



Ethnic clustering in schools and early career outcomes

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ABSTRACT

This study examines the impact of ethnic clustering during compulsory schooling on the career paths of ethnic minority students. We observe whether students upon completing compulsory school join an academic track, a vocational education, a transition year or no further education. We show that the effect of foreign language peers depends on whether or not they speak the same foreign language as the observed student. A higher overall share of foreign language peers in a cohort increases the probability of these students entering vocational education at the expense of academic education. It also leads to lower projected earnings. Peers speaking the same foreign language as the student observed also increase the student's chances of joining vocational education, but at the expense of a transition year. Looking at mechanisms, we provide evidence that foreign language peers affect language acquisition negatively, but can provide positive network effects.

1. Introduction

Following various waves of immigration, many Western countries are today characterized by high ethnic diversity and large shares of immigrants. This share is around 15 percent in France, Germany, the United Kingdom, and the United States, and even around 30 percent in Australia and Switzerland (United Nations, 2019). A high share of migrants increases the risk of ethnic clustering in specific municipalities and neighbourhoods, and also affects ethnic clustering in schools. Schools play an important role in promoting the integration of ethnic minority students and their families (Arenas & Hindriks, 2021; Billings, Deming, & Rockoff, 2014; Derenoncourt, 2022; Laliberté, 2021; Tuttle, 2019). Students learn the local language and other skills relevant to thrive in the local society. In addition, schools are a place where friendships are made within one's ethnic community and beyond. These friendships play a crucial role in promoting language acquisition and shaping students' (professional) networks. It is important to understand how ethnic clustering in schools affects the educational and early career outcomes of ethnic minority students.

Thus far, the literature has mainly analysed how short-term outcomes, such as test scores of the general population, change with the share of ethnic minority peers (Ballatore, Fort, & Ichino, 2018; Bossavie, 2020; Brunello & Rocco, 2013; Entorf & Lauk, 2008; Figlio & Özek, 2019; Jensen, 2015; Jensen & Rasmussen, 2011; Ohinata & Van Ours, 2013a, 2013b; Schneeweis, 2015; Tonello, 2016) or the share of non-native speakers (Cho, 2012; Conger, 2015; Diette & Uwaifo Oyelere, 2014, 2017; Geay, McNally, & Telhaj, 2013).¹ Results vary widely, with some studies finding positive effects of minority peers and other studies finding negative effects. Meschi and Pavese (2023) study the effect of low-ability peers on the educational attainment of ethnic minority students. Schneeweis (2015) studies, among others, the effect of immigrant peers on the transition from primary to secondary education of both native and immigrant students. Åslund, Edin, Fredriksson, and Grönqvist (2011), Fletcher, Kim, Nobles, Ross, and Shaorshadze (2021) and Friesen and Krauth (2011) study the additional effect of a greater share of members of a student's own ethnic group on short-term educational outcomes, such as test scores, grades, academic effort, and years of schooling.

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¹ A related strand of literature studies the impact of the racial composition of classes and schools on short-term educational outcomes (Angrist & Lang, 2004; Guryan, 2004; Hanushek, Kain, & Rivkin, 2009; Hoxby & Weingarth, 2005). Other studies have investigated how the development of soft skills, such as trust varies with the ethnic mix in schools and have examined the alleviating effect of targeted interventions (e.g., Alan, Baysan, Gumren, & Kubilay, 2021; Pregaldini, Balestra, & Backes-Gellner, 2022).

The diverse results in the previous literature are likely the result of different mechanisms through which ethnic minority peers can affect others. First, the development of the ethnic minority students' language skills may depend on the share of foreign language peers. Specifically, ethnic segregation reduces contact with native language speakers and possibilities for interactions (Lazear, 1999) and hampers language proficiency (Danzer & Yaman, 2016). This is unfortunate as a better command of the local language may open up a different set of career options for members of ethnic minorities (Dustmann, 1994; Dustmann, Machin, & Schönberg, 2010; Dustmann & van Soest, 2002).

Second, career opportunities may depend on the composition of a network. Ethnic enclaves provide members with useful information on norms, job offers, or social welfare programmes (Beaman, 2012; Bertrand, Luttmer, & Mullainathan, 2000; Cutler, Glaeser, & Vigdor, 2008; Damm, 2009; Edin, Fredriksson, & Åslund, 2003). For example, connections to employers are particularly relevant for post-compulsory education in Switzerland where Vocational Education and Training (VET) programmes require students to find an apprenticeship position with a firm upon leaving compulsory school.

Thus, so far, we know relatively little about the effects of ethnic clustering in schools on a broader set of outcomes, particularly post-compulsory schooling outcomes among members of ethnic minorities, and we have a limited understanding of the mechanisms resulting in positive or negative peer effects.²

We contribute to filling this research gap by studying how ethnic clustering during compulsory schooling affects post-compulsory educational choices and early career outcomes among ethnic minority students in Switzerland. Switzerland has a high share of immigrants (United Nations, 2019) as well as high levels of ethnic segregation (Alesina & Zhuravskaya, 2011; Hodler, Valsecchi, & Vesperoni, 2021) and ethnic fractionalization (Alesina, Devleeschauwer, Easterly, Kurlat, & Wacziarg, 2003), which generates variation in school ethnic composition that we can exploit for identification. We use newly released longitudinal data on the universe of students in Switzerland at the transition from compulsory schooling to post-compulsory education. We focus on foreign language students, defined as students whose first language spoken at home differs from the local language, and evaluate the impact of exposure to foreign language peers on their post-compulsory educational choices and projected labour market outcomes.³ These educational choices are (1) to transition into the academic track, (2) to start a VET programme, (3) to attend a transition year, and (4) to exit compulsory education without any further schooling. We further investigate the quality of the chosen VET programme and projected earnings and the prestige of associated occupations. To causally identify the effect of ethnic clustering, we exploit the natural variation in the ethnic composition across cohorts within school tracks.⁴ This strategy rests on the assumption that the variation in cohort ethnic composition is quasi-random and unrelated to other factors affecting educational and occupational choices. We provide evidence in support of this assumption with several tests.

We find that foreign language peers clearly affect educational choices and early career outcomes of foreign language students. An increase in the share of foreign language peers by one standard deviation (23.4 percentage points or approximately 15 students in a cohort of 64) increases the probability that the student under consideration starts a

VET programme by 1.5 percentage points (or 3.4% relative to the mean of 43.1% in the sample of foreign language students), while reducing the probability of proceeding to academic education by 0.8 percentage points (or 3.6% relative to the mean of 21.3%) and the probability of joining a transitional education programme by 0.6 percentage points (or 2.2% relative to the mean of 25.6%). There is interesting effect heterogeneity with respect to the type of foreign language peers that a foreign language student faces. A higher share of students speaking the same foreign language as the student under consideration is responsible for the shift from transitional education into VET programmes, while a higher share of students speaking another foreign language pushes students from academic education into VET programmes. Furthermore, we find some evidence that students with more foreign language peers tend to choose less ambitious VET programmes. For example, we find that a one standard deviation increase in the share of foreign language peers reduces the predicted future income by around CHF 420 per year.

We provide evidence on the importance of (negative) language and (positive) network effects. First, we present a heterogeneity analysis investigating the role of the size of foreign language communities to better understand the importance of network effects. Second, to study the effect of peers on language acquisition, we analyse how foreign language peers affect students' transition into VET programmes with high local language requirements. We conclude that the observed peer effects on educational and labour market outcomes of foreign language students are shaped by both, social networks, as measured by the size of ethnic enclaves, and the acquisition of local language skills.

This paper contributes to the literature on ethnic peer effects in schools in three ways. First, we focus on the sub-population of foreign language students. The literature primarily examines the general population, often finding very small to insignificant effects. We show that the clustering of ethnic minorities has substantial negative effects on foreign language students in terms of their career paths, but also uncover interesting differences between the effects of peers speaking the same or another foreign language as the student under consideration. Second, we go beyond analysing short-term outcomes such as test scores. Instead we focus on post-compulsory education, which is key for paving the way to long-term success in the labour market. In this way, we make a first step towards bridging the literature documenting the negative effects of other foreign peers in schools with studies showing improved labour market outcomes in ethnic enclaves. Third, we provide suggestive evidence that the observed peer effects of foreign language students are driven by minorities' command of the local language (or lack thereof) and the social networks offered by ethnic enclaves.

The paper proceeds as follows. Section 2 introduces the relevant background on immigration and the school system in Switzerland. Sections 3 and 4 present the data and the empirical strategy, respectively. Section 5 discusses the main results, presents robustness tests, and provides suggestive evidence on potential channels. Section 6 concludes.

2. Background

The share of foreign workers in the Swiss workforce was 32.2 percent in 2021 (Bundesamt für Statistik, 2021). In light of this high level of ethnic diversity, the Swiss school system plays an important role in promoting integration. A main integrative feature is, that almost all students – 96 percent of primary-school students and 94 percent of students at the (lower) secondary level – are enrolled in public schools (Nikolai, 2019). Moreover, there is a legal obligation to attend schools in the area where one lives (Diem & Wolter, 2011). This obligation might promote the integration of ethnic minority students, but it could also lead to ethnic clustering in the presence of high residential segregation (Alesina & Zhuravskaya, 2011; Hodler et al., 2021).

² Few studies investigate longer-term educational outcomes such as passing the high school matriculation exam and STEM major choice (Anelli, Shih, & Williams, 2023; Gould, Lavy, & Paserman, 2009) or other types of outcomes such as peers' mental health (Georgiades, Boyle, & Fife, 2013), health risk behaviour, labour market earnings, and the quality of residential location (Fletcher et al., 2021).

³ We follow a large literature by relying on language to measure ethnicity (e.g., Alesina et al., 2003).

⁴ One school track is one performance level (out of typically two) within one specific school.

The Swiss education system is characterized by comparatively early tracking into either academic or vocational post-compulsory education, and a strong standardization of certificates within the labour market (Allmendinger, 1989; Kerckhoff, 1995). The combination of early tracking and employers' reliance on VET certificates makes the educational and occupational choices at the end of compulsory schooling highly relevant for later labour market outcomes.⁵

Fig. 1 provides a graphical overview of the Swiss school system. As compulsory education is primarily a cantonal responsibility, this figure masks some limited heterogeneity in the exact school system across Swiss cantons. The Swiss school system is characterized by eleven years of compulsory education: after two years of compulsory kindergarten at the ages of four to five years, students continue with six years of primary education and then three years of lower secondary education. A first tracking based on grades takes place after six years of primary school (Neuenschwander & Malti, 2009). At age fifteen, after completing compulsory education, students separate into different career paths for their post-compulsory education. This transition is also affected by the track followed at the secondary level (Kost, 2013).

The most common option for post-compulsory education is to join a Vocational Education and Training (VET) programme (with the corresponding share being 46.5 percent in our data). VET programmes typically combine three to four days per week in a workplace with one to two days of schooling. Admission to VET programmes, therefore, requires a work contract with a firm. Students either choose a more difficult three- to four-year VET programme leading to a federal certificate of competence (Eidgenössisches Fähigkeitszeugnis, EFZ) or obtain a less difficult federal vocational certificate (Eidgenössisches Berufsattest, EBA) after two years. Upon completing one of these vocational degrees, students are ready to join the labour market as qualified workers or continue with further education. The second most common option is the academic track (with the corresponding share being 29.0 percent in our data), which prepares for tertiary education at a university or university of applied sciences. In most cantons, admittance into the academic track is in grade 9, which is conditional on passing an entry exam in many but not all cantons.

Since both the vocational and the academic education paths are selective, many students (16.5 percent in our data) have no better option than joining a transitional education—a so-called bridge (rather than gap) year. These bridge years should prepare students for the next steps in their career, typically the choice of a suitable VET programme. Finally, some students (8.1 percent in our data) may proceed without any post-compulsory education.

3. Data

To analyse the effect of ethnic minority peers on students' educational choices and projected labour market outcomes, we link two administrative data sets. First, we draw on the universe of students in Switzerland covered in the LABB data (*Längsschnittanalysen im Bildungsbereich*) provided by the Swiss Federal Statistical Office. Second, we augment this data set with predicted labour market outcomes using the Swiss Labour Force Survey (SLFS) for students who start a VET programme.

⁵ The permeability between vocational and academic career paths has increased in recent years. However, the selection of a post-compulsory educational path is still highly significant for youths' career opportunities. Moreover, permeability seems to facilitate the transition from academic paths to VET (9 percent of students) rather than the other way around (4 percent of students) (Tuor & Backes-Gellner, 2010). The results obtained from studying the Swiss case are mainly generalizable to countries with similar education systems, such as Austria, Germany, and the Netherlands. In 2023, the combined population of these countries roughly amounts to around 15 percent of the European population based on United Nations population data (United Nations, 2023).

The LABB data are a comprehensive data set that provides information about all students in compulsory education covering individual characteristics such as month and year of birth, gender, and first language spoken at home; educational pathways including the student's school, cohort, track, and grade; and the specific VET programme chosen (if any). The population of interest is all foreign language speakers in grade 8 – the second-to-last year of compulsory schooling – from 2011 to 2016. Grade 8 is a natural choice for two reasons. First, it captures the cohort composition before some students transition to academic education. Second, most of the students pursuing a vocational education decide on a specific VET programme in grade 8.

We define foreign language speakers as students whose first language spoken at home does not correspond to the predominant local language where the school is located.⁶ We prefer to define ethnic minorities by language rather than citizenship because the many migrants from France, Germany and Italy living in the French-, German-, and Italian-speaking parts of Switzerland, respectively, are typically well integrated and rarely experience the potential disadvantages commonly associated with ethnic minority status. Furthermore, Switzerland has a very strict naturalization policy (Solano & Huddleston, 2020). As a result, many second- and third-generation migrants are not Swiss citizens, but may be well integrated and may speak the local language at home. We thus view the language spoken at home as a better measure of integration.

In line with our empirical identification strategy, we define the peer group of students to be a single cohort within a school track, but possibly across classrooms if there are multiple classes of the same cohort and track within a school.⁷ Accordingly, we define two variables measuring the ethnic composition of the peer group of a student. First, we calculate the leave-one-out share of foreign language speakers in each student's school-track cohort (i.e., leaving out the student under consideration when computing this share). Second, we calculate the leave-one-out share of students speaking the *same* foreign language as the student in the school-track cohort.⁸

Our outcomes measure the student's career path in the first year of post-compulsory education and, therefore, two years after grade 8 (see Fig. 1). Specifically, we construct individual dummy variables for pursuing an academic education, vocational education, transitional education (i.e., a bridge year), and no post-compulsory education. For those students who start a VET programme, we can also observe their occupational choice. There are currently 245 distinct VET programmes to choose from (Forschung und Innovation Staatssekretariat für Bildung, 2022) that can be aggregated to broader fields of interest and levels of difficulty (EBA vs. EFZ; see Section 2).

For predicted labour market outcomes, we map VET programmes to a broad range of occupations. This mapping is nontrivial because the LABB data provide information about educational profiles but not later labour market outcomes, while the SLFS provides information about occupations and wages but not educational profiles. We thereby proceed in two steps. First, we assign the following two measures

⁶ Given that there are multiple language regions in Switzerland, a Swiss citizen who speaks an official Swiss language can be classified as a foreign language speaker if they reside in another language region. We show in Section 5.3 that our results are not driven by Swiss native language speakers who reside in a different language region.

⁷ We could alternatively define larger peer groups based on school cohorts (independently of tracks) or smaller peer groups based on classrooms. We later show that our results are robust to using school cohorts. In contrast, the variation in peer groups at the level of the classrooms would not be random. The reason is that school principals may be informed about their students' first language and may use this information when assigning students across classes of the same cohort and track.

⁸ Results are very similar when including the student under consideration when computing these shares. In what follows, we omit "leave-one-out" in the text for brevity.

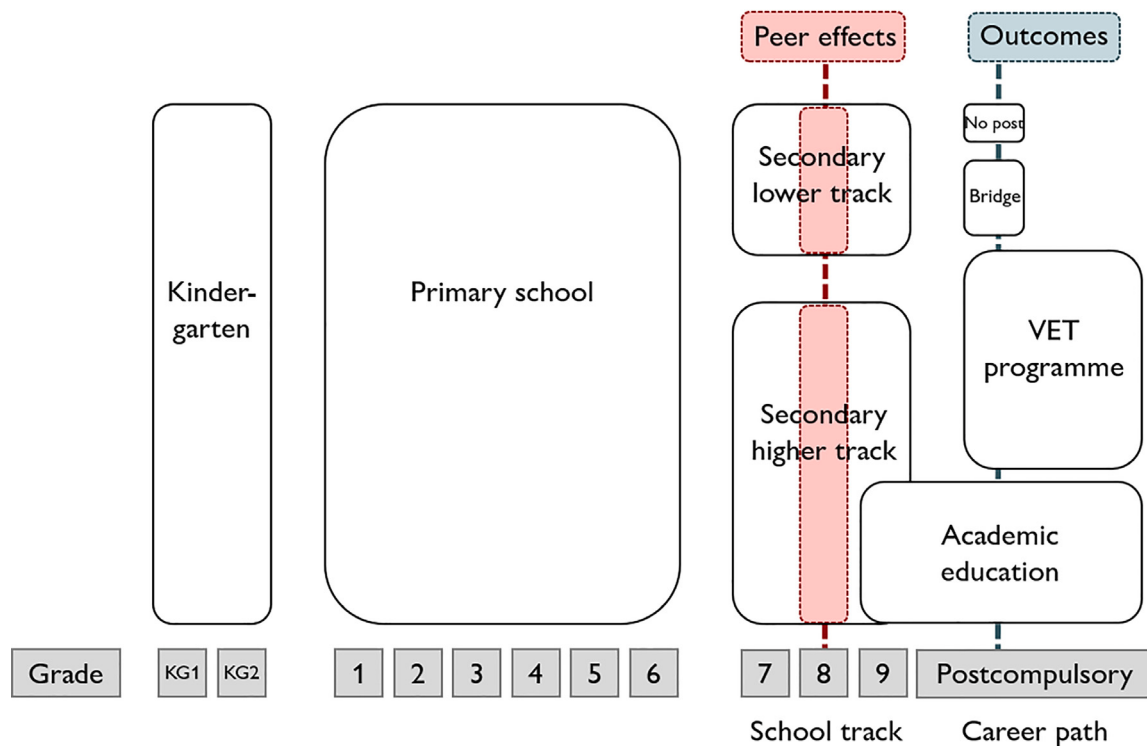


Fig. 1. Schematic overview of the Swiss schooling system.

Notes: This figure illustrates the structure of the Swiss school system. After two years of kindergarten, children attend primary school for six years (grade 1 to 6). After primary school, children are tracked into a lower or higher secondary track (grade 7 to 9). Peer effects are measured at grade 8 within each school track (i.e. within the lower or higher secondary track). Students who finish compulsory education can attend a VET programme, academic education (often starting already at grade 9), transition education (bridge year), or may proceed with no post-compulsory education. Outcomes are measured in the first year of post-compulsory education.

to each occupation surveyed in the SLFS in 2010–2012: (1) average gross annual income by gender and (2) prestige according to the Standard International Occupation Prestige Scale (SIOPS) by [Ganzeboom and Treiman \(1996\)](#).⁹ Second, we use a conversion table provided by the Swiss Federal Statistical Office, which allows us to link VET programmes to occupations in the SLFS, as well as the SLFS survey weights to compute expected/predicted income and prestige of the different VET programmes.

Table 1 shows descriptive statistics. The sample contains 434,480 students.¹⁰ Columns (1) and (2) present the descriptive statistics for the entire student population. The remaining columns zoom in on the sub-samples of interest. Columns (3) and (4) present the descriptive statistics for the population of foreign language students, who account for 25.6 percent of the entire student population. Finally, columns (5) and (6) restrict the sample to foreign language students who start a VET programme. In addition, Appendix Table A.1 presents information on the size of the different foreign language groups in our sample.

Table 1 shows that the samples of all eighth-grade students and foreign language eighth-grade students are comparable in characteristics such as gender and age but differ in many other aspects. Not surprisingly, the latter are less likely to be Swiss or to be born in Switzerland. More interestingly, they are also much more likely to be exposed to more foreign language peers (41.9 percent compared to 25.9 percent

in the overall student population). Additionally, they differ in their educational pathways. Only 21.3 percent of foreign language students continue with academic education, compared to 29.0 percent of the overall student population. Furthermore, foreign language students are less likely to continue with a VET programme (43.1 percent versus 46.5 percent) but more likely to attend a transitional education programme (25.6 percent versus 16.5 percent). However, foreign language students attend VET programmes with similar predicted income and prestige as the overall population in the vocational track.

4. Empirical strategy

The aim of this paper is to evaluate the impact of exposure to foreign language peers on the career paths and projected labour market outcomes of foreign language students. Empirically, we first estimate the following linear model:

$$y_{is(t+2)} = \alpha + \beta SFL_{-ist} + \gamma X_{ist} + \delta C_{-ist} + \theta_s + \rho_t + \epsilon_{is(t+2)}, \quad (1)$$

where $y_{is(t+2)}$ is the outcome of interest for student i from school track s in the first year of post-compulsory education, i.e., year $t+2$. SFL_{-ist} is the share of foreign language students in grade 8 at the *school-track cohort level*. With X_{ist} , we include a set of individual-level control variables. They include general determinants of school performance and career prospects like age, gender, and, importantly, dummy variables indicating the first language spoken at home. We further include a dummy variable for Swiss citizenship as well as time-of-arrival fixed effects indicating whether the student was born in Switzerland, arrived before compulsory schooling, arrived during primary school, or arrived during secondary school. With C_{-ist} , we include a set of school-track cohort control variables. These are the leave-one-out average age of peers and the leave-one-out share of female peers to control for age- and gender-related peer effects. We also control for the size of the school-track cohort. Furthermore, we include interacted school-track

⁹ SIOPS relies on a survey conducted in 55 countries where respondents were asked to rate job titles in terms of their social prestige. We also used the International Socioeconomic Index of Occupational Status by [Ganzeboom, De Graaf, and Treiman \(1992\)](#). Results are similar and available upon request.

¹⁰ The sample is restricted to students aged 11 to 18 in grade eight with non-missing information in their first language. 96.8 percent of these students are aged 13 to 15. We further exclude the 6.5 percent of students in implausibly small school track cohorts with less than 15 peers.

Table 1
Descriptive statistics.

	All eighth-grade students		Foreign lang. students		Foreign lang. VET students	
	Mean	SD	Mean	SD	Mean	SD
	(1)	(2)	(3)	(4)	(5)	(6)
<i>A. Individual characteristics</i>						
Foreign language	0.256	0.437	1		1	
Swiss nationality	0.800	0.400	0.437	0.496	0.446	0.497
Born in Switzerland	0.887	0.316	0.735	0.441	0.786	0.410
Arrival: before school entry	0.031	0.172	0.065	0.246	0.056	0.230
Arrival: during primary school	0.059	0.235	0.137	0.343	0.112	0.316
Arrival: during secondary school	0.024	0.152	0.064	0.244	0.046	0.209
Female	0.496	0.500	0.498	0.500	0.423	0.494
Age in 8th grade	13.485	0.678	13.614	0.725	13.709	0.713
<i>B. School-track cohort characteristics</i>						
SFL (any FL)	0.259	0.211	0.419	0.234	0.430	0.237
SFL-SSFL (other FL)	0.147	0.193	0.373	0.204	0.381	0.205
SSFL (same FL)	0.111	0.089	0.046	0.087	0.048	0.086
School-track cohort size	68.534	50.555	64.011	45.088	53.735	36.739
<i>C. Career paths</i>						
Academic education	0.290	0.454	0.213	0.410		
Vocational education	0.465	0.499	0.431	0.495	1	
Transitional education	0.165	0.371	0.256	0.436		
No post-compulsory education	0.081	0.272	0.100	0.300		
Observations	434,480		111,313		47,971	
<i>D. VET track</i>						
Difficult VET (EFZ)	0.960	0.197			0.911	0.284
Predicted income (in 1,000 CHF)	76.651	13.706			77.099	13.864
Predicted SIOPS prestige	41.204	6.612			41.183	6.100
Observations	201,822				47,971	

Notes: Columns (1) and (2) show descriptive statistics for the overall student population in grade eight. Columns (3) and (4) restrict the sample to students whose first language spoken at home is not the dominant language in the region where the school is located. Columns (5) and (6) further restrict this sample to those foreign language students starting a VET programme. Panel D has fewer observations because these outcomes are available only for students starting a VET programme.

fixed effects θ_s and cohort fixed effects ρ_t to account for the level of randomization. This means that we exploit idiosyncratic variation in ethnic composition across cohorts within a certain school and performance level (track). $\epsilon_{is(t+2)}$ represents the idiosyncratic error term. We cluster the standard errors at the school-track level to account for correlation across students within the common environment.

We then use the following specification to disentangle the effects of peers speaking the same foreign language as the student under consideration from the effects of peers speaking another foreign language:

$$y_{is(t+2)} = \alpha + \beta_1(SFL_{-ist} - SSFL_{-ist}) + \beta_2 SSFL_{-ist} + \gamma X_{ist} + \delta C_{-ist} + \theta_s + \rho_t + \epsilon_{is(t+2)}, \quad (2)$$

where $SSFL_{-ist}$ is the share of same foreign language students in the school-track cohort. Hence, the difference ($SFL_{-ist} - SSFL_{-ist}$) is equal to the share of peers speaking another foreign language than the student under consideration. The peer effect parameters of interest are β_1 and β_2 , which represent the impact of a marginal increase in the share of peers speaking any other foreign language and the share of peers speaking the same foreign language on student i 's outcome $y_{is(t+2)}$, respectively.

4.1. Validity of the identification strategy

With the analysis of peer effects at the school track level, the primary threat to identification lies in the potential sorting of students (Figlio, Giuliano, Marchingiglio, Ozek, & Sapienza, 2024). We expect limited selection for various reasons. First, the legal framework requiring students to attend a given school and cohort depending on their geographic location and age makes it hard for parents to strategically place their children into specific schools or cohorts. Empirical studies indeed find limited evidence for delayed school entries (red-shirting) in Switzerland (Balestra, Eugster, & Liebert, 2020; Buchmann

& Kriesi, 2010; Gangl & Huber, 2021).¹¹ Second, while there are different educational tracks at the secondary level, allocation to a specific track is defined based on prior achievement at the primary level. This makes it highly unlikely that parents would even attempt to engage in red-shirting prior to their children entering primary school because of the expected ethnic cohort track composition many years later in secondary school.

In what follows, we formally test the validity of the identification strategy. First, we check the feasibility of our research design. Since we compare cohorts within school-tracks over time, we need to ensure that there is variation in the share of foreign language peers and the share of same foreign language peers after netting out the fixed effects at the level of randomization. To do so, we compare the raw variation with the residual variation in both explanatory variables after (i) removing school-track and cohort fixed effects and (ii) all controls from the main specification. The results are reported in Table A.2. The standard deviation in the share of foreign language peers drops from 0.234 to 0.069, when we control for school-track and cohort fixed effects – a reduction to approximately one-third of the raw variation. Including the additional individual-level and cohort-controls from the main specification does not reduce the standard deviation any further. For the shares ($SFL - SSFL$) and $SSFL$ the reduction in the variation is less pronounced when including different controls. The standard deviation in ($SFL - SSFL$) decreases from 0.204 to 0.080 when we account for school-track and cohort fixed effects and to 0.076 when we

¹¹ Gangl and Huber (2021) find that sorting around the school starting cutoff date is not significant in a national sample. In contrast, studies based on a representative sample of school children (Buchmann & Kriesi, 2010) or based on cantonal data (Balestra et al., 2020) find some red-shirting, but limited to children born in the month just before the cutoff date.

also include the additional controls. For *SSFL*, the respective standard deviations are 0.087, 0.056, and 0.050. Taken together, there remains considerable residual variation for the estimation of the treatment effects.

Second, our strategy relies on the assumption that variation in the share of foreign language peers and the share of same foreign language peers within school-tracks across cohorts is as good as random. To detect potential selection, we follow Balestra, Eugster, and Liebert (2022) and Balestra, Sallin, and Wolter (2021) in examining whether any of the variables on ethnic diversity predict individual baseline characteristics such as gender, age, Swiss citizenship, and being born in Switzerland, separately or jointly, as reported in Tables A.3 and A.4. The shares of foreign language students and same foreign language students are both individually and jointly insignificant for explaining individual gender. While the share of same-foreign language speaking peers tends to be significant for explaining individual age, the effect size is very small (a standard deviation increase in *SSFL* increases age by 0.02 years or 7.4 days). Even though this violation is small, in a robustness check we follow Black, Devereux, and Salvanes (2013) and instrument the observed peer composition with the predicted peer composition based on birth dates. Similarly, we do not find any imbalances in Swiss nationality, but the share of peers speaking the same foreign language has some explanatory power on being born in Switzerland. This is intuitive since students from larger language groups are more likely to be born in Switzerland.

We also check if parents' socio-economic status is associated with the share of (same) foreign language peers of their kids. We know the highest level of education in the household for roughly 10 percent of foreign and local language students. We construct two dummy variables indicating the highest level of parental education: tertiary education or at least secondary education. Table A.5 shows that both the shares of foreign language students and same foreign language students are individually and jointly insignificant for explaining parental education.

Third, we show that the variation in both the share of foreign language speakers and the share of same foreign language speakers is consistent with what we would expect from random assignment. We do not detect nonrandom assignment of children to cohorts within school tracks, following a test developed by Bifulco, Fletcher, and Ross (2011). Specifically, we simulate 250 random assignments of students to cohorts within school tracks. We then calculate for each of the 250 simulations the share of (same) foreign language speakers within a school track and cohort for each student. We calculate the frequency distribution of the share of the (same) foreign language peers for each of the 250 simulations. We then average over these 250 simulated frequency distributions and compare the two simulated frequency distributions to their actual counterparts. Our comparisons in Figure A.1 show that the distributions of the two explanatory variables correspond to their simulated counterparts. We further highlight similarity of the distributions by redoing the exercise of netting out the fixed effects at the level of randomization from the raw variation. Table A.6 based on simulated data shows very similar results in raw variations and residual variations as Table A.2 based on data from the main specification.

Overall, these validity tests indicate that the key identifying assumption of (conditional) random assignment of foreign language students to school tracks is plausible and that there is considerable variation in the two explanatory variables to estimate precise effects.

5. Results

5.1. Career paths

Table 2 presents our main results on the foreign language students' post-compulsory educational choices and, hence, their career paths. The share of foreign language peers indeed affects the foreign language students' choices. An increase in this share significantly reduces the student's chances of proceeding to academic education and increases her

chances of starting a VET programme. The share of foreign language peers has no significant effect on a student's probability of going into transitional education or forgoing any post-compulsory education. The results in panel A include cohort fixed effects, interacted school-track fixed effects, and the individual-level control variables (which include the student's own first language). Panel B shows that the results remain qualitatively unchanged and quantitatively very similar when we add cohort-level control variables.

In panel C of Table 2, we disentangle the effect of peers speaking the same foreign language as the student under consideration from the effects of peers speaking another foreign language. We uncover interesting effect heterogeneity. An increase in the share of peers speaking the same foreign language has no effect on the probability of starting academic education, but leads to a sizeable and statistically significant increase in the probability of choosing vocational education that is compensated by a sizeable and statistically significant decrease in the probability of attending transitional education. The effects of a higher share of peers speaking another foreign language are similar to the average effects seen in panels A and B. That is, an increase in the share of foreign language speaking peers increases the probability of choosing vocational education at the expense of starting academic education. We will discuss in Section 5.4 how these results could be explained by local language acquisition or social networks.

To what extent can our results on the effect of the share of foreign language peers on the likelihood to transition into academic education explain the gap between local and foreign language students? As shown above, 31.7 percent of local language students proceed to academic education, while only 21.3 percent of foreign language students do so. Hence, there is a raw local-foreign gap of 10.4 percentage points in the likelihood of proceeding to academic education. At the same time, the share of foreign language peers, which is 25.9 percent in the overall student population, is only 20.3 percent for the average local language student, but 41.9 percent for the average foreign language student. Now consider a counterfactual student allocation that ensures that all students – no matter what language they speak – have a share of foreign language peers of exactly 25.9 percent. Our coefficient estimate in column (1) of panel B suggests that foreign language students would become 0.5 percentage points more likely to proceed to academic education. Moreover, in Table 3, we estimate the effect of the share of foreign language peers on the career paths of local language students. The coefficient estimate in column (1) suggests that local language students would become 0.2 percentage points less likely to proceed to academic education if the share of foreign language peers increased from 20.3 to 25.9 percent. Hence, the clustering of foreign language students can explain around seven to eight percent of the raw local-foreign gap in the likelihood of proceeding to academic education.

This effect is somewhat smaller than the effect of ethnic clustering in primary school on the raw local-foreign gap in the likelihood of proceeding to a high-track secondary school in Austria. More specifically, Schneeweis (2015) finds that if migrant students were surrounded by a migrant share of 8 percent (as native students are) instead of 25 percent (as they are), then their probability of going to a high-track secondary school would increase by 3.4 percentage points. This increase would reduce the raw attendance gap between native and migrant students by around 14 percent.

5.2. Labour market outcomes

In a next step, we reduce the sample to all foreign language students who start a VET programme. We examine how the share of foreign language peers influences the difficulty and prestige of the VET programme that a student joins. Note that these results are based on a selected sample since the share of foreign language peers also increases the likelihood that foreign language students actually start a VET programme.

Table 2
Peer effects on career paths.

Dependent variable:	Academic education	VET	Transitional education	No post-comp. education
	(1)	(2)	(3)	(4)
Panel A:				
SFL	−0.033** (0.013)	0.057** (0.022)	−0.020 (0.020)	−0.004 (0.015)
Cohort fixed effects	✓	✓	✓	✓
School track fixed effects	✓	✓	✓	✓
Individual controls	✓	✓	✓	✓
Cohort controls	–	–	–	–
Panel B:				
SFL	−0.033** (0.013)	0.059*** (0.022)	−0.023 (0.020)	−0.003 (0.015)
Cohort fixed effects	✓	✓	✓	✓
School track fixed effects	✓	✓	✓	✓
Individual controls	✓	✓	✓	✓
Cohort controls	✓	✓	✓	✓
Panel C:				
(SFL-SSFL)	−0.041*** (0.014)	0.051** (0.023)	−0.006 (0.021)	−0.004 (0.016)
SSFL	−0.007 (0.028)	0.104*** (0.034)	−0.110*** (0.033)	−0.000 (0.028)
Joint significance (<i>p</i> -value)	0.015	0.006	0.001	0.969
Cohort fixed effects	✓	✓	✓	✓
School track fixed effects	✓	✓	✓	✓
Individual controls	✓	✓	✓	✓
Cohort controls	✓	✓	✓	✓
Mean of dependent variable	0.213	0.431	0.256	0.100
Observations	111,313	111,313	111,313	111,313

Notes: Fixed-effect panel regressions in the sample of all foreign language students. Dependent variables are indicated in the top row. Explanatory variables are the leave-one-out share of foreign language students (SFL) on panels A and B, and the leave-one-out share for students speaking any other foreign language (SFL-SSFL) and the same foreign language (SSFL) in Panel C. All regressions include interacted school-track fixed effects and cohort fixed effects as well as the following individual-level control variables: age, gender, first language, Swiss citizenship, time-of-arrival fixed effects. Panels B and C further include the following cohort-level controls: leave-one-out average of school track age, share female, and cohort size. Standard errors are clustered at the school track level. ***/**/* indicate statistical significance at the 1%/5%/10%-level.

Table 3
Peer effects on career paths for local language students.

Dependent variable:	Academic education	VET	Transitional education	No post-comp. education
	(1)	(2)	(3)	(4)
SFL	−0.040*** (0.013)	0.011 (0.016)	0.007 (0.012)	0.022** (0.009)
Cohort fixed effects	✓	✓	✓	✓
School track fixed effects	✓	✓	✓	✓
Individual controls	✓	✓	✓	✓
Cohort controls	✓	✓	✓	✓
Mean of dependent variable	0.317	0.476	0.133	0.074
Observations	323,088	323,088	323,088	323,088

Notes: Fixed-effect panel regressions in the sample of all local-language speaking students. Dependent variables are indicated in the top row. Explanatory variable is the leave-one-out share of foreign language students (SFL). All regressions include interacted school-track fixed effects and cohort fixed effects as well as the following individual-level and cohort-level control variables: age, gender, first language spoken, Swiss citizenship, age-of-arrival fixed effects, leave-one-out average of school track age, share female, and cohort size. Standard errors are clustered at the school track level. ***/**/* indicate statistical significance at the 1%/5%/10%-level.

Table 4 presents our results. In column (1), we focus on the difficulty of the selected VET programme (EFZ as compared to EBA; see Section 2). In panels A and B, we see a negative effect of foreign language peers on the likelihood of choosing a difficult VET programme, which is not statistically significant at conventional levels. In panel C, we see that the effect is more negative and statistically significant for peers speaking the same foreign language as the student under consideration.

We now turn to outcome variables that proxy for the long-term socioeconomic status associated with the different VET programmes. In column (2), we focus on the income that students can expect conditional on their VET choice and gender. We find that foreign language students start VET programmes that lead to lower expected incomes if they have more foreign language peers. The point estimates in panel B suggest that a one standard deviation increase in the share of foreign

language peers leads to a reduction in expected annual income by CHF 425 (or 0.6 percent of the sample mean). This effect is rather modest. However, it comes on top of the potential (within-occupation) wage discrimination faced by foreign language speakers.

In column (3), we document a similar pattern for prestige. Foreign language students tend to start VET programmes that lead to less prestigious occupations if they have more foreign language peers. This effect, however, is not statistically significant. Overall, while more peers speaking the same foreign language reduce the probability of starting a difficult VET, the results in panel C do not suggest that the effect on income and prestige depend on whether the foreign language peers speak the same or another foreign language, since the coefficients on (*SFL* – *SSFL*) and *SSFL*, both in columns (2) and (3), are not statistically significantly different from each other.

Table 4
Peer effects on VET type and predicted labour market outcomes.

Dependent variable:	Difficult VET (EFZ)	Predicted income	Predicted prestige
	(1)	(2)	(3)
Panel A:			
SFL	−0.030 (0.020)	−1.756** (0.684)	−0.410 (0.392)
Cohort fixed effects	✓	✓	✓
School track fixed effects	✓	✓	✓
Individual controls	✓	✓	✓
Cohort controls	–	–	–
Panel B:			
SFL	−0.033 (0.020)	−1.792*** (0.690)	−0.437 (0.394)
Cohort fixed effects	✓	✓	✓
School track fixed effects	✓	✓	✓
Individual controls	✓	✓	✓
Cohort controls	✓	✓	✓
Panel C:			
(SFL-SSFL)	−0.023 (0.020)	−1.843** (0.714)	−0.552 (0.397)
SSFL	−0.089*** (0.031)	−1.528 (1.100)	0.165 (0.620)
Joint significance (<i>p</i> -value)	0.013	0.034	0.198
Cohort fixed effects	✓	✓	✓
School track fixed effects	✓	✓	✓
Individual controls	✓	✓	✓
Cohort controls	✓	✓	✓
Mean of dependent variable	0.911	77.086	41.180
Observations	47,841	47,718	47,718

Notes: Fixed-effect panel regressions in the sample of all foreign language students who start a VET programme. Dependent variables are indicated in the top row. Explanatory variables are the leave-one-out share of foreign language students (SFL) on panels A and B, and the leave-one-out share for students speaking any other foreign language (SFL-SSFL) and the same foreign language (SSFL) in Panel C. All regressions include interacted school-track fixed effects and cohort fixed effects as well as the following individual-level control variables: age, gender, first language, Swiss citizenship, time-of-arrival fixed effects. Panels B and C further include the following cohort-level controls: leave-one-out average of school track age, share female, and cohort size. Standard errors are clustered at the school track level. ***/**/* indicate statistical significance at the 1%/5%/10%-level.

5.3. Robustness

We now discuss eight robustness tests (with the corresponding tables shown in the Online Appendix). First, we drop all students who are Swiss citizens and speak one of the native languages of Switzerland from the sample to avoid that the effects are driven by internal migration of Swiss citizens. For example, we drop Italian speaking students living in the German speaking area who are Swiss citizens, but we keep Italian speaking students living in the German speaking area who are Italian citizens. Tables A.7 and A.8 show that results remain similar despite the drop in sample size.

Second, to address the potential concern that bilingual students may drive our results, we drop the five bi- or trilingual cantons (i.e., Berne, Fribourg, Grison, Ticino, and Valais), where bilingualism is most common (albeit still rare), from our sample.¹² Tables A.9 and A.10 show that results remain similar, with slightly weaker effects on VET.

Third, we exclude students aged 15 years or older from the sample (but not from the computation of the shares of (same) foreign language peers). These older students tend to be repeaters, which is a good proxy for having low scholastic abilities. They might be most vulnerable to unfavourable class composition. Hence, we might expect somewhat lower effects when excluding them. Tables A.11 and A.12 show that results remain similar despite the drop in sample size, suggesting that our main results are not driven by foreign language students who are repeating a grade.

Fourth, we calculate peer effects at the school cohort level rather than the school-track cohort level (while controlling for the individual

students' track). This strategy may be preferable if peer interactions that shape educational and occupational choices and opportunities do not primarily depend on the performance track, e.g., because these interactions mainly take place in the school yard or even the neighbourhood (as the place of residence determines the school to which schools are assigned). Tables A.13 and A.14 show that the point estimates on the share of foreign language peers typically become larger in absolute value and remain statistically significant. This is especially true for the effect of peers speaking the same foreign language. These results have two implications. First, our main results are not an artefact of a very specific definition of peer groups. Second, peer interactions may not be restricted to the school track cohort level, but may also take place at the school cohort or even the neighbourhood level, even more so when it comes to interactions within a student's own language group.

Fifth, we control for school-specific time trends, which could capture relevant developments at the school or neighbourhood level. Tables A.15 and A.16 show that the effects of the share of foreign language peers remain qualitatively unchanged but often become statistically insignificant at conventional levels. In contrast, the effects of the share of same foreign language peers remain similar in size and statistical significance.

Sixth, one could be concerned that teachers are not randomly assigned to classes with abnormally high shares of foreign language students. For instance, migrant teachers might be more likely to be assigned to migrant students (Seah, 2018). We think this concern should be alleviated by the combination of our identification strategy that relies on variation across cohorts (rather than classes) and the observation that teachers typically teach a whole 3-year cycle from the first to the last secondary grade and then take over a new class in first secondary grade, making it unlikely that teachers are strategically sorted into specific cohorts. We nevertheless augment the

¹² Our data contain no information about whether students speak a second language at home.

school-track fixed effects to school-track-cycle fixed effects in order to only compare cohorts that should have the same teacher composition (ignoring teacher mobility across schools, which we cannot observe but is likely to be low). Tables A.17 and A.18 show that the point estimates remain similar but become slightly smaller and that some coefficients are no longer statistically significant at conventional levels. This is not surprising as there are only 2–3 teacher-cycles within our sample period. Nonetheless, the negative effect of the share of foreign language students on entering academic education as well as the effects of share same foreign language students on both vocational and transitional education remain statistically significant.

Seventh, as discussed in Section 4.1, it is unlikely that parents could strategically red-shirt their children to improve the composition of their peers. Nevertheless, we follow Black et al. (2013) and instrument the observed peer composition with the predicted peer composition based on birth dates. This approach reduces the number of cohorts and thus the number of observations available for our estimations. Tables A.19 and A.20 report similar results using observed and predicted peer compositions, but estimates become less precise and we lose almost all statistical significance.

Finally, we change the way in which we compute the share of foreign language peers SFL_{-ist} . First, we exclude all foreign language peers with Swiss citizenships in the computation of this share. Second, we further exclude all foreign language peers born in Switzerland. Table A.21 report the results on educational tracks. The pattern is similar as in our main results when just excluding foreign language peers with Swiss citizenship (in panel A), but we lose statistical significance when further excluding foreign language peers born in Switzerland (in panel B). Table A.22 documents large and statistically significant negative effects of these redefined shares of foreign language peers on the predicted prestige of the chosen VET programmes.

5.4. Mechanisms

In this section, we discuss different mechanisms related to the acquisition of local language skills and social networks to better understand why and how the ethnic composition of school-track cohorts impacts upon the educational choices and career paths of foreign language students.

Our main results above show that foreign language peers affect foreign language students' chances to enrol in academic education negatively, but increase their chances to enrol in VET. In contrast, the share of same foreign language peers does not affect a foreign student's academic education negatively, but increases a student's chances to enrol in VET. These results suggest that foreign language peers affect a student negatively, presumably through a language acquisition effect. Same foreign language peers in contrast have a positive effect on a foreign language student, presumably through a network effect.

In a next step, we shed some light on the two mechanisms likely making up the observed peer effects: a potentially negative local language acquisition effect and a potentially beneficial social network effect. For this purpose, we first rerun the regressions presented in panel C of Tables 2 and 4, but interact the share of same foreign language peers with the size of the corresponding language group in the overall student population. Table 5 presents the results. We see that the effect of same foreign language peers on academic education is more positive for larger language groups. Specifically, the point estimates suggests that the effect of $SSFL$ on academic education turns positive for language groups with more than a 2.4% representation. The same holds true for prestigious VET programmes. In contrast, the effects of same foreign language peers on transitional and no post-compulsory education are more negative for larger language groups. These results suggest that co-ethnic peers are particularly useful for foreign students from large ethnic enclaves, possibly because of the social network these

enclaves offer.¹³ Tables A.23 and A.24 present additional heterogeneity analyses showing how the effects of foreign language peers vary with respect to the year of arrival of the student under consideration.¹⁴ The negative effect of $(SFL - SSFL)$ on academic education and the corresponding positive effect on VET is mainly driven by foreign-language speakers born in Switzerland or arriving at young ages. On the other hand, the positive effect from $SSFL$ on VET and corresponding negative effect on transitional education is driven by foreign-language speakers arriving at older ages.

We interpret our results as follows: Negative language peer effects are present both for foreign and same-foreign language peers. In large ethnic communities, these negative language peer effects are however compensated by positive network effects. Looking at the coefficient for the share of same foreign language, but controlling for the size of the ethnic enclave, shows that additional same foreign language students affect a student's chances to join academic education negatively, but increase their chances to join a VET programme. Thus, controlling for the size of the language group, the results for same-foreign language peers become similar to our main results for foreign language peers. However, in large ethnic communities a different dynamic obtains. Additional same-language peers in large ethnic communities increase a student's chance to go into academic education, at the expense of transitional education or not joining any educational programme.

Second, we focus on language acquisition and test whether foreign language peers decrease foreign language students' likelihood to enter VET programmes demanding advanced local language skills. We also look at VET programmes requiring advanced math skills. Doing so allows us differentiating the peer effects on the students' likelihood to enter linguistically demanding VET programmes from the peer effect on their likelihood to enter intellectually demanding VET programmes. We know the suggested language and math requirements of most VET programmes. The requirements relate to scores of a standardized test that assesses students' math, German (local language), and other skills on a scale from 200–800 in grade 8.¹⁵ Among the VET programmes in our sample, the required math skills range from 290 (e.g., agricultural trainee EBA) to 590 (e.g., computer scientist EFZ) and the required German skills from 310 (e.g., agricultural trainee EBA) to 680 (e.g., information and documentation specialist).¹⁶

Table 6 presents the results of the regressions using the required math and language skills as dependent variables in columns (1) and (2), respectively. We see in panels A and B that more foreign language peers reduce a foreign language student's probability of entering a VET programme requiring advanced local language skills. In panel C, we again differentiate between peers speaking the same or another foreign language than the student under consideration. We see that peers speaking the same foreign language have a large negative effect on the student's likelihood to transition into a VET programme requiring advanced local language skills. We see no similar result for VET programmes requiring advanced math skills. Neither do we find a similar pattern for local language speakers (see Table A.27). These findings suggest that language acquisition is indeed an important mechanism by which foreign language peers shape early career outcomes of foreign

¹³ A complementary explanation could be that public information on educational options is more easily available for larger foreign language groups.

¹⁴ See Table A.25 for descriptive statistics on the career paths by time of arrival.

¹⁵ The requirements for VET programmes are determined by vocational teachers, and the scales are based on a standardized test conducted in eight German speaking cantons (Lehrmittelverlag St. Gallen, 2022). See Balestra et al. (2022) for more information on these tests.

¹⁶ Figure A.2 shows that required language skills is not strongly related with our binary measures of ethnic-typical VET programmes.

Table 5
Peer effects by size of language group.

Dependent variable:	Career paths				VET & labour market		
	Academic education	VET	Transit. education	No education	Difficult VET	Predicted income	Predicted prestige
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(SFL-SSFL)	−0.054*** (0.014)	0.053** (0.023)	−0.009 (0.021)	0.001 (0.016)	−0.021 (0.020)	−1.755** (0.715)	−0.630 (0.402)
SSFL	−0.211*** (0.014)	0.147** (0.057)	−0.012 (0.046)	0.076 (0.054)	−0.045 (0.042)	0.312 (1.838)	−1.488* (0.402)
SSFL*(Group size in %)	0.087*** (0.014)	−0.017 (0.018)	−0.039*** (0.014)	−0.031** (0.015)	−0.016 (0.014)	−0.680 (0.538)	0.610** (0.291)
Cohort fixed effects	✓	✓	✓	✓	✓	✓	✓
School track fixed effects	✓	✓	✓	✓	✓	✓	✓
Individual controls	✓	✓	✓	✓	✓	✓	✓
Cohort controls	✓	✓	✓	✓	✓	✓	✓
Mean dependent variable	0.213	0.431	0.256	0.100	0.911	77.086	41.180
Observations	111,313	111,313	111,313	111,313	47,841	47,718	47,718

Notes: Fixed-effect panel regressions in the sample of all foreign language students (columns 1–4) who start a VET programme (columns 5–7). Dependent variables are indicated in the top row. Explanatory variables are the leave-one-out share of foreign language students (SFL) on panels A and B, and the leave-one-out share for students speaking any other foreign language (SFL-SSFL) and the same foreign language (SSFL) in Panel C. All regressions include interacted school-track fixed effects and cohort fixed effects as well as the following individual-level control variables: age, gender, first language, Swiss citizenship, time-of-arrival fixed effects. Panels B and C further include the following cohort-level controls: leave-one-out average of school track age, share female, and cohort size. Standard errors are clustered at the school track level. ***/**/* indicate statistical significance at the 1%/5%/10%-level.

Table 6
Evidence for the role of local language skills.

Dependent variable:	Importance of math skills	Importance of local language skills
	(1)	(2)
Panel A:		
SFL	−4.467 (3.976)	−7.909* (4.043)
Cohort fixed effects	✓	✓
School track fixed effects	✓	✓
Individual controls	✓	✓
Cohort controls	–	–
Panel B:		
SFL	−5.430 (4.016)	−8.530** (4.076)
Cohort fixed effects	✓	✓
School track fixed effects	✓	✓
Individual controls	✓	✓
Cohort controls	✓	✓
Panel C:		
(SFL-SSFL)	−6.164 (4.132)	−5.501 (4.205)
SSFL	−1.574 (6.066)	−24.433*** (6.672)
Joint significance (<i>p</i> -value)	0.292	0.001
Cohort fixed effects	✓	✓
School track fixed effects	✓	✓
Individual controls	✓	✓
Cohort controls	✓	✓
Mean of dependent variable	480.053	510.798
Observations	43,988	43,988

Notes: Fixed-effect panel regressions in the sample of all foreign language students who start a VET programme. Sample size is slightly reduced compared to baseline specification as we cannot match all VET programmes with skill profiles. Dependent variables are indicated in the top row. Explanatory variables are the leave-one-out share of foreign language students (SFL) on panels A and B, and the leave-one-out share for students speaking any other foreign language (SFL-SSFL) and the same foreign language (SSFL) in Panel C. All regressions include interacted school-track fixed effects and cohort fixed effects as well as the following individual-level control variables: age, gender, first language, Swiss citizenship, time-of-arrival fixed effects. Panels B and C further include the following cohort-level controls: leave-one-out average of school track age, share female, and cohort size. Standard errors are clustered at the school track level. ***/**/* indicate statistical significance at the 1%/5%/10%-level.

language speakers.¹⁷ These results are in line with Schmid (2023) who shows the importance of language proficiency for employment of African refugees in Switzerland. While the results in Table 6 are based on the sample of students in VET programmes, we expect strong peer effects in language acquisition to have implications beyond the choice of VET programmes. After all, advanced command of the local language is also an important condition for admittance to academic education.

Overall, we conclude that the observed peer effects of foreign language students on educational and labour market outcomes are shaped by both, social networks, in particular those offered within large ethnic enclaves, and local language skills.

6. Conclusion

This paper studies the effect of ethnic peer composition on post-compulsory educational outcomes and occupational choices of foreign language speakers. Empirical identification relies on quasi-random differences in cohort composition within the same school and the same track. The findings suggest that a higher share of foreign language speakers in a school track cohort reduces a student's probability of pursuing academic education and increases her probability of starting a VET programme. Peers speaking the same foreign language also increase a student's probability of starting a VET programme, but at the expense of a lower probability of them attending a transitional education programme. For students who enter a VET programme, a higher share of foreign language peers also reduces their predicted wages.

We provide suggestive evidence that the negative effect of foreign peers is due to a language acquisition effect, and the positive effect of same foreign language peers due to a positive network effect. The presence of foreign language peers – especially those speaking the same foreign language – reduces foreign language students' chances to join a VET programme that is demanding in terms of local language. Our results show that additional same-foreign language peers can be beneficial for students of large ethnic group, which might indicate the presence of a network effect.

Our results also suggest that the presence of clusters of students of a single foreign language might counteract the negative effects on educational outcomes. While we see this positive effect in our data, we cannot further specify the mechanisms through which this network effect works. Access to information or jobs could be important mechanisms. Alternatively, ethnic communities may also form aspirations and provide role models inspiring foreign language students to achieve more. Further research should analyse under what conditions peer effects turn positive.

Our finding that language acquisition is hampered by foreign language peers indicates that the unequal distribution of ethnic minorities across and within municipalities is problematic. It results in foreign language students having a much higher share of foreign language peers (41.9 percent) than the average student (25.9 percent). The language peer effects found in this paper suggest that ethnic clustering in Swiss schools is harmful for foreign language students and partly responsible for the local-foreign gap in post-compulsory educational outcomes and, consequently, the longer-term local-foreign gap in labour market outcomes.

A straightforward policy implication of these findings is to counter the negative language peer effects. School principals should aim at balancing foreign language speakers across classes. The potential of this policy, however, is limited if the ethnic composition is vastly different

across schools because of high ethnic residential segregation. In this case, policymakers worried about the performance of foreign language students should consider relaxing the students' obligation to attend schools where they live or even think about broader policies aimed at reducing residential segregation. If none of these measures is politically feasible, then policymakers should at least ensure that sufficient courses are offered that promote the acquisition of the local language.

CRedit authorship contribution statement

Caroline Chuard: Conceptualization, Design, Execution, Interpretation of the reported research. **Annatina Aerne:** Conceptualization, Design, Interpretation of the reported research. **Beatrix Eugster:** Conceptualization, Design, Execution, Interpretation of the reported research. **Roland Hodler:** Conceptualization, Design, Interpretation of the reported research.

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Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix A. Supplementary data

Supplementary material related to this article can be found online at <https://doi.org/10.1016/j.econedurev.2025.102645>.

Data availability

The authors do not have permission to share data.

¹⁷ VET programmes and occupations may require advanced local language skills because the corresponding occupations involve regular contact with customers. As such, these VET programmes may also require advanced cultural skills. If so, then (same) foreign language peers may also impact upon early career outcomes by lowering a foreign student's cultural skills.

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