Rolf Becker*

# Social classes, school performance, subjective expected utilities, and educational decisions

## A rigorous application of a Rational Choice Theory for explaining educational differentials in German-speaking parts of Switzerland**, ***

**Abstract:** There have been several suggestions on how Rational Choice Theories (RCT) for educational decisions could be tested directly. In this empirical analysis, it is argued that these testing strategies have shortcomings, and therefore a different testing strategy is suggested. An innovative specification of a broad version of an RCT for educational decisions is applied, directly taking the utility-maximising behaviour of the actors into account. By using this improved testing strategy, it is demonstrated for young people residing in German-speaking Switzerland that rational decisions play an important role in educational decisions. They calculate the subjective expected benefit of every educational option at the end of compulsory school that, in their view, is relevant to the continuation of their school and vocational training. Panel data show that they ordinally rank the educational options considered according to their benefit and that they choose the option that promises the greatest benefit. For young people in different school branches, it can be seen that the purposive-rational evaluation of the educational options considered and the selection of the educational option with the highest subjectively expected

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utility are essential mechanisms of educational decision-making characterised by procedural rationality.

**Keywords:** Educational Decisions; Inequality of Educational Opportunity; Rational Choice Theories; Social Class; Social Mechanisms; Subjective Expected Utility

# Soziale Klassen, schulische Leistungen, subjektive Werterwartungen und Bildungsentscheidung

## Eine strenge Anwendung einer Rational-Choice-Theorie für die Erklärung von Bildungsungleichheiten in der Deutschschweiz

**Zusammenfassung:** Es gibt mehrere Vorschläge, wie die Rational-Choice-Theorie für Bildungsentscheidungen direkt getestet werden könnte. In dieser empirischen Analyse wird argumentiert, dass diese Teststrategien Mängel aufwiesen und daher eine andere Teststrategie nahelegen. Dabei kommt eine innovative Spezifikation einer breiten Fassung einer Rational-Choice-Theorie für Bildungsentscheidungen zum Einsatz, die unmittelbar das nutzenmaximierende Verhalten der Akteure berücksichtigt. Durch den Einsatz dieser verbesserten Teststrategie wird für Jugendliche mit Wohnsitz in der Deutschschweiz gezeigt, dass rationale Entscheidungen bei Bildungsentscheidungen eine wichtige Rolle spielen. Sie berechnen den subjektiven erwarteten Nutzen jeder Bildungsoption am Ende der Pflichtschule, die aus ihrer Sicht für den Fortgang ihrer schulischen und beruflichen Ausbildung relevant ist. Es wird anhand von Paneldaten ersichtlich, dass sie die berücksichtigten Bildungsoptionen nach ihrem Nutzen ordinal einstufen und dass sie vornehmlich die Option wählen, die den höchsten Nutzen verspricht. Für Jugendliche in verschiedenen Schulzweigen zeigt sich, dass die zweckrationale Evaluation der jeweils ins Auge gefassten Bildungsoptionen und die Auswahl der Bildungsoption mit dem höchsten subjektiv erwarteten Nutzen ein wesentlicher, von prozeduraler Rationalität geprägter Mechanismus der Bildungsentscheidung ist.

**Stichworte:** Bildungsentscheidung; Ungleichheit der Bildungschancen; Rational-Choice-Theorie; soziale Klasse; soziale Mechanismen; subjektiv erwarteter Nutzen

## 1 Introduction

To explain class-related educational inequalities, different Rational Choice Theories (RCT) have been developed and extended over the past 25 years (e.g. Erikson and Jonsson 1996; Breen/Goldthorpe 1997; Esser 1999: 265–274; Hillmert/Jacob 2003; Breen/Yaish 2006; Tutić 2017). They refer back to the seminal work by Boudon (1974) on the inequality of educational opportunity (IEO). This empha-

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sises that educational differentials are based on *primary and secondary effects of social origin* as the "basic mechanisms of the IEO-generating process" (Boudon 1974: 32; Jackson et al. 2007). The primary effect comprises the impacts of class-specific cultural background, socialisation, and nurture on offsprings' school achievement and academic performance (Boudon 1974: 29). Class-specific educational decisions at the branching points in an educational system, net of achievement, are defined as a secondary effect of social stratification (Boudon 1974: 28). Thus, educational differentials emerge as an aggregated consequence of the interplay of the primary and secondary effects (Breen/Goldthorpe 1997: 299; Becker 2022: 368). Since the secondary effect is assumed to be dominant, class-specific educational decisions are prominent in empirical applications and tests of the RCT that provide systematic explanations of educational inequality (Boudon 1974: 29). This assumption is based on the fact that the class structure and the necessity of making educational decisions in a hierarchised educational system are fundamental causes of educational inequality (Skopek/Triventi/Buchholz 2019). Educational decisions are reconstructed as a rational choice of educational options in the choice set of an individual or of their parents. An educational option is selected based on its subjective expected utility (SEU) compared to the SEU of the alternative options. The *SEU* of an option is calculated by its subjectively expected costs *C* (such as participation costs, opportunity costs, and transaction costs) and benefits *B* (such as income, social approval, or access to a favourable class position), weighted by the probability of success *p*. The amount of these expectations for each educational option depends on the position of an individual's parental home in the class structure. For example, going to university appears more expensive for a family from a lower social class than for a socially privileged family. The reverse association with social class is assumed for the probability of success. Individuals *i* calculate the $SEU_{ji} = p_{ij} \cdot B_{ji} - C_{ij}$ for all the possible alternatives *j* in their choice set, rank them according to their SEU, and choose the alternative with the highest SEU in order to maximise the desired outcome, such as income or intergenerational class maintenance (Erikson/Jonsson 1996: 14–15). Since the SEU for university training is often significantly higher for individuals from upper social classes, they are more likely to decide on this option in contrast to working class children.

There have been several suggestions on how RCT could be tested directly. However, the numerous empirical applications of the main arguments of RCT on class-related educational decision-making at the branching points in the educational system (e.g. Jonsson 1999; Becker 2003; Breen/Yaish 2006; Stocké 2007; Gabay-Egozi et al. 2010; Schindler/Lörz 2012; Daniel/Watermann 2018; Fujihara 2023) suffer from an incomplete transformation of the theoretical arguments of the RCT into the statistical model. To the best of our knowledge, there is not one empirical study that models an individual's rational choice in terms of the selection of educational

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options according to their SEU.[1] Instead, these empirical studies seek to indicate the impact of class-specific expectations of the costs and benefits of different educational options, as well as the expected probability of successfully attaining an educational degree, through regression models (e.g. Fujihara 2023: 8; Barone et al. 2018: 564; Becker/Hecken 2009: 27). A typical example is found again in a recent study by Fujihara (2023). For each of the four educational options considered in this study, the expected benefit, cost, and probability of success of each of these options is included as explaining variables instead of the four SEUs of these options. This makes it appear as though individuals would compare the probabilities of success, costs, and benefits of educational options rather than their SEU. In this case of additive regression of these three components of the SEU on an educational option, an individual has to make 108 pairwise comparisons. Otherwise, if the SEU of these four options is taken into account, the individual might make 12 comparisons maximally. In general, the usual method of statistical modelling is notoriously incomplete, since it does not meet *the logic of the rational choice of options* mentioned above – namely, the *maximisation of the SEU as the rule of selecting an educational option* (Erikson/Jonsson 1996: 14).

In this contribution, it is argued that these previous testing strategies have shortcomings. Therefore, an alternative testing strategy is suggested. By using this improved testing strategy, it is shown that rational decisions play an important role in educational decisions. An individual's choice of an educational option from among a range of others has to be analysed based on the consideration of their SEU rather than the components constituting the utilities of all options in the individual's choice set. Regarding the falsification of theoretical assumptions, the direct specification of this *procedural rationality* in empirical models – i.e. the choice of one option among others that promises the maximum or optimum desired consequences (Diekmann 2022: 102) or satisficing utility (Simon 1955) as a social mechanism – is the backbone of a *rigorous test* of RCT on educational decision-making (Brüderl 2004: 167; Sørensen 1998: 240). In order to overcome some limits of previous research, it is the aim of this empirical contribution to demonstrate a rigorously theory-driven translation of the explanation of educational differentials into a testable statistical model. The demonstration is focused on an individual's educational choice at the end of compulsory schooling in German-speaking cantons of Switzerland. In the remainder of the contribution, the next section will briefly

1 Another class of empirical study estimates the amount of secondary effect of social origin without any direct measure of an individual's choice set and the SEU for each educational alternative (e.g. Jackson et al. 2007; Maaz/Nagy 2009: 173; Kartsonaki et al. 2013: 50). Due to the identification problem regarding the choice of an educational option and the related behaviour (Manski 1995), these studies also do not contribute to a *direct* falsification of RCT (Kroneberg/Kalter 2012; Brüderl 2004). Apart from the fact that the secondary effect of origin is not measured directly but is assumed as a residual variable via the primary effect of origin, the orders of magnitude of the effects of origin do not provide a sociological explanation for the IEO.

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outline the theoretical background; the third section comprises the description of the data, variables, and statistical procedures; the fourth section will present the empirical findings; and the fifth section provides a discussion and a conclusion.

## 2 Theoretical background

Embeddedness in social class dominates the process of educational decision-making. Besides optimisation of *income* for daily living and class lifestyle (resulting in physical integrity), *intergenerational status maintenance* (resulting in social recognition) is seen as a major goal of families in terms of investing in their children's education and training (Erikson and Jonsson 1996: 15–16).[2] Families in privileged social classes, particularly the upper service class, pursue more ambitious educational and occupational aspirations compared to working class families. Families in privileged social classes are more likely to invest in their children's continued and higher education because they anticipate a higher risk of status demotion in cases where they might opt for educational alternatives with low permeability to higher education, and therefore with restricted access to higher class positions (Boudon 1974; Keller/Zavalloni 1964). Working class families are more likely to aspire to solid intermediate educational attainment, such as vocational education and training (VET), which is sufficient for status maintenance.[3]

### 2.1 The structure of the educational decision and its components

A formal model that accounts for the underlying mechanisms in the decision process in order to explain inequalities in educational outcomes by social origin has been suggested by Esser (1999: 266–274). These arguments are formalised in a comprehensive model, which has been successfully applied several times (e.g. Becker/Hecken 2009; Becker 2003). For our purposes, this model has been slightly modified in terms of its detail. There are two alternatives for individuals at the end of compulsory schooling: leaving the educational system $A_L$, or continuing

2 When *status maintenance* is one of the goals of education decisions, individuals seek to attain the educational degree that guarantees them at least the same class position their parents have already received. Status maintenance implies the motive of avoiding social demotion, as well as the opportunity for social advancement in the face of better educational opportunities in the course of educational expansion (Jæger 2007: 452; Jæger/Holm 2012: 223; Barone et al. 2021; Becker 2022: 367; Nennstiel/Becker 2023).

3 For the middle classes, the system of VET – as established in Germany or Switzerland, for example – is attractive for low-achieving children as it provides the opportunity to attain an advanced certificate, such as the "Fachabitur", or the FVB. These certificates are a "second chance" for them in terms of tertiary education since holders are at least eligible to study at a university of applied sciences. This could be a "hedging" strategy for middle class families with children who have a level of academic achievement that is inadequate for university training (Tutić 2017). Due to their uncertain educational success regarding enrolling in a *Gymnasium*, which provides the option of university training, they can attain an FVB certificate, which entitles them to study at a university of applied sciences.

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in education $A_E$. The more ambitious option of continuing in education will be chosen if its SEU exceeds the utility of the other option (Esser 1999: 269):

$$(1)\ SEU(A_L) < SEU(A_E)$$

In the case of ceasing education, one might expect a failure of status maintenance (SM) in the amount of *SM* weighted by a subjective expected probability of failing status maintenance $1–c_{SM}$, but zero benefits and costs (Esser 1999: 267):

$$(2)\ SEU(A_L) = (1–c_{SM})\ SM$$

The SEU of the other options – the more demanding, risky, and costly option of continuing in education $A_E$ at a higher level of the educational system – depends on the subjective expected probability of success $p_S$, the subjective expected benefit $B$ of this educational pathway, the amount of *SM* weighted by a subjective expected probability of status maintenance $c_{SM}$, and the cost $–C$ (Esser 1999: 269):

$$(3)\ SEU(A_E) = B + c_{SM}\,SM – C/p_S$$

As suggested by Esser (1999: 270), the term ($B + c_{SM}\ SM$) refers to an individual's *educational motivation*, while the term ($C/p_S$) is defined as *investment risk*. The higher the estimated material benefit $B$ and the higher the probability and amount of status maintenance $c_{SM}\ SM$ by continuing in education, the larger the educational motivation. A low status quo, which can also be maintained without continuing in education, reduces educational motivation, i.e. the net result is the return to education in terms of income. The higher the expected costs of continuing in education and the lower the expected probability of success, the higher the investment risk. If it is valid for each educational option that the investment risk exceeds the educational motivation, individuals might have serious problems making a substantial educational decision without any assistance from others, or they may have to choose the least bad option (e.g. finding an intermediate "bridging solution", or leaving the educational system without any certified training).

## 2.2 The procedure of educational decision-making and its test

In order to model the structure of the educational decision discussed above, the specification of the regression models have to consider the axioms of the theory of subjective utility suggested by von Neumann and Morgenstern (1944; see also Savage 1954). It has to be demonstrated empirically that an individual decides in favour of the educational option with the highest SEU, whereby the SEU represents the observable preferences (*representation theorem*) (Diekmann 2022: 103). For example, in the Swiss case, an individual at the end of compulsory schooling should decide to continue in an academic upper secondary school (USS) such as the *Gymnasium*, since the SEU of this option exceeds the SEU values for the other options in the choice set – VET with or without a federal vocational baccalaureate (FVB) (Becker/Glauser 2018; Glauser/Becker 2016; Glauser 2015). After calculating the educational motivation and investment risk for each perceived educational option,

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the value of SEU(.) is calculated by the difference of educational motivation EM(.) and investment risk IR(.) for each of the perceived educational alternatives, e.g. SEU(USS) = EM(USS)–IR(USS). According to the *axiom of order*, it is assumed that a person is always able to compare two results or alternatives, A and B, and to state whether he or she prefers A, prefers B, or is indifferent . The *axiom of completeness* states that this preference relation holds over every pair of alternatives. In the next step, the SEU values of each educational option are compared mutually, e.g. SEU(USS) – SEU(VET). The positive difference of these SEU values indicates that SEU(USS) is higher than SEU(VET) in the subjective view of the individual concerned. For a negative difference, it is true that SEU(USS) < SEU(VET).

After the pairwise comparisons, the options are ranked by their SEU value, from the highest to the lowest utilities. This is the *ordinal preference order*. According to the *independence axiom*, an individual's order of preference over two alternatives is independent of whether the individual judges them in isolation or in connection with other alternatives in a more complex choice situation. According to the *transitivity assumption*, it is postulated in relation to these individual preferences that an individual who prefers alternative A to alternative B, and who in turn prefers B to alternative C, must also prefer A to C (Diekmann 2022: 103). Due to procedural rationality driven by the interest in a maximum of utility, individuals choose, with a measurable "*chance*" *p(.)*, the educational option providing the highest SEU: SEU(USS) > SEU(FVB) → p(USS) > p(FVB) and SEU(USS) > SEU(VET) → p(USS) > p(VET). An uncertified training course (UTC) is chosen when the individual is indifferent and has no preferred option: SEU(USS) <> SEU(FVB) <> SEU(VET). In sum, and *consistently* in accordance with these axioms, the decision an individual prefers depends on which SEU is higher (Diekmann 2022: 103).

As already mentioned, it is expected that individuals from different social classes will make different decisions because they have different utility functions on educational options or different beliefs about the probabilities of different outcomes based on educational attainments. Because the educational motivation of privileged service class families is higher in regard to higher education and because their investment risk is lower compared to the other social classes, they are more likely to choose to continue in education and higher education (such as USS) in contrast to other perceived options because the SEU value is highest for USS. According to the *rule of transitive preferences*, they might provide the following *ranking of preferred options* according to the amount of their SEU: SEU(USS) > SEU(FVB) > SEU(VET) → p(USS) > p(FVB) > p(VET). In the case that the most ambitious option (USS) seems rather uncertain or not feasible in their subjective view (e.g. due to constraints such as unexpectedly low achievement or uncertain benefits), middle class people might choose the next preferred option according to the thesis of "hedging" (Tutić 2017). For the working class, however, it is assumed that: SEU(VET) > SEU(FVB) | SEU(USS). Therefore, the working class provide the following ranking of educational preferences and related likelihood of an educational

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decision: p(VET) > p(FVB) | p(USS). If these assumptions are true, the class-related educational disparities at a branching point in the educational system should be completely "explained" by the interplay of the primary and secondary effects of social inequality in terms of class structure. For individuals who have an unclear preference order and problems making a decision, different voluntary but UTCs are offered as part of a "bridging system" (Sacchi/Meyer 2016). These adolescents should be supported by these interim solutions to make an educational decision in favour of VET or USS. Within an institutionalised respite, they can make use of educational and preliminary vocational training courses.

## 3 Data, variables, and statistical procedure

### 3.1 Data base

The empirical analysis is based on longitudinal data from the *DAB Panel Study* of the determinants of educational choice and training opportunities (Becker et al. 2020).[4] This project started in 2012 and aims to collect *longitudinal data* about the class-related educational opportunities and occupational situations of adolescents and young adults in the German-speaking cantons of Switzerland. The project was initiated for investigating processes from educational aspirations formation to actual decision-making at the end of compulsory schooling in Switzerland. Another issue of interest is the theory-driven analysis of educational trajectories after compulsory schooling. A further aim is to describe and explain an individual's educational decisions at the transition from school to work using a multi-level longitudinal design.

The target population of DAB comprises 8th Graders of the 2011/12 school year (born around 1997) who were enrolled in regular classes in public schools within German-speaking Switzerland. The panel data are based on a random and 10% stratified gross sample of 296 school classes, out of a total universe of 3,045 classes (Glauser 2015: 125–129). A disproportional sampling of school classes from different school types, and a proportional the sampling of school classes regarding the share of migrants within schools, were applied. At school level, a simple random sample of school classes was used.

In this contribution, *longitudinal data* of the first four waves – spanning a time interval of almost 36 months – are used. To gather information about the time-related process of the development of expectations and utilities in regard to educational options, as well as about the decision-making process at the transition to upper secondary education after compulsory schooling, different survey time

4 Since an educational decision is a process in time, there is a need for *longitudinal data* on its components and mechanisms, and since an educational choice is the result of a time-related process, it is therefore necessary to measure the essential components of the educational decision-making rigorously across *time*. As a consequence, the process of decision-making is to be analysed in a *longitudinal design* (Stocké 2007).

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points have been considered. The survey time points were the middle of the 8th Grade (January–February 2012) and the beginning (September–October 2012) and end (May–June 2013) of the final year of compulsory education. Data on the actual transition were collected in a follow-up study approximately 15 months after pupils had left lower secondary education, in October or November 2014. While in the first three waves the students were surveyed within their classes using online questionnaires (administered by the Department of Sociology of Education at the University of Bern), the follow-up was conducted as an individual survey, using a combination of online questionnaires and computer-assisted telephone interviews (by a commercial polling agency, M.I.S Trend, in Lausanne). At the class level, between 199 and 215 of the 296 classes sampled (72.6–67.2%) and, at the individual level, approximately 3,700–3,300 students (response rates within waves: 90–96%) participated in the first three waves. Due to missing contact information, 2,550 out of 3,302 pupils who participated in Wave 3 were invited to participate, and 2,237 pupils (87.7%) participated in Wave 4. For the analysis, the sample was restricted to 1,743 students who had participated in Wave 4 and for whom complete information on their educational decision and transition to the upper secondary level was available (Becker/Glauser 2018).

## 3.2 Dependent and independent variables

The main dependent variable is the *transition from the lower to the upper secondary level in the education system* at the end of compulsory schooling (Wave 4). The following outcomes of the decisions of adolescents are distinguished: (1) VET; (2) VET combined with FVB; (3) a USS, such as a *Gymnasium* or other baccalaureate school; and (4) UTCs.

*Social origin* – measured in Wave 3 – is an essential reference point for educational decisions indicated by the class position of the parental household in which a target person lives (Stocké 2007: 507). For the definition of class position as an important independent variable, the well-established EGP class scheme is used (Erikson/Goldthorpe 1992). In congruence with the theoretical outline, three hierarchical categories of social class are distinguished: (1) the upper and lower service classes (I+II); (2) the middle class (IIIa/b–V); and (3) the working class (VI–VIIa/b). Because of its special position in relation to educational motivation, the upper service class is the reference category.

The target person's expectations and values in regard to class-related educational decisions (the secondary effect of social origin) are topics in Wave 2. The components of *EM* and *IR* are considered for each educational alternative in an individual's choice set. The *importance of status maintenance* – i.e. the expected value of avoiding intergenerational status demotion – is measured by a question suggested by Stocké (2007): "How important is it for you to have an occupation which provides similar approval as the occupations your parents (father or mother) have?"

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The answer range runs from 1 for "very unimportant" to 5 for "very important".[5] The *probability of status maintenance* – i.e. the expected likelihood of avoiding status demotion by pursuing a specific educational attainment – is measured for each educational option, such as USS, VET, and FVB, in the following way: "How useful are the following types of education and training in terms of you obtaining an occupation that provides a similar level of social approval to your father's or mother's occupation?" The answer range runs from 1 for "not useful at all" to 5 for "very useful". The *expected probability of success* is treated in the same way. The respondents are asked: "How likely is it that you will finish the following types of education and training successfully?" The range of values runs from 1 for "very unlikely" to 5 for "very likely". In order to overcome the ordinal scale level, these initial values of both probabilities are converted into probabilities, running from ".1" to ".9" (Becker/Glauser 2018: 18; for critics, see Kahneman 2011: 383). The material *benefit* of the educational options is measured in terms of income optimisation ("Do you expect to get a well-paid job when you opt for one of the training options?").[6] The *cost* of educational options is indicated by effort, time, and expense ("Different types of education and training are related to different efforts and expenditures. Altogether, how costly are the following types of education and training?"). Respondents are asked about the expected benefits and costs of each educational option. The values range from 1 for low benefits/costs to 5 for high benefits/costs.[7]

Due to missing alternative measurements of the origin-related informal and formal competencies (talents and efforts), the certified performance assessment is used as an indicator for the primary origin effect. The *achievement* of individuals is measured in Wave 3 by the *grade point average (GPA) in German language* and *Mathematics*. On the one hand, the GPA inform young people about their achievements and their entitlement to pursue a certain educational path – for example

5 In line with SEU theory on educational differentials, as well as with the research results (e.g. Stocké 2007; Becker and Hecken 2009), there are no class differences in regard to the importance of status maintenance (see *Table A.2.1* in the appendix). While juveniles from other social classes are more likely to expect than children from the upper service class that VET will be suitable for reproducing the paternal class position, they are less convinced in contrast to upper service class children that USS is more likely to maintain parental status. Regarding the probability of success, juveniles from the other social classes are more likely to be convinced than upper service class children of success in VET. The reverse association is true for USS.

6 In contrast to the offspring from the upper service class, juveniles from the other social classes are more likely to expect that VET is suitable for income optimisation. In regard to USS, the association of material benefit with social origin is reversed. For the cost expected for the different educational options, there are no origin-related differences.

7 First of all, these variables have proven successful in other studies (Stocké 2007). In our case, the measurement of this variable in Wave 2 is highly and significantly correlated with its measurement in Wave 3 ($0.5 \leq r \leq 0.9$). From this result, it can be concluded that the measurement errors of these variables could be negligibly small.

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through high school – in the Swiss educational system (Becker und Glauser 2018). They are also signals that inform the apprenticeship providers about an applicant's training ability. On the other hand, such performance-related signals affect an individual's subjectively expected probability of success. In multivariate estimations of educational decisions, origin-related GPA indicates the primary effect of social origin.[8]

Each independent variable, except social origin and school type, is z-standardised. The descriptive statistics are reported in *Table A.1* (Appendix). The missing values are not systematic due to selective response to questions (Becker/Glauser 2018). Therefore, there is no urgent need for the imputation of missing data.

## 3.3 Statistical procedures

For dependent variables with a metric scale, *OLS regression* is utilised in the multivariate analysis (Cameron/Travedi 2010). When the dependent variable is categorical, estimations are based on the *multinomial* or *binary logistic regression model* (Long/Freese 2006). For the main dependent variable – the educational decision – we run binary logistic regressions separately for each of the four outcomes considered by actors.

For the following reasons, this procedure corresponds in a mostly adequate way with the logic of selection emphasised by RCT. Different types of multinomial logistic regression model do not consider the logic of selection of educational outcomes mentioned above when more than two options are considered by an actor. First, they neglect the ordinal preference order (based on the axiom of order) in which individuals compare the SEU of each perceived educational option. The multinomial logistic regression, however, does not impose any preference order and does not consider an individual's mutual comparisons of the outcomes.

Second, the usual regression analysis is also not in line with the consistency conditions of the preference order – such as completeness, transitivity, and continuity – which are not completely considered by the multinomial procedures. According to completeness, each individual is able to compare each outcome and create a ranking of the options. According to transitivity, individuals create a logically consistent preference order and are therefore able to prefer a single option to other options.

8 The primary origin effects of performance assessment are the social origin effects on school grades conveyed via objective school performance. Additionally, they are the influences of social origin on the actual transition, which are conveyed via objective school performance (Maaz/Nagy 2009: 160). Previous analyses have also shown for the German-speaking cantons in Switzerland that school grades in German language and Mathematics correlate with both the intelligence of school children and with the test results for these two school subjects (Becker et al. 2013: 534). However, "degrees of freedom" when assigning grades by teachers are not excluded (Bittmann/Mantvill 2020), so information about the social background of the school child and the performance level of the classmates in a school class are also included in the performance assessment (Becker 2019).

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This implies the following fact. Given the following ranking for an individual USS – FVB – VET, it is true that SEU(USS) > SEU(FVB) and SEU(USS) > SEU(VET). When both previous conditions are valid, a third condition – continuity – could be true: when an option such as USS is preferred to VET, and options such as an FVB are similar to USS in terms of important characteristics (e.g. eligibility for university training or status maintenance), it is possible that an FVB might be preferred to VET. All three conditions are necessary for theoretical and methodological reasons; however, it is not possible to consider them using multinomial approaches.

Third and finally, there is a methodological reason to prefer binary logistic regression to different forms of multinomial logistic regression, such as ordered logistic regression. If one focuses on a specific outcome, the specified SEU values should focus on this outcome. In other words, if one is interested in VET as the outcome, the SEU values should first relate to this outcome. This has to be considered for the other outcomes. However, in the case of multinomial logistic regression, it is not possible to exclude inappropriate SEU values for the different outcomes at the same time.

Running binary logistic regression separately for each educational option, average marginal effects (AME) are estimated that are suitable for comparisons of nested models (Mood 2010) or for comparisons between groups (Allison 1999). These estimates minimise biases that could occur due to unobserved heterogeneity. AME are a measure of the "average" power of the effect of explanatory variables $x_j$ on the propensity of respondents for choosing an option ($y = 1$) versus omission of the other options ($y = 0$). They correspond to the average additive effect of a predictor $x_j$ on the probability of $y = 1$ by a unit change in $x_j$. The estimations of standard errors are clustered by school classes.

For the decomposition of the direct and indirect effects of class-related individual achievement and the SEU of different options in an individual's choice set from the total effect, the so-called *Karlson–Holm–Breen (KHB) method* (Breen et al. 2013; Karlson et al. 2012) is employed. By running the user-written Stata command *khb* (Kohler et al. 2011), it is possible to separate the impact of confounding from rescaling when comparing conditional and unconditional parameter estimates in nonlinear probability models such as the logit regression (Breen et al. 2021). In a first step, a regression model is estimated with social origin as the key variable, but without the GPA and SEU values as the mediator variables (reduced model). In a second step, a model is estimated that also contains the mediator variables (full model). In a final step, the difference between the regression weights of social origin as the key variable in both regression models is determined. This difference is the effect of social origin on the selected educational option mediated by GPA and SEU values of these options in an individual's choice set (indirect effect), while the regression weight of the social origin in the full model is the direct effect. If one relates the indirect effect to the regression weight of an individual's social origin in

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the initial model, one gets the proportion of the relationship between social origin and the chosen educational option that is mediated by the primary and secondary effects of stratification. The result of this procedure informs their contribution on the educational outcome (indirect effect) net of social class (direct effect) (Kohler et al. 2011: 420–422).

## 4 Empirical results

The empirical analysis consists of three steps. First, the primary and secondary effects of social origin are briefly described. The multivariate analysis of the educational decision – the logic of selection – is the focus of the second step. In a third step, the total effect of social origin at the end of compulsory schooling is decomposed by running the KHB procedure.

### 4.1 Description of the primary and secondary effect of social origin

Class-related IEO is obvious for adolescents in the educational systems of German-speaking cantons in Switzerland. The *primary effect* (the class-related achievement in school, indicated by the GPA in German language and Mathematics) and the *secondary effect of social stratification* (the relation between class origin and educational decision-making by taking achievements into account) are documented in *Table 1*.

There are class-related differentials in school performance. Children from the service and middle classes are more likely to achieve a favourable GPA than working class children, particularly in German language. This is particularly valid for children who are enrolled in school types with extended requirements, which provide favourable learning contexts due to the primary effects of social origin.

Net of their achievement and by taking previous "ability tracking" into account, since the current school type as an institutional context might have an impact on an individual's definition of their own situation, it is obvious that juveniles from the service classes are more likely to decide in favour of USS and continue their educational trajectory on a direct route towards university than working class children. In contrast to working class children, adolescents from the middle and service classes generally do not decide in favour of VET. A decision in favour of FVB, this option is significantly preferred by middle class juveniles. This finding is in line with the thesis of "hedging".

Overall, in line with the RCT model, offspring from the service classes prefer USS over VET and FVB, while offspring from the middle class prefer FVB over VET, compared to working class children. However, the statistically significant effects of social origin on the individuals' educational decision are not resolved completely – even when previous educational achievements are taken into account.

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**Table 1: GPA [a] and enrolment after compulsory school [b]**

| | Achievement | | Destination | | |
|---|---|---|---|---|---|
| | German | *Maths* | VET | FVB | USS |
| *Social origin* | | | | | |
| *Upper service class* | *Reference* | *Reference* | *Reference* | *Reference* | *Reference* |
| Lower service class | 0.061<br>(0.065) | –0.031<br>(0.071) | 0.027<br>(0.036) | 0.016<br>(0.025) | –0.022<br>(0.026) |
| Middle class | 0.006<br>(0.077) | –0.035<br>(0.075) | 0.045<br>(0.034) | 0.044<br>(0.022)* | –0.063<br>(0.023)** |
| Working class | –0.161<br>(0.079)* | –0.117<br>(0.076) | 0.112<br>(0.034)*** | 0.028<br>(0.023) | –0.113<br>(0.026)*** |
| *GPA* | | | | | |
| German | | | –0.070<br>(0.013)*** | –0.001<br>(0.009) | 0.076<br>(0.011)*** |
| Maths | | | 0.004<br>(0.013) | 0.042<br>(0.008)*** | 0.025<br>(0.010)* |
| *School type* | | | | | |
| Basic requirements | *Reference* | *Reference* | *Reference* | *Reference* | *Reference* |
| Extended requirements | 0.235<br>(0.084)** | 0.193<br>(0.074)* | –0.135<br>(0.033)*** | 0.069<br>(0.016)*** | 0.177<br>(0.019)*** |
| Pre-Gymnasium | 0.312<br>(0.103)** | 0.096<br>(0.092) | –0.596<br>(0.031)*** | 0.147<br>(0.040)*** | 0.631<br>(0.052)*** |
| Transitions | | | 52.4% | 11.1% | 21.2% |
| Adjusted/Pseudo-$R^2$ | 0.026 | 0.010 | | 0.196 | |
| N of cases | 1,743 | 1,743 | | 1,743 | |

*Note:* [a] β-coefficients, estimated by OLS regression (in parenthesis: robust standard error, clustered by school class). [b]AME, estimated by multinomial logit regression (in parenthesis: standard error, clustered by school class); reference category: UTC. * $p<0.05$; ** $p<0.01$; *** $p<0.001$.

*Source:* Data: DAB – own compilation.

## 4.2 Revealing the process of educational decision-making

In order to describe the secondary effect of social origin in detail, the educational decision in favour of VET or FVB or USS is analysed for adolescents at the end of their compulsory schooling in accordance with the logic of selection (i.e. the maximisation of SEU).[9] For adolescents with an indifferent preference order, the

9 There are class-related differences in the SEU of the educational options (see *Table A.2.3* in the appendix). In contrast to offspring from the upper service class, juveniles from the other social classes are more likely to prefer VET in terms of their SEU as an observed preference. In the case of USS, there are reverse class differences.

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decision in favour of a UTC is considered an additional test of the RCT. Since their choice set depends on their enrolment in one of the different school types, the models are estimated separately for adolescents enrolled in these school types. Since adolescents in a lower secondary school with extended requirements have the greatest choice set compared to adolescents in other school types, their educational decisions are analysed first (*Table 2*).

**Table 2: Transition to USS-level tracks – Juveniles in lower secondary school with extended requirements only**

| | VET | FVB | USS | UTC |
|---|---|---|---|---|
| *Models* | *1* | *2* | *3* | *4* |
| *Social origin* | | | | |
| *Upper service class* | *Reference* | *Reference* | *Reference* | *Reference* |
| Lower service class | –0.001<br>(0.046) | –0.018<br>(0.039) | 0.033<br>(0.027) | –0.024<br>(0.030) |
| Middle class | 0.015<br>(0.046) | 0.033<br>(0.032) | –0.005<br>(0.025) | –0.045<br>(0.032) |
| Working class | 0.076<br>(0.042) | –0.005<br>(0.031) | –0.058<br>(0.029)* | –0.015<br>(0.030) |
| *GPA* | | | | |
| German language | –0.072<br>(0.017)*** | 0.018<br>(0.014) | 0.069<br>(0.013)*** | –0.023<br>(0.015) |
| Maths | –0.025<br>(0.018) | 0.061<br>(0.013)*** | 0.022<br>(0.013) | –0.061<br>(0.013)*** |
| *Evaluation of SEU* | | | | |
| SEU(VET)–SEU(FVB) | 0.087<br>(0.029)** | | | 0.009<br>(0.012) |
| SEU(VET)–SEU(USS) | 0.081<br>(0.017)*** | | | –0.001<br>(0.010) |
| SEU(FVB)–SEU(VET) | | 0.018<br>(0.014) | | |
| SEU(FVB)–SEU(USS) | | 0.040<br>(0.009)*** | | |
| SEU(USS)–SEU(VET) | | | 0.162<br>(0.021)*** | |
| SEU(USS)–SEU(FVB) | | | –0.037<br>(0.038) | |
| Pseudo-$R^2$ | 0.1290 | 0.0817 | 0.3620 | 0.0681 |
| Number of cases | 998 | 998 | 998 | 998 |
| % of selection | 54.9 | 12.8 | 20.0 | 12.3 |

*Note:* * $p<0.05$; ** $p<0.01$; *** $p<0.001$; AME (estimated by logistic regression; in parenthesis: robust standard error, clustered by school class).

*Source:* Data: DAB – own compilation.

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Net of adolescent achievement, it is obvious that adolescents decide in favour of VET when the expected net benefit of VET exceeds the SEU values of the other options, such as FVB and USS (Model 1). When the SEU for FVB exceeds the SEU values of VET and USS, the individuals indeed choose FVB (Model 2). Furthermore, individuals continue their educational trajectory on the academic track (USS) when the SEU value is higher for this option than the utility expected for VET (Model 3). It is obvious that the preference for USS and the rejection of VET have the greatest impact on the decision in favour of USS, besides the decision of adolescents favouring an FVB when the SEU value for FVB is compared with the SEU for USS. A comparison of the SEU values of USS and FVB, however, does not explain choices in favour of USS. Such a comparison absorbs the net benefits for USS and FVB. This is not surprising, since VET is both an institutional precondition for, and an integral part of, FVB.[10] However, it has to be noticed for the choice of USS the effect of social origin remains closely significant at the 5-%-level. Compared to middle and upper class children, working class children are less likely to choose USS. In the case of USS, the class-related differentials are not completely explained by the primary and secondary effects of social origin. The reason for this could be an unobserved selection effect. Due to contingent vacancies at the *Gymnasium*, the juveniles are selected through a successful examination. Here again, primary origin effects to the disadvantage of working-class children are likely to be decisive because they are more likely to fail than the socially privileged descendants. This ad hoc hypothesis is supported empirically if the individuals' educational decision in favour of USS in the previous Wave 3 (i.e. in the middle of their last school year) is considered (see models 2 in *Table A.3 in the Appendix*). In this case, there is no statistically significant effect of social origin on the educational choice at all. This conclusion is even valid for the previous educational choice of individuals who participated in Wave 4.

It is also revealed that the decision to attend a UTC is obviously based on an indifferent preference order (Model 4). The assessment of the SEU is insignificant for each combination of options. If more than two comparisons are considered, the additional terms are omitted during the estimation process. Therefore, it is empirically supported that a UTC is a type of stopgap for individuals who are not able to make an educational decision due to missing preferences or having an indifferent preference order. It is concluded, therefore, that a UTC is indeed a makeshift solution for such cases at the end of compulsory schooling. This could be the reason that the Pseudo-$R^2$ value for modelling the choice of a UTC is rather low compared to the choice of the other options (*Table 2*).

10 Automated robustness checks were also carried out using Stata ado *mrobust* (Auspurg/Brüderl 2021). For the first three models, the statistically significant SEU values were used as the variable of interest. The robustness ratios were 2.5 (Model 1), 4.5 (Model 2), and 6.2 (Model 3). The significance stability and significance rate were both 100%.

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For *adolescents enrolled in a lower secondary school with basic requirements*, the findings are in line with the theory (see *Table 3*). In general, their choice set is institutionally limited to VET and FVB. Therefore, their transition is driven by the primary effect, while the secondary effects – indicated by comparisons of the SEU values for each educational option – are insignificant.

The situation is different for *adolescents enrolled in a pre*-Gymnasium. When the SEU of VET exceeds the SEU for FVB, these individuals decide in favour of VET. This is similar for the evaluation of the SEU values of VET and of FVB. In the case of individuals enrolled in a pre-*Gymnasium*, it could be assumed that decision-making in favour of an FVB is based on "hedging", since an FVB is an alternative for low-achieving or undecided adolescents. For them, an FVB provides a wide range of options that could be realised at a later stage of their educational career As expected theoretically, a USS will be chosen by juveniles in a pre-*Gymnasium* if the SEU of USS exceeds the SEU of VET. Overall, the impact of class origin on education decision-making is completely "explained" by the primary effect and, in particular, by the logic of rational selection (the secondary effect).[11]

In sum, if one takes the logic of selection into account – i.e. the rational choice of an educational option based on the comparison of its subjectively expected utilities, net of the primary effect of social origin – the impact of social origin becomes statistically insignificant with one exception. This finding means that the theoretically adequate modelling of the primary and secondary effects, in particular, contributes to the "complete explanation" of the IEO. The rigorous modelling of the *logic of situation* by an individual's assessment of the SEU(.) values of each different educational option – considered as differences in the SEU values for different educational options – is in line with the theoretically expected process of an individual's selection of an educational alternative in terms of utility maximisation: namely, that individuals are more likely to select the option where the SEU exceeds the net benefits of the other options.

Drawing on this analysis, the study reveals empirically (in contrast to existing studies) that the rational choice of educational options is based on an individual's achievement and selection of the option with the highest SEU. Of course, the amount of the SEU(option) is indeed based on a subjective calculation of the benefits, costs, and success probability of different educational options, i.e. the educational motivation and investment risk relating to an individual's class position. However, the "real" educational choice is based on an individual's selection of the best option to improve their situation in terms of status maintenance, as well as in terms of social and economic welfare. Net of previous class-related achievement as an indicator of the primary effect of social origin, the educational differentials at a

11 The automated robustness checks, in terms of significance stability and rate, provide the same results for juveniles enrolled in the pre-*Gymnasium*. The robustness ratios are also substantively high (VET: 3.05 resp. 2.95; FVB: –2.63 resp. 5.1; USS: 3.15).

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**Table 3: Transition to USS-level tracks – Adolescents in a lower secondary school with basic requirements or in pre-*Gymnasium* only**

| Destination | VET | | FVB | | USS | | UTC | |
|---|---|---|---|---|---|---|---|---|
| *Models* | *Basic* | *Pre-Gym* | *Basic* | *Pre-Gym* | *Basic* | *Pre-Gym* | *Basic* | *Pre-Gym* |
| *Social origin* | | | | | | | | |
| *Upper service class* | *Reference* | *Reference* | *Reference* | *Reference* | | *Reference* | *Reference* | *Reference* |
| Lower service class | –0.058 (0.068) | 0.045 (0.055) | 0.041 (0.040) | 0.027 (0.093) | | 0.028 (0.077) | 0.031 (0.068) | –0.099 (0.071) |
| Middle class | –0.039 (0.058) | 0.027 (0.054) | 0.019 (0.036) | 0.077 (0.073) | | –0.048 (0.070) | 0.017 (0.054) | –0.014 (0.032) |
| Working class | 0.020 (0.069) | 0.056 (0.069) | 0.014 (0.038) | 0.101 (0.077) | | –0.045 (0.075) | –0.021 (0.062) | |
| *GPA* | | | | | | | | |
| German language | –0.047 (0.024) | 0.001 (0.018) | –0.002 (0.010) | –0.029 (0.015) | | 0.050 (0.023)* | 0.044 (0.022) | –0.026 (0.012)* |
| Maths | 0.106 (0.021)*** | –0.030 (0.010)** | 0.009 (0.010) | 0.049 (0.020)* | | –0.001 (0.022) | –0.119 (0.020)*** | –0.010 (0.015) |
| *Evaluation of SEU* | | | | | | | | |
| SEU(VET)– SEU(FVB) | 0.028 (0.019) | 0.076 (0.020)*** | | | | | –0.011 (0.018) | –0.002 (0.042) |
| SEU(VET)– SEU(USS) | 0.013 (0.021) | 0.031 (0.010)** | | | | | –0.019 (0.018) | 0.015 (0.016) |
| SEU(FVB)– SEU(VET) | | | 0.004 (0.007) | –0.087 (0.039)* | | | | |
| SEU(FVB)– SEU(USS) | | | 0.007 (0.008) | 0.101 (0.017)*** | | | | |
| SEU(USS)– SEU(VET) | | | | | | 0.196 (0.069)** | | |
| SEU(USS)– SEU(FVB) | | | | | | 0.043 (0.147) | | |
| Pseudo-$R^2$ | 0.0495 | 0.3045 | 0.0203 | 0.2225 | | 0.4037 | 0.0676 | 0.1087 |
| Number of cases | 510 | 235 | 510 | 235 | 510 | 235 | 510 | 235 |
| % of selection | 68.7 | 7.9 | 4.9 | 18.7 | 0.0 | 68.1 | 25.1 | 5.4 |

*Note:* * $p<0.05$; ** $p<0.01$; *** $p<0.001$; AME (estimated by logistic regression; in parenthesis: robust standard error, clustered by school class).

*Source:* Data: DAB – own compilation.

later stage of the educational trajectory are mainly based on the secondary effect of stratification, i.e. on the class-related educational choice among educational options driven by the motive of intergenerational status maintenance and optimisation of other benefits, as well as by a mutual comparison of the net benefits of each perceived educational option.

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## 4.3 Additional robustness checks and sensitivity analysis

The previous model specification has been parsimonious in order to test the RCT by Boudon (1974) in its original version. For many published studies on the IEO, it has been observed that several "control variables", such as immigration status or the number of books at home, are considered (e.g. Lörz 2012: 314). On the one hand, these studies overlook the fact that these control variables are often confounded with social background, i.e. the class position of the parental home, and therefore do not contribute to the actual problem of the present study. On the other hand, a couple of sociological studies show that the association of gender with educational decision-making is independent of social class (DiPrete/Buchmann 2013; Breen et al. 2010). It is often witnessed that educational disparities due to social origin are larger among women than men.

The estimations of an individual's educational decision-making, documented in *Table 2*, are re-estimated separately for female and male juveniles. For juveniles enrolled in a lower secondary school with extended requirements, it is found that male graduates mostly prefer VET, compared to young women, while female graduates are more likely to decide in favour of the USS, in contrast to their male counterparts (see *Table A.4* in the Appendix). The previous findings of the multivariate analysis are reproduced completely for the young women and men, with the choice of the "bridging solution" (UTC) being the single exception. However, this different case does not count since the real educational decision is postponed due to an unclear order of preferences.

As a second step, it is tested whether a sample selection bias among the panellists occurring across Waves 2–4 might have an impact on the findings. For this purpose, each individual – regardless of their enrolment in one of the tracks at the lower secondary school level – are taken into account for analysing their educational choice (*Table A.5* in the Appendix). The selection into the analysis sample is controlled by the two-step procedure suggested by Heckman (1979). The selection model consists of the impact of school track and gender, since it is known that these variables are associated with panel attrition (Becker et al. 2019). The previous estimations on an individual's educational choice are reproduced overall. However, the selection model tells us that a sample selection bias based on gender and enrolment in the school tracks is obvious. Thus, it is revealed by the Mill's ratio that inclusion in the analysis sample leads to an underestimating the choice in favour of VET and UTC, while the choice of FVB and USS is overestimated. Therefore, like in other panel studies, the previous estimates must be interpreted with this methodological caveat.

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## 4.4 Decomposition of total effect of social origin at the end of compulsory schooling

The decomposition procedure is limited to the largest and most interesting subsample: the juveniles enrolled in a secondary school with extended requirements, who have the greatest scope for decision-making. Employing the KHB method (Breen et al. 2013; Karlson et al. 2012; Kohler et al. 2011), this conclusion is supported by the decomposition of the direct and indirect effects of class-related individual achievement and the SEU of different options in an individual's choice set from the total effect (*Table 4*). Only the VET and USS options are considered due to significant impacts of the reduced and difference model, while for the other options (FVB and UTC) there are no significant decomposition effects.

**Table 4: Decomposition of the total effect of social origin at the end of compulsory schooling – Adolescents in a lower secondary school with extended requirements only (see Table 3)**

| *Educational options* | VET | FVB | USS | UTC |
|---|---|---|---|---|
| Reduced model | –0.267<br>(0.069)*** | –0.072<br>(0.098) | 0.559<br>(0.103)*** | 0.033<br>(0.095) |
| Full model | –0.116<br>(0.069) | –0.060<br>(0.100) | 0.191<br>(0.099) | 0.066<br>(0.097) |
| Difference | –0.151<br>(0.035)*** | –0.012<br>(0.029) | 0.368<br>(0.078)*** | –0.033<br>(0.028) |
| Pseudo-$R^2$ | 0.13 | 0.08 | 0.36 | 0.07 |
| Number of cases | 998 | 998 | 998 | 998 |
| % of selection | 54.9 | 12.8 | 20.0 | 12.3 |

*Note:* * $p<0.05$; ** $p<0.01$; *** $p<0.001$; (KHB procedure: logits, estimated by logistic regression; in brackets: standard errors).

*Source:* Data: DAB – own compilation.

First, it becomes obvious that the parental class position increases the log odds of deciding in favour of VET by 0.267. Controlling for achievement and the evaluation of SEU, the effect of social origin reduces to 0.116, leaving an indirect effect of 0.151 based on an individual's primary and secondary effects of social origin. Second, it is found that social origin increases the log odds of deciding in favour of USS by 0.559. If one takes the primary and secondary effects into account, the effect of social origin decreases to 0.191, while the amount of the indirect effect is 0.368. That again means that – as claimed by Boudon (1974: 32) – the effects of social origin are the basic mechanisms of the IEO-generating process.

As emphasised in the theoretical part of this article, the transition in the educational system is mainly driven by educational decision-making that varies across social

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**Table 5: Decomposition of primary and secondary effects of social origin (in %)**

| Options | VET | | USS | |
|---|---|---|---|---|
| Contribution | A | B | A | B |
| Primary and secondary effects | 100.0 | 56.5 | 100.0 | 65.9 |
| School performance | 12.3 | 6.97 | 10.2 | 6.70 |
| SEU | 87.7 | 49.5 | 89.9 | 59.2 |
| Pseudo-$R^2$ (Number of cases) | 0.13 (998) | | 0.36 (998) | |
| % of selection | 54.9 | | 20.0 | |

*Note:* A = Contribution of each mediator to the indirect effect in %. B = Share of primary and secondary effects at total effect in %.

*Source:* Data: DAB – own compilation.

classes (*Table 5*). Based on the decomposition of the total effect of social origin reported in *Table 4*, the percentages of the primary and secondary origin effects are calculated for the individuals' decision in favour of VET or USS. For juveniles enrolled in a secondary school with extended requirements, it is observed that about 57 resp. 66% of the impact of their social origin for the transition to VET resp. USS is mediated by their school performance and their subjective evaluation of the utilities of these options (Column B).

The majority of these indirect effects, however, is driven by the SEU (88% for VET; 90% for USS), and to a rather low degree by achievement (Column A). In other words, the result is in line with the claim by Boudon (1974) that the role of the secondary effect of social origin on the IEO is much larger than the impact of class-related achievements (the primary effect of social origin). In sum, these findings again support the theoretical arguments on class-related educational decision-making, resulting in the IEO.

## 5 Summary and conclusions

The motivation of this contribution has been to present an alternative application of a parsimonious RCT on educational decisions. The aim of this empirical analysis has been to demonstrate a rigorously theory-driven and mechanism-based reconstruction of educational decisions as a utility-maximising choice of educational options (Boudon 1974; Erikson/Jonsson 1996; Breen/Goldthorpe 1997; Esser 1999). This ambitious requirement, seeking to overcome the shortcomings of previous direct tests of RCT, is realised by the application of a wide version of RCT, such as the theory of SEU (e.g. Diekmann 2022: 104; Esser 1999: 265–274; Erikson/Jonsson 1996: 14–15; Savage 1954; von Neumann/Morgenstern 1944). According to this version of RCT, forward-looking individuals calculate, based on previous academic performance, the SEU of each option in their choice set – such as an educational certificate – instead of the cognitively demanding comparison

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of the expected costs and benefits for each of these options. In order to maximise the expected benefits, they rank their preferences – indicated by the SEU of the options in their choice set – in ascending order, and choose the option that seems to be the most promising for realising the aim of their decision. Since the individual preference order varies systematically across the social classes, class-related IEO is the logical consequence of subjectively rational action.

This theoretical claim has been supported empirically, as an illustrative example, for the situation of Swiss adolescents at the end of their compulsory schooling. Using a unique modelling of the core mechanisms – such as selecting one educational option – by a direct measure of the cost–benefit calculation (Becker/Glauser 2018) and an evaluation of the SEU (Glauser/Becker 2016), or by "hedging" (Tutić 2017), the impact of social origin on an offspring's educational decision has been described statistically completely by longitudinal data. Controlling for previous academic achievements, adolescents from the upper and lower service classes are more likely to decide to continue their education in USS, in contrast to middle class and working class children. This is because socially privileged groups provide higher educational motivation and lower investment risk regarding continuing their education on the risky and demanding pathway towards university. Adolescents from the middle class seem more likely to pursue a "hedging strategy" and are therefore more likely to see an FVB and/or VET as a "safety net" than offspring from other social classes. In order to optimise the returns on investment in continued education, working class children are more likely to decide in favour of VET than offspring from the service classes. Finally, by measuring the primary and secondary effects of social origin directly, it has been possible to quantify each of these effects, while other studies conclude the extent of the secondary origin effect is a complement of the primary origin effect and the overall origin effect. Indeed, this study revealed that class-related educational decision-making dominates the impact of academic performance on an individual's educational choice. This is true for the main educational options at the end of compulsory schooling. Finally, in order to avoid misunderstandings, it should be made clear again that the aim of this contribution is not to refute similar analyses in this research area, but rather to optimise them.

However, it is important to note the following *limitations* of this contribution. First of all, a replication of this study – in combination with other longitudinal data gathered in other countries and in other periods – would be needed in order to test the validity of the items used in this contribution and to replicate the findings.

Second, only a single branching point in the Swiss educational system is considered. In the present case, previous educational decision-making during the transition from primary to lower secondary level is expected to have an impact on current educational decision-making. This path dependency was initially apparent from institutional restrictions on people in the lower school career, who could only

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choose VET with or without FVB. Furthermore, the transition to the pre-*Gymnasium* track strongly influenced further educational decision-making in favour of the academic track in USS. What is needed is a continued test of the RCT across the educational career in other types of educational system (Blossfeld 1996).

Third, this claim is valid for the micro–macro linkage itself (Raub et al. 2011). In order to reconstruct a macro phenomenon such as educational differentials, the idea might be too simple to aggregate individual educational decisions (Becker 2022). For example, the sorting and filtering functions of the educational system (Triventi et al. 2016), as well as the subsequent correction of an educational decision (in a more or less permeable education system), have to be considered for the development of theoretical "transformation rules" (Wippler/Lindenberg 1987). This theoretical problem is not trivial, because it is often not possible to add all individual decisions to the aggregated phenomenon to be explained (Opp 2011; Lazarsfeld/Menzel 1961).

Fourth and finally, it is necessary to test for each of the social classes if they decide on their educational career in terms of a strict RCT. It could be assumed that families with a distinct academic tradition in regard to educational attainment and profession have a relatively tiny choice set, which is limited to a university degree as the one and only option. In regard to the typology of social action suggested by Max Weber (1922), this type of educational decision could be labelled as a traditional action. Furthermore, it would be interesting to discover if educational decision-making is driven by overwhelmed values. In this case, the decision could be categorised as value-rational behaviour (Becker 2022). Additionally, one has to consider the norms and values of a reference group that could influence an individual's educational preferences (Zimmermann 2019). Beyond the theory of strict rationality, these theoretical arguments are compatible with the wide version of SEU theory considered in this contribution.

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# Appendix

## Table A.1: Descriptive statistics

| Variables | N of cases | Mean | Std. dev. | Minimum | Maximum |
|---|---|---|---|---|---|
| **Table 1** | 1.743 | | | | |
| *Social origin* | | | | | |
| Upper service class | | 17.5% | | 0 | 1 |
| Lower service class | | 22.6% | | 0 | 1 |
| Middle class | | 36.2% | | 0 | 1 |
| Working class | | 23.7% | | 0 | 1 |
| *GPA* | | | | | |
| German language | | 0.128 | 0.942 | –6.215 | 2.704 |
| Maths | | 0.094 | 0.974 | –5.482 | 2.25 |
| *School type* | | | | | |
| Basic requirements | | 29.3% | | 0 | 1 |
| Extended requirements | | 57.3% | | 0 | 1 |
| Pre-Gymnasium | | 13.5% | | 0 | 1 |
| *Destination* | | | | | |
| VET | | 52.4% | | 0 | 1 |
| FVB | | 11.1% | | 0 | 1 |
| USS | | 21.0% | | 0 | 1 |
| UTC | | 15.3% | | 0 | 1 |
| **Table 2** | 998 | | | | |
| *Evaluation of SEU* | | | | | |
| SEU(VET)–SEU(FVB) | | –0.01 | 1.013 | –4.761 | 5.046 |
| SEU(VET)–SEU(USS) | | 0.108 | 1.455 | –6.074 | 3.3 |
| SEU(FVB)–SEU(VET) | | 0.01 | 1.013 | –5.046 | 4.761 |
| SEU(FVB)–SEU(USS) | | 0.118 | 1.096 | –4.008 | 2.945 |
| SEU(USS)–SEU(VET) | | –0.108 | 1.455 | –3.3 | 6.074 |
| SEU(USS)–SEU(FVB) | | –0.118 | 1.096 | –2.945 | 4.008 |
| **Table 3** (Basic) | 510 | | | | |
| *Evaluation of SEU* | | | | | |
| SEU(VET)–SEU(FVB) | | 0.501 | 1.435 | –8.777 | 4.975 |
| SEU(VET)–SEU(USS) | | 0.447 | 1.308 | –8.966 | 3.255 |
| SEU(FVB)–SEU(VET) | | –0.501 | 1.435 | –4.975 | 8.777 |
| SEU(FVB)–SEU(USS) | | –0.055 | 1.078 | –4.601 | 3.083 |
| **Table 3** (Pre-Gymnasium) | 235 | | | | |
| *Evaluation of SEU* | | | | | |
| SEU(VET)–SEU(FVB) | | –0.763 | 1.02 | –6.668 | 2.17 |
| SEU(VET)–SEU(USS) | | –1.188 | 1.99 | –9.655 | 3.05 |
| SEU(FVB)–SEU(VET) | | 0.763 | 1.02 | –2.17 | 6.668 |
| SEU(FVB)–SEU(USS) | | –0.425 | 1.218 | –4.7 | 2.985 |
| SEU(USS)–SEU(VET) | | 1.188 | 1.99 | –3.05 | 9.655 |
| SEU(USS)–SEU(FVB) | | 0.425 | 1.218 | –2.985 | 4.7 |

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**Table A.2.1: Class-related probability of success, probability c, and the importance of status maintenance**

| | Probability of success | | | Status maintenance | | | |
|---|---|---|---|---|---|---|---|
| | VET | FVB | USS | c(VET) | c(FVB) | c(USS) | Importance |
| Upper service class | *Reference* | *Reference* | *Reference* | *Reference* | *Reference* | *Reference* | *Reference* |
| Lower service class | 0.042<br>(0.020)* | 0.012<br>(0.019) | –0.060<br>(0.023)** | 0.029<br>(0.014)* | –0.009<br>(0.019) | –0.064<br>(0.021)** | 0.094<br>(0.071) |
| Middle class | 0.055<br>(0.018)** | –0.003<br>(0.016) | –0.097<br>(0.021)*** | 0.040<br>(0.013)** | –0.025<br>(0.018) | –0.099<br>(0.020)*** | 0.042<br>(0.068) |
| Working class | 0.078<br>(0.020)*** | –0.007<br>(0.018) | –0.124<br>(0.023)*** | 0.059<br>(0.014)*** | –0.021<br>(0.018) | –0.103<br>(0.022)*** | 0.092<br>(0.069) |
| Intercept | 0.720<br>(0.019)*** | 0.518<br>(0.014)*** | 0.488<br>(0.023)*** | 0.755<br>(0.013)*** | 0.630<br>(0.014)*** | 0.630<br>(0.017)*** | 3.964<br>(0.050)*** |
| Adjusted $R^2$ | 0.0136 | 0.0008 | 0.0228 | 0.0100 | 0.0014 | 0.0182 | 0.0013 |
| N of cases | 1,743 | 1,743 | 1,743 | 1,743 | 1,743 | 1,743 | 1,743 |

*Note:* * $p<0.05$; ** $p<0.01$; *** $p<0.001$; estimated by OLS regression (in brackets: robust standard errors, clustered by school class).

*Source:* Data: DAB – own compilation.

**Table A.2.2: Class differences in the expectation of the benefits and costs of educational options**

| | Benefit: optimisation of income | | | Cost | | |
|---|---|---|---|---|---|---|
| | VET | FVB | USS | VET | FVB | USS |
| Upper service class | *Reference* | *Reference* | *Reference* | *Reference* | *Reference* | *Reference* |
| Lower service class | 0.147<br>(0.065)* | 0.032<br>(0.059) | –0.152<br>(0.070)* | 0.016<br>(0.091) | –0.049<br>(0.083) | –0.007<br>(0.098) |
| Middle class | 0.266<br>(0.060)*** | 0.035<br>(0.061) | –0.216<br>(0.073)** | 0.078<br>(0.085) | 0.103<br>(0.071) | 0.005<br>(0.086) |
| Working class | 0.310<br>(0.073)*** | –0.020<br>(0.064) | –0.299<br>(0.078)*** | 0.163<br>(0.090) | –0.039<br>(0.079) | –0.086<br>(0.100) |
| Intercept | 3.879<br>(0.062)*** | 4.141<br>(0.047)*** | 4.338<br>(0.052)*** | 2.738<br>(0.065)*** | 3.249<br>(0.059)*** | 3.515<br>(0.073)*** |
| Adjusted $R^2$ | 0.0158 | 0.0006 | 0.0080 | 0.0025 | 0.0036 | 0.0009 |
| N of cases | 1,743 | 1,743 | 1,743 | 1,743 | 1,743 | 1,743 |

*Note:* * $p<0.05$; ** $p<0.01$; *** $p<0.001$; estimated by OLS regression (in brackets: robust standard errors, clustered by school class).

*Source:* Data: DAB – own compilation.

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**Table A.2.3: Class differences in the calculation of the SEU of different educational options**

| | SEU | | |
|---|---|---|---|
| | VET | FVB | USS |
| Upper service class | *Reference* | *Reference* | *Reference* |
| Lower service class | 0.214<br>(0.109) | 0.060<br>(0.083) | –0.166<br>(0.072)* |
| Middle class | 0.296<br>(0.098)** | –0.013<br>(0.076) | –0.254<br>(0.073)*** |
| Working class | 0.390<br>(0.105)*** | 0.043<br>(0.078) | –0.285<br>(0.079)*** |
| Intercept | –0.231<br>(0.105)* | –0.041<br>(0.062) | 0.181<br>(0.065)** |
| Adjusted $R^2$ | 0.0173 | 0.0009 | 0.0096 |
| N of cases | 1,743 | 1,743 | 1,743 |

*Note:* * $p<0.05$; ** $p<0.01$; *** $p<0.001$; estimated by OLS regression (in brackets: robust standard errors, clustered by school class).

*Source:* Data: DAB – own compilation.

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**Table A.3: Educational decision in favour of USS in the middle of the last school year: Juveniles in lower secondary school with extended requirements only1**

| *Participation in Wave* | 3 | | 4 | |
|---|---|---|---|---|
| *Model* | 1 | 2 | 1 | 2 |
| *Social origin* | | | | |
| *Upper service class* | *Reference* | *Reference* | *Reference* | *Reference* |
| Lower service class | –0.017<br>(0.029) | 0.037<br>(0.025) | –0.021<br>(0.033) | 0.024<br>(0.027) |
| Middle class | –0.067<br>(0.029)* | –0.008<br>(0.024) | –0.086<br>(0.032)** | –0.027<br>(0.025) |
| Working class | –0.130<br>(0.038)*** | –0.023<br>(0.028) | –0.185<br>(0.044)*** | –0.043<br>(0.030) |
| *GPA* | | | | |
| German language | | 0.057<br>(0.011)*** | | 0.069<br>(0.013)*** |
| Maths | | 0.019<br>(0.011) | | 0.021<br>(0.013) |
| *Evaluation of SEU* | | | | |
| SEU(USS)–SEU(VET) | | 0.181<br>(0.019)*** | | 0.179<br>(0.019)*** |
| SEU(USS)–SEU(FVB) | | –0.048<br>(0.027) | | –0.042<br>(0.032) |
| Pseudo-$R^2$ | 0.0134 | 0.3215 | 0.0236 | 0.3751 |
| Number of cases | 1.375 | 1.375 | 998 | 998 |
| % of selection | 20.1 | 20.1 | 21.0 | 21.0 |

*Note:* * $p<0.05$; ** $p<0.01$; *** $p<0.001$; estimated by OLS regression (in brackets: robust standard errors, clustered by school class). [1] other options (ceasing the educational system; indifferent decision; other options): 1.3% of individuals.

*Source:* Data: DAB – own compilation.

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**Table A.4: Transition to USS-level tracks: Young women and men in a lower secondary school with extended requirements only**

| Destination | VET | | FVB | | USS | | UTC | |
|---|---|---|---|---|---|---|---|---|
| *Gender* | *Male* | *Female* | *Male* | *Female* | *Male* | *Female* | *Male* | *Female* |
| *Social origin* | | | | | | | | |
| *Upper service class* | *Reference* | *Reference* | *Reference* | *Reference* | *Reference* | *Reference* | *Reference* | *Reference* |
| Lower service class | 0.050 (0.065) | –0.004 (0.057) | 0.017 (0.068) | –0.037 (0.037) | 0.016 (0.038) | 0.040 (0.041) | –0.106 (0.052)* | 0.010 (0.042) |
| Middle class | –0.044 (0.067) | 0.051 (0.058) | 0.067 (0.060) | 0.007 (0.036) | 0.022 (0.031) | –0.023 (0.037) | –0.050 (0.030) | –0.018 (0.051) |
| Working class | 0.025 (0.057) | 0.116 (0.060) | 0.046 (0.056) | –0.046 (0.045) | –0.054 (0.044) | –0.064 (0.043) | –0.021 (0.032) | –0.007 (0.048) |
| *GPA* | | | | | | | | |
| German language | –0.085 (0.023)*** | –0.018 (0.030) | 0.025 (0.018) | 0.026 (0.019) | 0.063 (0.021)** | 0.052 (0.020)* | –0.010 (0.016) | –0.069 (0.022)** |
| Maths | –0.048 (0.027) | –0.028 (0.027) | 0.080 (0.022)*** | 0.036 (0.015)* | 0.015 (0.020) | 0.038 (0.017)* | –0.040 (0.017)* | –0.054 (0.017)** |
| *Evaluation of SEU* | | | | | | | | |
| SEU(VET)– SEU(FVB) | 0.161 (0.080)* | 0.060 (0.029)* | | | | | –0.005 (0.018) | 0.014 (0.018) |
| SEU(VET)– SEU(USS) | 0.065 (0.027)* | 0.084 (0.021)*** | | | | | –0.001 (0.012) | 0.004 (0.013) |
| SEU(FVB)– SEU(VET) | | | 0.021 (0.025) | 0.011 (0.010) | | | | |
| SEU(FVB)– SEU(USS) | | | 0.033 (0.013)* | 0.044 (0.011)*** | | | | |
| SEU(USS)– SEU(VET) | | | | | 0.124 (0.047)** | 0.199 (0.024)*** | | |
| SEU(USS)– SEU(FVB) | | | | | –0.034 (0.075) | –0.044 (0.042) | | |
| Pseudo-$R^2$ | 0.1915 | 0.0983 | 0.0880 | 0.0793 | 0.4179 | 0.3307 | 0.1052 | 0.0775 |
| Number of cases | 465 | 533 | 465 | 533 | 465 | 533 | 465 | 533 |
| % of selection | 62.8 | 47.3 | 15.7 | 10.1 | 14.6 | 25.0 | 6.88 | 17.6 |

*Note:* * $p<0.05$; ** $p<0.01$; *** $p<0.001$; AME (estimated by binary logistic regression; in parenthesis: robust standard error, clustered by school class).

*Source:* Data: DAB – own compilation.

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**Table A.5: Transition to USS-level tracks by control for social selective transition to school tracks on the lower secondary school level**

| | VET | FVB | USS[1] | UTC |
|---|---|---|---|---|
| *Models* | *1* | *2* | *3* | *4* |
| *Social origin* | | | | |
| *Upper service class* | *Reference* | *Reference* | *Reference* | *Reference* |
| Lower service class | 0.017 (0.060) | 0.003 (0.024) | 0.023 (0.077) | –0.017 (0.027) |
| Middle class | 0.018 (0.055) | 0.034 (0.022) | –0.020 (0.071) | –0.021 (0.025) |
| Working class | 0.083 (0.059) | 0.004 (0.024) | –0.066 (0.081) | –0.016 (0.027) |
| *GPA* | | | | |
| German language | –0.046 (0.022)* | 0.002 (0.009) | 0.060 (0.032) | –0.004 (0.010) |
| Maths | 0.007 (0.021) | 0.042 (0.009)*** | 0.035 (0.030) | –0.077 (0.010)*** |
| *Evaluation of SEU* | | | | |
| SEU(VET)–SEU(FVB) | 0.028 (0.021) | | | 0.003 (0.010) |
| SEU(VET)–SEU(USS) | 0.062 (0.017)*** | | | 0.001 (0.008) |
| SEU(FVB)–SEU(VET) | | –0.003 (0.006) | | |
| SEU(FVB)–SEU(USS) | | 0.046 (0.007)*** | | |
| SEU(USS)–SEU(VET) | | | 0.130 (0.025)*** | |
| SEU(USS)–SEU(FVB) | | | –0.014 (0.034) | |
| Constant | –0.478 (0.183)** | 0.339 (0.063)*** | 1.291 (0.291)*** | –0.051 (0.069) |
| *Selection* | | | | |
| Gender (Ref.: male) | 0.135 (0.044)** | 0.135 (0.044)** | 0.131 (0.053)* | 0.135 (0.044)** |
| Basic requirements | *Reference* | *Reference* | | *Reference* |
| Extended requirements | 0.217 (0.048)*** | 0.217 (0.048)*** | | 0.217 (0.048)*** |
| Pre-Gymnasium | 0.565 (0.079)*** | 0.565 (0.079)*** | 0.349 (0.074)*** | 0.565 (0.079)*** |
| Constant | –0.238 (0.042)*** | –0.238 (0.042)*** | –0.020 (0.039) | –0.238 (0.042)*** |
| $\Lambda$ (Mill's ratio) | 1.248 (0.227)*** | –0.316 (0.078)*** | –1.401 (0.390)*** | 0.292 (0.086)*** |
| Observed cases | 3,372 | 3,372 | 2,281 | 3,372 |
| Selected cases | 1,743 | 1,743 | 1,233 | 1,743 |
| Wald Chi$^2$ | 49.81 | 81.97 | 78.69 | 82.59 |

*Note:* * $p<0.05$; ** $p<0.01$; *** $p<0.001$; Coefficients, estimated by Heckman's two-step procedure.[1] Without individuals enrolled in lower secondary school with basic requirements.

*Source:* Data: DAB – own compilation.

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