The institutional dimension of class-based educational decision-making: Evidence from regional variation in Switzerland

Institutionelle Dimensionen klassenbasierter Bildungsentscheidungen: Belege für regionale Unterschiede in der Schweiz

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Abstract

This article examines to what extent specific institutional arrangement of an education system moderates the influence of social background on students' track allocation, and whether this happens via primary or secondary effects of social origin. I tackle the problem of omitted-variable bias by analyzing subnational education systems in Switzerland, a country with a variety of cantonal school systems but otherwise homogeneous institutions. The results show a complex picture. First, even though the absolute transition probability to the highest track is higher in education systems with low stratification for students of higher social background, this does not translate into a relative advantage as in most cantons the odds of transitioning do not differ between high- and low-SES students. Second, in line with previous research, I observe that the secondary effect of social origin prevails in more stratified education systems. Third, it is not possible to conclude with certainty that specific features of the education system enable high-SES parents to disproportionately influence their children's transition probabilities because the results are rather unstable.

Zusammenfassung

Dieser Artikel untersucht inwiefern der Einfluss der sozialen Schicht auf die Übertrittschancen in den leistungsstärksten Schultrack durch die institutionelle Ausgestaltung des Bildungssystems moderiert wird und wieweit dies über den primären oder den sekundären Herkunftseffekt geschieht. Das Problem des *omitted variable bias* bei Ländervergleichen wird mittels eines Vergleichs von subnationalen Bildungssystemen entschärft. Die Schweiz ist dafür besonders geeignet aufgrund einer großen Varietät von Bildungssystemen bei gleichzeitig ähnlichen sozialstaatlichen Institutionen. Die Resultate zeichnen ein komplexes Bild: Erstens, während überraschenderweise die absolute Übertrittswahrscheinlichkeit für Kinder aus hoher Schicht in weniger stratifizierten Bildungssystemen höher ist, führt dies nicht zwingend zu einem relativen Vorteil, da sich die Übertrittschancen zwischen den Schichten nicht unterscheiden. Zweitens lässt sich der Befund aus früherer Forschung, dass in stärker stratifizierten Bildungssystemen der sekundäre Herkunftseffekt grösser ist, replizieren. Drittens ist es nicht möglich festzustellen, ob gewisse Institutionen im Bildungssystem für Kinder aus höherer Schicht vorteilhaft sind, da die Resultate nicht robust sind.

1. Introduction

Inequality in education based on social background is a widespread phenomenon that varies significantly between countries. This variability of parents' influence suggests that the structure of education systems moderates parents' impact on children's education. The main result from extensive reviews (Betts 2011; Brunello and Checchi 2007; van de Werfhorst and Mijs 2010) is that a high degree of stratification[1] (e.g. early grouping of students according to their educational performance, henceforth called tracking) increases inequality in educational performance and in educational attainment. However, as van de Werfhorst and Mijs point out (2010: 413), less attention has been paid to inequality in decision-making regarding educational transitions, conditional on prior achievement (in Boudon's term the so-called secondary effect of social origin, c.f. Boudon 1974).

Research on how the education system affects the influence of a student's social background on the decision-making process has either focused on one specific feature of the education system (namely, the method of selection, c.f. Dollmann 2016; Gresch et al. 2009; Neugebauer 2010) or conflated various aspects of the education system in overarching categories (stratification and selectivity) (Jackson and Jonsson 2013). Results show that the overall social background effect, as well as the social background effect conditional on the child's educational performance, is bigger in education systems with more stratification and in education systems in which actors have more leeway in their decisions. However, the analytical approach applied by these different authors does not make it possible to disentangle the effect magnitude between different features of the education system, such as the age at which tracking starts, the number of tracks, or the selection method. Further, the aforementioned studies have mostly compared national education systems with each other, an approach that is not without problems. On the one hand, it is difficult to pinpoint exactly which characteristics of the education system are influential due to the multitude of factors that differ between education systems on a country level. On the other hand, we might face an omitted-variable bias because other country characteristics that correlate with the design of the education system might actually be causally relevant but are not taken into account in the analysis. By contrast, by comparing education systems within a single country, my approach ensures lower unobserved heterogeneity because more potentially influential factors remain constant.

The goal of this paper is to show how parents from a high social background (in the following

[1] Following the usual distinction, differences between education systems are summarized by the terms 'stratification' and 'standardization' (e.g. Allmendinger 1989; van de Werfhorst & Mijs 2010). The concept of stratification is based on Allmendinger (1989). Stratification describes vertical differentiation in an education system: for example by grouping students into different performance tracks with distinct curricula, often in geographically separated schools. The channeling of students can be based either on their performance (usually assessed by grades or standardized examinations) or on unrestricted access, and thus based on the free decision of parents and their children. Standardization describes to what degree schools can choose their own curricula and examinations. Further, it also expresses the degree to which financial (e.g. school budget) and human resources (e.g. teacher training) differ between schools.

abbreviated as 'high-SES parents') influence their children's probability of transitioning to the highest performance track at lower secondary level[2] in various education systems within Switzerland. To do so, I will on the one hand present descriptive results and on the other hand test possible mechanisms. More precisely, I will proceed as follows. First, I will show descriptively how the overall effect of social background differs by education system and by the corresponding degree of stratification. Second, I will focus on analyzing whether parents use particular strategies in different education systems to ensure their children's track allocation – that is, if parents rely primarily on improving their children's educational performance or if they use other performance-independent strategies (c.f. the primary and secondary effects of social origin, Boudon 1974). Third, I am interested in assessing which features of the different education systems (the number of tracks, the age at which tracking starts, the method of selection) increase high-SES parents' influence. For this reason, I will suggest potential mechanisms in the theory section, which I will later test statistically. From a methodological point of view, I will try to tackle the problem of country comparisons and the resulting omitted-variable bias by comparing subnational administrative divisions (called cantons) in Switzerland.

Switzerland is a highly suitable case for examining how the structure of the education system affects educational inequality, for two reasons. First, Switzerland has a very decentralized education system, which leads to extensive variation in educational stratification between the cantons, but to a lesser degree within them (Hega, 2000). At the same time, there is no variation in the degree of standardization[3] due to inter-cantonal agreements issued by the EDK (the Swiss Conference of Cantonal Ministers of Education), which enables us to solely focus on the impact of stratification. Second, analyzing institutional differences on a subnational level decreases the likelihood of an omitted-variable bias to a greater extent than cross-country comparisons due to the greater similarity of institutions within countries (see also Betts 2011 for a discussion of this).

Several other authors have already examined the relationship between educational inequality and education systems within Switzerland. The focus of their research has been on educational performance (Stadelmann-Steffen 2012) and on career decisions after compulsory schooling (unconditional on educational performance) (Bauer and Riphahn 2006). While Stadelmann-Steffen did not find that an increased degree of stratification mediates parental influence, Bauer and Riphahn showed that the influence of social background is bigger in cantons with early tracking. Further, there exists one article in Switzerland that has analyzed the social background effect on educational decision-making, conditionally

[2] I analyze the first transition between primary and lower secondary levels for two reasons: firstly, the institutional structure of primary schools differs less between the cantons than that of lower secondary schools, which provides the advantage of fewer unobserved differences between the education systems; secondly, this transition is crucial for students' educational pathway and determines their entire educational career (see Breen and Jonsson 2000)

[3] Besides educational stratification, cantonal education systems only differ in aspects such as maximum class size, the number of hours taught at school, and the extent of the educational expenditure of schools, factors that are not expected to have any impact on students' track choice.

on students' performance. It concluded that the secondary effect potentially exceeds the primary one (Combet 2013). However, the author did not focus on how these effects depend on the structure of the education system, a lacuna that I will fill in the remainder of this article.

The structure of the article is as follows. In the next chapter, I will discuss how specific arrangements of the education system might influence educational decision-making and I derive testable hypotheses. After elaborating on the analytical strategy, I then present my results and I finish with a discussion of the results.

2. Theory and potential mechanisms

One of my main goals is to propose potential mechanisms that can explain how high-SES actors benefit from specific features of the education system. As a simplified representation of the strategies that might lead to an overall advantage of high-SES students, I will use Boudon's parsimonious model of the primary and secondary effects of social origin, which mirrors similar arguments made in other rational choice-based theories (e.g. Erikson and Jonsson 1996; Breen and Goldthorpe 1997). All of these models assume that the actors (children and/or their parents)[4] make their decisions in regard to educational transitions based on previous academic performance (the primary effect)[5] and (conditionally on the performance) based on additional cost–benefit calculations (the secondary effect) (see Figure 1, Panel A). These cost–benefit factors do not only involve the direct and indirect costs of the chosen school or school track, they are also based on an assessment of the child's probability of success since much of the benefit of education only accrues in the case of success. Additionally, theories predict that the benefit of further education is greater for high-SES parents because educational values are class-dependent (Bourdieu and Passeron 1977) and/or because parents have the desire to prevent status loss / to maintain their status (e.g. Breen and Goldthorpe 1997; and, more generally: Kahnemann and Tversky 1979). Further, parents' ambitions concerning the educational transition are directly affected by their child's previous educational performance and the child adapts its educational performance to its parents' ambitions, which makes the identification of the primary and secondary effect of social origin challenging (see Morgan et al. 2013 for further discussion) (see Figure 1, Panel B).

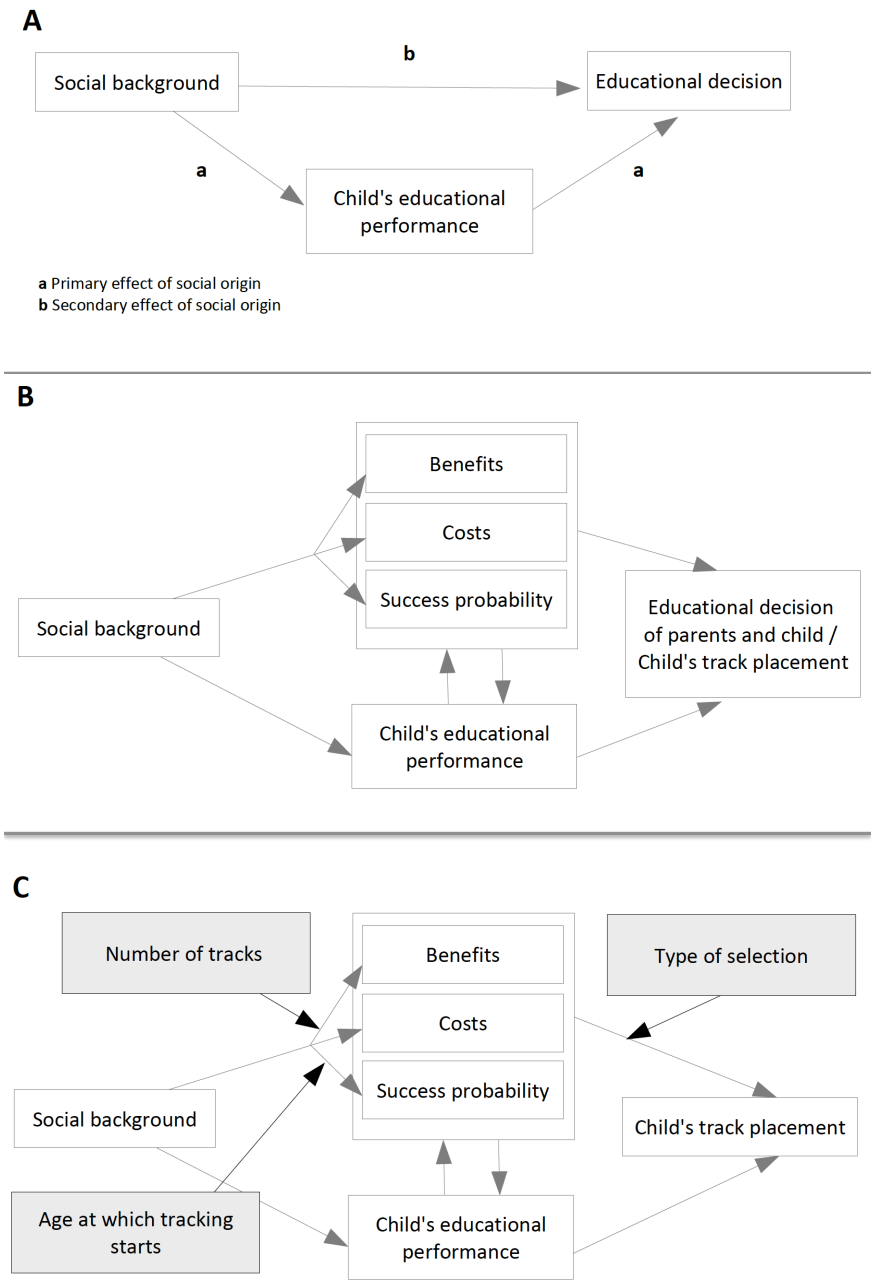
Concerning the influence of the education system on the overall educational inequality and the primary and secondary effects of social origin, I have already explained in the introduction that I am

[4] Not explicitly discussed in these models is the question of who is actually responsible for the student's actions. In line with Mare's argument (1980), I assume that parental influence affects younger students more strongly while factors outside of the family affect students more in later educational transitions. Parents' behavior in regard to realizing their ambitions for their children are thus non-negligible factors in these models, especially if they describe early educational transitions.

[5] Social background also influences the child's academic performance by providing unequal genetic endowment and unequal learning environments (e.g. Jackson 2013 for a theoretical elaboration and Belsky et al. 2018 for an empirical test).

especially interested in the exact mechanisms by which the specific features of the education system might influence the process that creates educational inequality. For this reason, I will describe for three features of the education system – the age at which tracking starts, the number of tracks and the method of selection – how these might affect parents' assessment of the cost–benefit factors and how parents might adapt their strategic behavior (see Figure 1, Panel C for an illustration).

Figure 1: Representation of the potential mechanisms



Number of tracks

Although several researchers have found a positive relationship between the number of tracks and parental influence on educational achievement (e.g. Le Donné 2014, Ammermüller 2013, contrasting Horn 2009), as well as on respondents' educational attainment (e.g. Pfeffer 2008), no research has focused explicitly on how the number of tracks influences educational decision-making, at least to my knowledge. For that reason, suggestions regarding the potential mechanisms have not been put forward. I thus propose that the inclusiveness of the highest-ability track could be a crucial factor, a concept first introduced by Gamoran (1992).

In education systems with a high level of inclusiveness in the highest track, a high percentage of students are assigned to the highest track, while in education systems with low inclusiveness, only a minor share of students attend the highest track, which is therefore highly elitist. In the case of Switzerland, there exists a high correlation between the number of tracks, their inclusiveness, and the type of the highest track at lower secondary level (between 0.7 and 0.9): education systems with a long-term *Baccalaureate school* (comparable to the German *Gymnasium*)[6] are very elitist (only around 14% of all students attend the highest track) and have at least three tracks, while in education systems with two tracks the highest track at lower secondary level is in general highly inclusive (around 55% of all students attend the highest track) and *Baccalaureate school* starts after compulsory schooling at the upper secondary level. Meanwhile, education systems with three tracks without a long-term *Baccalaureate school* lie in between (around 35% attend the highest track, see Table 1 for more detailed information and also Section A.2 in the Appendix, on the Swiss education system). It is therefore evident that the degree of inclusiveness is negatively correlated with the degree of stratification.

I argue that with an increasing number of tracks, attending the highest track becomes more of a positional good due to the scarcity of the spots available (e.g. Adnett and Davies 2002), resulting in a a highly interdependent competitive situation that favors high-SES actors. Two factors cause this positional arms race. First, since the degree of inclusiveness declines with a high number of tracks, there are fewer spots available in the top track. Second, in cantons with a higher number of tracks, the highest-ability track is often a long-term *Baccalaureate school* that explicitly prepares for university entrance, and thus attending this track conveys a certain elitist status. These factors simultaneously raise the benefits of attending the highest track and thus the competition for the available spots. However, while the utility of attending the highest track increases for all parents independently of their social background, the increased

[6] Completion of the Baccalaureate school and passing of the exit exams are prerequisites for university entrance. Students from both short-term and long-term Baccalaureate schools face the same conditions for university entrance (for more information, see Section 1 on the Swiss education system in the Online Appendix).

competition for these positions favors resourceful actors like high-SES parents, as has been shown in game-theoretic models (e.g. Boudon 1982). There exist several possibilities for how high-SES parents will ensure that their child keeps its advantage: they can improve their child's educational performance[7] and/or they can strategically try to influence the track allocation process, as will be described in the next section. While it is not possible to predict which strategy parents will pursue, we know that due to the intensifying competition for spots, their overall influence will grow. Thus I conclude that *the overall influence of high-SES parents' on students' track allocation increases with the number of tracks, and respectively decreases with greater inclusiveness of the education system.*

Age at which tracking starts

Several studies suggest that early tracking increases the association between social background and educational achievement, as well as educational attainment (e.g. Brunello and Checchi 2007; Horn 2009; Horn 2013; Le Donné 2014; Pfeffer 2008; Schütz et al. 2008; with the exception of Waldinger 2007). This has also been shown to be true for Switzerland in research by Bauer and Riphahn (2006), although their data did not include students' performance.

The increased association between social background and early start of tracking, conditional on students' educational performance, can be explained in two ways. A first explanation is that decisions made at an older age are less dependent on social background because students are influenced by agents other than their parents (peers, the media etc., see Mare 1980). A second explanation assumes that the earlier the tracking starts, the less time parents have to observe their child's learning behavior and their educational performance, which makes it more difficult for them to predict the likelihood that their child will successfully complete the high-ability track. Parents from high social backgrounds will not be heavily influenced by this increased uncertainty because they are in a loss-frame: if they want their child to maintain their social status, they have to be risk-seeking and choose the highest performance track, independently of the increased uncertainty. Low-SES parents, however, are in a gain frame: their child does not need to attend the highest track to maintain its parents' status. They thus have less incentive to behave in a risk-seeking manner and will consequently be more affected by the increased uncertainty about their child's success probability (e.g. Kahneman and Tversky 1979; for experimental evidence see Berger and Combet 2017). Summarizing, both explanations predict that *an earlier start of the tracking increases high-SES parents' influence on their child's track allocation, conditional on their child's performance.*

[7] We assume in the model that this is an indirect path over the parental cost–benefit-assessment-box down to the child's educational performance because a higher number of tracks mainly influences parents' assessment of the benefits of attending the highest track.

Method of selection

While the age at which tracking starts, as well as the number of tracks, affect parents' cost–benefit assessments, the method of selection influences their strategic behavior in regard to ensuring the desired track placement of their children. In an institutional setting without any access restrictions for the highest track, high-SES parents' more favorable cost–benefit assessment of higher education increases the secondary effect of social origin, as has been shown by several authors for Germany. The possibility of rejecting schoolteachers' recommendations strengthens parental influence on their child's educational choice, even when controlling for a child's previous school achievement (e.g. Dollmann 2016; Gresch et al. 2009; Neugebauer 2011). Unsurprisingly, parents with high aspirations in particular reject teacher recommendations – notably parents of a high social background (e.g. Lohmann and Groh-Samberg 2010) or parents belonging to certain migrant groups (e.g. Jonsson and Rudolphi 2011).

While rejecting teacher recommendations is possible in some German states, in Switzerland teacher decisions are compulsory. Nevertheless, parents can influence teachers' decision-making process and high-SES parents have a stronger incentive to do so because of their more favorable cost–benefit assessment of higher education. Additionally, due to their greater familiarity with the prevailing norms and expectations in the education system, it is likely that their efforts will be successful more often, in comparison to low-SES parents. Most parents will rely on lobbying on their child's behalf, for example by suggesting that the teachers also take less reliably measurable characteristics, such as non-cognitive skills and development prognoses, into account to determine track placement, which is allowed in the Swiss education system (EDK 2007). High-SES parents are also more likely to resort to more zealous means, like repeatedly demanding conversations with the teacher, threatening to call on the school board (e.g. see examples in the article in BildungSchweiz 2016) or resorting to legal action (an increasing trend in Bavaria, as reported by the head of the law division of the Bavarian teachers' union (Fokken 2016) as well as in Switzerland (Simon 2016)). Additionally, it might be the case that teachers' assessment of students, and thus their track placement, is biased, independently of parental interference (e.g. Boone and Van Houtte 2013; Dusek and Joseph 1983; Ready and Wright 2011), especially because teachers are allowed to consider in their assessment less reliably measurable characteristics like non-cognitive skills.

Given these issues, standardized entrance examinations – a selection method that is used in a small number of cantons – might seem to be a more social class-blind measure. However, given that the content of these examinations is predictable due to their standardization, research has found that high-SES parents are more likely to use private tutoring offered by specialized companies that explicitly teach to the test, to prepare their child for these exams (see Hof and Wolter 2012 for Switzerland; Buchmann et al. 2010 for the U.S., Stevenson and Baker 1992 for Japan).

Summarizing, it is not possible to conclude from the theoretical reflections which institutional arrangement benefits high-SES parents more and it thus makes sense to examine *whether high-SES parents' influence on students' track allocation is greater in education systems with standardized examinations or in education systems with compulsory teacher decisions, conditional on students' performance.*

3. Analytical strategy

3.1. Data

For the analyses, I use the PISA datasets for Switzerland (2000, 2003, 2006, 2009, 2012) to obtain a high number of individuals ($N_{individuals}$=32261) and macro units ($N_{cantons}$ = 14, $N_{canton\text{-}waves}$=48, $N_{schools}$=302). The goal of the PISA study is to assess and compare the educational ability of 15-year-old students in various countries. In Switzerland, an additional random sample was drawn to be representative of students attending ninth grade and some cantons commissioned an additional sample in order to achieve representativeness for their canton (for more information on the various PISA surveys, see FORS 2017). The analyses have been restricted to the following cantons: in the PISA waves before 2006, all cantons with fewer than 100 individuals in a wave were excluded due to the small number of schools involved, which increases the risk of biased sampling of tracks at cantonal level. In the PISA waves from 2006 onwards, all cantons that provided a representative sample were included. Further, cantons with a comprehensive system without clear tracking at the lower secondary level (e.g. Jura or Ticino) were excluded, as well as the canton of Grisons and the canton of Solothurn in the PISA survey of 2000, due to sampling problems (for more information about the sample restriction and the possibility of a bias, see Section 1 in the Online Appendix).[8]

The advantage of using the PISA datasets is their combined high number of canton-waves, which increases the reliability of the cross-level interaction effects (see Bryan and Jenkins 2015, Heisig et al. 2017), and, in the latest waves, the contemporaneity of the assessments. The downside is that the measurement of performance occurs two to three years after the transition from primary to secondary school takes place place. This does not affect the assessment of the overall influence of the social

[8] As additional analyses show, these restrictions do not lead to a biased cantonal sample in regard to important factors like language region; percentage of people living in cities or in its agglomerations; percentage of migrants living in these cantons; GDP per person; percentage of people working in the primary, secondary or tertiary sector; and percentage of people with a tertiary degree. However, the excluded cantons have a smaller population size (t-test, p=0.0247). For further information about the reasons for exclusion, as well as the sensitivity analyses, consult Section 2 of the Online Appendix.

background but could bias the direct effect of social background if students' individual performance increases at a faster rate in some education systems. To test whether this is the case, I conducted sensitivity analyses with the 1995 TIMSS dataset (Ramseier et al. 1995), in which the lag between the transition and the performance assessment is half a year. In the sensitivity analyses in Section A.3 in the Appendix, I check for the seven cantons present in both datasets whether the magnitude of the coefficients differs significantly between the two datasets for the main model. Despite the time lag between the transition and the measurement of the performance in the PISA datasets, the robustness check shows that the likelihood of this introducing a substantial bias is minor.

3.2. Variables

The binary dependent variable measures whether a respondent attends the highest school track in a canton. As there are unequal numbers of tracks in the different cantons, this variable is coded 1 if the respondent attends the highest performance track in a canton and zero otherwise (the categorization of the school tracks and the exact operationalization are described in Section 3 in the Online Appendix). The measure of social background is based on an index (Cronbachs' Alpha=0.61) consisting of the following equally weighted factors: i) highest education level achieved by parents[9], ii) the number of books at home, and iii) the highest parental socioeconomic index (HISEI) (Ganzeboom et al. 1992).[10] To measure educational performance, I rely on the PISA German or Math assessment test (or the mean of both in the PISA waves 2006, 2009, and 2012), as grades are not comparable across school tracks. Furthermore, at the individual level I control for age in months, gender and degree of urbanization of the school district. For further information on the summary statistics, see Table 1.

[9] The share of individuals who have at least one parent with a tertiary degree seems to be relatively high in the datasets (see Table 1), for which reason it makes even more sense to use an index consisting of different measures of social background.

[10] In the Online Appendix (Section 4.3) I also provide calculations with the social background indicators separately. As can be seen in Figure A3, building an index provides us with a higher reliability and validity than using one of those indicators alone. The lower Cronbach's Alpha reflects the properties of the formative measurement model with variables expressing different constructs.

Table 1: Summary statistics

Variables	Summary Statistics	Operationalization / Source
Transition into the highest track *(dependent variable)*	Highest track: 47.94% Other tracks: 52.06%	Highest track in a canton. Binary variable: 1 = highest track, 0 = other tracks *(for more information on the operationalization, see section 3 in the Web Appendix)*
PISA test score	Mean: 531.26 SD: 82.38 Min: 92.3 Max: 884.49	PISA scores in predominant language of the region (2000), mathematics (2003), or mean of both (2006 following), index built as mean of plausible values. Metric variable
Highest level of parental education	1: 16.19% 2: 32.54% 3: 51.27%	1: Only compulsory schooling 2: Secondary degree 3: Tertiary degree
Number of books at home	1: 9.53% 2: 13.91% 3: 29.15% 4: 21.40% 5: 26.01%	1: 0-10 books 2: 11-25 books 3: 26-100 books 4: 101-200 books 5: more than 200 books
Higher International Socioeconomic Inex (HISEI)	Mean: 50.49 SD: 15.90 Min: 16 Max: 90	HISEI is an index, which assigns a score to each occupational category, based on the income and the education (Ganzeboom et al. 1992).
Parental social class (constructed)	Mean: 65.65 SD: 16.57 Min: 23.11 Max: 96.67	Constructed from the three indicators of parental social class (equally weighted): 1) Highest level of parental education 2) Nr. of books at home 3) HISEI Cronbach's Alpha: 0.61
Gender	Female: 50.90% Male: 49.10%	Binary variable: 1 = male 0 = female
Age	Mean: 15.73 SD: 0.44 Min: 14.25 Max: 18.33	Age of respondent in months. Metric variable.
Urbanization of area in which school is located	1: 13.09 2: 53.51 3: 26.95 4: 6.45	1 = geographically isolated area 2 = village or rural (farm) area 3 = one on the outskirts of a town/city 4 = one close to the center of a town/city

My analyses focus on three different features of the education system: i) the age at which tracking starts (earlier versus later tracking); ii) the number of tracks (two to four) and iii) the method of selection (teacher decision versus standardized examinations). Even though Switzerland has nine different education systems, only six are considered in this article. The three education systems not discussed in this article have been excluded due to the comprehensive nature of their tracking system or due to sampling issues (see Section 2 in the Online Appendix for further explanations). Table 2 provides an overview of the education systems considered in this article. The education systems are sorted by descending degree of stratification (and thus ascending degree of inclusiveness). In Education System 1, students are tracked early, standardized tests are applied for selection, and there are four tracks, with the highest track being a *Baccalaureate school*, which is thus highly elitist (only around 14% of all students attend the highest track). Education System 2 only differs from Education System 1 in respect of the number of tracks, as it has one less. Unfortunately, no data is available on the percentage of students attending the highest track, so this canton is dropped in some of the analyses. Education System 3 has the same number of tracks as Education System 2, but has no standardized entry examinations and is more inclusive (on average, 18% of all students attend the highest track). Education Systems 4 and 5 share the same number of tracks (three), the type of highest track (*Sekundarschule*) and the method of selection (teacher decision), but in Education System 5 tracking starts later. These education systems are also clearly more inclusive than the others: 34% (Education System 4) and 38% of all students (Education System 5) attend the highest track. Finally, education system 6 is the education system with the lowest degree of stratification: it has only two tracks, the highest track is a *Sekundarschule,* which is highly inclusive, with around 60% of students attending the higher of two tracks, teachers decide about the track placement, and it has a late start of tracking.

Table 2: Education systems in Switzerland

		Number of tracks	Inclusivness: Percent attending highest track[a]	Start of tracking	Type of highest track	Method of selection	N
Education system 1	**Solothurn**	4	2012: 13%	7th grade	long-term Baccalaureate school	Standardized entrance examination	overall: 706 2012: 706 canton-waves: 1
	Zurich	4	2000: 13% 2003: 13% 2006: 14% 2009: 15%	7th grade	long-term Baccalaureate school	Mean of standardized entrance examination and school grades	overall: 2957 2000: 775 2003: 829 2006: 651 2009: 702 canton-waves: 6
Education system 2	**Thurgau** (old system)	3	2000: unknown	7th grade	long-term Baccalaureate school	Standardized entrance examination	overall: 150 2000: 150 canton-waves: 1

Education system 3	**Lucerne**	3	2000: 18% 2003: 18%	7th grade	long-term Baccalaureate school	Teacher's decision	overall: 371 2000: 189 2003: 182 canton-waves: 4
Education system 4	**Aargau**	3	2000: 37% 2003: 37% 2006: 37% 2009: 36% 2012: 39%	6th grade	Sekundar-schule	Teacher's decision	overall: 3543 2000: 351 2003: 1065 2006: 719 2009: 824 2012: 584 canton-waves: 5
	Basel-Land	3	2000: 26% 2003: 26% 2006: 27%	6th grade	Sekundar-schule	Teacher's decision	overall: 932 2000: 152 2003: 142 2006: 638 canton-waves: 3
	Vaud (old system)	3	2000: 37%	6th grade	Sekundar-schule	Teacher's decision	overall: 229 2000: 229 canton-waves: 1
Education system 5	**Bern, French speaking part**	3	2003: 35% 2006: 37% 2009: 37%	7th grade	Sekundar-schule	Teacher's decision	overall: 1880 2003: 601 2006: 686 2009: 593 canton-waves: 3
	Fribourg	3	2000: 33% 2003: 33% 2006: 32% 2009: 36% 2012: 33%	7th grade	Sekundar-schule	Teacher's decision	overall: 3733 2000: 112 2003: 1037 2006: 1089 2009: 716 2012: 779 canton-waves: 5
	Neuchâtel	3	2003: 42% 2006: 43% 2009: 47% 2012: 48%	7th grade	Sekundar-schule	Teacher's decision	overall: 4089 2003: 1278 2006: 1173 2009: 758 2012: 880 canton-waves: 4
	Vaud (new system)	3	2003: 37% 2006: 36% 2009: 36% 2012: 35%	7th grade	Sekundar-schule	Teacher's decision	overall: 3656 2003: 988 2006: 1099 2009: 786 2012: 783 canton-waves: 4
Education system 6	**Appenzell Ausserrhoden**	2	2009: 65%	7th grade	Sekundar-schule	Teacher's decision	overall: 168 2009: 168 canton-waves: 1
	Bern (German speaking part)	2	2000: 55% 2003: 55% 2006: 57% 2009: 59% 2012: 61%	7th grade	Sekundar-schule	Teacher's decision	overall: 3535 2000: 682 2003: 916 2006: 697 2009: 830 2012: 410 canton-waves: 5
	Schaffhausen	2	2006: 56% 2009: 59%	7th grade	Sekundar-schule	Teacher's decision	overall: 1157 2006: 609 2009: 548 canton-waves: 2
	Schwyz	2	2003: 66%	7th grade	Sekundar-schule	Teacher's decision	overall: 116 2003: 116 canton-waves: 1
	St. Gallen	2	2000: 63% 2003: 63% 2006: 65% 2012: 65%	7th grade	Sekundar-schule	Teacher's decision	overall: 3567 2000: 756 2003: 1332 2006: 821 2012: 658 canton-waves: 4

	Thurgau (new system)	2	2003: 56% 2006: 54%	7th grade	Sekundar-schule	Teacher's decision	overall: 1472 2003: 893 2006: 579 canton-waves: 2

Education systems from 1994 onwards. Resource: EDK 1995, Regli and Furrer 1996, or personal inquiry.
More information can be found in the Web Appendix, section 2.
[a] Numbers are from the Swiss Federal Statistical Office.

3.3. Analytical strategy

The basic setup of the analyses is as follows. Because my main interest is examining the probability of attending the highest track in a canton, the dependent variable is binary. There exist several possibilities for dealing with the complicated interpretation of the effects of nonlinear models, and I will take advantage of several of them. As I am both interested in the absolute and relative advantage of high-SES students in education systems with different features, I calculate linear probability models (LPMs)[11] and binary logit models (reporting odds ratios).[12] The main focus of my analyses is the interaction effects between students' social background and macro variables describing the education systems, capturing the degree to which social background affects the transition probability differently depending on the education system. In the case of LPMs, significant interaction effects tell us that the influence of social background differs between these macro-level contexts, referring to differences in the effect size in the absolute probability. In the case of odds ratios, significant interaction effects imply that the share of high-SES students who transition versus those high-SES students who do not compared to the share of low-SES students who transition versus those who do not are significantly higher/lower in different macro contexts, referring to differences in the effect size in the relative odds. Besides reporting odds ratios for the nonlinear model, I will also show graphical representations of the predictive margins of the logit models. I take into account the clustered nature of the data and the possibility of unobserved heterogeneity between cantons at different points in time by calculating fixed-effects models with dummy variables that indicate the canton and the wave simultaneously (a cantonal-wave dummy variable). This approach ensures that my estimates identify the *common* variance of the cantons that is theoretically based on the education system, and it ensures that the estimates are not confounded by idiosyncratic differences between the cantons. The remaining variance *between* the education systems identifies the interaction effects between the social background variable and the variables describing the education system. To correct for the clustering at school level, I calculate cluster-robust standard errors for all models. The varying cantonal sample sizes are taken into account by weighting the canton-waves with the inverse of their number of students on the total number of students in the datasets. To compare coefficients from different logit models, I apply the KHB method (Karlson et al. 2011). The confidence intervals of the primary and the secondary effects are

[11] The LPM coefficient of the social class variable is approximately an average marginal effect as the variable is normally distributed.

[12] Kröger and Skopek (2017) show that the problem of biased estimates due to unobserved heterogeneity when comparing coefficients between groups in a nonlinear model is less of an issue because the outcome variable is naturally categorical.

calculated using the delta method (see Oehlert 1992). Finally, I provide for some of the analyses' jackknife-type sensitivity robustness checks by excluding cantons one at a time, thereby testing whether the observed effects are driven by single outlier cantons (see Section 4.4. in the Online Appendix).[13]

The main goal of the analytical models is to assess the effect of social background in different education systems. I am thus particularly interested in the social background variable and its interaction with the context variable (type of education system or specific features of the education system). Additionally, several control variables, like age, sex of the respondent, and degree of urbanization of the school district, are always included in the models. Further, depending on the exact analyses, I report the total, the direct effect, the indirect effect, and the size of the indirect relative to the total effect of the social background variable. Statistically, the total effect is the sum of the direct effect and the indirect effect. The indirect effect represents parental influence transmitted through the educational performance of students (often referred to as the primary effect of social origin), while the direct effect represents the remaining effect of parental influence on the transition probability conditional on students' educational performance (the secondary effect of social origin). I therefore calculate two different types of models, one without and one with educational performance as an independent variable, to assess the mediating effect of the educational performance variable.

To answer the research question how high-SES parents influence their children's probability of transitioning to the highest performance track at lower secondary level[14] in various education systems, I use three different analytical strategies that all rely on both the LPM and the logit model. (A) To describe how the absolute and the relative transition probability depends on the social background, I plot predictive margins of the interaction effect between the social background and the education system, and further present the coefficients of the LPM and logit model in a Table. (B) In line with Jackson and Jonssons' (2013) approach, I present scatterplots to describe the relationship between the overall effect, the direct effect, the indirect effect, the size of the indirect effect relative to the overall effect (the primary effect of social origin) and the degree of inclusiveness for the different cantons in each wave. The data points in the scatter plot are coefficients from the standard analytical model, calculated for each canton in each wave separately and made comparable using the KHB method. (C) In order to examine which features of the education system are responsible for the observed patterns in the descriptive part, and also to test the theoretical assumptions of how and why high-SES students might benefit in different types of education systems, I analyze the coefficients from the standard models with interaction terms for the different system

[13] The Stata scripts (Version Stata 15.1) are available at GESIS Datorium. Additional user-written packages that were used are: coefplot (Jann 2014), estout (Jann 2007a), fre (Jann 2007b) and grstyle (Jann 2018a, Jann 2018b).

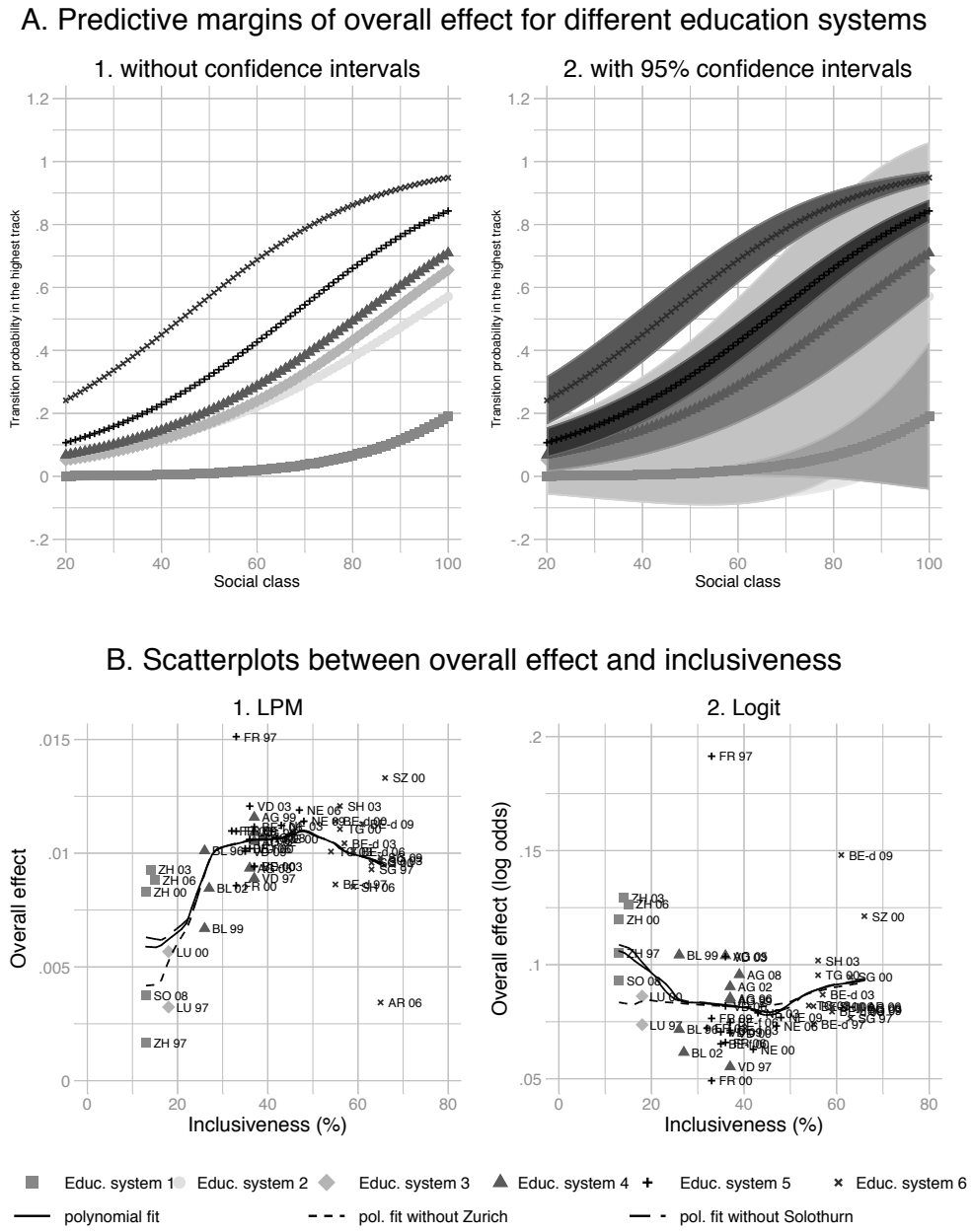
[14] I analyze the first transition between primary and lower secondary levels for two reasons: firstly, the institutional structure of primary schools differs less between the cantons than that of lower secondary schools, which has the advantage of fewer unobserved differences between the education systems. Secondly, this transition is crucial for students' educational pathway and determines their entire educational career (see Breen and Jonsson, 2000)

variables (education system and features of the education system), again for both the LPM and the logit model.

4. Results

4.1. Research question 1: Does the overall effect of social background differ between education systems?

Figure 2: Overall effect of social background in different education systems.



The first goal of this research is to describe how the overall (total) social background effect varies between the education systems, and how this is related to their degree of stratification (and thus their lack of inclusiveness). Figure 2 (top row) shows the predictive margins of the overall effect of the logit model in Table 3 (Model 1b). The following two points are noteworthy. First, the general probability of attending the highest track clearly differs between the education systems, independently of social background. Unsurprisingly, students in Education System 1, which is the most stratified and the least inclusive, have the lowest transition probability, while students in Education System 6, which is the least stratified and the most inclusive, have the highest transition probability, while the other education systems lie in between. As a consequence, in Education System 1, with its four tracks and standardized examinations, low-SES students' transition chances are virtually nil and high-SES students' transition chances are rather low, at around 20%. In contrast, in Education System 6, with its two tracks and teachers' decisions, low-SES students' transition probabilities are higher than those of high-SES students in Education System 1, and almost all high-SES students attend the highest track. Second, it seems that the more inclusive an education system, the better the transition probabilities of high-SES students as the slope is clearly steeper in Education Systems 4, 5, and 6, in comparison to Education System 1. This result is confirmed in the linear probability model (see Table 3, Model 1a) because the interactions between social class and Education System, 4, 5, and 6 are significant and therefore indicate that high-SES students in those systems have higher advantages over low-SES students in terms of transition probabilities in comparison to those in Education System 1. However, I find an interesting effect for the two cantons that apply Education System 1 in the jackknife-type sensitivity robustness checks: while the social background effect in the canton of Zurich is relatively strong and only differs significantly from Education System 5 (see Model 3a in Table 3), the effect is particularly weak in the canton of Solothurn, which consequently increases the effect size differences between the different cantons (Model 5a in Table 3). This heterogeneous effect within one education system is surprising and gives us a first hint that, unexpectedly, other context factors might be relevant, something about which I will elaborate at the end of this section. While the LPM presents us with the absolute advantage of high-SES students, I am also interested in their relative advantage in comparison to their peers. For this reason, I also present logit models with odds ratios (Model 1b and 3b, Table 3). Interestingly, I find that the absolute advantage does not translate into a relative advantage: the odds of high-SES students' transition probability relative to their low-SES peers does not differ significantly between the education systems as soon as I exclude the canton of Zurich. The bottom row in Figure 2, which illustrates the relationship between the overall effect and an education system's degree of inclusiveness, shows these patterns graphically. The overall effect of the LPM is lowest in the more exclusive education systems and increases clearly with a higher inclusiveness, only to decrease again (bivariate regression: $p_{beta} < 0.001$, $p_{beta^2} < 0.001$), equivalent to the pattern I find in Model 1a. For the logit model, I find the opposite pattern, exactly as in Model 1b in Table 3, as long as I do not exclude the canton of Zurich from the analyses, as can be seen in the fractional polynomial fit without the canton of Zurich that

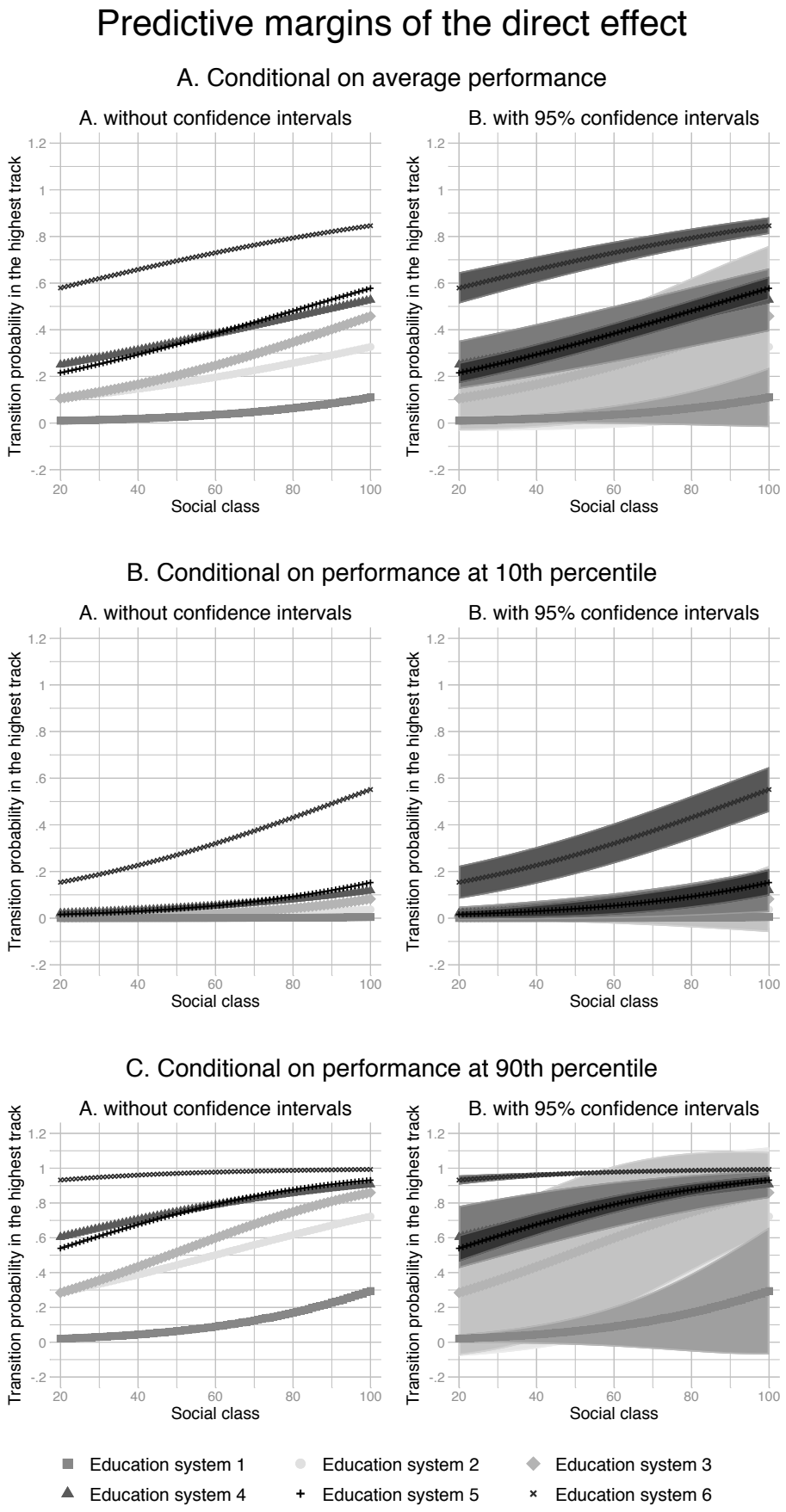
shows no correlation (bivariate regression: p = 0.374). Summarizing the results on the overall effect of social background in different education systems, I find that the absolute transition probability of high-SES students increases in more inclusive education systems, with a slight tendency toward an inverted u-shape, while their relative advantage in comparison to low-SES students does not differ between the education systems, with the exception of the canton of Zurich. This result is surprising because research in general has found higher levels of inequality in education systems with more stratification. However, looking at the top row of Figure 2 we get the impression that the lower absolute educational inequality might be created by the, in general, very low transition probability in Education System 1.

Table 3: Effect of social background in different education systems. Dependent variable: transition to the highest track in a canton

	Linear probability model						**Logit model (OR reported)**			
	Full model		Without Solothurn in education system 1		Without Zurich in education system 1		Full model		Without Zurich in education system 1	
	(1a)	(2a)	(3a)	(4a)	(5a)	(6a)	(1b)	(2b)	(3b)	(4b)
Parental class	0.007***	0.001	0.008***	0.001	0.004	-0.002	1.075***	1.046***	1.069***	1.027***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.005)	(0.006)	(0.007)	(0.006)
PISA test score		0.003***		0.003***		0.003***		1.025***		1.025***
		(0.000)		(0.000)		(0.000)		(0.001)		(0.001)
Educ. system 2 x Parental class[a]	-0.001	0.000	-0.001	-0.000	0.003	0.002	0.973*	0.984	0.979	1.002
	(0.004)	(0.004)	(0.005)	(0.004)	(0.005)	(0.004)	(0.011)	(0.008)	(0.012)	(0.008)
Educ. system 3 x Parental class	-0.001	0.002	-0.001	0.001	0.003	0.004	0.980*	0.996	0.986	1.014
	(0.003)	(0.003)	(0.003)	(0.003)	(0.004)	(0.003)	(0.008)	(0.010)	(0.010)	(0.010)
Educ. system 4 x Parental class	0.003*	0.003**	0.002	0.003*	0.006*	0.006**	0.980***	0.982**	0.985*	0.999
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.006)	(0.007)	(0.007)	(0.007)
Educ. system 5 x Parental class	0.004**	0.006***	0.003*	0.005***	0.007**	0.008***	0.983***	0.990	0.988	1.008
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.005)	(0.006)	(0.007)	(0.007)
Educ. system 6 x Parental class	0.003*	0.004***	0.002	0.003**	0.006**	0.006***	0.984**	0.985*	0.990	1.003
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.005)	(0.006)	(0.007)	(0.007)
Constant	0.780***	-1.404***	0.776***	-1.426***	1.407***	-1.023***	0.130	0.000***	142.26***	0.000***
	(0.148)	(0.132)	(0.153)	(0.136)	(0.140)	(0.127)	(0.166)	(0.000)	(106.03)	(0.000)
N	32261	32261	31555	31555	29304	29304	32261	32261	29304	29304
R^2 / Pseudo R^2	0.282	0.461	0.274	0.457	0.263	0.454	0.240	0.460	0.218	0.444

Standard errors in parentheses, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
Controlled for: age, sex, urbanity of school district, canton-waves.
a: Reference category: Education system 1

Figure 3: Direct effect of social background in different education systems.



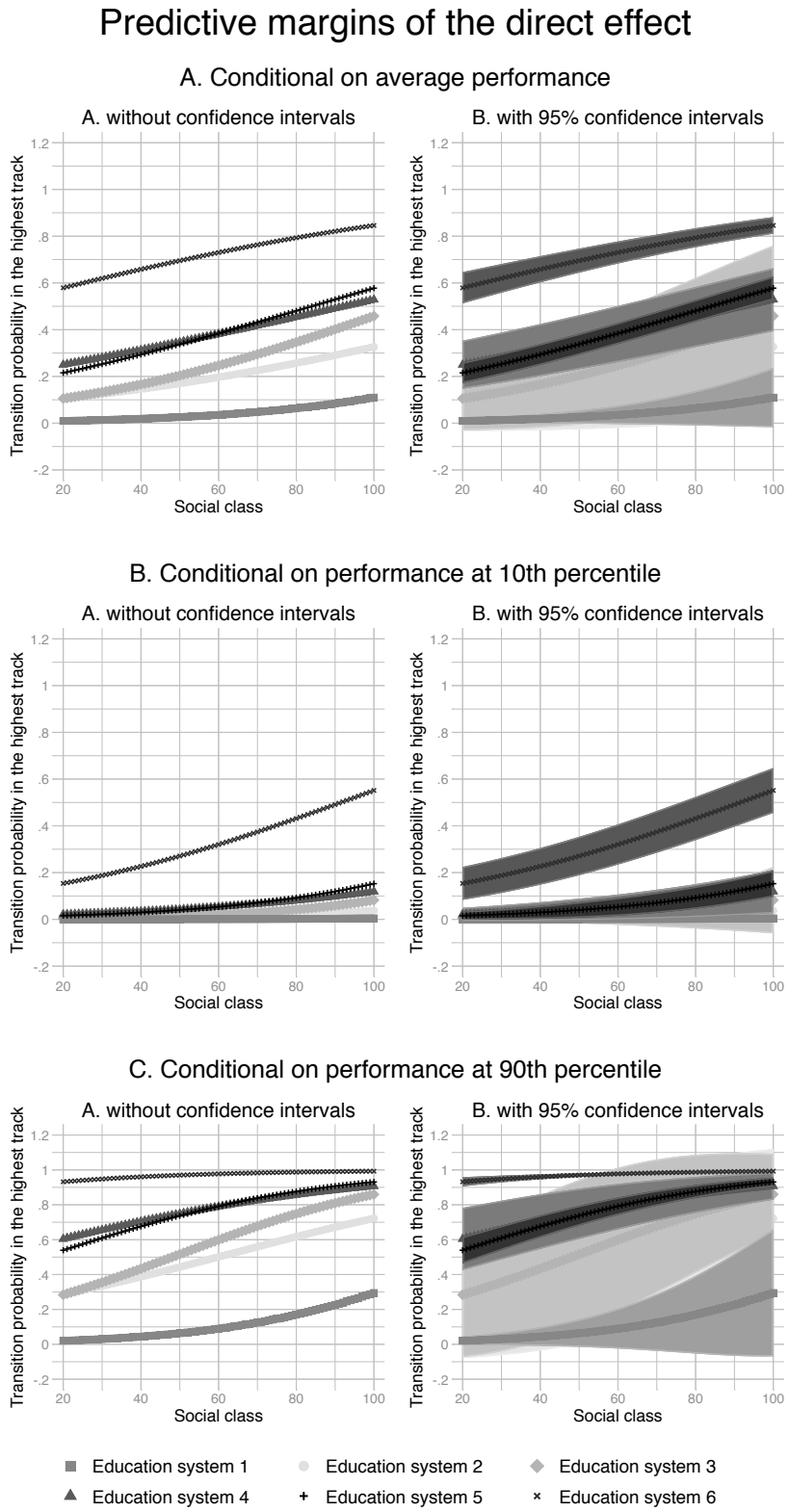
4.2. Research question 2: Do the direct and the indirect effect of social background differ between education systems?

In a next step, I examine, in relation to the second research question, by which channels students' social background creates these inequalities – whether it is mostly their educational performance (indirect effect) or whether social class has an effect above and beyond students' performance (direct effect). As already mentioned in the data section, the educational performance was not observed before students transitioned from primary to secondary school, so there is a potential risk that my estimate of the social background effect conditional on students' performance is biased. However, the robustness check (see Section A.3 in the Appendix) indicates that this time lag between the actual transition and the assessment of the educational performance does not bias the estimates. I start the analyses again by plotting the predictive margins of the social background effect conditional on students' educational performance in ninth grade to show how the effect size of the direct effect differs by education system (see Figure 3). Subfigure A of Figure 3 shows a similar pattern as Subfigure A of Figure 2, with the exception that high-SES students in Education Systems 4, 5, and 6 now have an even higher absolute transition probability compared to those in Education System 1 (see also Table 3, Model 4a, in which we see a tendency toward an inverted u-shape relation too). To further illustrate these differences in the track allocation, I also plot the predictive margins not only for the average performance, but also for students in the 10th and the 90th percentile of the educational

performance distribution in ninth grade (Figure 3, middle row and bottom row). It is impressive to observe that even students with a very low test score have had a decent chance of being placed in the highest education track in the most inclusive education system, Education System 6, unlike in all other education systems. In contrast, there is a very high chance that even the most skilled low-SES students will not attend the highest track in the least inclusive education system, Education System 1 (bottom row). Focusing on the relative educational inequality, we see again that as soon as I exclude the canton of Zurich, the share of high-SES students versus low-SES students in the highest track does not differ between the education systems, conditional on their performance in the ninth grade (see Model 4b versus 6b in Table 3). In a next step, I examine with scatterplots the relationship between the direct effect, the indirect effect, and how these effects relate to the degree of stratification, and thus the inclusiveness of an education system (see Figure 4). First, we see more clearly in Subfigure A of Figure 4 that the size of the direct effect in the LPM tends to follow an inverted u-shape (bivariate regression: $p_{beta} = 0.063$; $p_{beta^2} = 0.064$), which resembles the results in the Models 4a and 6a in Table 3. For the logit model (see Subfigure B of Figure 4), however, we do not observe a correlation between the size of the direct effect and the inclusiveness of the education system. Second, we also find a nonlinear relationship for the indirect effect in the LPM (bivariate regression: $p_{beta} < 0.001$, $p_{beta^2} = 0.002$), while the nonlinear effect in the logit model is not significant (bivariate regression: $p_{beta} = 0.129$, $p_{beta^2} = 0.074$) (see middle row). This implies that the less selective an

education system is, the more parents influence their child's transition probability over their child's educational performance, peaking in Education System 5 and slightly decreasing in Education System 6.

Figure 4: Scatterplots and local polynomial fit based on the full models



Third, to be able to compare the share of these effects independently of the size of the overall effect, I need to report their relative size in relation to the overall effect. I thus present in Table 4 the relative size of the indirect effect (in Boudon's terminology the primary effect of social origin) for each education system, with confidence intervals, to be able to assess the predominant transmission channel. My results show that in almost all education systems, with the exception of Education Systems 3 and 4, the coefficient of the primary effect is above 50% for both the LPM and the logit models, and in Education System 5 and 6 the confidence intervals are higher than 50%, thus implying that the primary effect indeed prevails over the secondary effect. To examine the relationship between the primary effect of social origin and the degree of inclusiveness, I refer to the last row of the scatterplots (see Figure 4, Subgraphs E and F): there we observe a positive correlation between the primary effect of social origin and the degree of inclusiveness (bivariate regression coefficient for both models = 0.31, p_{LPM} = 0.039; p_{Logit} = 0.02). I can thus conclude that with an increasing inclusiveness, and thus less selectivity in the education system, parents seem to exercise their influence mostly over students' educational performance.

Table 4: Primary effect of social origin in different education systems

Education system	Primary effect of social origin[a]	
	LPM	Logit models
1	56.34	55.56[b] (CI: 49.88 – 61.25)
2	66.67	58.98 (CI: 30.13 – 87.82)
3	45.45	40.12 (CI: 22.51 – 57.72)
4	57.69	59.07 (CI: 52.49 – 65.65)
5	45.87	52.93 (CI: 48.96 – 56.90)
6	66.67	64.07 (CI: 59.79 – 68.36)

a: 100 - (direct effect / total effect)
b: Results without canton of Zurich: 79.33 (53.23 – 105.43)
Confidence intervals for the KHB method obtained by the delta method

4.3. Research question 3: Which features are responsible for the unequal impact of social background in the different education systems?

The main goal of my analyses so far has been to show how the education systems differ from each other descriptively. However, it remains unclear which features of the education system create these inequalities, which is my third research question. In Section 2, I proposed several mechanisms by which high-SES students could benefit from different institutional settings. First, I suggested that the overall influence of high-SES parents on students' track allocation increases with higher stratification respectively

decreases with higher inclusiveness because the competition for attending the highest track becomes more fierce due to the scarcity of the spots available (e.g. Adnett and Davies 2002). As parents may transmit their privilege in any way possible in a highly competitive environment, I assumed that the overall effect of social background should increase in education systems that are less inclusive, with more tracks. We already observed in the scatterplots above that the relationship between the overall parental influence and the inclusiveness of an education system is nonlinear, and that educational inequality even differs heavily between different cantons within the same education system, as in the case of the cantons of Solothurn and Zurich. In Table 4 (Models 1a and 1b), we see that the overall influence of parental class does not change with a higher number of tracks. However, looking at Model 2a, it seems that conditionally on their educational performance at ninth grade, high-SES students indeed have a higher absolute probability of being in the highest performance track in education systems with more tracks and thus with a lower inclusiveness. This is unexpected from a theoretical point of view but mirrors the previous result that in less inclusive education systems parents are more prone to use additional strategies beyond increasing their child's educational performance (Jackson and Jonsson 2013). Second, I elaborated that an earlier start of tracking should increase high-SES parents' influence on their child's track allocation conditional on their child's performance because, on the one hand, external influences like peers increase, while, on the other hand, the ambiguity about the child's future performance decreases. My results indeed show an effect of later age at tracking, but in the opposite direction as predicted, for both the LPM and the logit model (see Model 2a and 2b). Third, I elaborated that it is not possible to conclude from my theoretical reflections whether the direct effect of social background should be greater in education systems with standardized examinations or with compulsory teacher decisions. As can be seen in Table 5, at least in absolute terms (see all Models a), high-SES parents have more influence on their child's track allocation in education systems with compulsory teacher decisions, while there is no effect in the logit models. All these aforementioned effects of the different features of the education system are, further, rather unstable, as can be seen in the jackknife analyses in the Web Appendix (see Section 4.4). Two possible explanations come to mind: first, the effect identification very often depends on a very small set of cantons,[15] and, second, it seems as if there is a lot of effect heterogeneity even within education systems. Summarizing the results of my third research question, I can conclude that the results are rather unstable, therefore precluding a valid conclusion regarding the exact mechanisms by which high-SES parents transmit their privilege in different education systems.

[15] For example, age of tracking is identified only by the difference between Education Systems 3, 4, and 5.

Table 5: Effect of social background in different education systems. Dependent variable: transition to the highest track in a canton

	Linear probability models				Logit models, OR reported			
	Full model		Without Zurich in education system 1		Full model		Without Zurich in education system 1	
	(1a)	(2a)	(3a)	(4a)	(1b)	(2b)	(3b)	(4b)
Parental class	0.010***	0.003**	0.010***	0.002**	1.053***	1.020***	1.056***	1.021***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.005)	(0.005)	(0.005)	(0.005)
PISA test score		0.003***		0.003***		1.025***		1.025***
		(0.000)		(0.000)		(0.001)		(0.001)
Number of Tracks x Parental Class	0.000	0.001*	0.000	0.001*	1.001	1.007*	0.998	1.005
	(0.001)	(0.001)	(0.001)	(0.001)	(0.003)	(0.003)	(0.003)	(0.003)
Late start of tracking[a] x Parental Class	0.001	0.002*	0.000	0.002*	1.004	1.010*	1.002	1.009*
	(0.001)	(0.001)	(0.001)	(0.001)	(0.004)	(0.004)	(0.004)	(0.005)
Stand. Test[b] x Parental Class	-0.004*	-0.006***	-0.005	-0.006**	1.009	1.000	0.997	0.994
	(0.002)	(0.001)	(0.003)	(0.002)	(0.008)	(0.006)	(0.010)	(0.005)
Constant	0.789***	-1.424***	1.417***	-1.018***	0.217	0.000***	145.63***	0.000***
	(0.148)	(0.136)	(0.139)	(0.128)	(0.288)	(0.000)	(108.36)	(0.000)
N	32261	32261	29304	29304	32261	32261	29304	29304
R^2 / Pseudo R^2	0.281	0.460	0.262	0.454	0.239	0.460	0.218	0.444

Controlled for: age, sex, urbanity of school district, canton-waves.
a: Reference category: Early start of tracking
b: Reference category: Teacher decision

4.4. Post-hoc reflections

Finally, I want to provide a hypothetical explanation of the heterogeneous effect within the most stratified education system and propose some possible further research questions. In the analyses of the overall effect of social background in Table 3, we observed that in the canton of Solothurn, high-SES students' transition probability is not increased, while in the canton of Zurich, high-SES students clearly not only have an absolute but also a relative advantage over their low-SES peers. This result implies that there are other contextual factors that are probably relevant, something that is normally not considered in country comparisons. In the case of these two cantons, a possible explanation might be the different socioeconomic composition of the population. While the share of the population with a tertiary degree is rather low in the canton of Solothurn (2000: 18.2%; 2010: 23.1%), it is markedly higher in the canton of Zurich (2000: 25.6%; 2010: 33.8%)[16], while the percentage of students attending the highest track does not differ (arithmetic mean Solothurn: 13%; arithmetic mean Zurich: 13.6%). This could create a highly competitive situation in the canton of Zurich due to the mismatch between available spots in the highest track and the share of parents interested in those, while in the canton of Solothurn there is only a weak competition for allocation in the highest track among high-SES parents, due to the sufficient number of spots available. Thus, high-SES parents in the canton of Solothurn do not have to rely on anything else besides their child's educational performance to increase the probability of their child's transition to the highest track (primary effect of social origin in Solothurn: 79.33, CI: 53.23 – 105.43), while high-SES parents

[16] Source: Swiss Federal Statistical Office: https://www.atlas.bfs.admin.ch/maps/13/de/10645_9514_9507_3113/17942.html (15.6.16)

in the canton of Zurich are forced to consider other means (primary effect of social origin: 44.15, CI: 38.40-49.91). In the future, it might thus be worth exploring whether the structure of the education system only affects educational decision-making behavior in a context of high competition for track allocation.

5. Conclusion

The objective of this paper was to investigate how the degree of stratification and the specific institutional setting of the education system moderate parental influence over their child's track allocation, using a Swiss dataset. To be more specific, the paper's focus was, first, whether the total effect of parents' social background differs by education system and whether this is related to the education system's degree of stratification, and thus inclusiveness; and, second, whether this correlates with the strategy parents use to ensure their child's track allocation – the primary or the secondary effect of social origin; and, third, whether specific features of the education system, like the number of tracks, the point at which tracking starts and the method of selection, are especially beneficial for high-SES parents. This contribution expands on previous research in several respects. First, previous research has either focused only on one aspect of the education system (namely, the method of selection) or has conflated various aspects of the education system into one category – the degree of stratification. Second, to decrease omitted-variable biases, to which cross-national comparisons are prone, I compared education systems within one country.

Summarizing my results on the overall effect of social background in different education systems, I find, first, that the absolute transition probability of high-SES students increases in more inclusive education systems, with a slight tendency toward an inverted u-shape pattern, while their odds in comparison to low-SES students do not differ between the education systems – a rather unexpected result given previous research. Second, taking into account students' performance, I observed that with an increasing inclusiveness in the education system (i.e. a lower degree of stratification) parents tend to transmit their privilege by influencing their child's educational performance, consequentially increasing the primary effect of social origin in these education systems. This result confirms the previous finding by Jackson and Jonsson (2013) that the higher the degree of stratification, the bigger the secondary effect of social origin. Third, based on previous research and theoretical considerations, I suggested several mechanisms by which certain features of the education system might increase educational inequality. However, because the results were rather unstable, valid conclusions on the exact mechanisms by which high-SES parents transmit their privilege in different education systems are not possible. I am therefore also not able to confirm the finding of Bauer and Riphahn (2006) that the overall educational inequality is greater in Swiss cantons with early tracking. Finally, I made the observation, which was unforeseen, that

the two cantons belonging to the most stratified education system differ heavily in their overall educational inequality. As a possible explanation for this unexpected result, I suggested that in a canton with low inclusiveness of the highest track and with a high share of well-educated parents the mismatch between demand and available spots in the highest track might create a competitive situation, consequently increasing the secondary effect of social origin because high-SES parents need to adopt further strategies beyond their child's educational performance to ensure allocation to the highest track. Even though this explanation is only loosely based on data, it merits attention for further research because it hints at the possibility that institutions influence the behavior of individuals differently with varying contexts.

Some last words on the limitations and the contribution of this study. A first limitation is that the analyses are based on a rather small number of units at the macro level. Even though the number of canton-waves is quite high, in the end I nevertheless only observe 14 macro units. Clearly, a larger number of cases at the macro level would further strengthen the findings, and thus replication in other countries with similarly decentralized education systems may be worthwhile. Second, the case number at the micro level is also rather small for Education Systems 2 and 3, leading to high standard errors. Third, the PISA dataset is not the best dataset for analyzing the size of the primary and secondary effects of social origin in different education systems, given that the test is taken three to four years after transition. However, sensitivity analyses using the TIMSS dataset, in which it is possible to restrict the analysis to students who transitioned around nine months before taking the test, showed that the effect of social background while controlling for performance does not differ heavily between the PISA and the TIMSS datasets. Therefore, it can be assumed that there is no disproportionate performance increase in specific education systems over time, which would bias the results. Still, it would be advisable to replicate these analyses with a dataset in which students' performance is measured before the transition takes place. Notwithstanding these limitations, this study provides two important contributions for theory development. First, to my knowledge, this is the first paper to describe in detail possible mechanisms by which specific features of an education system could increase class-based educational decision-making. Second, the unexpected finding that the same features might affect the decision-making process differently depending on context factors warrants more research on the mechanisms of educational decision-making.

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