning the direct effects of social origin and university enrolment, as well as the indirect effects of primary and secondary effects of social stratification, are provided in Table 1. In the first model (M1) we only control for the social origin of the respondents. Positive coefficients indicate a higher propensity to be enrolled at a university for students whose parents belong to the highest ISEI tertile compared to the reference group (students from the lowest ISEI tertile). The positive coefficient for students from the middle ISEI tertile is not statistically significant. We also observe a positive direct effect regarding parental education. Students whose parents have a tertiary degree qualification (ISCED 6–8) are more likely to be enrolled at a university than those in the reference group (ISCED 1–5).

In line with hypothesis 1, part of the direct effect of social origin on university enrolment is mediated by the primary effect of social stratification. This finding indicates that the pathway to university in the Swiss education system is explained by the indirect effects of prior achievement and the school type attended in Grade 8 (see M2). Attending a pre-gymnasium and achieving better grades in language and mathematics are associated with a higher propensity to enrol at a university, although only part of the direct effect of social origin is explained by the primary effects of social stratification.

In Model 3, we control for net utility for VET and tertiary education respectively, which is measured as the difference between the subjectively perceived EM and IR. As expected, the indirect effects show that the probability of university enrolment is lower the higher the perceived net utility of VET is, and higher the higher the perceived

Table 1 Determinants of University Enrolment

	M1	M2	M3
Social origin			
Parental HISEI (Ref = Lowest tertile)			
2nd tertile	0.427 (.344)	0.242 (.257)	0.168 (.247)
3rd tertile	1.133 ** (.392)	0.631 * (.281)	0.500 (.261)
Parental education (Ref = ISCED 1–5)			
ISCED 6–8	0.852 ** (.274)	0.737 ** (.260)	0.423 (.219)
Prior Attainment & Achievement			
Attended school type Grade 8 (Ref = adv. requirements)			
Basic requirements		−0.896 (.623)	−0.605 (.590)
Pre-gymnasium		1.723 *** (.300)	1.226 *** (.278)
GPA German (z-stand.)		0.452 *** (.117)	0.399 ** (.117)
GPA mathematics (z-stand.)		0.377 ** (.117)	0.326 ** (.115)
Subjective expectations			
Net utility VET = (EM _{VET} − IR _{VET})			−0.243 *** (.057)
Net utility tertiary education = (EM _{TE} − IR _{TE})			0.390 *** (.101)
Constant	−3.777 (.526)	−3.226 (.359)	−3.094 (.345)
Number of observations	1818	1818	1818

Note: Logit coefficients measured on the scale of the full model. Bootstrapped standard errors (250 replications) in parentheses. Estimations based on 25 imputed data sets using survey weights. Significance levels: *p < 0.05, **p < 0.01, ***p < 0.001. Controls: Gender. Data: DAB-Panel Study, own calculations.

Table 2
Selected Indirect Effects and Percent Mediated of Social Origin on University Enrolment

	HISEI		ISCED
	2nd tertile	3rd tertile	ICSED 6–8
Indirect Effects			
M1 → M2	–	–0.502 (0.241)	–0.115 (0.103)
M1 → M3	–	–0.633 (0.257)	–0.429 (0.127)
M2 → M3	–	–0.131 (0.088)	–0.314 (0.091)
Percent mediated			
M1 → M2	–	44.33%	13.49%
M1 → M3	–	55.89%	50.37%

Note: Logit coefficients, percent mediated, and bootstrapped standard errors are in parentheses (250 replications). Estimations based on 25 imputed data sets using survey weights. Based on coefficients reported in Table 1, reference category for parental HISEI is lowest tertile and for ISCED is ISCED 1–5. Data: DAB-Panel Study, own calculations.

net utility of tertiary education is. Of particular significance is the finding that, when controlling for subjective expectations and in line with hypothesis 2, all coefficients of the direct effects of social origin on the outcome of interest are insignificant.

Table 2 illustrates the extent to which the direct effects of social origin are mediated by the indirect effects of the primary and secondary effects of stratification. As only the direct effect of the third ISEI tertile differed significantly from that of the reference group (the lowest ISEI tertile), we only report the indirect effects and the percent mediated for the highest ISEI tertile. When accounting for the primary effect of stratification, the direct effect between M1 and M2 decreases by –0.502, with 44 percent of the direct effect of ISEI being mediated. Once the secondary effects of stratification are accounted for, the direct effect of respondents in the highest ISEI tertile decreases further, by –0.131. This decline is comparatively small with an additional 11.5 percent of the direct effect being explained; however, the indirect effect between M2 and M3 is not statistically significant.

By contrast, we observe an inverse pattern regarding the direct effect of parental education on university enrolment. Our results suggest a minor reduction in the direct effect between M1 and M2 of –.115, equivalent to 13.5 percent being mediated by the primary effect of stratification. The magnitude of the indirect effect of subjective perceptions between M2 and M3 is greater (–0.314). While around 50 percent of the direct effect of parental education is mediated by the primary and secondary effects of stratification, 37 percent is explained by the SEU parameters considered

in Model 3. This is substantiated by the fact that the indirect effect between M2 and M3 is statistically significant, whereas that for the highest ISEI tertile is not.

6 Conclusion

This article aimed to highlight the path dependency of access to university education and explain the associated IEO in the Swiss education system. Drawing on SEU theory, we examined the extent to which subjective expectations measured in compulsory education can explain social stratification in academic university enrolment, net of prior achievement and the school track attended. Social inequalities in university enrolment have long-lasting consequences for individuals because access largely depends on previous educational decisions and trajectories. Opting for vocational training at 15 opens up opportunities at the tertiary level, but simultaneously closes off access to universities, as this path is rarely chosen. The path dependency of educational pathways, particularly regarding university enrolment, is empirically substantiated by longitudinal data on the trajectories of students from the 2013 school-leaver cohort in German-speaking Switzerland.

In our analysis, we consider key arguments derived from social position and SEU theory. Our findings emphasise that the subjective perception of educational motivation (EM), investment risk (IR), and net utility regarding vocational education and training (VET) and tertiary education are socially stratified in Grade 9. In line with our theoretical reasoning, children from the socio-economically disadvantaged families, or whose parents have not attained a tertiary degree, value the EM for tertiary education the least and the IR the most. This results in a comparatively low perceived net utility of attaining a tertiary degree whereas the opposite is true for VET. The exact opposite pattern is evident among children from socio-economically advantaged families. They assign the highest weight to EM and the lowest weight to IR for tertiary education, which ultimately leads to a high perceived net benefit of tertiary education, while the VET route is perceived as less attractive.

In the multivariate analysis, we estimate the extent to which the direct effect of social origin on university enrolment is mediated by the primary and secondary effects of social stratification. To this, we apply the reformulated KHB decomposition method. Our results reveal the following. Firstly, the primary effects of social stratification do indeed mediate part of the direct effect of social origin on the outcome of interest. Secondly, the observed direct effect of social origin is statistically mediated by the subjectively perceived net utility of VET and tertiary education, operationalised as the difference between the perceived educational motivation and investment risk for these alternatives. The indirect effects show that perceptions of the net utility of VET versus tertiary education have clear behavioural consequences. The higher the perceived net utility of VET – as indicated by a higher educational motivation and a lower perceived investment risk – the lower the likelihood of university enrolment.

Conversely, a higher perceived net utility of tertiary education increases the likelihood of university enrolment. In line with the theoretical reasoning, the results emphasise that the observed IEO at the tertiary level is associated with class-related differentials in the subjective perceptions of the costs and benefits of educational alternatives.

Thirdly, the primary and secondary effects of stratification together explain around 50 percent of the direct effect of social origin. However, subjective perceptions contribute more toward explaining the direct effect of parental education than the socio-economic status of the family. Our findings emphasise the validity of Boudon's (1974) theoretical distinction, as well as the explanatory power of primary and secondary effects of social stratification for IEO and life course research. While Boudon simulated the influence of primary and secondary origin effects up to the tertiary level, our findings provide empirical evidence relating to the Swiss education system, thereby contributing to theory and model-building.

To the best of our knowledge, this is the first contribution to use subjective expectations measured in Grade 9 to explain social inequalities in university enrolment ten years later. While existing research focuses on specific trajectories, our findings reveal the lasting consequences of subjective expectations and educational decision-making at an early age in a highly stratified education system, where permeability between the various tertiary education institutions is low. Children from less privileged social backgrounds are diverted from pathways leading to universities early on, although our analysis of educational path dependencies reveals that 40 percent of students with an FVB enrol at a UAS/UTE, while 20 percent attain a certificate via an HFP/HF. Nevertheless, the Swiss education system amplifies path dependence, shaping class-differentials in the perceived utility of educational alternatives and maintaining IEO at different educational levels (Kriesi & Leeman, 2020).

There are limitations to the data used for the analysis. Regarding the impact of the primary effects of social stratification, the data includes information on grades in German and mathematics as reported by teachers but lacks standardised achievement tests. In addition, the school type attended at the lower-secondary level is likely to be influenced by secondary effects of stratification, making it impossible to accurately determine the magnitude of primary and secondary effects of social stratification. With the data at hand, we cannot determine the extent to which the secondary effect of stratification is shaped by factors not directly attributable to the parents, such as school environments, institutional signalling, or peers (Becker, 2022; Stocké, 2013). Therefore, while our findings demonstrate statistical mediation of the direct effect of social origin on university enrolment by the primary and secondary effects of stratification, we do not make any causal claims. As the analysis sample was restricted to students who took part in the eleventh wave of the DAB Panel Study, we may under- or overestimate the direct effect of social origin, as well as the magnitude of primary and secondary effects of stratification, due to right censoring of the data.

Although our findings show that educational pathways in the Swiss education system are only permeable to a limited extent, further analyses should focus on which

individuals adapt their educational expectations and on how transition rates to tertiary education can be increased, particularly for VET degree holders (Neugebauer & Schindler, 2012; Reimer & Thomsen, 2019; Roth, 2017; Schindler & Bittmann, 2021; Watermann et al., 2014). This applies not only to possible nudging during upper-secondary education, but also to an in-depth examination of the process of career orientation and educational expectations (Barone et al., 2019; Van den Broeck et al., 2022). This is particularly relevant in the Swiss context for individuals who are not eligible for gymnasium due to admission requirements, as they must decide on a career path by the age of fourteen. Considering lifelong learning, and against the backdrop of occupational changes and increasing digitisation affecting labour market prospects and return to education in manifold ways, an in-depth examination of education and career planning is needed. Mixed-methods studies would be valuable in capturing how students understand the constraints and opportunities of the Swiss education system, how families influence these perceptions and how institutional actors (e.g. teachers and counsellors) shape expectations through guidance and signalling.

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Appendix

Table A1 Descriptives

Sample (N = 1818)		
	Prop./Mean	95%CI
University enrolment = Yes	.098	.071; .126
Social origin		
HISEI		
1st tertile	.367	.317; .417
2nd tertile	.383	.340; .426
3rd tertile	.251	.210; .291
Highest Parental Education		
HISCED 1–5	.673	.633; .712
HISCED 5–8	.327	.288; .367
Prior Achievement and attainment		
School type Grade 8		
Basic requirements	.325	.249; .400
Advanced requirements	.551	.471; .632

Continuation of Table A1 on the next page.

Continuation of Table A1.

	Prop./Mean	95 % CI
Pre-gymnasium	.124	.068; .181
Mathematics (z-stand.)	-.063	-.166; .040
Language (z-stand.)	-.066	-.162; .029
SEU parameter		
Net utility VET		
× 1st tertile	.207	.018; .396
EM / IR × 1st tertile	.115 / -.092	-.030; .260 / -.193; .009
× 2nd tertile	-.044	-.304; .216
EM / IR × 2nd tertile	-.034 / .010	-.183; .114 / -.146; .166
× 3rd tertile	-.428	-.741; -.116
EM / IR × 3rd tertile	-.256 / .172	-.418; -.095 / -.046; .390
× HISCED 1–5	.121	-.034; .276
EM / IR × HISCED 1–5	.054 / -.067	-.046; .154 / -.159; .026
× HISCED 5–8	-.396	-.665; -.127
EM / IR × HISCED 5–8	-.218 / .178	-.372; -.065 / .012; .345
Net utility Higher Education		
× 1st tertile	-.423	-.672; -.174
EM / IR × 1st tertile	-.266 / .157	-.414; -.118 / -.013; .327
× 2nd tertile	.007	-.217; .231
EM / IR × 2nd tertile	-.064 / -.071	-.217; .089 / -.198; .056
× 3rd tertile	.394	.127; .662
EM / IR × 3rd tertile	.242 / -.152	.083; .401 / -.332; .027
× HISCED 1–5	-.313	-.487; -.139
EM / IR × HISCED 1–5	-.203 / .109	-.310; -.096 / -.001; .220
× HISCED 5–8	.477	.254; .700
EM / IR × HISCED 5–8	.229 / -.248	.080; .377 / -.378; -.118
Gender		
Women	.494	.453; .534
Men	.506	.466; .547