School trajectories of the second-generation of Turkish immigrants in Sweden, Belgium, Netherlands, Austria and Germany: The Role of School Systems

Gülseli Baysu[1], Ahu Alanya[2] and Helga A.G. de Valk [3]

[1] Queen's University of Belfast, United Kingdom

[2] University of Leuven, Belgium

[3] Netherlands Interdisciplinary Demographic Institute and University of Groningen

Corresponding author is Dr. Gülseli Baysu, Queen's University of Belfast, School of Psychology, University Road, Belfast, BT7 1NN, Northern Ireland, United Kingdom

Email: g.baysu@qub.ac.uk

Abstract

In this paper, we aim to explain the school careers of the second-generation of Turkish immigrants in nine cities in five western European countries and show the influence of the national school systems ranging from comprehensive to hierarchical tracking structures. We apply sequence analyses, optimal matching and cluster analyses to define school trajectories complemented with propensity score matching to study the differences between young adults of different origin. Participants were 4,516 young adults of Turkish second-generation and native origin aged between 18-35. Findings show that the school system makes a difference for school careers: (1) in rigid systems with higher differentiation and early tracking, the gap between the second-generation and native school trajectories begins to unfold early in the school career; (2) in the rigid systems, the track in which students enter secondary education determine the routes they take as well as their final outcomes; (3) more open systems allow for "second-chance" opportunities for immigrant students to improve their track placement. However, across school systems, second-generation youth follow more often non-academic or short school careers while native youth follow academic careers. When individual and family background are controlled via propensity score matching, the ethnic gap is explained better in more stratified systems highlighting the important role of family background in more stratified school systems.

Key words: second-generation, Turkish immigrants, national school systems, school trajectories, tracking, optimal matching analysis, propensity score matching

School trajectories of the second-generation of Turkish immigrants in Sweden, Belgium, Netherlands, Austria and Germany: The Role of School Systems

One of the main ways in which the second-generation is integrated in society is through education. Education thus receives attention from scholars in the field of sociology of education and of migration. Many studies cover the final school levels students attain (Heath et al., 2008; Phalet and Heath, 2011), their test scores (Levels and Dronkers, 2008; Schnepf, 2007), and drop-out levels (Kalmijn and Kraaykmp, 2003). These issues were studied in individual countries, but more and more also in cross-national comparisons (Entorf and Minoiu, 2005; Dustmann et al., 2012; Schnepf, 2007). While many studies focused only on migrants, recently the special position of children of immigrants, the second-generation, received more attention. Despite the fact that many second-generation young adults are experiencing upward social mobility compared to their parents, school outcomes of children of immigrants are often lagging behind their native peers (Borgna and Contini, 2014; Dustmann et al., 2012; Heath et al., 2008; Tolsma et al., 2007).

Most studies on education take a static approach by focusing on one aspect in time, such as final or current educational status, rather than looking at the whole school career (for exceptions see: Baysu and De Valk, 2012; Baysu and Phalet, 2012; Crul, 2013; Kalmijn and Kraaykamp, 2003; Tolsma et al., 2007). In this paper, we take a different approach by looking at the school careers of young adults of different origins in Europe. We do so by applying sequence analyses, a method well known in the study of the life course and of labour market careers (Abbott 1995; Billari 2001; Brizinsky-Fay 2007). By including the sequencing of school stages, we get an insight into the ways young adults navigate the school system and the critical turning points

in their school careers. This is relevant for the second-generation youth whose parents are less familiar with the school systems in the country of residence (Kristen, 2008). Our study focuses on the divergent school careers of the second-generation Turkish and the native youth in large cities of five Western European countries: Sweden, Belgium, Netherlands, Austria, and Germany. Parents of the second-generation Turkish youth migrated to these countries as low-skilled migrant workers in the 1960s. Most of them originated from rural areas in Turkey, and had limited education or were illiterate (for more information on Turkish immigrants in different countries, see Crul et al., 2012). We focused on big cities because the majority of these migrants settled in large European cities. This implies that the majority of children of immigrants attend schools in inner cities, since most parents choose a neighbourhood school for their children (De Valk and Crul, 2007).

On the explanatory side, we focus on the national school systems in Europe, which vary widely ranging from countries with a comprehensive school system with no or limited differentiation to countries with tracking or streaming of students between schools or between classes within schools. The selected five countries in this paper reflect these differences in national school systems: from the most comprehensive school system in Sweden to the most restrictive and rigid tracking structures in the Austrian and German school systems, with Belgium and Netherlands somewhere in between (for similar rankings, Bol and Van de Werfhofst, 2013; Crul and Vermeulen 2006; Crul et al., 2012; Dronkers 2010).

In this paper, we question how the school careers of Turkish second-generation young adults develop compared to their native peers in different school systems across Europe. Although it is assumed that school systems make a difference for school outcomes, little is known about the key moments at which these inequalities manifest

in the school career, since most available data do not cover full school histories. The aim of the paper is threefold. First, we want to provide insight in the school careers of second-generation Turks in each European country. Using unique comparative data, we cover the full school history of the young adult from the end of primary education to the last education they attempted; we refer to these as school trajectory. Second, we question to what extent the school trajectories of second-generation and native youth diverge in different school systems, which vary in the options they offer to students at different stages. It is relevant to know whether these possibilities are used and whether they are of the same relevance for all groups. Third, we look at the gaps between second-generation and native school trajectories and whether the gaps remain after controlling for individual and family background via propensity score matching.

Ethnic gaps in educational outcomes

Immigrant children are not doing well in the European school systems (Allmendinger and Von Den Driesch, 2014; Borgna and Contini, 2014; Dustmann et al., 2012; Heath et al., 2008; Tolsma et al., 2007). For instance, Schnepf (2007) examined the difference in standardized performance tests between first and second-generation immigrant and native students in ten Western countries. She found that immigrant children achieved lower scores than natives in reading, mathematics, and science. Moreover, there was a performance gap between immigrant and native students already at the primary school. Other studies found that for most immigrant children in the European school systems, and particularly for Turkish youth, the rates of dropping out and grade retention were significantly higher, while access to higher education was lower than that of their native peers (Crul and Vermeulen, 2006; Dustmann et al., 2012; Heath et al., 2008).

Much of the research about ethnic educational disadvantage looks for explanations at the individual level such as differences in academic motivation, knowledge and skills (Okagaki, 2001) or family background such as parental education or family income (Heath et al., 2008). Although individual and family background explain a large part of minority disadvantage (Borgna and Contini, 2014; Heath and Brinbaum 2007; Heath et al. 2008; Moldenhawer et al. 2009; Penn and Lambert 2009; Phalet et al., 2007), residual ethnic differences remain significant (Borgna and Contini, 2014), especially for most disadvantaged minorities such as the Turkish second-generation in Western European countries (Heath et al. 2008) and Hispanics in the United States (Kao and Thompson 2003). For instance, there are significant achievement gaps in standardized performance tests (such as PISA) between Turkish first and second-generation immigrants and natives in Germany, Austria, Belgium, and Switzerland, even after controlling for their family background (Dustmann et al., 2012; Song, 2011). Moreover, there is a large variation in educational inequality between these countries. The varying levels of educational inequality across European countries are also a function of characteristics of the school systems, as we explain in the next section. We thus move beyond previous studies that focus on individual and family background by comparing school trajectories of the same ethnic group, Turkish second-generation, across countries with different school systems.

Navigating the School Systems in Europe

The varying levels of educational inequality in different countries are related to the national school systems (Allmendinger 1989; Shavit and Müller 1998; Kerckhoff, 2001). We use the Comparative Integration Context theory as the theoretical framework (Crul and Schneider 2010; Crul et al., 2012) to investigate the role of national "institutional arrangements" of school systems in reproducing or reducing

inequality at various stages of the school career (Crul and Schneider 2010: 1259). One important aspect of national school systems is tracking, namely, the way in which students are allocated into different types of education or school tracks (Marks 2005; Brunello and Checchi 2007; Horn 2009; Van de Werfhorst and Mijs 2010). In line with the literature on school tracking (Breen and Jonsson, 2005; Brunello and Checchi, 2007; Entorf and Lauk, 2008; Horn, 2009; Penn and Lampert, 2009; Shavit, 1990; Van de Werfhorst and Mijs, 2010), we focus on three major factors that differentiate between school systems in Europe and elsewhere: the degree of formal stratification between tracks, the timing of tracking (or selection) and permeability of tracking (or track mobility) (Allmendinger 1989; Crul et al., 2012, Crul, 2013, 2015; Kerkhoff, 2001; Van de Werfhorst and Mijs, 2010).

Degree and Timing of Tracking

A higher degree of formal stratification refers to a school system with several types of secondary schools that are associated with different degrees of access to higher education (Allmendinger, 1989). The German system is an example of a highly stratified system. Secondary school students are sorted into the Vocational (Hauptschule) Middle (Realschule) or Academic Schools (Gymnasium). The successful Academic School (Gymnasium) student obtains the Abitur, a certificate required to attend a university. The successful Middle School (Realschule) student may attend an advanced vocational school (Fachoberschule), but Vocational School (Hauptschule) students have fewer options (Kerkhoff, 2001). Sweden, on the other hand, is a typical example of a comprehensive system. Students are sorted into "programmes," i.e., different types of school focus (an academic or vocational programme), and all allow access to a university education.

Tracking time or early selection is another important characteristic of school systems. A higher degree of stratification is combined with streaming into different tracks at an early age. In Germany, as a highly stratified school system, students are sorted into different tracks at the age of 10 after 4 years of education, while those in Sweden, as a comprehensive system, students are sorted into different programmes at the age of 16 after 9 years of schooling.

School systems that allocate students to different educational tracks at an early age increase social inequalities, because such tracking magnifies the impact of socio-economic status on school outcomes (Marks, 2005; Horn, 2009). Since in highly stratified school systems, students are streamed into different tracks at an early age after fewer years of schooling, students who start school with a disadvantaged position in language and social abilities, such as those from families with lower levels of school attainment or with a migration background, have limited time to overcome their disadvantaged starting position (Hanuschek and Wössmann 2006). Many studies show how early selection and tracking negatively affect the children from lower-class backgrounds (Breen and Jonsson, 2005; Brunello and Checchi, 2007; Hanuschek and Wössmann 2006; Horn, 2009; Van der Werfhorst and Mijs, 2010) and immigrant backgrounds (Borgna and Contini, 2014; Crul et al. 2012; Entorf and Lauk, 2008; Penn and Lampert, 2009; Shavit, 1990). Descriptive data on the Turkish second-generation in Europe indicate that early selection in Germany and Austria is associated with lower rates of higher education (Crul et al., 2012; Crul and Vermeulen, 2006).

Comparative European research also supports the argument that degree and timing of school tracking magnifies educational inequalities. Several studies show that the ranking of the five Western European countries in terms of stratification of school

systems (Germany-Austria>Netherlands-Belgium>Sweden) corresponds roughly to the size of ethnic gaps in early achievement and final attainment levels. Thus, there is more school disadvantage in Germany and Austria than in Sweden (Bol and Van de Werfhofst, 2013; Dustman et al, 2012; Heath et al., 200;).

We apply previous research findings to investigate how the school careers of Turkish second-generation young adults develop and diverge compared to their native peers in different school systems across Europe. Since the degree and the timing of tracking in different school systems go hand in hand, in highly stratified systems, selection into different tracks happens at an early stage of the school career and generally after few years of schooling, which does not give enough time to children of immigrant origin to overcome their disadvantaged starting position. That in turn should affect how early in the school career, the ethnic gap between second-generation and natives would unfold. We hypothesized that *the earlier the timing of the tracking and the higher the degree of tracking is, the earlier in the school career we should observe the gap between second-generation and native school careers (H1)*. This implies that in the Swedish comprehensive school system the gap would unfold only after secondary school; while in Germany the gap would be observed already in the first stage of the school career after primary school, that is, in lower secondary school.

The degree of stratification refers not only to the kinds of programs offered but also to their links to future opportunities (Allmendinger, 1989). In highly stratified systems, students in vocational and academic tracking at the beginning of secondary school have clearly-structured pathways ahead with different levels of access to the university. This is e.g. the case in Germany, while in more comprehensive systems such as in Sweden, students from vocational programmes are also able to enter higher education. Therefore, i*n highly stratified educational systems, the track in which*

students enter secondary education should determine the routes they take as well as their final outcomes (H2).

Permeability of the system

While the degree and timing of tracking received much research attention, school systems also differ in their levels of track mobility (Kerckhoff, 2001) or permeability (Alba et al., 2011, Crul et al., 2012, Crul, 2013), i.e., the possibility for a student to improve their track placement and final educational attainment. The effects of the permeability of the school system, however, were generally overlooked due to lack of data. Alba and colleagues (2011) argue that the degree of formal stratification in school systems goes hand in hand with their rigidity. For instance, in Germany, students are streamed into different tracks at an early age and the curricular differences between these tracks leave little room for second-chances. Thus, more comprehensive school systems allow for, at least in principle, more "second-chance" opportunities for students to go back to school or to improve their track placement because they are less rigid (Alba et al., 2011, Crul, 2013). Qualitative research findings on the successful second-generation Turkish students in Austria (Pasztor, 2016), the Netherlands and France (Schnell, Keskiner and Crul, 2013) illustrate their often indirect pathways to higher education. In the Netherlands, this phenomenon is called as the "long route" (Crul and Holdaway 2009). Track mobility can offset some of the negative effects of tracking on educational outcomes of second-generation students (Crul, 2013, 2015). However, track mobility may also involve down streaming of students from academic to technical or vocational types of tracks (Crul, 2013, 2015). As far as we know, there is no quantitative research describing school careers that involve track mobility systematically.

We aim to describe these indirect school careers, or second chances, across school systems. School systems across our study countries have different options for track mobility, which coincides with the degree and timing of tracking. We do not know to what extent these options are used. Tentatively, we expect that i*n more open or less stratified educational systems, second generation students are more likely to find "backdoors" (i.e., second chances) to achieve upward trajectories in school careers and thus higher final outcomes (H3).*

Ethnic Gaps in the School Careers

The stratification in school systems is relevant for understanding second-generation school trajectories. Irrespective of the school systems, however, in the selected European countries, the children of immigrant workers from less developed countries are more likely to be in non-academic tracks (for a review, Alba et al., 2011, Heath et al., 2008), and to drop out without a diploma, and less likely to stay on beyond secondary school compared to their native peers (Kalmijn and Kraaykamp, 2003). Accordingly, *across systems second-generation Turkish young adults should more often follow non-academic or short school careers and less often academic or longer careers relative to their native peers* (H4).

To understand these ethnic gaps, we need to take into account individual and family background, which are extremely relevant for children's educational careers and outcomes. We used propensity score matching to make second-generation immigrant samples from different cities/countries comparable to the native comparison group with respect to individual and family background[1] (Brannstrom 2004; Harding 2003). At the individual level, we focused on age, gender, student status, school starting age, and whether they changed schools in primary education. While gender, age and student status refer to compositional differences between native and second-

generation youth, school starting age and changing schools are also related to characteristics of school systems. For family background, we focused on parents' education, parents' employment status and siblings' educational status (Schnell et al., 2013). Family background may indicate compositional differences between natives and second-generation youth. However, the role of family background in school careers might also depend on the stratification of the school systems. There are two contradictory findings on the role of family background. On the one hand, ethnic gaps persist even controlling for background (Dustmann et al., 2012; Phalet et al., 2007; Song, 2011). Accordingly, *when we take into account individual and family background, ethnic gaps in school careers should persist*. On the other hand, the effects of family background increase most strongly in the countries with highly stratified school systems (Ammermuller, 2005; Marks, 2005; Entorf and Lauk, 2008). According to this latter finding, selection in the highly stratified systems is biased in favor of advantaged groups, and perpetuates or even increases the existing differences in background (Müller and Karle, 1993). These systems produce a heavy dependence of educational outcomes on family background (Ammermuller, 2005, Marks, 2005). This argument leads to a competing hypothesis: *when we take into account individual and family background, ethnic gaps might be explained better or reduced to a greater extent in more stratified systems.*

Background on School Systems in Five Western European Countries

This section provides detailed information about the school systems in the selected countries in terms of the three major distinctions that we focus (that is, degree and time of tracking, and permeability of the system), along with school starting age, and duration of compulsory education which tend to reinforce national differences

between stratified and comprehensive systems (Crul et al., 2012) (Please see Appendix 1 for a summary of different characteristics of the school systems).

Degree of stratification and associated future options with each track range from more comprehensive systems such as in Sweden to highly stratified systems such as in Germany. In Sweden, students attend 9 years of comprehensive primary school, which covers the years that are generally associated with "lower secondary" in other systems. Only in upper secondary school, students are streamed into either academic or vocational programme, both of which give the basic qualification to attend university. All the remaining countries have tracking in place already in lower secondary school. In Belgium, students can be oriented towards vocational or academic types of lower secondary and then into three types of tracks in upper secondary education. While all programmes provide the basic qualification to attend university in theory, in practice it is mostly the academic education that leads to university. In the Netherlands, Austria and Germany, the degree of stratification is higher; students can be oriented towards at least three types of education. Only the academic education diploma grants access to universities. In the Netherlands and Austria, technical tracks can grant access to polytechnics.

Selection age and degree of stratification are strongly related so that more stratified systems have early selection ages. Students are sorted into different tracks at age 16 (after 9 years of schooling) in Sweden, at age 12 after 6 or 7 years of schooling in Belgium and the Netherlands, at age 10 after 4 years of schooling in Austria and Germany[2]. In Sweden, selection requires passing grades in several subjects, slightly different for each programme, although it is rather automatic. In other countries, it depends on high grades as well as teacher recommendations.

In terms of permeability or track mobility, Belgium, the Netherlands and Austria leave room for track mobility so that students can switch tracks, while in Germany, this is practically non-existent (Crul, 2013). Students can be streamed up so that vocational pathways may offer alternative routes to higher education. Students can also be streamed down, that is, from academic track to vocational tracks such as in Belgium (Crul, 2013). In Sweden tracking is minimal, and only in upper secondary school. There is no point in switching tracks as all programmes grant access to higher education. Instead, the Swedish system widely provides adult education outside the secondary school system.

Finally, the length of compulsory education and school starting age also differ across systems. While in Sweden all children attend compulsory comprehensive school between ages 7 and 16, education in Belgium is compulsory between the ages of 6 and 18. The Netherlands has 13 years of compulsory schooling from age 5 to 18. Austria and Germany have 9 years of compulsory schooling, from ages 6 to 15.

Data

We used the survey data from *The Integration of the European Second generation* (TIES) study. These data are unique for the purpose of our work as we had full school careers of young adults of diverse origins across different European countries. The survey covered 13 cities in seven European countries and took place in 2007/2008. It sampled second-generation Moroccans, Turks, and ex-Yugoslavians, and a native comparison group between the ages of 18 and 35. Our analyses were confined to two major cities in Germany (Berlin and Frankfurt; IMIS 2009), Austria (Linz and Vienna; Vienna AoS, 2008), Belgium (Antwerp and Brussels; CeSo-CSCP, 2008), Netherlands (Amsterdam and Rotterdam; NIDI-IMES, 2007), and Sweden (Stockholm; CEIFO, 2008). We selected the Turkish second-generation and the native

comparison group, who were sampled in all nine cities[3]. While the target sample sizes in the survey were 250 participants per group and city, actual sample sizes varied between 200 and 322 respondents. Turkish second-generation were all born in the country of residence with one or both parents born in Turkey, while the native young adults were born in the country of residence and had both parents born there too. Intermarriage in the parental generation is very limited and by far the majority (90-95%) of the parents are of the same ethnic origin (for the actual numbers of mixed marriages, see Supplementary Online Material Section 1).

Samples were randomly drawn from the population registers, using administrative data on parental origin and place of birth in Stockholm, Antwerp, Amsterdam and Rotterdam; and using name recognition and screening in Vienna, Linz, Berlin and Frankfurt to identify target populations. In Brussels, a mix of random sampling and semi-quota sampling was applied, using different sources. Moreover, to make the two populations more comparable, as a general sampling strategy, native respondents were sampled from the same neighbourhoods with the second-generation respondents. Only in Sweden and Germany were the natives not sampled from the same neighbourhoods. All participants were visited at home by trained interviewers who took computer-assisted personal interviews in the official language(s) of the country, German (in Vienna and Linz), Swedish (in Stockholm), Dutch (in Antwerp, Brussels, Amsterdam and Rotterdam) or in French (in Brussels). Reported overall response rates to the TIES-surveys ranged between 58.4% (Antwerp), 56% (Linz), 45.5 (Vienna), 42.6% (Stockholm), 31% (Brussels), 31.1% (Amsterdam), 29.2% (Rotterdam), 26.4% (Berlin) and 24% (Frankfurt) (For information regarding sampling and response rates, see Crul et al., 2012; Groenewold and Lessard-Phillips, 2012). Low response rates are due in part to the quality of available address lists in

cities and neighbourhoods with high mobility rates and in part to generally low cooperation rates in inner cities, in young age groups, and in ethnic minority populations, which make up the target population of the TIES-surveys (Groenewold and Lessard-Phillips, 2012; Stoop et al., 2010).

Analytical approach

School Trajectories

Construction of Trajectories. Respondents retrospectively reported at what level they started secondary school, and at what level they continued afterwards up to a maximum of five episodes. Episodes refer to sequencing and stages of the school career. Coding and number of episodes depend on the country because in more stratified systems, students may go through more episodes and therefore can fill in information for all the five episodes. For instance, in Belgium a student who went to vocational track in lower secondary, technical track in upper secondary, vocational track in upper secondary, studied an additional year to be able to go to university, and went to university, would have five episodes (the trajectory was coded as 24568, see below for details). In Sweden, we coded until three episodes as the highest number of episodes, which refers to e.g. a student who went to vocational programme in upper secondary, then switched to adult education and finally to university (the trajectory was coded as 346). Even in stratified systems, some students follow more direct pathways going through fewer episodes. A student who follows such a direct track e.g. in Belgium attending academic tracks in lower and upper secondary school, followed by university, would have three episodes. In such cases, the student's trajectory was still coded as five episodes with coding of the remaining two episodes as 0 (the trajectory was coded as 13800) so that all trajectories within each country have the same length.

Individual school trajectories were reconstructed referring to the routes taken until the highest level attempted (not necessarily completed). Additional information on the duration of each school transition was also asked. Because of the high number of missing values, we were unable to use this information. The trajectories thus focused on the sequence in the school career rather than the timing: lower secondary, upper secondary and beyond. The information we used included track placement and drop-out status at lower and upper secondary schools. Beyond secondary school, we differentiated between polytechnics, university and extra years of specialization[4]. Since we were interested in detailed routes, we analysed the data per country. A recoding to, for example, ISCED codes, would reduce the level of complexity and detail, which was the focus of our study.

In the following, we describe how individual trajectories (sequences) were coded for each country. The graphical representations in Figure 1-5 visualize the number of people in each track (along the vertical axis) and the order (i.e., sequencing) of tracks (along the horizontal axis). These figures show us at which stage of the academic career (lower secondary, upper or beyond) the gap between second-generation and native trajectories start to unfold.

-Figures 1-5 about here-

A school trajectory in Sweden consisted of 3 episodes with coding as follows: 1 lower secondary; 2 higher secondary academic; 3 higher secondary vocational; 4 adult secondary and folk high school; 5 polytechnics (university < 3 years); 6 university and higher. Recall that in Sweden, students attend 9 years of comprehensive primary school, which covers the period called lower secondary in other systems. Here "1" indicates those few students who stopped their education after this comprehensive

education (and they were coded as 100). Whenever the student stopped in the career this was coded with 0[5]. A three-episode-sequence in Sweden such as 260 means that the respondent started first at academic higher secondary, and then continued to university before the school career stopped. There were, for example, 88 respondents who followed this trajectory. Overall, only 16 different types of trajectories were defined in Sweden.

In Belgium, a school trajectory consisted of five episodes with the following coding: (0 stop); 1 lower secondary academic; 2 lower secondary vocational; 3 upper secondary academic; 4 upper secondary technical; 5 upper secondary vocational/ apprenticeship; 6 additional year; 7 polytechnics (*hogeschool);* and 8 university or higher. A five-episode-sequence in Belgium such as 13700 means that the respondent followed the academic track in lower and upper secondary school, and then continued to polytechnics. There were 206 respondents in this trajectory. Overall, 64 different types of school trajectories were defined in Belgium.

In the Netherlands, a school trajectory involved 4 episodes with the following coding: (0 stop); 1 lower secondary academic; 2 middle school; 3 lower secondary vocational; 4 upper secondary academic (VWO); 5 technical (HAVO); 6 vocational/apprenticeship; 7 polytechnics (hogeschool); 8 university and higher. A four-episode-sequence in the Netherlands such as 1480 means that the respondent followed academic education in lower and upper secondary school, and then continued to university. There were 179 respondents in this trajectory. Overall, 95 different types of school trajectories were defined in the Netherlands.

In Austria, a school trajectory involved 4 episodes with the following coding: (0 stop); 1 lower secondary academic; 2 lower secondary middle track (*mittelschule*); 3 lower secondary vocational, 4 upper secondary academic; 5 upper secondary technical; 6

upper secondary vocational/apprenticeship; 7 additional year; 8 polytechnics; 9 university or higher. A four-episode-sequence in Austria such as 3600 means that the respondent followed vocational education both in lower and upper secondary school. There were 179 respondents in this trajectory. 81 different types of trajectories were defined in Austria.

Finally, in Germany, a school trajectory also involved 4 episodes: (0 stop); 1 lower secondary academic; 2 comprehensive (gesamtschule); 3 middle school (realschule); 4 lower secondary vocational; 5 upper secondary academic; 6 technical (non-academic); 7 vocational/apprenticeship; 8 polytechnics (hogeschool); 9 university and higher. A four-episode-sequence in Germany such as 3700 means that the respondent started first at middle school, and then continued to vocational secondary school. There were 236 respondents in this trajectory. Overall, 51 different trajectories were defined in Germany.

Results

Description of Trajectories. Figures 1-5 graphically show (see supplementary online material section 2 for colored figures) the distribution of the trajectories in each of the study countries and for the Turkish second-generation and the majority group. In Sweden (Figure 1), in secondary school the shares of Turkish second-generation and the native group in vocational and academic education were similar. Yet, fewer Turkish second-generation students continued to university and more of them switched to adult secondary school, either after vocational or academic tracks. Finally, adult secondary school did not lead to tertiary education in most cases. The gap between the second-generation and their native peers started later in the school careers, after full secondary school.

In Belgium (Figure 2), a majority of both the second-generation and the native group started in academic tracks. However, many second-generation students who started in academic tracks switched to a vocational or technical track in the upper secondary level, resulting in a reduced number of second-generation students in the academic track compared to the native group at this level. Thus, the real disadvantage of the second-generation students in terms of their underrepresentation in academic tracks seems to start in the upper secondary level. Finally, since only academic and, to a lesser extent, technical tracks led to higher education, second-generation students were underrepresented in any type of higher education.

In the Netherlands (Figure 3), a larger share of Turkish young adults started their education in middle and vocational tracks compared to their native peers. Even those Turkish students who followed an academic education in lower secondary school continued with technical education in the upper secondary school. On the contrary, many native young adults started and continued with academic education in secondary school. The underrepresentation of Turkish young adults in the academic education began in the lower secondary; and this gap was maintained throughout the school career. Consequently, few Turkish young adults ended up at university.

In Austria (Figure 4), the vast majority of the second-generation students started their secondary school education in a vocational track. This initial disadvantage was maintained through school careers, resulting in fewer number of second-generation students in academic tracks in upper secondary school and then in university. It thus seems that the disadvantage of second-generation Turkish students began already in the lower secondary school level.

In Germany (Figure 5), the underrepresentation of Turkish young adults in academic tracks and their overrepresentation in vocational tracks already started in lower

secondary school. In upper secondary school, there were few Turkish students in the academic track. Since only those graduating from the academic track can continue with university in Germany, even fewer Turkish students ended up at university. The situation in Germany is similar to Austria and the Netherlands in terms of the stage that the gap begins to unfold. Yet, the persistence of this initial disadvantage of Turkish students throughout their school career seems to be more evident in Germany and Austria.

Clusters of School Trajectories

After each respondent's school career was coded in a sequence (or a trajectory), differences between individual trajectories were calculated by using optimal matching analyses. This is a technique for the analysis of sequence data, which takes into account the order of the sequences. It uses an iterative minimization procedure to find the distance between every pair of sequences in a sample. The distance between two sequences can be defined as the number of operations one must perform to match the sequences. For each pair of sequences in the sample, the lowest "costs" needed to turn one sequence into another are calculated by using three elementary operations: insertion (an item can be inserted into the first sequence), deletion (an item can be deleted from the first sequence), and substitution (an item can be substituted by another item). The first two operations are called as indel (insert-delete) costs. We adopted the most commonly applied indel and substitution costs (1 for indel cost, 2 for substation cost). The distances for each pairwise combination of individual sequences were saved as a dissimilarity matrix (Brzinsky-Fay, 2007; Brzinsky-Fay et al., 2006).

In the second step, cluster analysis was carried out on the dissimilarity matrix using the average linkage algorithm. In this algorithm, the distance between two

clusters is defined as the average of distances between all pairs of objects, where each pair is made up of one object from each group[6]. Cluster analysis was carried out separately for each country, but the data were aggregated over cities within the same country to increase statistical power[7]. Since conventional test statistics are not available with sequence data, the appropriate number of clusters was defined based on observation of analytically meaningful groups and a sufficient number of cases. Each cluster of school trajectories was named after the most common trajectory in this cluster. For instance, the school trajectory coded as 260 in Sweden was grouped with other similarly academic trajectories (e.g., 250), and hence this cluster was named as academic trajectory. A five-cluster solution was preferred in all the countries but for Germany (with a four-cluster solution). Table 1 shows the clusters in each country.

-Table 1 about here-

Short, academic and vocational trajectories were found in all countries (except for Germany where there was no short trajectory), although their details were slightly different.

A short trajectory[8] involved students who stopped after lower or upper secondary school. These students were mostly down-streamed from academic to other types of tracks or moved between other types of tracks (except for Sweden where tracking is minimal).

A typical *academic trajectory* included students who studied an academic type of secondary education and then followed the tertiary education. In Belgium and Austria, it included a few students who moved from an academic to a technical track and then continued to tertiary education. Only in Germany, the "academic" cluster also involved students who did not follow tertiary education because they switched to a vocational/ apprenticeship track afterwards.

There were also longer academic trajectories. In Sweden, an *academic adult trajectory* referred to a small cluster of students who switched to adult secondary education, as they did not graduate from the "regular" secondary education, only one third continued to tertiary education. In Belgium, an *academic bumpy road* consisted of students who started secondary school in an academic track, and then switched to a technical or vocational track. Some of these students also took an extra year beyond secondary education and some (20 percent) continued into tertiary education.

A *vocational trajectory* included students who completed vocational secondary education. In Sweden, they all went on to tertiary education; in Austria, only one third ended up in university (through moving to a technical track and/or following an additional year); while in Germany and Belgium, none did.

There were also longer vocational trajectories in all countries except for Germany. In Sweden, a *vocational adult trajectory* was a small cluster of students who began secondary school in a vocational track but then switched to adult secondary education; they did not continue to tertiary education. Belgium had a *vocational long trajectory*, where students switched between tracks but none went on to university. In the Netherlands, one fourth of students who followed a *vocational long trajectory* continued beyond secondary education to polytechnics. In Austria, a *vocational upward trajectory* included a small cluster of students who started secondary school education in a vocational track, switched to an academic or technical track, and then continued to any type of tertiary education.

There were also *middle school trajectories* in the Netherlands, Austria and Germany. In the Netherlands, the "middle trajectory" was a specific cluster of students who first attended middle school (MAVO old system, VMBO-theoretisch), and then continued to technical education in the upper secondary school. Most of these students went on

to study at polytechnics. A “middle school trajectory” in Austria consisted of students who attended “Mittelschule”, some of whom continued to tertiary education (20 percent). In Germany, the “Middle” cluster involved students who started their education in middle school (Realschule), most of whom either continued with vocational/apprenticeship or stopped studying altogether.

In the Netherlands, there was an additional cluster labelled as technical (HAVO) trajectory. Students in this cluster began their school career in an academic trajectory, switched to a technical track and then pursued their education in polytechnics. A few of them continued to university after polytechnics. It is similar to the middle trajectory in the Netherlands except that they began secondary school in the academic track.

In Germany, there was an additional cluster labelled as *Comprehensive School trajectory* (Gesamtschule). Students started their secondary education in mixed/comprehensive schools, most of them continued in vocational training/apprenticeship. A few of the students in this cluster (15 percent) followed tertiary education (through moving to an academic track). This trajectory is “higher” than the middle trajectory in Germany in terms of access to tertiary education.

Overall, in Germany, clusters reflected the tracks in which students started secondary education (with four trajectories named academic, vocational, middle, comprehensive), so the track they began in secondary school determined the route they took as well as their final attainment level, and only the academic trajectory led to higher education (but not for everyone). Some students who began secondary school in a comprehensive school also went on to tertiary education but only via moving to an academic track.

In terms of track mobility, most school trajectories included track mobility, but not always ended up in tertiary education. In Belgium, the bumpy road indicated a

"second-chance" trajectory for those who failed in an academic track, because they were later able to switch to a vocational track and to go on to a university, while a vocational long trajectory involved track mobility between vocational and technical tracks but did not lead to tertiary education. Longer vocational trajectories in the Netherlands and Austria allowed students to move from a vocational track to an academic one, which led to tertiary education for some. Middle trajectories in the Netherlands and Austria and the technical trajectory in the Netherlands also allowed students to move to other tracks and some of them continued to tertiary education. In Sweden, where tracking is minimal, young adults also had academic and vocational adult trajectories indicating "second chance" trajectories, as they were backdoors to education for those who did not succeed in regular academic or vocational tracks.

The gap between second-generation and native school trajectories before and after matching

The Gap in School Careers before Matching. Looking at the gap between second-generation and native school trajectories, we compared the distribution of young adults over the different clusters of school trajectories by country/city and origin (Table 1). We found that native young adults more often followed the direct academic trajectories, whereas second-generation young adults more often followed the short and vocational trajectories in each country. One exception is the vocational trajectory in Sweden, which was more often followed by natives. One should, however, bear in mind that this trajectory involved students who all went on to tertiary education (unlike other vocational trajectories) (Readers who are interested to see which of these gaps are significant should see the Supplementary Material section 4, confidence interval for probabilities)

There were also second-chance trajectories such as adult education routes in Sweden, bumpy road and vocational long routes in Belgium, the vocational long route in the Netherlands, and the vocational upward trajectory in Austria. These routes are less common and followed by fewer people. Still, they were more often followed by the second-generation than the native youth (except for the vocational upward trajectory in Austria). Finally, the middle trajectory, which granted some access to tertiary education in Austria but none in Germany, was followed by more native youth in Austria and more second-generation youth in Germany. As for the Netherlands, while both middle and technical trajectories granted access to polytechnics, the former was equally followed by the natives and second-generation, while the latter was more often followed by the natives.

Propensity Score Matching. We used propensity score matching to control for individual (age, gender, student status, age at first school year, changing schools) and family background (parents' education, parents' employment status and siblings' educational status: no diploma or tertiary education diploma) while comparing school trajectories of Turkish second-generation to native young adults (see Table 2). Matching methods are used as an alternative or a complementary method to regression analysis for group comparisons (e.g., in education research, Guill et al., 2017; Kainz and Pan 2014). The primary advantage of using matching methods is to ensure a comparison between balanced samples with respect to control variables. Regression models can also be used, when the comparison groups are balanced. Making comparisons between two groups, which have little overlap in terms of background characteristics, may bias the results in regression analyses, if these characteristics are correlated with the outcome of interest. For instance, parental background of second-generation and native children vastly differ (that is, there is

little overlap), and in such cases, controlling for parental background in regression analysis may bias the results. The standard diagnostics of regression involve neither evaluating the overlap between the groups, nor excluding cases outside the overlap (Stuart, 2010), whereas the propensity score matching method allows for an evaluation of the quality of results given the overlap between the samples. For instance, while balancing the native and immigrant children in terms of parental background, we can statistically test the significance of the bias in their background before and after matching. We can also look into the profiles of participants who could not be matched. Thus, this method allows for an informed discussion of the limitations of our attempts to control for the background characteristics.

In each country, we matched Turkish second generation with native young adults who have similar characteristics. That is, each respondent from the Turkish second generation was given a weight of one, and the weights for the native young adults reflected the closeness of match with respect to the individual and family background. We ran two matching models. The first model included individual background characteristics, such as *age, gender, student status,* as covariates in the matching model. The second model also included family background characteristics such as *parent's education and employment status*. The two-step modeling aimed at revealing the relative importance of these two sets of covariates in explaining school trajectories in different countries. We used the Stata command psmatch2 to perform Kernel-based (the epanechnikov kernel type) propensity score matching (Leuven and Sianesi 2003). We followed the necessary steps suggested by Caliendo and Kopeinig (2008) when implementing propensity score matching.

Table 2 about here

Table 2 provides an overview of the background characteristic variables that are used in the matching and compares distributions of individual and family background among native adults and the Turkish second generation sample before and after matching. Before matching, the Turkish second generation sample differed considerably from the native young adults with respect to their background, particularly, parents' education, parents' employment status, and having siblings who dropped out of school.

There is a large gap in parental educational levels of the Turkish second-generation and the native youth. About 57% of the Turkish second-generation in Sweden reported that their parents had lower secondary education or lower while the corresponding figure was 12% among the natives. The gap was even larger in Germany where 84% of Turkish parents had lower secondary education or lower, as opposed to 20% among natives (for the other countries the respective figures are 62% vs 8% in Belgium, 60% vs. 9% in Austria, 77% vs 27% in the Netherlands, 57% vs. 12% in Sweden). Regarding the employment status of the parents, across all countries parents of native adults were more likely to be both employed. Furthermore, parents of the Turkish second generation were more likely to be both unemployed. Finally, the Turkish second-generation were more likely to have siblings who dropped out of school across all countries (17% among the Turkish second-generation vs 6% among native adults in Germany, 43% vs 21% in Belgium, 20% vs 5% in Austria, 21% vs 13% in Sweden, and 33% vs 14% in the Netherlands).

Table 2 (columns titled "matched") also shows the distribution of background variables after matching. The differences in background variables become smaller or nonsignificant after matching. Note that the matching excluded cases out of common support (the overlap between the two groups given their propensity score distribution)

to ensure that samples were balanced (See the sample sizes before and after matching in Table 2). (See Supplementary Material Section 3 for details of balancing in the propensity score matching)

The Gap in School Careers after Matching. Once samples were balanced, we subsequently estimated the probability of being in a certain school trajectory using multinomial logistic regression where different school trajectories were the dependent variable and an indicator of Turkish second-generation (versus native) was the independent variable (Readers who are interested to see which of these gaps are significant should see the Supplementary Material section 4, regression results and confidence intervals for the probabilities). We ran the multinomial logistic regressions twice, with and without matching weights. The figures 6a-e show the gap in predicted probabilities for each school trajectory between the Turkish and native young adults.

-Figures 6a-e about here-

Did ethnic gaps persist or disappear in more stratified educational systems after controlling for individual and family background? After controlling for individual background, the gaps either remained the same or slightly increased. Family background had much more explanatory power particularly in more stratified systems like Austria and Germany where the gaps in academic, short and vocational trajectories almost disappeared. In Belgium, and the Netherlands, gaps were also reduced but did not disappear. In Sweden, the gaps were reduced very little or remained the same. The importance of second-chance (adult education) trajectories after controlling for individual and family background is hard to evaluate given the fact that these are very small clusters to start with.

Discussion

In this paper, we questioned how the school trajectories of second-generation young adults evolved compared to their native peers in different school systems across Europe. We used unique data that included retrospective school histories of the respondents. We were interested in the key determining moments in the school career. Our study is one of the few quantitative studies that looks at the whole school career of the second-generation and native students, and that does so comparatively across five European countries. It thus contributes to the literature on the effects of school tracking by showing how tracking shapes the actual school careers of these students. Our findings showed that the school system makes a difference in the second-generation school trajectories in significant ways. In line with the first hypothesis, we found that the more differentiated the tracking is and the earlier the tracking takes place, the earlier the gap between the second-generation and native school trajectories start to unfold throughout the school career. Accordingly, while in Sweden the gap was only evident after secondary school, in Belgium the real disadvantage of the second-generation students in terms of their underrepresentation in academic tracks started in the upper secondary level. In Germany, Austria and the Netherlands, the gap started to unfold very early in lower secondary school. However, the persistence of this initial disadvantage of the Turkish students throughout the whole school career seems to be more evident in Germany and Austria. Since different characteristics of the school systems (such as degree and timing of tracking and flexibility) generally go hand in hand, it is hard to pinpoint which of these aspects lead to the differences in the timing of the observed gaps across countries. Nevertheless, one can speculate that the gaps emerged later in the school career in Sweden and Belgium because students were streamed into fewer types of education and the selection happened after many years of schooling.

In line with the second hypothesis, stratified school systems also determine the opportunities associated with each track by granting access to higher education (Allmendinger, 1989). This was most evident in Germany, where school trajectories were clustered according to the track students were sorted into in lower secondary school, while only the academic track granted access to university.

Going beyond previous research, this study systematically investigated which track mobility or permeability options school systems offer and are used by students. The picture was more complicated than what we anticipated: Most school systems allowed for track mobility opportunities, but Germany and Austria fared worse when we also considered whether these opportunities led to tertiary education. Students were able to find "back doors" into education through "second chance" trajectories in three main routes: through the vocational routes such as in Sweden (vocational adult trajectories), Belgium (vocational long), Netherlands (vocational long) and Austria (vocational upward), through the academic routes such as in Sweden (academic adult trajectory) and in Belgium (bumpy road), and through the middle track routes such in Netherlands, Austria and Germany. Second-generation youth were generally more likely to follow these routes than the natives were.

First, vocational "second-chance" trajectories allowed for upward mobility from vocational to other types of tracks, and generally led to some form of tertiary education except for Sweden and Belgium. Secondly, academic "second-chance" trajectories allowed for back doors into education for those students who started secondary school in an academic track but failed. For instance, the bumpy road trajectory in Belgium involved down-streaming at first, as Crul (2013) also found, but nonetheless some students who followed this route went on to tertiary education. Finally, middle trajectories also allowed for track mobility for students who started

their education in middle tracks, and sometimes led to tertiary education (such as in the Netherlands and Austria but not in Germany).

While we interpret these differences in school careers of native and second-generation young adults in terms of different school systems, the rational choice approach suggests that ethnic minority students are more likely to choose vocational education by weighing the costs and benefits of their alternatives (Breen and Goldthorpe 1997). Research indeed shows that vocational education combined with apprenticeship such as in Germany makes school-to-work transition easier (Crul and Schneider, 2009). Therefore, vocational education could be a more secure option or a safety net for children from disadvantaged backgrounds (DiStasio, 2017; Vergolini and Vlach 2017). However, there are a number of problems with the rational choice explanation. First, for making a rational choice, the individual should weigh the costs and benefits of different options. However, looking at Turkish parents' choice for a primary school for their children, Kristen (2008) found that since Turkish families were less familiar with the German school system, they paid attention only to a single school without considering the alternatives. The school they considered was the one with a high concentration of immigrant students. Secondly, even controlling for their achievement in math and German in primary school, Turkish-origin children were more likely to attend vocational (lower) secondary school than their native peers (Kristen, 2000). Finally, the ethnic gap remains even in the type of apprenticeships. Thus, native German students were more likely to be placed in more promising apprenticeships than the Turkish-origins students (Bosch and Kalina, 2008; Worbs 2003). Overall, we think that there is not enough evidence for the rational choice approach in the case of the Turkish second-generation.

Finally, we compared how and to what extent the school trajectories of second-generation and native youth varied in different school systems. As expected, across systems second generation Turkish young adults followed more often non-academic or short school careers and less often academic careers relative to their native peers. By using propensity score matching of the young adults, we controlled for individual and family background and found that individual background did not affect the gaps. However, we could only include a limited set of individual background measures with the available data we had, which did not capture previous performance or achievement such as grades. Research suggests that when controlling for previous achievement, second-generation youth more often choose academic routes in upper secondary education or have higher access to tertiary education (Heath et al., 2008; Jackson et al., 2012).

Our results showed varied effects of family background on ethnic gaps in school careers depending on the stratification of the school systems, in line with previous findings on test scores (Ammermuller, 2005; Marks, 2005; Entorf and Lauk, 2008). Thus, family background explained away the gaps in Austria and Germany, while it reduced (but did not explain away) the gaps in Belgium and Netherlands, and had little if any effects on gaps in Sweden. Crul (2013) suggests that the educational background of the parents, rather than ethnicity, plays a major role in Austria and Germany. In these countries, the system is so selective that at important transition points, children of lower-educated Turkish parents are driven away from academic tracks. This would imply that it is nearly impossible to achieve entry into higher education if parents are low educated. However, not all systems that differentiate students show strong effects for family background. For instance, Belgium and Netherlands also track students at an early age but do not show as strong effects for

family background as Germany and Austria (see also, Marks, 2005). One reason could be their relative flexibility where students are able to catch up later on; even if it means a longer route (Crul and Holdaway, 2009). Thus, tracking in and of itself can, but need not necessarily, promote socioeconomic inequality (Marks, 2005).

Despite these new and innovative insights, our study also has limitations. First, we had to rely on retrospective data to reconstruct the individual school careers. Although the retrospective data we use can be expected to yield reasonably reliable information (Blossfeld and Rohwer, 2002), having longitudinal data following young people over time could provide more accurate data on critical moments in school careers. Ongoing linkages between population register data and educational achievements of youth that are developed in northern Europe are a step forward in this direction. Second, low response rates pose challenges to the comparative scope of any large-scale survey (Stoop et al., 2010). Even though the low response rates in TIES surveys are not surprising given the study population of youth with an ethnic minority background living in an urban context, they potentially limit generalization. At the same time, they are the only cross-country data that we can use for the purpose of our study as far as we know. Thirdly, while we compare the five countries in terms of school systems, these countries also differ in many other ways (such as their integration policies). Future multilevel studies are necessary to take into account these country-level differences. Fourth, due to smaller sample sizes, we were unable to analyse the data at the city level and compare city differences. Although educational systems are generally nationally regulated, a comparison of cities might have yielded interesting differences in educational practices. Fifth, this study focused only on the Turkish minority as an exemplary case of disadvantaged immigrant minorities in Europe. Future studies should investigate to what extent these findings apply to the school

careers of other disadvantaged groups. Finally, the matching was not equally effective in each country. Although we do not expect conclusions to change substantially, a more rigorous matching in these countries with more balanced observed data would have led to more accurate estimates.

Overall, we believe that the costs of early tracking for immigrants' school careers may overwhelm its benefits. Our findings suggest that an ideal school system has a longer block of integrated compulsory education (such as ten years), that is, identical for everyone, so that even those who start with a disadvantaged background have time to catch up with others. Compulsory education could be then followed by certain tracks or ability grouping in upper secondary school from two to four years; and importantly all these tracks should give access to some tertiary education. Finally, through extensive adult education and by allowing change of tracks, pupils should be given second chances to complete their education also at later ages. Our findings underline the importance of flexible tracking structures in stratified school systems for allowing upward mobility of students from disadvantaged backgrounds. Finally, in such an open system, students' success should depend less on their family background so that there is actual progress in terms of decreasing inequalities across groups and generations. These conclusions are even more important in the current context in which the student populations in European schools are going to be increasingly diverse, making it essential to create educational systems that provide equal opportunities for all students.

Conflict of Interest: The authors declare that they have no conflict of interest.

Footnotes

[1] We match the Turkish second-generation and the native youth on individual and family background within each country. Thus, our aim here is not to provide a cross-country comparison of the second-generation Turks, who may still differ in their compositions across countries. Moreover, we do not claim that our samples are representative of the second-generation or natives within each country due to selection biases in the TIES surveys (e.g., due to low response rates). However, our comparisons between these two populations within each country are internally valid since these populations are made "equivalent" through propensity score matching.

[2] In Berlin as opposed to Frankfurt, selection age is 12 after 6 years of schooling

[3] Switzerland and France also sampled Turkish second-generation. The school system in Switzerland is similar to other Germany speaking countries (Crul et al., 2012), and we chose to focus on Germany and Austria. France is similar to Sweden in terms of a more open or less stratified school system, and we chose to focus on Sweden (Crul et al., 2013; Crul, 2013; Schnell et al., 2013). Our choices also reflect concerns about sampling designs and implementation (Groenewold and Lessard-Phillips, 2012).

[4] Breen and Johnson (2000) looked at the transition/selection points throughout a school career by taking into account the path dependency of later transitions. Our approach looks at the sequencing of the school career as a whole, which allows us to estimate the ethnic gaps in the types of school careers rather than at different transition points.

[5] "Stop" (code 0) may mean that students either dropped out or completed the degree, depending on the length of compulsory education in that country. For instance, a student leaving school (coded as 0) just after lower secondary school would be considered a drop out in Belgium but not in Sweden. In Sweden students can stop studying after the compulsory and comprehensive primary school (a combination of

primary and lower secondary school) since they are not obliged to go to upper secondary school. While respondents were asked whether they completed that level for each of the episodes, there were many missing values, so we could not use that information.

[6] We also applied Ward's hierarchical fusion algorithm. Only in Austria Ward's algorithm yielded slightly better differentiation of clusters. To enhance comparability, we presented the results of average linkage clustering in all countries.

[7] We also conducted cluster analysis separately for each group in each country. As clusters emerging from within-group analysis were similar to those emerging from within country analysis, here we only presented the latter.

[8] Approximately half of the sample in each country was between the ages of 18-25 years. We did additional analyses to test whether the short school trajectories were related to younger age. First, mean ages for each school trajectory in each country were generally 25 or older. Secondly, school trajectories were mostly unrelated to age. Only in Sweden, those in the short trajectory were younger than those in other trajectories, but the mean age in this trajectory was almost 25.

References

Abbott A (1995) Sequence analysis: New methods for old ideas. *Annual Review of Sociology,* 21(1): 93-113

Alba R, Sloan J and Sperling J (2011) The integration imperative: the children of low-status immigrants in the schools of wealthy societies. *Annual Review of Sociology,* 37: 395-415.

Allmendinger J (1989) Educational systems and labor market outcomes. *European Sociological Review*, 5(3): 231-250.

Allmendinger J and Von Den Driesch E (2014) Social inequalities in Europe: facing the challenge (No. P 2014-005). WZB Discussion Paper.

Ammermüller A (2005) Educational opportunities and the role of institutions. *ZEW Discussion paper,* 5–44. http://digitalarchive.maastrichtuniversity.nl/fedora/get/guid%3A1e028e4f-ff63-4f12-80d6-b90f79c1d5f0/ASSET1/

Baysu G and De Valk HAG (2012) Navigating the School System in Sweden, Belgium, Austria and Germany: School segregation and second generation school trajectories. *Ethnicities*, 12(6): 776-799.

Baysu G and Phalet K (2012) Staying on or dropping out: the role of the school environment in minority and non-minority school careers. *Teachers College Record*, 114(5).

Billari FC (2001) Sequence analysis in demographic research. *Canadian Studies in Population,* 28(2): 439-458

Blossfeld H and Rohwer G (2002) *Techniques of Event History Modeling: New Approaches to Causal Analysis (*2nd ed). New Jersey: Lawrence Erlbaum Associates.

Bol T and Van de Werfhorst HG (2013) Educational systems and the trade-off between labor market allocation and equality of educational opportunity. *Comparative Education Review,* 57(2): 285-308.

Borgna C and D Contini (2014) Migrant Achievement Penalties in Western Europe: Do Educational Systems Matter? *European Sociological Review,* 30(5): 670–683

Bosch G and Kalina T (2008) Low- wage work in Germany: An overview. In Bosch G and Weinkopf C (Eds.) *Low-Wage Work in Germany* (pp. 19-112). New York: Russell Sage.

Brannstrom, L. 2004. Poor places, poor prospects? Counterfactual models of neighbourhood effects on social exclusion in Stockholm, Sweden. *Urban Studies* 41 (13), 2515–2537.

Breen R. and Goldthorpe JH (1997) Explaining educational differentials: Towards a formal rational action theory, *Rationality and society*, 9:275-305.

Breen R and Jonsson JO (2000) Analyzing educational careers: A multinomial transition model. *American Sociological Review*, 754-772.

Breen R and Jonsson J (2005) Explaining change in social fluidity: Educational equalization and educational explanation in twentieth-century Sweden. *American Journal of Sociology*, 112: 1775–810

Brunello G and Checchi D (2007) Does school tracking affect equality of opportunity? New international evidence. *Economic Policy*, 781–861. DOI: http://dx.doi.org/10.1111/j.1468-0327.2007.00189.x

Brzinsky-Fay, C. (2007). Lost in transition? Labour market entry sequences of school leavers in Europe. *European Sociological Review*, 23(4), 409-422.

Brzinsky-Fay C, Kohler U and Luniak M (2006). Sequence analysis with STATA. *Stata Journal* 6, 435-460.

Caliendo M and Kopeinig S (2008) Some practical guidance for the implementation of propensity score matching. *Journal of Economic Surveys*, 22(1): 31-72.

Crul M (2013). Snakes and Ladders in Educational Systems: access to higher education for second-generation Turks in Europe. *Journal of Ethnic and Migration Studies*, 39: 1383–1401

Crul M (2015) Is education the pathway to success? A comparison of second generation Turkish professionals in Sweden, France, Germany and the Netherlands. *European Journal of Education*, 50(3): 325-339.

Crul M and Holdaway J (2009) Children of immigrants in schools in New York and Amsterdam: the factors shaping attainment. *Teachers College Records,* 111:1476–507.

Crul M and Schneider J (2009) Children of Turkish Immigrants in Germany and the Netherlands: The Impact of Differences in Vocational and Academic Tracking Systems. *Teachers College Record*, 111:1508-1527.

Crul M and Schneider J (2010) Comparative context integration theory. Participation and belong in Europe's large cities. *Journal of Ethnic and Racial Studies*, 34: 1249–1268.

Crul. M. and Vermeulen, H. (2006). Immigration, education and the Turkish second generation in five European nations: a comparative study. In Parsons CA and Smeeding TM (Eds.), *Immigration and the transformation of Europe* (pp. 235-250). Cambridge: Cambridge University Press.

Crul M, Schneider J and Lelie F (2012) (Eds).*The European Second Generation Compared: Does the Integration Context Matter?* Amsterdam: Amsterdam University Press.

De Valk HAG and Crul M (2007) Education. In Crul M and Heering L (Eds.), *The integration of the European second generation (TIES): A survey in Amsterdam and Rotterdam* (pp. 43-63). Amsterdam/The Hague: IMES/NIDI.

Di Stasio V (2017) 'Diversion or safety net?' Institutions and public opinion on vocational education and training. *Journal of European Social Policy*, 27:360-372.

Dronkers J (2010*). Positive but also negative effects of ethnic diversity in schools on educational performance? An empirical test using cross-national PISA data*, paper presented at the conference Integration and Inequality in Educational Institutions at the University of Bremen, http://www.eui.eu/Personal/Dronkers/English/oratie.pdf

Dustmann C, Frattini T and Lanzara G (2012) Educational achievement of second generation immigrants: An international comparison. *Economic Policy*, 143–185. DOI: http://dx.doi.org/10.1111/j.1468-0327.2011.00275.x

Entorf H and Minoiu N (2005) What a difference immigration policy makes: a comparison of PISA results in Europe and traditional countries of immigration. *German Economic Review*, 6, 355-376.

Entorf H and Lauk M (2008) Peer effects, social multipliers and migrants in school. *Journal of Ethnic and Migration Studies*, 34, 633-654.

Groenewold G and Lessard-Phillips L (2012). Research methodology. In Crul M, Schneider J and Lelie F (Eds.), *The European Second Generation Compared: Does the Integration Context Matter?* (pp. 39-56). Amsterdam: Amsterdam University Press

Guill K, Lüdtke O and Köller O (2017) Academic tracking is related to gains in students' intelligence over four years: Evidence from a propensity score matching study. *Learning and Instruction*, *47*:43-52.

Heath A and Brinbaum Y (2007) Guest editorial: Explaining ethnic inequalities in educational attainment. *Ethnicities*, 7(3): 291–305.

Heath A, Rothon C and Kilpi E (2008) The Second Generation in Western Europe: Education, unemployment and occupational attainment. *Annual Review of Sociology* 34: 211-235.

Hanuschek EA and Wöessmann L (2006) Does school tracking affect performance and inequality? Differences in differences evidence across countries. *Economic Journal*, 116: 63-76.

Harding DJ (2003. Counterfactual models of neighbourhood effects: The effect of neighbourhood poverty on dropping out and teenage pregnancy. *American Journal of Sociology*, 109(3): 676–719

Horn D (2009) Age of selection counts: cross-country analysis of educational institutions, *Educational Research and Evaluation*, 15: 343–366.

Jackson M, Jonsson JO and Rudolphi F (2012) Ethnic inequality in choice-driven education systems: A longitudinal study of performance and choice in England and Sweden. *Sociology of Education*, 85(2): 158-178.

Kainz K and Pan Y (2014) Segregated school effects on first grade reading gains: Using propensity score matching to disentangle effects for African-American, Latino, and European-American students. *Early Childhood Research Quarterly*, *29*(4): 531-537.

Kalmijn M and Kraaykamp G (2003) Dropout and downward mobility in the educational careers: an event-history analysis of ethnic schooling differences in the Netherlands. *Educational Research and Evaluation,* 9, 265-287.

Kao G and Thompson JS (2003) Racial and ethnic stratification in educational achievement and attainment. *Annual Review of Sociology*, 29(1): 417-442.

Kerckhoff A (2001) Education and social stratification processes in comparative perspective. *Sociology of Education*, 74(extra issue): 3-18.

Kristen C (2000) Ethnic Differences in Educational Placement: The Transition from Primary to Secondary schooling. Working paper Mannheim Centrum for European Social Research (MZES), 32, ISSN 1437-8574

Kristen C (2008) Primary school choice and ethnic school segregation in German elementary schools. *European Sociological Review*, 24: 495-510.

Levels M and Dronkers J (2008) Educational performance of native and immigrant children. *Ethnic and Racial Studies,* 31: 1404-1425.

Leuven E and Sianesi B (2003) Stata module to perform full Mahalanobis and propensity score matching, common support graphing, and covariate imbalance testing. *Statistical Software Components S*, *432001*.

Marks GN 2005 Cross-national differences and accounting for social class inequalities in education. International Sociology, 20(4): 483-505.

Müller W and Karle W 1993 Social selection in educational systems in Europe. European Sociological Review 9(1): 1-23.

Moldenhawer B et al. (2009) Comparative Report on Education. Ethnic Differences in Education and Diverging Prospects for Urban Youth in an Enlarged Europe. Budapest: EDUMIGROM. https://cps.ceu.edu/sites/cps.ceu.edu/files/cps-working-paper-comparative-report-on-education-2009.pdf

Okagaki L (2001) Triarchic model of minority children's school achievement. *Educational Psychologist*, 36(1): 9-20.

Pásztor A (2016) Divergent pathways: the road to higher education for second-generation Turks in Austria, *Race Ethnicity and Education*, 19:4, 880-90

Penn R and Lampert P (2009) *Children of International Migrants in Europe*. Comparative Perspectives. New York: Palgrave Macmillan

Phalet K, Deboosere P and Bastiaenssen V (2007) Old and new inequalities in educational attainment: ethnic minorities in the Belgian Census 1991-2001. *Ethnicities*, 7(3): 390-415.

Phalet K and Heath A (2011) Ethnic community, urban economy and second generation attainment: Turkish disadvantage in Brussels, Belgium. In Alba R and Waters M (Eds.) *New Dimensions of Diversity: The Children of Immigrants in North America and Western Europe* (pp. 135-65). New York: New York University Press.

Schnell P, Keskiner E and Crul M (2013) Success against the Odds, *Education Inquiry*. 4(1): 125-147

Schnepf SV (2007) 'Immigrants' educational disadvantage: an examination across ten countries and three surveys. *Journal of Population Economics.* 20(3): 527–45.

Shavit Y (1990) Segregation, tracking and the educational attainment of minorities: Arabs and Oriental Jews in Israel. *American Sociological Review*, 55: 115–126.

Shavit Y and Müller W (1998) *From school to work: A comparative study of educational qualifications and occupational destinations*. Oxford: Oxford University Press.

Song S (2011) Second-generation Turkish youth in Europe: Explaining the academic disadvantage in Austria, Germany, and Switzerland. *Economics of Education Review*, 30(5): 938-949.

Stoop I et al. (2010) *Improving survey response. Lessons learned from the European Social Survey*. Chichester: Wiley.

Stuart E A (2010) Matching methods for causal inference: A review and a look forward. *Statistical Science: A Review Journal of the Institute of Mathematical Statistics*, *25*(1): 1-21.

Tolsma J et al. (2007). Trends in ethnic school inequalities in the Netherlands: A cohort design. *European Sociological Review*, 3, 325-339.

Van der Werfhorst HG and Mijs J (2010) Achievement inequality and the institutional structure of educational systems: A comparative perspective. *Annual Review of Sociology*, 36: 407–428.

Vergolini L and Vlach E (2017) Family background and educational path of Italian graduates. *Higher Education,* 73:245-259.

Worbs S (2003) The second generation in Germany: between school and labor market. *International Migration Review*, *37:*1011-1038.

Table 1 Percentages of Respondents in Sweden, Belgium, Netherlands, Austria and Germany in clusters of school trajectories

SWEDEN	All	Natives	Turkish		
N	471	230	241		
Short	0.41	0.32	0.51		
Academic	0.29	0.37	0.22		
Academic+adult	0.07	0.04	0.10		
Vocational	0.14	0.20	0.09		
Vocational+ adult	0.08	0.07	0.09		
BELGIUM	All	Natives Brussels	Natives Antwerp	Turkish Brussels	Turkish Antwerp
N	1075	254	282	217	322
Short	0.24	0.22	0.13	0.39	0.27
Academic	0.48	0.68	0.65	0.33	0.26
Bumpy Road	7.00	0.02	0.08	0.05	0.12
Vocational	17.00	0.08	0.11	0.22	0.28
Vocational Long	3.00	0.01	0.04	0.01	0.07
NETHERLANDS	All	Natives Amsterdam	Natives Rotterdam	Turkish Amsterdam	Turkish Rotterdam
N	993	254	250	231	258
Short	0.43	0.24	0.34	0.55	0.60
Academic	0.22	0.42	0.27	0.13	0.06
Middle	0.13	0.12	0.13	0.14	0.12
Technical HAVO	0.15	0.18	0.21	0.10	0.12
Vocational long	0.07	0.05	0.05	0.07	0.10
AUSTRIA	All	Natives Linz	Natives Vienna	Turkish Linz	Turkish Vienna
N	904	219	242	199	244
Short	0.53	0.47	0.43	0.54	0.67
Academic	0.18	0.23	0.23	0.18	0.11
Middle	0.12	0.12	0.20	0.05	0.09
Vocational	0.13	0.14	0.08	0.20	0.11
Vocational upward	0.04	0.04	0.06	0.04	0.03
GERMANY	All	Natives Berlin	Natives Frankfurt	Turkish Berlin	Turkish Frankfurt
N	957	233	243	239	242
Academic	0.19	0.28	0.28	0.09	0.10
Middle	0.13	0.11	0.10	0.14	0.16
Comprehensive	0.35	0.28	0.24	0.47	0.40
Vocational	0.34	0.34	0.37	0.30	0.35

Table 2: Distribution of individual and family background variables before and after matching, by ethnic origin

	AUSTRIA				BELGIUM				SWEDEN			
variable	***nonmatched***		***matched***		***nonmatched***		***matched***		***nonmatched***		***matched***	
	Native	Turkish	Native	Turkish	Native	Turkish	Native	Turkish	Native	Turkish	Native	Turkish
sample size	*443*	*461*	*431*	*461*	*539*	*536*	*523*	*536*	*241*	*230*	*214*	*230*
Individual background												
Age (mean)	25.6	23.9	24.6	24.0*	25.8	24.8	24.5	25.0	28.0	25.7	28.7	25.8*
Age at first year of schooling (mean)	4.2	4.9	4.7	4.9*	2.9	3.0	3.0	3.0	3.7	3.1	3.4	3.3
Male	47%	46%	53%	46%*	49%	56%	55%	55%	49%	49%	50%	50%
Student	30%	27%	23%	28%	26%	22%	27%	22%	19%	20%	15%	21%
Changed school	8%	14%	14%	13%	29%	40%	36%	39%	29%	38%	66%	56%
Family background												
Siblings dropped out of school	5%	20%	13%	18%*	21%	43%	34%	42%*	13%	21%	15%	22%
Siblings with higher education	15%	15%	14%	15%	49%	37%	32%	37%	28%	22%	24%	20%
Parent's education												
Lower secondary education or lower	9%	60%	53%	59%	8%	62%	47%	61%*	12%	57%	22%	58%*
Upper secondary or higher	91%	40%	47%	41%	92%	38%	53%	39%*	88%	43%	78%	42%*
Employed												
None employed	3%	5%	6%	5%	3%	16%	9%	13%	2%	9%	3%	5%
One parent employed	38%	51%	48%	50%	33%	56%	53%	58%*	17%	37%	18%	40%*
Both employed	59%	44%	46%	45%	65%	28%	39%	29%*	81%	55%	78%	54%*

Note. * Significant difference between natives and the Turkish second generation remains after matching. The significance is calculated based on the standardized % bias in the percentage difference of the sample means using pstest command in statistical software Stata.
**Matching weight are capped at a maximum of 6, and cases out of common support are excluded from the analysis for the matched results.

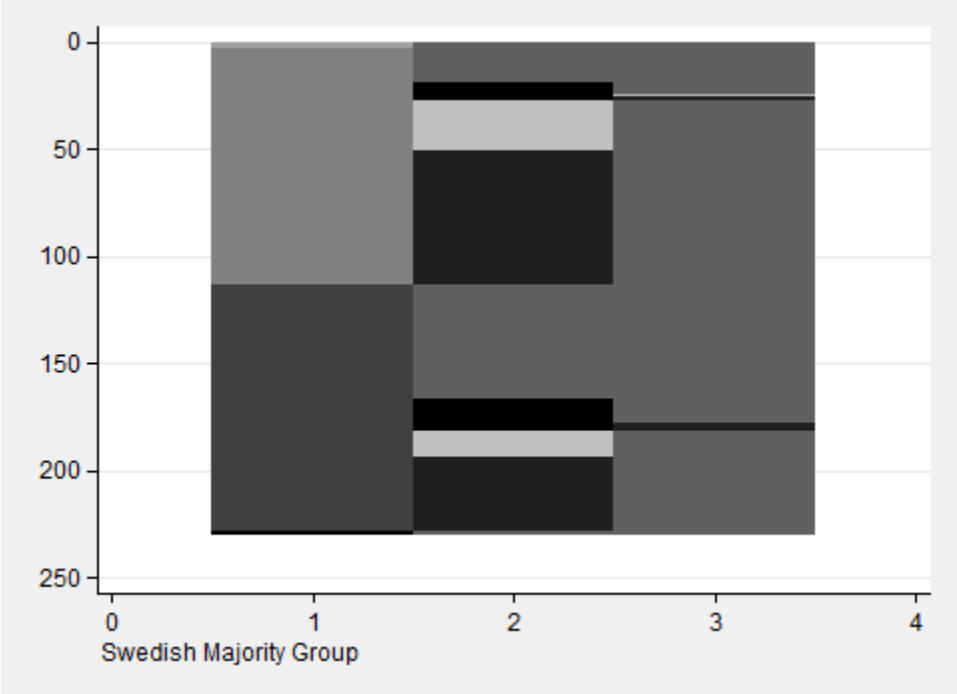
Table 2: Distribution of individual and family background variables before and after matching, by ethnic origin

	NETHERLANDS				GERMANY			
variable	***nonmatched***		***matched***		***nonmatched***		***matched***	
	Native	Turkish	Native	Turkish	Native	Turkish	Native	Turkish
sample size	*489*	*504*	*466*	*504*	*476*	*481*	*467*	*476*
Individual background								
Age (mean)	27.5	24.6	24.8	24.8	27.6	26.1	25.6	26.2*
Age at first year of schooling (mean)	3.6	4.0	3.8	3.9*	3.8	4.3	4.0	4.2
Male	49%	49%	50%	50%	47%	48%	50%	47%
Student	25%	26%	26%	27%*	4%	5%	4%	3%
Changed school	29%	29%	73%	70%	4%	6%	3%	6%*
Family background								
Siblings dropped out of school	14%	33%	27%	31%*	6%	17%	15%	16%
Siblings with higher education	42%	37%	34%	37%*	17%	7%	7%	9%
Parent's education								
Lower secondary education or lower	27%	77%	69%	76%*	20%	84%	82%	84%
Upper secondary or higher	73%	23%	31%	24%*	80%	16%	18%	16%
Employed								
None employed	6%	27%	13%	23%*	8%	14%	28%	14%
One parent employed	42%	54%	59%	56%*	50%	69%	42%	69%
Both employed	53%	19%	28%	21%*	42%	17%	30%	17%

Note. *Significant difference between natives and the Turkish second generation remains after matching. The significance is calculated based on the standardized % bias in the percentage difference of the sample means using pstest command in statistical software Stata.
**Matching weight are capped at a maximum of 6, and cases out of common support are excluded from the analysis for the matched results.

Figure 1-5. Sequence index plots per origin group per country.

Native Young Adults



Turkish second-generation young adults

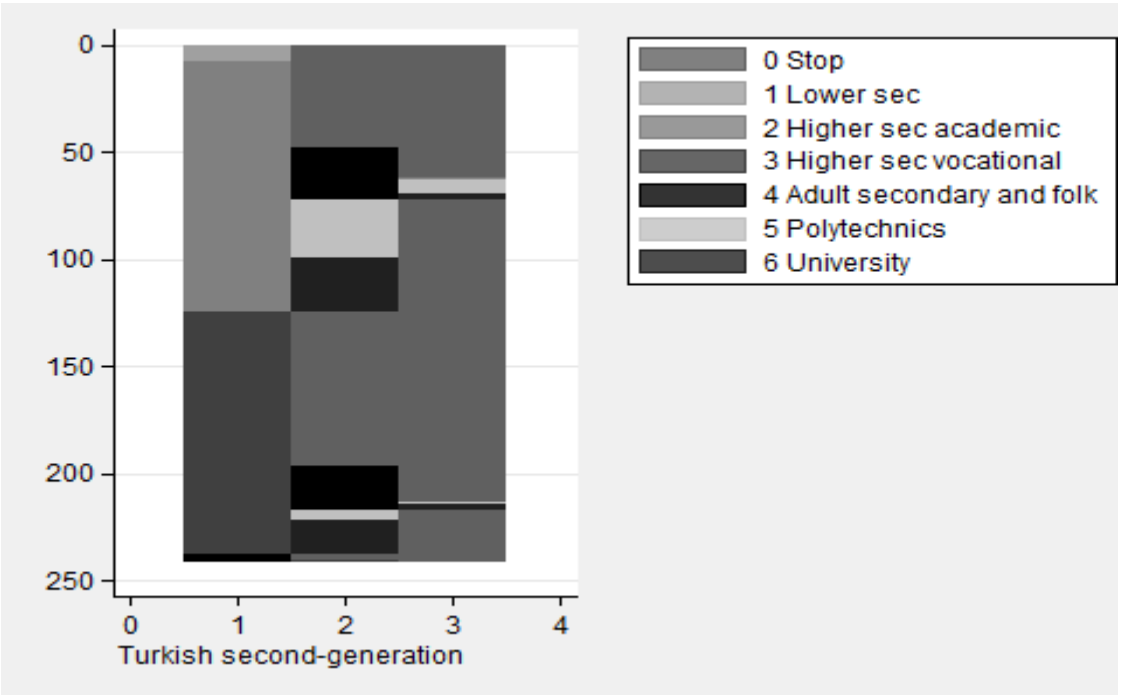
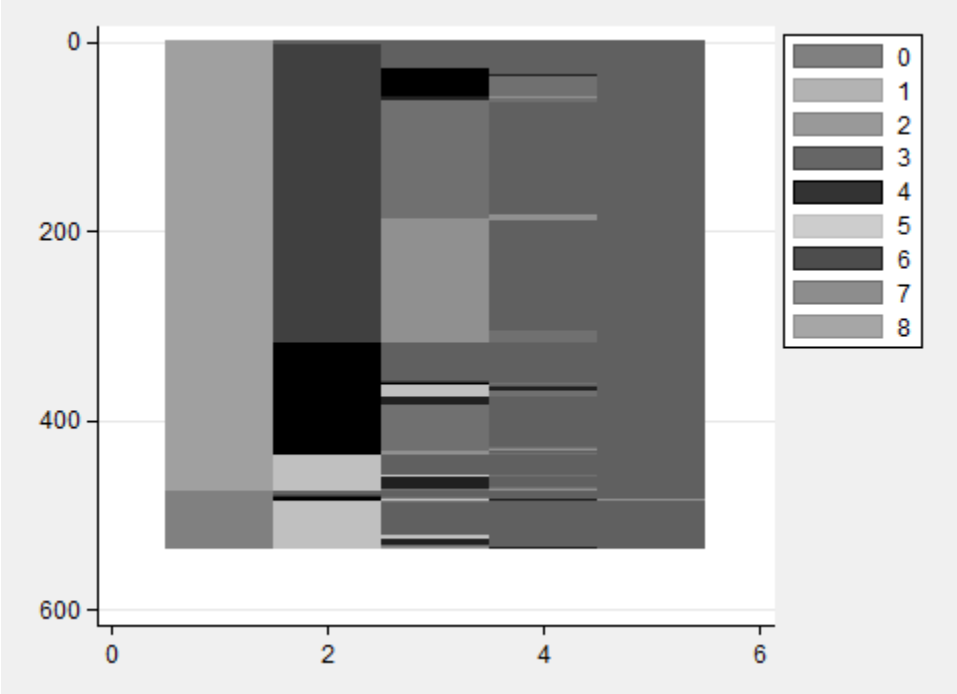


Figure 1 Sequence index plot per origin group in Sweden

Native young adults



Turkish second-generation young adults

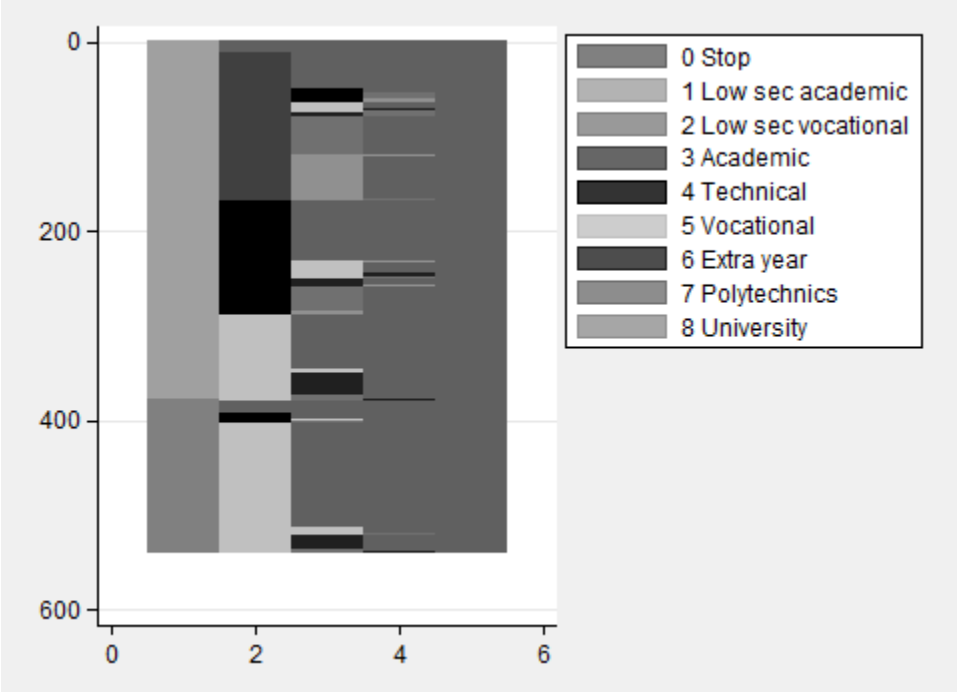
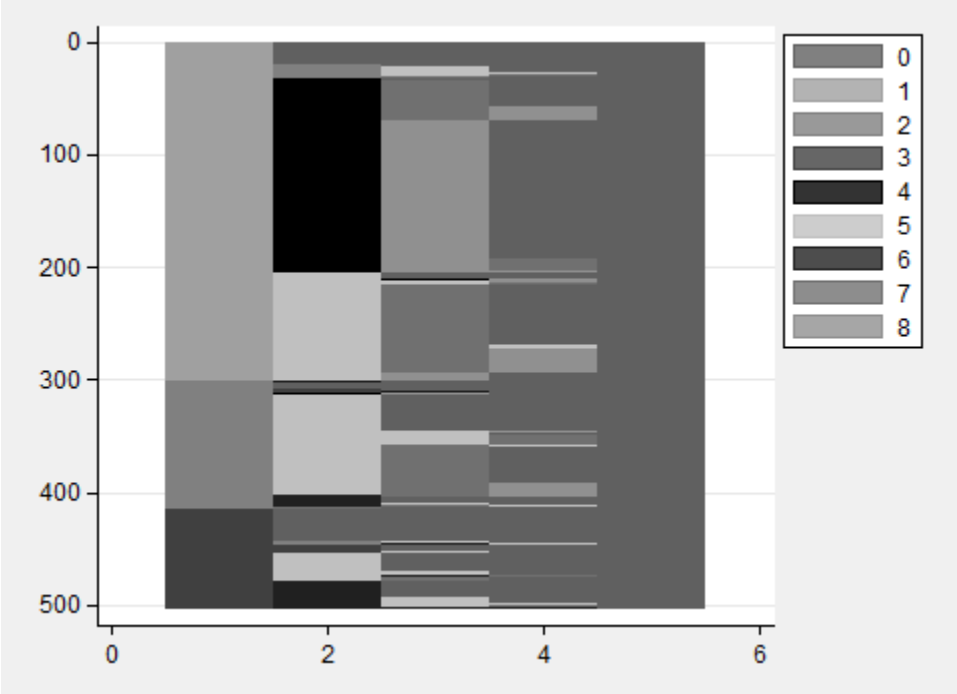


Figure 2 Sequence index plot per origin group in Belgium

Native young adults



Turkish second-generation young adults

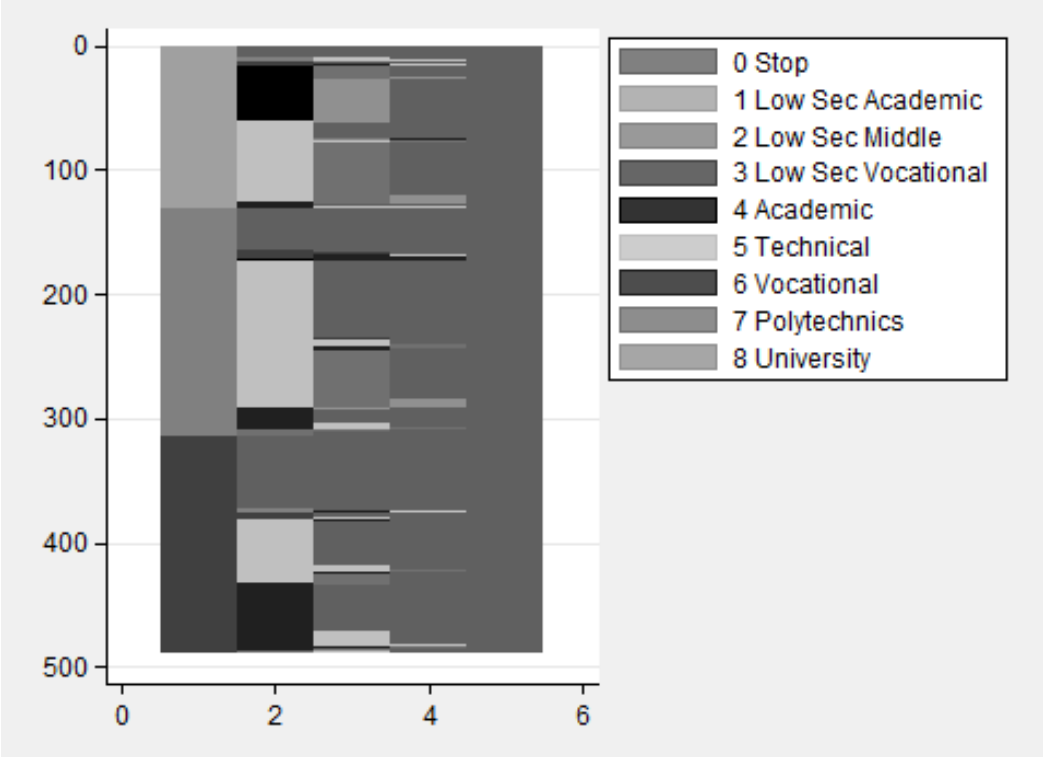
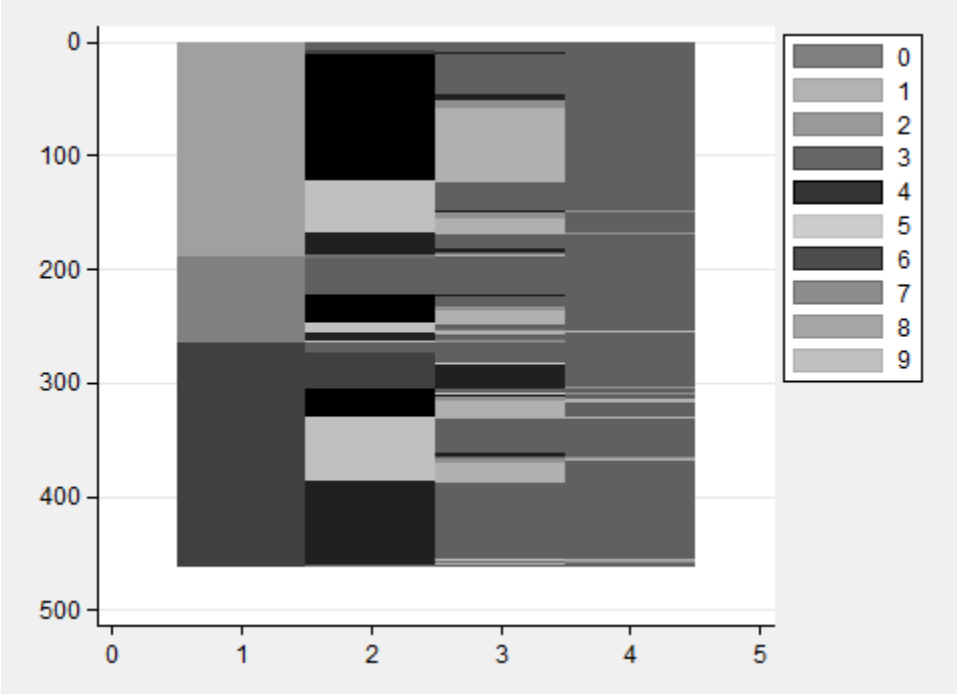


Figure 3 Sequence index plot per origin group in the Netherlands

Native young adults



Turkish second-generation young adults

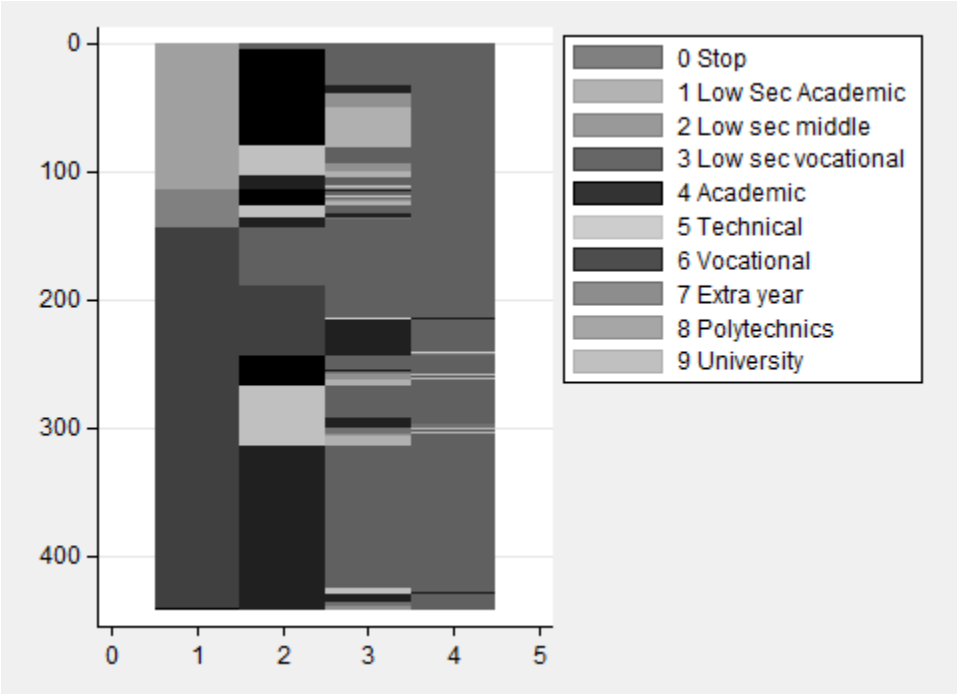
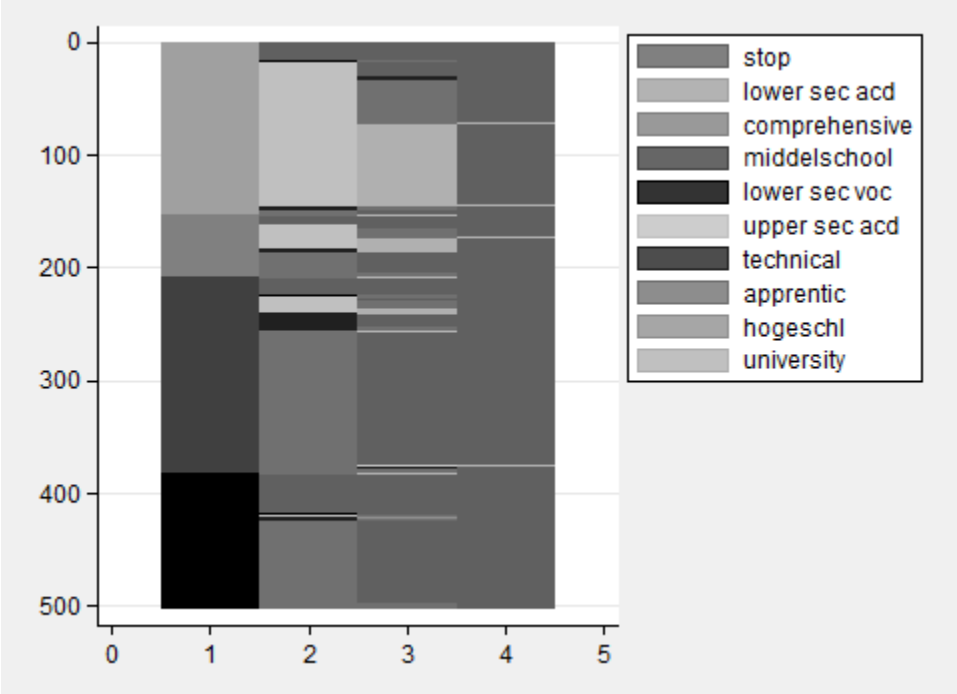


Figure 4 Sequence index plot per origin group in Austria

Native young adults



Turkish second-generation young adults

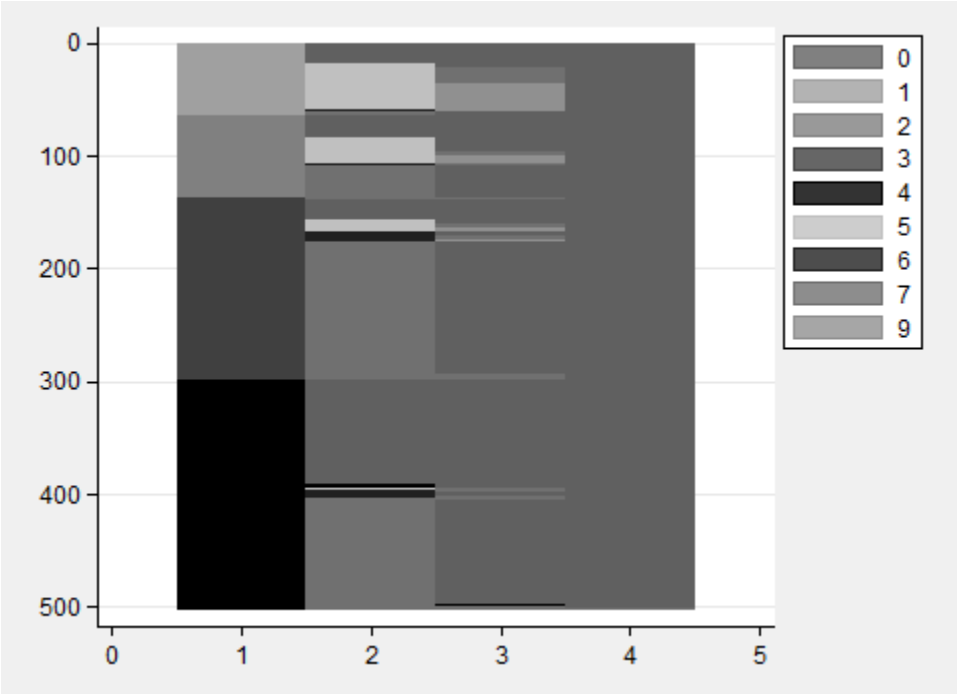


Figure 5 Sequence index plot per origin group in Germany

Figures 6a-e.

The gap in the probability of being in a certain track between Turkish second-generation and native school trajectories before and after propensity score matching

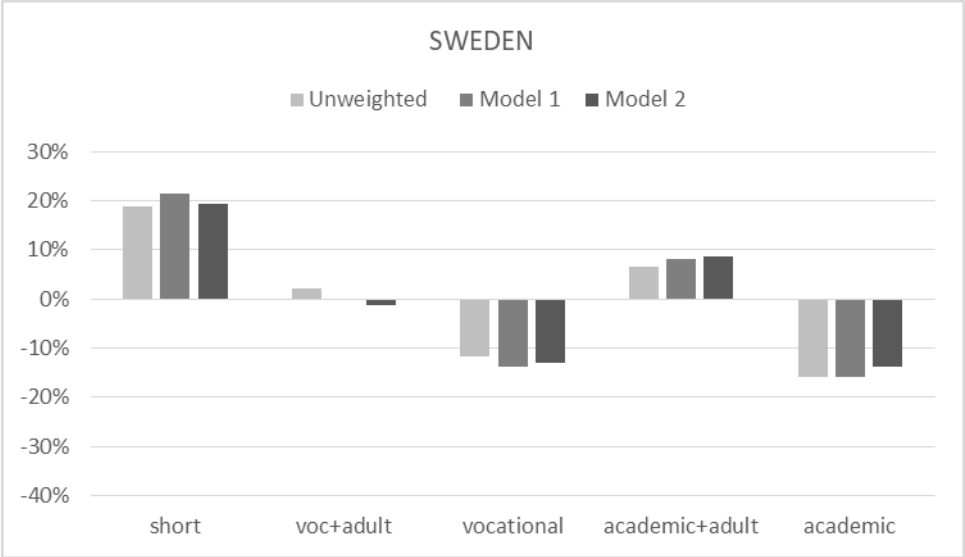


Figure 6a. The gap between Turkish second-generation and native school trajectories in Sweden

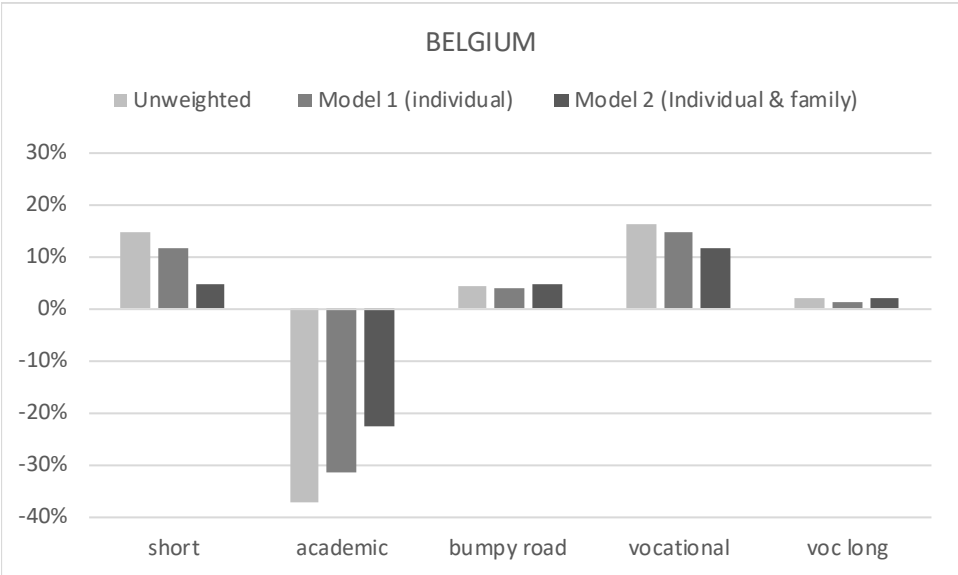


Figure 6b. The gap between Turkish second-generation and native school trajectories in Belgium

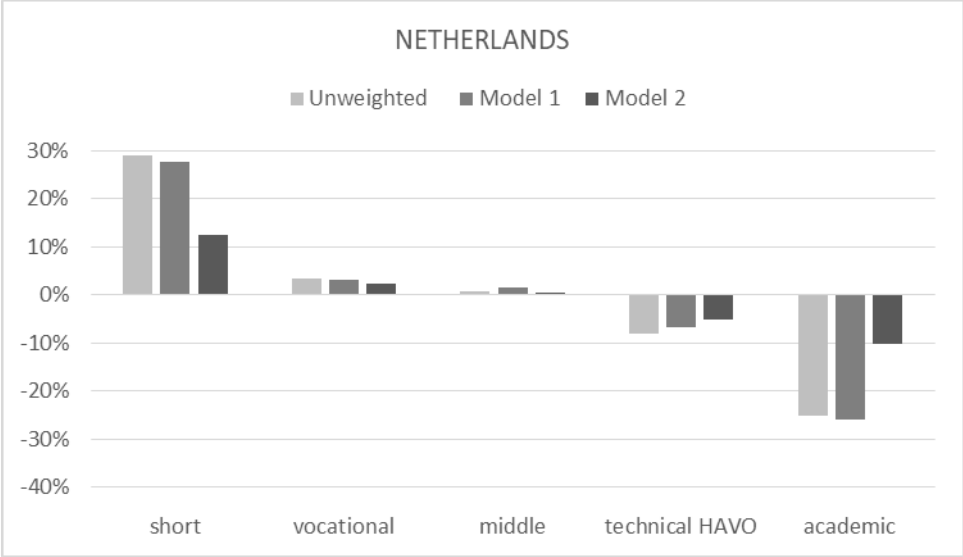


Figure 6c. The gap between Turkish second-generation and native school trajectories in the Netherlands

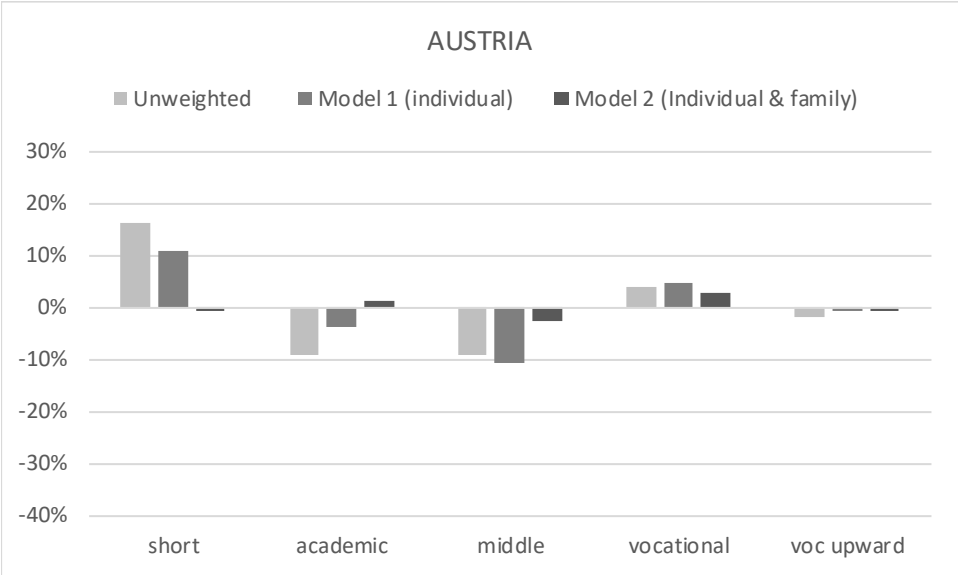


Figure 6d. The gap between Turkish second-generation and native school trajectories in Austria

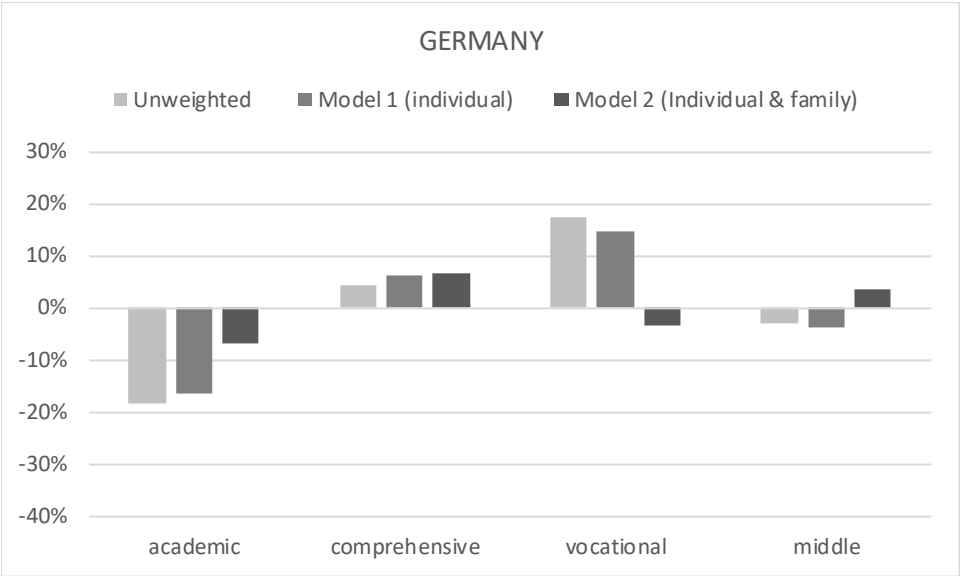


Figure 6e. The gap between Turkish second-generation and native school trajectories in Germany

Appendix 1. Summary of different characteristics of the school systems across five countries

	Sweden	**Belgium**	**Netherlands**	**Austria**	**Germany**
Degree of Tracking*	Two types of education in upper secondary (academic, vocational) after 9 years of comprehensive primary school (that covers the years called lower secondary in other systems)	Two types of education in lower secondary (academic, vocational) followed by three types of education in upper secondary school (academic, vocational, technical)	Three types of education in lower secondary (academic, vocational, middle) followed by three types of education in upper secondary school (academic, vocational, technical)	Three types of education in lower secondary (academic, vocational, middle) followed by three types of education in upper secondary school (academic, vocational, technical)	Four types of education in lower secondary (academic, vocational, middle, comprehensive) followed by three types of education in upper secondary school (academic, vocational, technical)
Access to higher education	All can grant access to higher education	All can grant access to higher education in theory; in practice, academic education leads to higher education	Only the academic education grants access to a university education; technical tracks can grant access to polytechnics.	Only the academic education grants access to a university education; technical tracks can grant access to polytechnics.	Only the academic education diploma grants access to higher education
Types of post education	Adult secondary and folk, polytechnics and university	Extra year, polytechnics and university	Polytechnics and university	Extra year, polytechnics and university	Polytechnics and university
Second-chances	Adult secondary education is common	There is room for track mobility	There is room for track mobility	There is room for track mobility	Track mobility is practically non-existent
Compulsory school starting age	from 7 and 16	from 6 to 18	from age 5 to 18	from age 6 to 15	from age 6 to 15
Selection age	at age 16 after 9 years of schooling	at age 12 after 6 years of schooling	at age 12 after 7 years of schooling	at age 10 after 4 years of schooling	at age 10 after 4 years of schooling

The types of education and the labels chosen reflect the existing research findings and our coding of the types of education for this study

Supplementary Online Material

1. Mixed Marriages

Number of mixed marriages are very few in each country. Therefore, we did not included this information in the analysis. However, for interested readers, we looked at the number of fathers and mothers who were born in the survey country. Technically, these mothers and fathers can be themselves second-generation of Turkish immigrants. Although we did not have information about grandparents in the survey, we knew which languages mothers and fathers were raised in. Those mothers and fathers who are local-born but raised in Turkish are probably second-generation, and thus, they should not be considered as mixed marriage. As you see in the Table, the number of mixed marriages vary across countries but they are overall low.

Table 1. Supplementary Material. Estimated numbers of second-generation children from mixed marriages

	Sweden	**Belgium***	**Netherlands**	**Austria**	**Germany**
Local-born fathers	0	42	5	6	12
raised in Turkish (out of local-born)	0	24	0	3	6
Local born Mothers	0	58	15	24	50
raised in Turkish (out of local-born)	0	16	0	3	18
other-origin parent	0	7	0	3	
total estimated native parents and percentage*	0	67 (%12)	20 (%4)	27 (6%)	38(7%)

*Total numbers are calculated by summing the total numbers of parents who were local born but not raised in Turkish (subtracting those raised in Turkish from those local-born parents). In parentheses, percentages indicate the percent of mixed marriages within the second-generation samples in each country

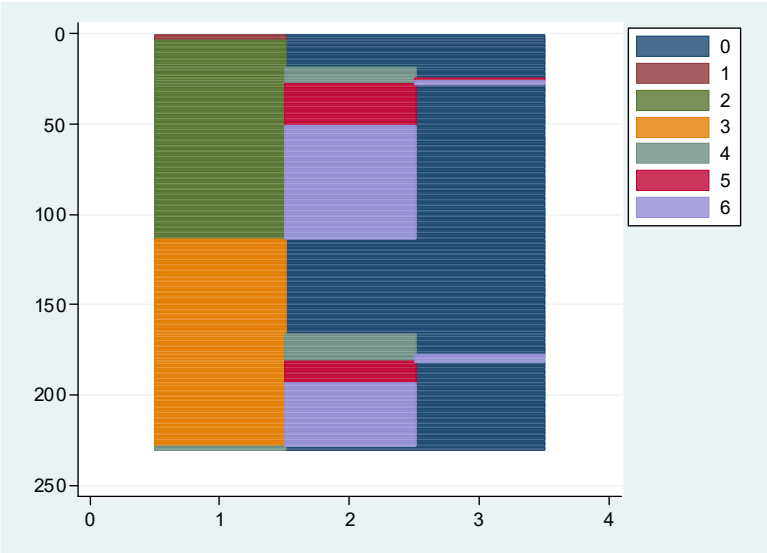
*In Belgium, we only knew whether parents were not fluent in native language (instead of whether they were raised in Turkish)

2. Colored sequence index plots per origin group per country.

Here we present the same Figures from the paper but in colors in order to enhance readability for interested readers

Figure 1a. Supplementary Material. Sequence index plot per origin group in Sweden

Native Young Adults



Turkish second-generation young adults

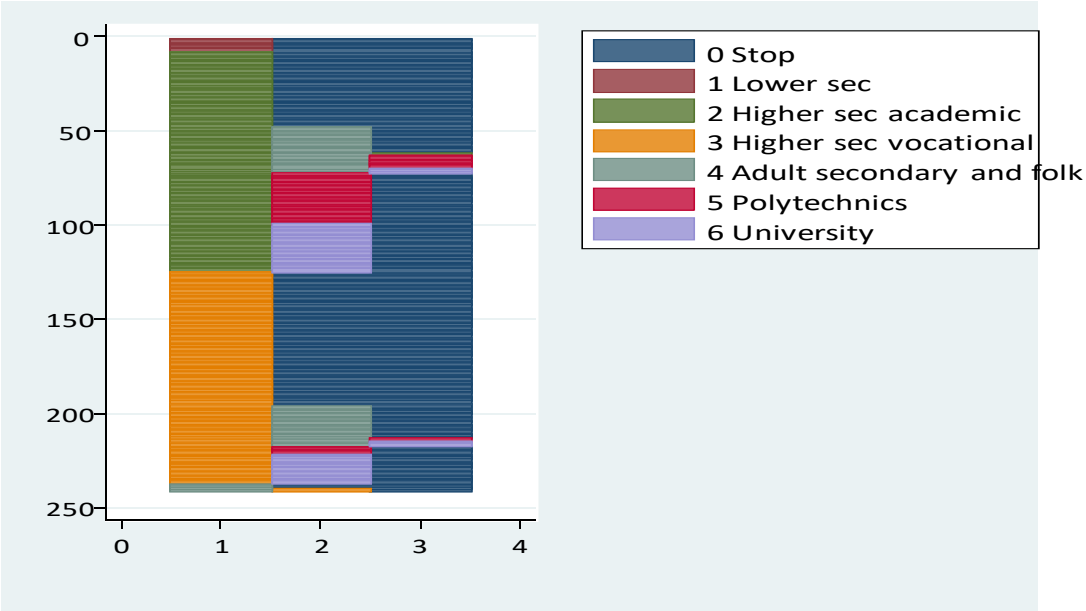
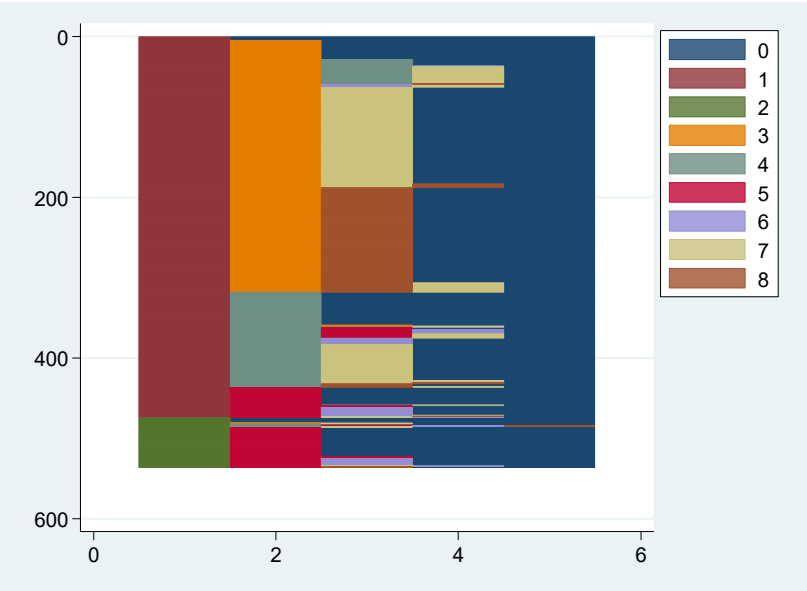


Figure 1b. Supplementary Material. Sequence index plot per origin group in Belgium

Native young adults



Turkish second-generation young adults

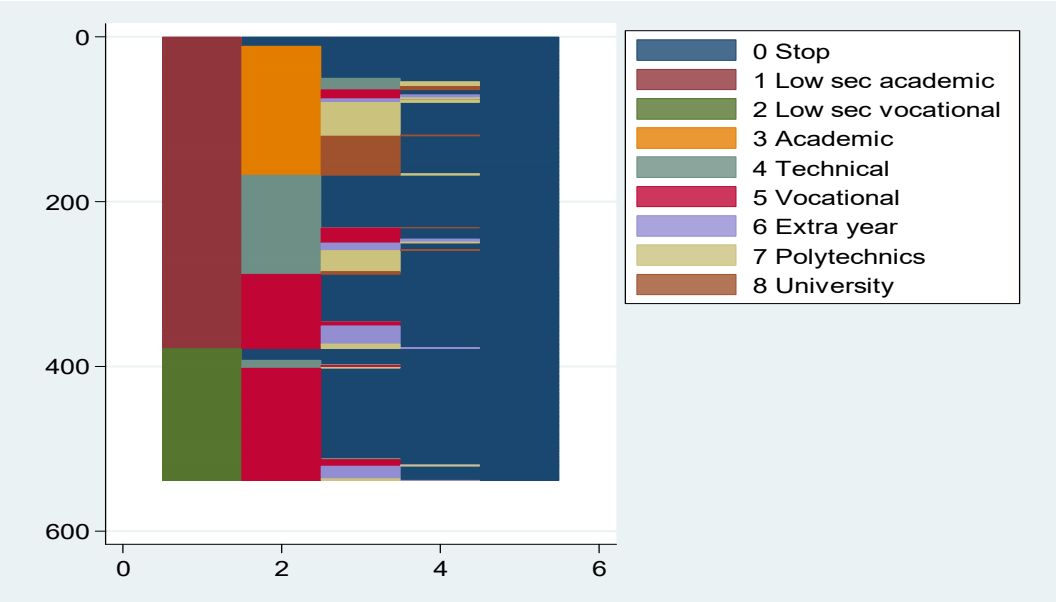
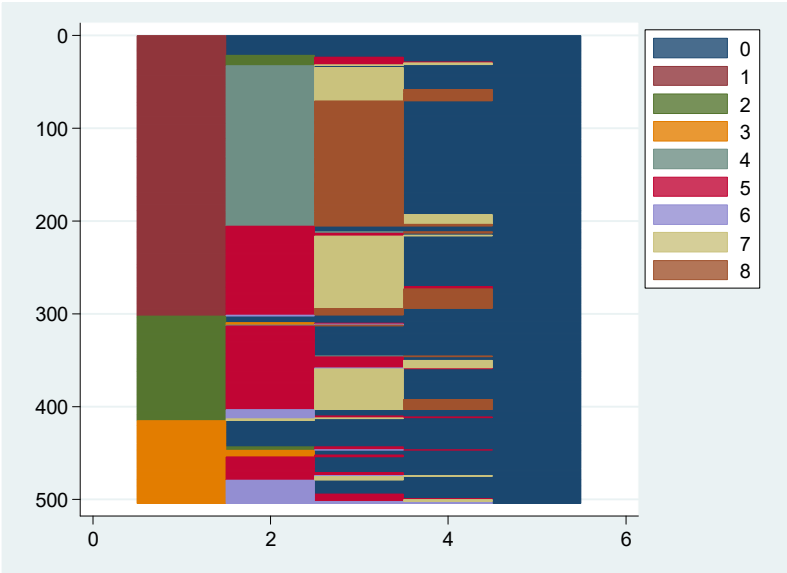


Figure 1c. Supplementary Material. Sequence index plot per origin group in the Netherlands

Native young adults



Turkish second-generation young adults

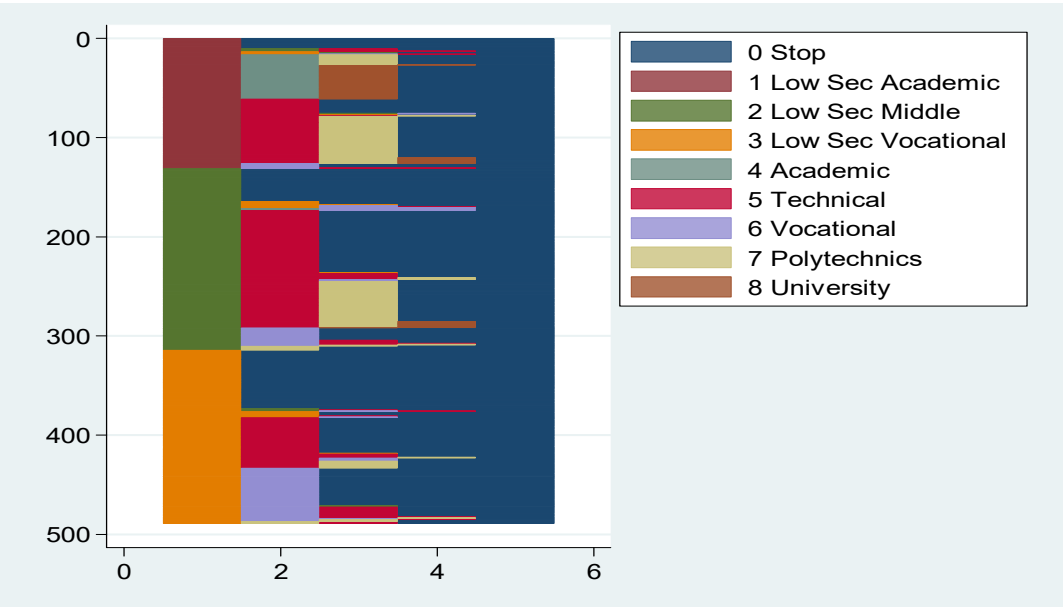
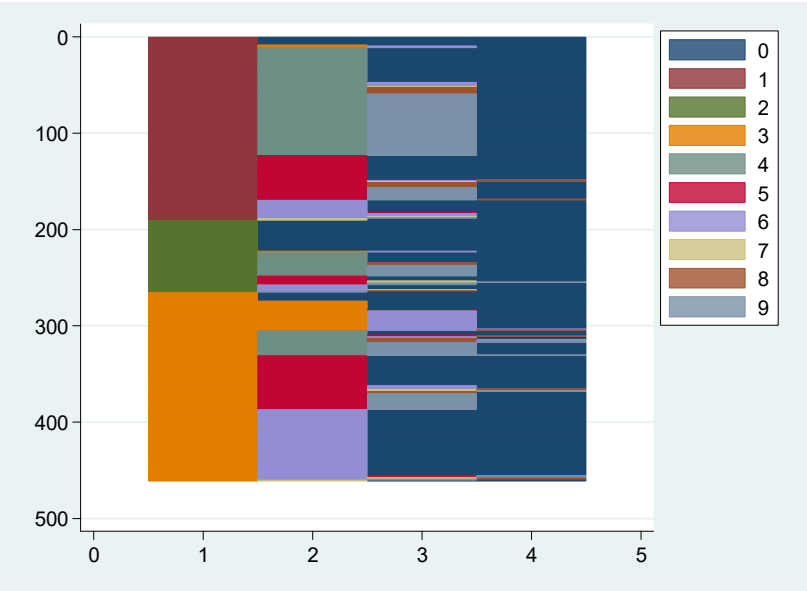


Figure 1d. Supplementary Material. Sequence index plot per origin group in Austria

Native young adults



Turkish second-generation young adults

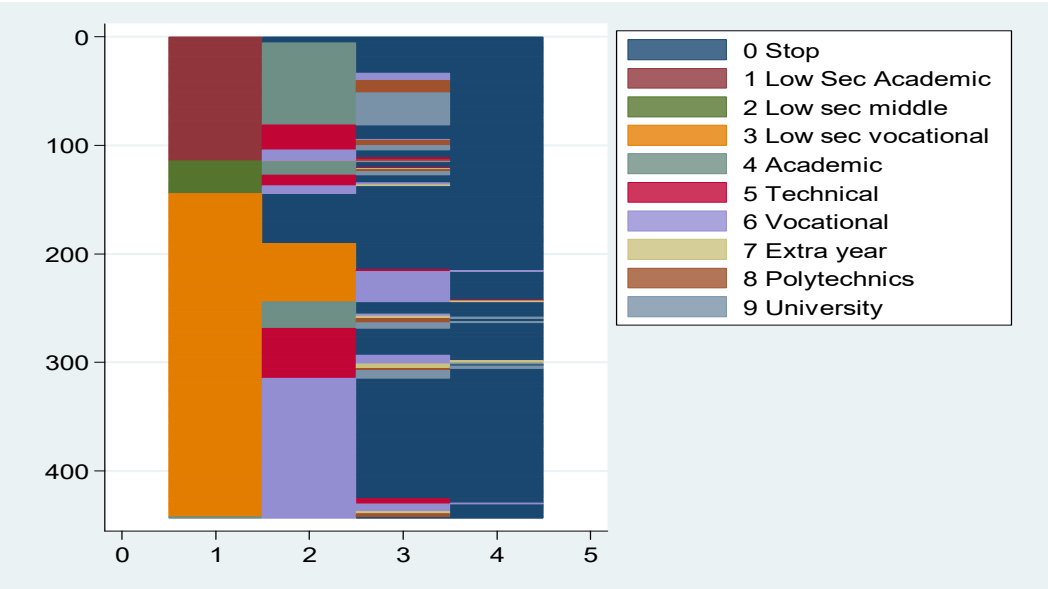
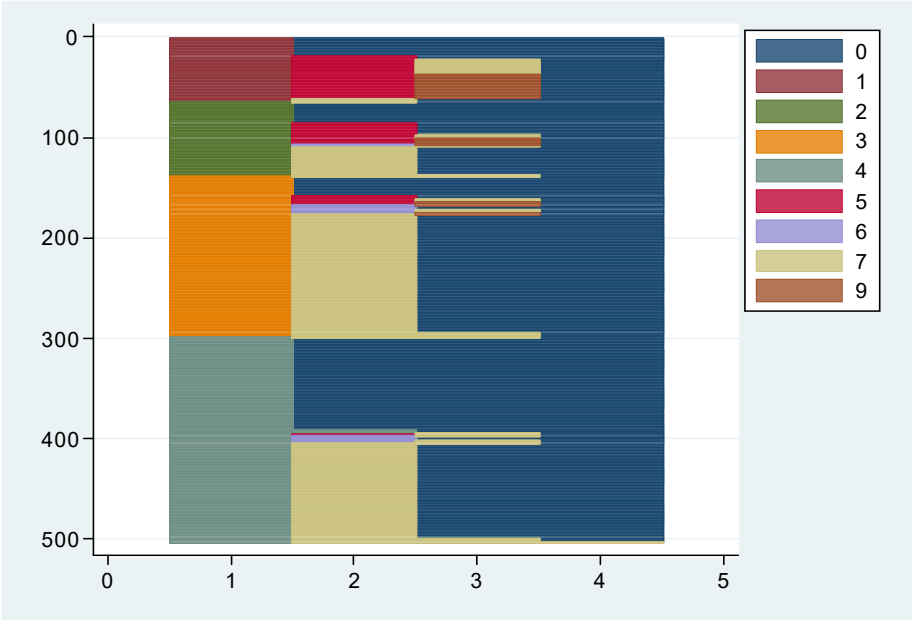
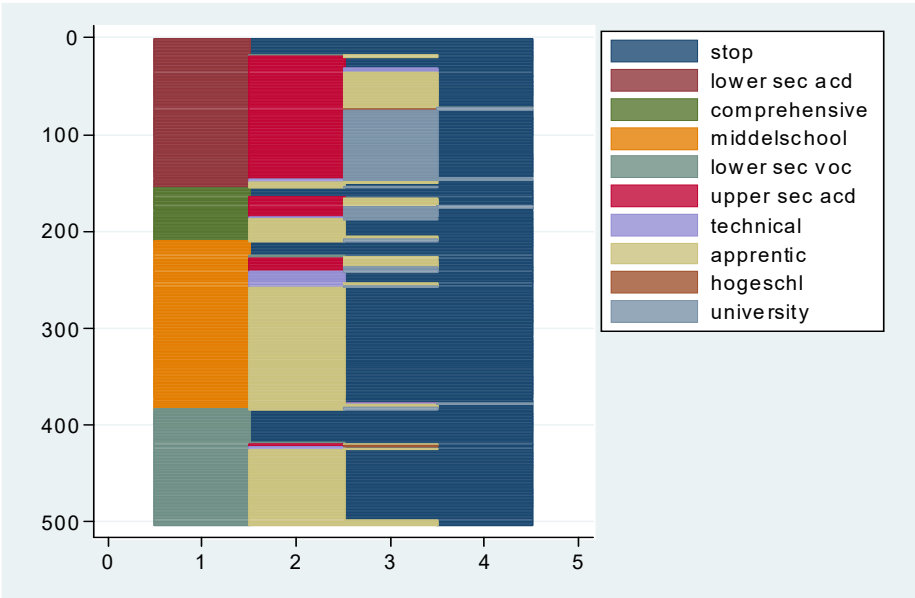


Figure 1e. Supplementary Material. Sequence index plot per origin group in Germany

Native young adults



Turkish second-generation young adults



3. Balancing in the Propensity Score Matching

The variables used in the propensity score matching need to be balanced. Table 1 shows the standardized % bias between the Turkish second-generation and the natives for the selected individual and family background variables before and after matching. The standardized % bias is the percentage difference of the sample means in the Turkish and native (full or matched) sub-samples as a percentage of the square root of the average of the sample variances in the Turkish and native groups (see `pstest` command in Stata for more detail). After matching, the bias should no longer be significant. Another indicator of balance is the variance ratio of continuous variables of treated over control (V(T)/ V(C)); if it equals 1, there is perfect balance. Variables of concern in this regard are indicated in the Table with superscript letters. As summary statistics, we also present pseudo R2 (from probit estimation of the conditional treatment probability on all the variables), mean and median bias as summary indicators of the distribution of the bias, Rubins' B (the absolute standardized difference of the means of the linear index of the propensity score in the treated and (matched) non-treated group) and Rubin's R (the ratio of treated to (matched) non-treated variances of the propensity score index). B less than 25 and R between 0.5 and 2 indicate sufficiently balanced samples. An asterisk is displayed next to B and R values that fall outside those limits.

Using all four indicators, Austria and Netherlands seem to be sufficiently balanced. For the other countries, there is a reduction in overall bias from unmatched to matched samples and some (but not all) indicators suggest balance. Looking at individual variables and Rubin's B, Sweden, Belgium and Germany do not seem to be sufficiently balanced due to parental employment in all the countries, age in Sweden and age of going to school for the first time in Belgium and Germany. This should be taken into account while interpreting the results after matching.

Table 2. Supplementary Material. Balancing of Individual Background Characteristics Before and After Matching

	Before Matching						After Matching					
SWEDEN	Mean		t-test			V(T)/ V(C)	Mean		t-test			V(T)/ V(C)
Variable	Turkish	Native	%bias	t	p>t		Turkish	Native	%bias	t	p>t	
student	0.20	0.19	2.80	0.32	0.75	.	0.20	0.15	12.60	1.70	0.09	.
age	25.69	28.04	-48.10	-5.39	0.00	0.78[a]	25.69	28.72	-62.20	-7.78	0.00	0.77[a]
gender	0.49	0.49	0.40	0.05	0.96	.	0.49	0.50	-0.80	-0.10	0.92	.
age first school	3.15	3.68	-32.20	-3.23	0.00	0.94	3.15	3.40	-15.40	-1.47	0.14	1.03
change primary	0.62	0.71	-18.40	-2.05	0.04	.	0.62	0.66	-7.40	-0.93	0.35	.
sibling no diploma	0.21	0.13	21.30	2.38	0.02	.	0.21	0.15	14.40	1.80	0.07	.
sibling edu: high	0.22	0.28	-14.10	-1.58	0.12	.	0.22	0.24	-5.90	-0.76	0.45	.
parental education	0.43	0.88	-106.10	-11.87	0.00	.	0.43	0.78	-81.20	-9.70	0.00	.
parental employ	1.46	1.80	-60.70	-6.79	0.00	2.18[a]	1.46	1.75	-52.70	-6.67	0.00	1.68[a]
Summary stats	Pseudo R^2= .266. Mean bias = 33.8. Median bias= 21.3. Rubin's B= 134.5*. R = 2.03**						Pseudo R^2= .057. Mean bias = 28.1. Median bias= 14.4. Rubin's B= 58.2*. R = 2.21**					
BELGIUM	Turkish	Native	%bias	t	p>t		Turkish	Native	%bias	t	p>t	
student	0.22	0.26	-8.00	-1.37	0.17	.	0.22	0.27	-12.20	-1.96	0.05	.
age	24.83	25.83	-20.00	-3.43	0.00	0.93	24.83	24.49	6.90	1.13	0.26	0.97
gender	0.56	0.49	13.30	2.28	0.02	.	0.56	0.55	2.30	0.37	0.71	.
age first school	3.03	2.93	14.40	2.46	0.01	1.80[b]	3.03	3.02	0.80	0.13	0.90	1.65[b]
change primary	0.60	0.71	-22.70	-3.90	0.00	.	0.60	0.64	-8.20	-1.29	0.20	.
sibling no diploma	0.43	0.21	50.20	8.60	0.00	.	0.43	0.34	21.50	3.23	0.00	.
sibling edu: high	0.37	0.49	-25.00	-4.30	0.00	.	0.37	0.32	9.40	1.57	0.12	.
parental education	0.38	0.92	-137.70	-23.48	0.00	.	0.38	0.53	-38.90	-5.04	0.00	.
parental employ	1.12	1.62	-83.40	-14.29	0.00	1.46[b]	1.12	1.30	-29.60	-4.48	0.00	1.09
Summary statistics:	Pseudo R^2= .341. Mean bias = 41.6. Median bias= 22.7. Rubin's B= 162.5*. R = 2.01**						Pseudo R^2= .036. Mean bias = 14.4. Median bias= 9.4. Rubin's B= 45.6*. R = 1.53**					
NETHERLANDS	Turkish	Native	%bias	t	p>t		Turkish	Native	%bias	t	p>t	
student	0.26	0.25	2.80	0.44	0.66	.	0.26	0.26	0.90	0.13	0.90	.
age	24.60	27.52	-64.00	-10.07	0.00	0.85	24.60	24.84	-5.30	-0.78	0.44	0.88
gender	0.49	0.49	0.00	-0.01	0.99	.	0.49	0.50	-1.90	-0.28	0.78	.
age first school	3.95	3.62	46.90	7.39	0.00	0.79[c]	3.95	3.84	15.60	2.37	0.02	0.91

Table 2. Supplementary Material. Balancing of Individual Background Characteristics Before and After Matching

change primary	0.71	0.71	-1.20	-0.18	0.86	.	0.71	0.73	-4.10	-0.60	0.55	.
sibling no diploma	0.33	0.14	45.90	7.24	0.00	.	0.33	0.27	12.40	1.61	0.11	.
sibling edu: high	0.37	0.42	-9.30	-1.47	0.14	.	0.37	0.34	6.90	1.03	0.30	.
parental education	0.23	0.73	-115.90	-18.26	0.00	.	0.23	0.31	-16.70	-2.40	0.02	.
parental employ	0.93	1.47	-85.70	-13.52	0.00	1.26[c]	0.93	1.14	-33.70	-4.80	0.00	1.16
Summary statistics:	Pseudo R^2= .369. Mean bias = 41.3. Median bias= 45.9. Rubin's B= 170.6*. R = 1.16						Pseudo R^2= .032. Mean bias = 10.8. Median bias= 6.9. Rubin's B= 42.8*. R = 1.54					
AUSTRIA	Turkish	Native	%bias	t	p>t		Turkish	Native	%bias	t	p>t	
student	0.27	0.30	-7.30	-1.12	0.26	.	0.27	0.23	9.70	1.46	0.14	.
age	23.92	25.57	-33.50	-5.14	0.00	0.86	23.92	24.58	-13.50	-1.95	0.05	0.87
gender	0.46	0.47	-1.70	-0.26	0.80	.	0.46	0.53	-13.70	-1.97	0.05	.
age first school	4.90	4.24	47.90	7.35	0.00	1.01	4.90	4.66	17.70	2.55	0.01	1.00
change primary	0.86	0.92	-17.00	-2.61	0.01	.	0.86	0.86	2.20	0.28	0.78	.
sibling no diploma	0.20	0.05	45.70	7.07	0.00	.	0.20	0.13	22.60	2.84	0.01	.
sibling edu: high	0.15	0.15	-1.30	-0.20	0.85	.	0.15	0.14	1.60	0.23	0.82	.
parental education	0.40	0.91	-127.20	-19.64	0.00	.	0.40	0.47	-18.10	-2.13	0.03	.
parental employ	1.39	1.56	-30.10	-4.63	0.00	1.12	1.39	1.40	-1.20	-0.16	0.87	0.94
Summary statistics:	Pseudo R^2= .280. Mean bias = 34.6. Median bias= 30.1. Rubin's B= 142.8*. R = 2.30**						Pseudo R^2= .027. Mean bias = 11.1. Median bias= 13.5. Rubin's B= 39.1*. R = 1.41					
GERMANY	Turkish	Native	%bias	t	p>t		Turkish	Native	%bias	t	p>t	
student	0.05	0.04	3.90	0.60	0.55	.	0.05	0.04	2.50	0.38	0.70	.
age	26.09	27.65	-31.30	-4.85	0.00	1.05	26.09	25.60	9.70	1.48	0.14	1.01
gender	0.48	0.47	0.70	0.10	0.92	.	0.48	0.50	-4.20	-0.64	0.52	.
age first school	4.27	3.83	36.10	5.59	0.00	1.72[e]	4.27	3.99	23.10	3.52	0.00	1.58[e]
change primary	0.94	0.96	-13.20	-2.04	0.04	.	0.94	0.97	-15.40	-2.44	0.02	.
sibling no diploma	0.17	0.06	35.60	5.49	0.00	.	0.17	0.15	6.10	0.81	0.42	.
sibling edu: high	0.07	0.17	-28.20	-4.37	0.00	.	0.07	0.07	1.40	0.26	0.80	.
parental education	0.16	0.80	-169.60	-26.23	0.00	.	0.16	0.18	-4.60	-0.74	0.46	.
parental employ	1.04	1.34	-51.70	-7.99	0.00	0.81[e]	1.04	1.02	2.40	0.32	0.75	0.53[e]
Summary statistics:	Pseudo R^2= .373. Mean bias = 41.1. Median bias= 31.3. Rubin's B= 181.7*. R = 0.80						Pseudo R^2= .014. Mean bias = 7.7. Median bias= 4.6. Rubin's B= 27.6*. R = 1.68					

*if B> 25%; ** R outside [0.5; 2]; If variance ratio V(T)/V(C) outside a [0.78; 1.28] b [0.85; 1.17] c [0.84; 1.19] d [0.83; 1.20] e [0.84; 1.20]

4. The results from the weighted multinomial logistic regression of trajectories on ethnic origin (using matching weights).

Here we present the multinomial logistic regression results with trajectories as the outcome and ethnic origin as the predictor using matching weights. These tables show which ethnic gaps are still significant in each country after propensity score weighting including individual and family background. In Table 4, we also present the confidence intervals for the probabilities of being in different trajectories for the unmatched and matched samples. For instance, for Sweden for the short trajectory, Table3a shows a significant ethnic gap even after the matching. Similarly, Table 4 shows that there was a significant ethnic gap in the short trajectory in the unmatched sample, and this remained significant after the matching.

Table 3a. Multinomial logistic regression of trajectories on ethnic origin in Sweden

	short	voc+adult	vocational	academic+adult	academic†
	b/se	b/se	b/se	b/se	b/se
Turkish	2.564**	1.365	0.595	6.842**	1
	-0.903	-0.816	-0.304	-4.824	(.)
Constant	1.051	0.200***	0.592	0.081***	1
	-0.265	-0.094	-0.181	-0.05	(.)
ll	-1083.94				
chi2	17.802				
N	444				

Note. * $p < .05$, ** $p < .01$, *** $p < .001$ †Base outcome (Reference category)

Table 3b. Multinomial logistic regression of trajectories on ethnic origin in Belgium

	short	academic†	bumpy road	vocational	voc long
	b/se	b/se	b/se	b/se	b/se
Turkish	2.092**	1	3.386**	3.288***	3.089*
	-0.493	(.)	-1.329	-0.936	-1.574
Constant	0.509**	1	0.096***	0.261***	0.048***
	-0.105	(.)	-0.034	-0.067	-0.022
ll	-1253.85				
chi2	27.969				
N	1059				

Note. * $p < .05$, ** $p < .01$, *** $p < .001$ †Base outcome (Reference category)

Table 3c. Multinomial logistic regression of trajectories on ethnic origin in Netherlands

	short	vocational	middle	technical HAVO	academic†
	b/se	b/se	b/se	b/se	b/se
Turkish	2.505**	2.667*	2.004	1.355	1
	-0.74	-1.241	-0.77	-0.475	(.)
Constant	2.116***	0.292**	0.629	0.797	1
	-0.48	-0.116	-0.199	-0.215	(.)
ll	-1137.27				
chi2	12.299				
N	970				

Note. * p < .05, ** p < .01, *** p < .001 †Base outcome (Reference category)

Table 3d. Multinomial logistic regression of trajectories on ethnic origin in Austria

	short	academic†	middle	vocational	vocational upward
	b/se	b/se	b/se	b/se	b/se
Turkish	0.911	1	0.676	1.129	0.787
	-0.223	(.)	-0.214	-0.403	-0.402
Constant	4.659***	1	0.728	0.958	0.313**
	-0.927	(.)	-0.163	-0.296	-0.132
ll	-942.118				
chi2	2.315				
N	892				

Note. * p < .05, ** p < .01, *** p < .001 †Base outcome (Reference category)

Table 3e. Multinomial logistic regression of trajectories on ethnic origin in Germany

	academic†	comprehensive	vocational	middle
	b/se	b/se	b/se	b/se
Turkish	1	2.908*	1.563	1.887
	(.)	-1.261	-0.514	-0.645
Constant	1	0.549	2.763***	1.714*
	(.)	-0.201	-0.721	-0.47
ll	-1184.96			
chi2	6.704			
N	943			
* p<0.05,	** p<0.01, *** p<0.001			

Note. * p < .05, ** p < .01, *** p < .001 †Base outcome (Reference category)

Table 4. Supplementary Material. Confidence Intervals for the probabilities

	Unweighted				Family weighted (Model 2)			
SWEDEN	Turkish		Native		Turkish		Native	
N	241		230		214		230	
short	51%	[.44, .57]	32%	[.26, .38]	55%	[.46, .65]	36%	[.26, .46]
voc+adult	9%	[.05, .12]	7%	[.03, .10]	6%	[.02, .09]	7%	[.01, .12]
voc	9%	[.05, .12]	20%	[.15, .26]	7%	[.02, .12]	20%	[.12, .29]
academic+adult	10%	[.07, .14]	4%	[.01, .06]	11%	[.05, .18]	3%	[.00, .06]
academic	22%	[.16, .27]	37%	[.31, .44]	21%	[.13, 28]	34%	[.24, .44]
BELGIUM								
N	539		536		523		536	
short	32%	[.28, .36]	17%	[.14, .21]	31%	[.27, .35]	27%	[.19, .34]
academic	29%	[.25, .33]	66%	[.62, .70]	29%	[.26, .33]	52%	[.44, .60]
bumpy road	9%	[.07, .12]	5%	[.03, .07]	10%	[.07, .12]	5%	[.02, .08]
vocational	25%	[.22, .29]	9%	[.07, .12]	25%	[.22, .29]	14%	[.08, .19]
voc long	4%	[.03, .06]	2%	[.01, .04]	4%	[.03, .06]	3%	[.003, .05]
NETHERLANDS								
N	489		504		466		504	
short	58%	[.54, .62]	29%	[.25, .33]	56%	[.52, .61]	44%	[.35, .53]
vocational	8%	[.06, .11]	5%	[.03, .07]	8%	[.06, .11]	6%	[.02, .10]
middle technical	13%	[.10, .16]	13%	[.10, .15]	13%	[.10, .17]	13%	[.07, .19]
HAVO	11%	[.09, .14]	19%	[.16, .23]	11%	[.09, .14]	16%	[.10,.23]
academic	9%	[.07, .12]	34%	[.30, .39]	11%	[.07, .14]	21%	[.14,.27]
AUSTRIA								
N	443		461		431		461	
short	61%	[.56,.66]	45%	[.41, .49]	60%	[.56,.65]	61%	[.53, .69]
academic	14%	[.11, .17]	23%	[.19, .27]	14%	[.11, .18]	13%	[.09, .17]
middle	7%	[.05, .09]	16%	[.13, .20]	7%	[.05, .09]	10%	[.06, .13]
vocational	15%	[.12, .18]	11%	[.08, .14]	15%	[.12, .19]	13%	[.06, .19]
voc upward	3%	[.02, .05]	5%	[.03, .07]	3%	[.02, .05]	4%	[.01, .07]
GERMANY								
N	481		476		467		476	
academic	9%	[.07, .12]	28%	[.24, .32]	10%	[.07, .13]	17%	[.10, .23]
comprehensive	15%	[.12, .18]	11%	[.08, .14]	16%	[.12,.20]	9%	[.04, .14]
vocational	43%	[.39, .48]	26%	[.22, .30]	43%	[.38, .47)	46%	[.37, .55]
middle	32%	[.28, .37]	36%	[.31, .40]	32%	[.28, .36]	28%	[.20, .37]