Is 'immigrant optimism' in educational choice a problem? Ethnic gaps in Swedish upper secondary school completion

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Abstract

In many Western countries, researchers have documented ambitious educational choices among students of immigrant origin, for example, the tendency to choose academically more demanding routes than others at given levels of school achievement (e.g. grades, GPA). While this may indicate integration, some warn against an 'immigrant optimism trap', because choosing more demanding tracks at lower levels of GPA may increase risks of non-completion. Using longitudinal Swedish population data ($n \approx 90,000$), we estimate an upper secondary 'ethnic completion gap' of 12 per cent to the detriment of students of immigrant background. We then address the 'trap hypothesis' via two analyses. The first shows that if students of immigration background would make similar educational choices as other students at the same GPA, the completion gap would shrink by 3.4 percentage points. The second analysis, based on simulations, suggests that restricting admission to academic programmes based on prior GPA, would lead to a massive relocation of low- and mid-GPA students to—usually less demanding—vocational programmes, but would only reduce the completion gap by 2.2 percentage points. These changes must be considered marginal in view of the substantial restrictions of choice that either of these measures would entail. We conclude that completion gaps are not primarily a result of unfounded immigrant optimism, and that optimistic choices are likely to be a net positive for integration by improving the chances of immigrant youth to reach tertiary-level qualifications and professional occupations.

Introduction

In several Western countries, school performance and educational choice are counteracting forces in the educational careers of youth with an immigration background (e.g. Heath and Brinbaum, 2014). While their school performance is, on average, worse than that of youth of the majority background, their educational aspirations are higher, and their choices at different educational transitions tend to be more ambitious, especially considering their on average lower grade point averages (GPA) and weaker family resources. When compared with the more commonly studied socioeconomic inequality in schooling, children of immigrant origin share their relatively poor performance with

the working class, but their bold educational choices with the upper middle class. This has led researchers to talk about 'immigrant optimism' (cf. Kao and Tienda, 1995), a term we shall also use.

Immigrant optimism is a potentially positive force that may reduce gaps in educational attainment between youth of the majority and immigrant backgrounds. Thereby, it may contribute to structural integration, by which we mean advancement not only in the educational system, but also in the labour market and with respect to their socioeconomic position. This holds true under the premise that the ambitious choices among those with immigrant origin also lead to formal educational qualifications (Jackson, Jonsson and

Rudolphi, 2012: p. 175). However, recently researchers have warned that optimistic choices often result in failure to obtain such qualifications, and that high aspirations therefore in fact represent a 'double-edged sword' (Birkelund, 2020) or an 'optimism trap' (Tjaden and Hunkler, 2017), leading youth with an immigration background down too demanding educational routes. In educational systems with viable vocational options there is the further assumption that it would be better for those with lower GPA to opt for such work-life oriented educational paths instead of aiming for tertiary education (Tjaden and Hunkler, 2017).

Of course, there may be a general optimism trap in open and cost-free school systems, enticing too many *of all groups* to opt for educational paths that are beyond their capacity, leading to high overall non-completion rates. The core of the presumed *immigrant* optimism trap is the higher likelihood of those of immigrant background, as compared with other students, to choose more demanding educational paths at a given GPA: because their 'optimism' is greater, they are supposedly more vulnerable than other students to the risk of non-completion.

There is tentative support for the optimism trap narrative, both from recent analyses on Germany (Dollmann and Weißmann, 2020) and Denmark (Birkelund, 2020). In particular, those studies, as earlier ones (Kalmijn and Kraaykamp, 2003; Colding, Husted and Hummelgaard, 2009; Støren and Helland, 2010), find higher risks of drop-out, 'failure', or non-completion at upper secondary level for students of immigrant origin. This is not surprising, as the optimism mechanism leads them to attend this level of education at an overall lower GPA from comprehensive school. However, this finding is not enough to warrant the conclusion that the optimistic choices constitute a trap for youth of immigrant background. Implicit in the trap hypothesis is the presumption that there are alternative routes that these optimistic students of immigrant background would be better off taking, and that steering them into such presumably more realistic paths would increase their completion rates and reduce the gap to youth of majority background. The weakness of previous studies (e.g. Birkelund, 2020) lies precisely in not addressing the counterfactual question: would optimistic students of immigrant origin succeed better in, for example, vocational rather than academic programmes? Would that, in turn, lead to less inequality in completion between youth of immigrant and majority backgrounds? While it may appear plausible that this would be so, it is far from a trivial deduction, as it depends on a combination of different conditional distributions—not only the GPA distribution, but group-specific transition rates to and completion rates from different programmes at given GPA's.

Our main contribution is to move beyond previous studies by estimating two distinct models of 'what if'-scenarios that we test against empirical data. The first simulates completion rates under different GPA and programme distributions, and the second simulates the ethnic optimism gap under a *numerus clausus* regime. These models represent two different policy strategies for deactivating the immigrant optimism trap. The first holds that students of immigrant origin could be convinced to adjust their educational choices at given GPAs to mirror those of other students, perhaps by teachers and guidance counsellors emphasizing the advantages of vocational schooling, also in contrast to tertiary education, as suggested by Tjaden and Hunkler (2017). The second strategy is to introduce minimum GPA requirements for the more demanding programmes, thus delimiting the choices for those with low or medium school achievements. We do not claim that any of these strategies are realistic, only that they represent useful counterfactual scenarios for estimating the optimism trap effect with greater precision than hitherto.

This leads us to ask three main questions in this study. The first is descriptive and fundamental for the others, and will contribute to the descriptive literature around the actual behavioural consequences of the high aspirations of youth of immigrant background. However, our main contribution lies in the simulation analyses:

(1) Do youth of immigrant background have lower upper secondary completion rates?
(2) How much of this ethnic completion gap is due to immigrant optimism, defined as the higher aspiring choices of youth of immigrant background at a given GPA?
(3) How much would the ethnic completion gap be reduced by limiting access to more academically demanding tracks based on GPA?

We address these questions for the case of Sweden, with a school system characterized by a low degree of stratification and based on choice rather than selection (e.g. Jackson and Jonsson, 2013), affording children of immigrants much room for their ambitious choices to play out, thereby potentially leading to higher non-completion rates. Besides a set of academic programmes preparing for tertiary education, upper secondary schools offer vocational programmes with favourable labour market prospects, meaning that these programmes pose promising alternative routes for those who run the risk of being trapped by making too ambitious choices in relation to their previous academic performances.

We study an entire Swedish comprehensive school cohort (*n* = 93,495), born in 1996, with all or the major part of their schooling in Sweden, using register data on their GPA and choice of and graduation from upper secondary school programmes. Importantly, the

detailed performance-choice-graduation data means that we can estimate plausible counterfactual outcomes in alternative scenarios in which optimistic choices are circumscribed. Ultimately, our study contributes to the understanding of institutional effects: does an open school system that allows for aspirations to play out also benefit structural integration, or does it have the opposite effect through 'deceiving' many ambitious students of immigrant origin into aiming high, only to leave them stranded, with no upper secondary degree? The fact that around a fourth in our cohort did not complete their studies at this level (Skolverket, 2020), verifies that the concern raised in the recent literature must be taken seriously.

Immigrant optimism and the educational choice structure

A substantial body of studies during the last decades have shown that youth of immigrant background on average have lower achievement but higher aspirations at given levels of achievement than youth of the majority background. The latter finding has been observed for subjectively expressed aspirations as well as aspirations manifested in educational choices and transitions, and in a number of different countries, for example, England, Finland, France, Germany, the Netherlands, Norway, Sweden, and Switzerland (e.g. Brinbaum and Cebolla-Boado, 2007; Fekjær and Birkelund, 2007; van de Werfhorst and van Tubergen, 2007; Kristen and Dollmann, 2010; Jonsson and Rudolphi, 2011; Kilpi-Jakonen, 2011; Jackson, 2012; Jackson, Jonsson and Rudolphi, 2012; Jonsson, Kilpi-Jakonen and Rudolphi, 2014; ; Tjaden and Scharenberg, 2017; Dollmann, 2021; Rudolphi and Salikutluk, 2021).[1]

Although the ambitious choices of immigrant-background youth support an optimistic interpretation of structural integration, most previous studies have analysed educational transitions only, not following students until graduation. Recently, however, Birkelund (2020) for Denmark, and Dollmann and Weißmann (2020) for Germany, have shown higher non-completion rates among students of immigrant origin. The optimistic interpretation may thus not hold when extending the analysis to upper secondary school *completion*. Instead, in a more pessimistic scenario, children of immigrants unwisely choose advanced educational programmes where they face higher risk of non-completion due to a lack of sufficient abilities, low prior achievements being a key predictor of leaving school without graduating (Rumberger and Larson, 1998; Battin-Pearson et al., 2000; Bradley and Lenton, 2007; Jonsson, Kilpi-Jakonen and Rudolphi, 2014).

How, then, could students avoid the optimism trap and boost completion rates? In both vertically and horizontally stratified educational systems, the demands for academic aptitude and previous knowledge vary between different alternatives or programmes, although such differentiation emerges at different stages in different countries. Common to many educational systems, especially within a German tradition, is the presence of vocational routes that provide the clearest alternative for avoiding the optimism trap. The Scandinavian countries, probably as a consequence of their late differentiation (at around age 16), afford their students several academic as well as vocational programmes to choose from.

The Swedish cohort we study, attending their ninth and final grade in comprehensive school in the spring of 2012 and enrolling in upper secondary school (*Gymnasieskolan*) later that year, had a choice of 6 major academic and around 12 vocational programmes, all 3 years long. The choice was mainly unconstrained, encouraging both students' and parents' active involvement. Information about the choice, which is a crucial one in the Swedish educational system, was widespread and all students were seeing a study and vocational counsellor. Although formally a unified system, the differentiation between academic and vocational programmes was (and still is) pronounced, highlighted by the very low mobility between these two types (around 1–2 per cent in our student cohort), and by the sharp differences in enrolment in tertiary-level education: less than 10 per cent of vocational graduates, but over 50 per cent of those graduating from an academic programme (and as much as 73 per cent from the natural science programme) were enrolled in tertiary education within 3 years (Skolverket, 2020). The difference in enrolment is of course to be expected because those who go to academic programmes have already made plans for going to university, but obtaining general eligibility for tertiary education was also more complicated for students in vocational programmes, and their tertiary alternatives fewer.

The academic demands were arguably lowest in the vocational programmes, with their stronger focus on practical subjects (mostly, although not exclusively, connected with manual work), and with little variation between them in their average comprehensive school GPA composition. At the other end, the clearly most prestigious academic programme was natural science, followed by social science, and then other academic programmes. When analysing immigrant optimism, we therefore use this four-category variable, which 'rank' upper secondary programmes according to GPA demands, thereby providing a clue to how students could be matched to programmes on the basis of scholastic aptitude.

The immigrant optimism trap could, according to this classification, be disarmed if students of immigrant

origin made the same educational choices, within this choice set, as other students at the same levels of GPA. We could imagine this happening if those of immigrant origin scaled down their ambitions due to intensified information about the risks of failure at more demanding programmes; or at least by reduced encouragement by study counsellors (cf. van de Werfhorst and van Tubergen, 2007). An additional strategy would be to give more information on, or emphasize the advantages with vocational qualifications. Rerouting students from academic to vocational programmes is not an obvious demotion in Sweden. Vocational graduates enter the labour market quickly, most working in occupations in line with their programme (Skolverket, 2020). Their labour market prospects are among the very best in the OECD, with an employment rate over 90 per cent in all age groups, which is higher than for those with academic upper secondary degrees, and even somewhat higher than for those with tertiary degrees (OECD, 2020, Table A3.3 and Figure A3.1). Their wages also tend to be high in a comparative perspective (OECD, 2020, Figures A5.1 and A5.2).

Rather than persuading students of immigrant origin to reduce their educational aspirations, the immigrant optimism trap could, theoretically, be addressed by limiting access to the more prestigious programmes, or even by introducing a full-scale *numerus clausus* system. Admittedly, such 'manpower-planning' principles, matching students with specific aptitude and talent to educational programmes with corresponding requirements, are alien to the current Swedish upper secondary school system. However, restricted intake is common in many other countries (if often to school forms rather than programmes), and used to be prevalent also in Sweden (Erikson and Jonsson, 1993). Indeed, 'diversion policies' have historically, along with the introduction of viable vocational alternatives, been a prominent strategy in the Swedish school system for handling problems with over-crowding of higher education, and the potential emergence of an 'academic proletariat' (Murray, 1988).

Nonetheless, the measures mentioned are not very realistic in an open educational system like the Swedish, where the free choice principle has strong support. However, we take them as a point of departure for studying the existence, and numerical importance, of the immigrant optimism trap.

Data and measures

We use full-population data from the Swedish educational and population registers for the cohort that left grade 9 (compulsory school) in 2012, normally born in 1996. This cohort was the second to experience the re-organization of upper secondary education in 2011,

and we want to safeguard against 'implementation effects' for the first cohort.

The core data were collected from the register on grades from school year nine (age 16), which is the final grade in compulsory school, and the yearly registers of enrolment in and graduation from upper secondary school. These data are of high quality and contain the full student cohort, and we match them at the individual level to the general population registers where we can identify students' and their parents' country of birth and year of immigration. This matching, following permission from an ethical vetting board, was done by Statistics Sweden, and the analyses were all run on their secure remote online system (MONA).

The full student cohort consists of 99,723 students. We remove 14 students with missing information on country of birth, 5,214 students who immigrated at a late age (see below), and 1,000 students with missing information on GPA, resulting in an analytical population of 93,495, of which 12,583 (13.5 per cent) have immigrant background. This is the population used in Figure 1. In all subsequent analyses, we focus on completion among those eligible for and enrolled in upper secondary school ($N = 84,243$, of which 10,577 (12.6 per cent) have immigrant background). This restriction on the analytical population is natural as our questions concerns the risk of non-completion among those who have had the opportunity of making optimistic choices (see below on the distinction between completion and graduation).

Immigrant background

We classify youth as having a Swedish background if they were born in Sweden and had at least one parent who was. The immigrant background category thus incorporates both youth who have immigrated themselves, and those with two foreign-born parents. We focus on youth who have spent most of their comprehensive education in the Swedish system, thereby excluding those who have immigrated 2 years or more after normal school starting age, that is, at age 9 and older (5.2 per cent of the student cohort). This group has dramatically lower grades than the majority (the gap is 99 per cent of a standard deviation) and more than a third of them lack eligibility to upper secondary education, meaning that their educational trajectories are difficult to model within the same framework (cf. Grönqvist and Niknami, 2017).

In our analyses, we identify two groups: students of Swedish versus immigrant background. The latter are 13.5 per cent of our population, around half of them drawn from the Middle-East and Africa, and 9 out of 10 of non-Western background. Supplementary Appendix, Table A1 displays the distribution over regions of origin in our analytical population. In the
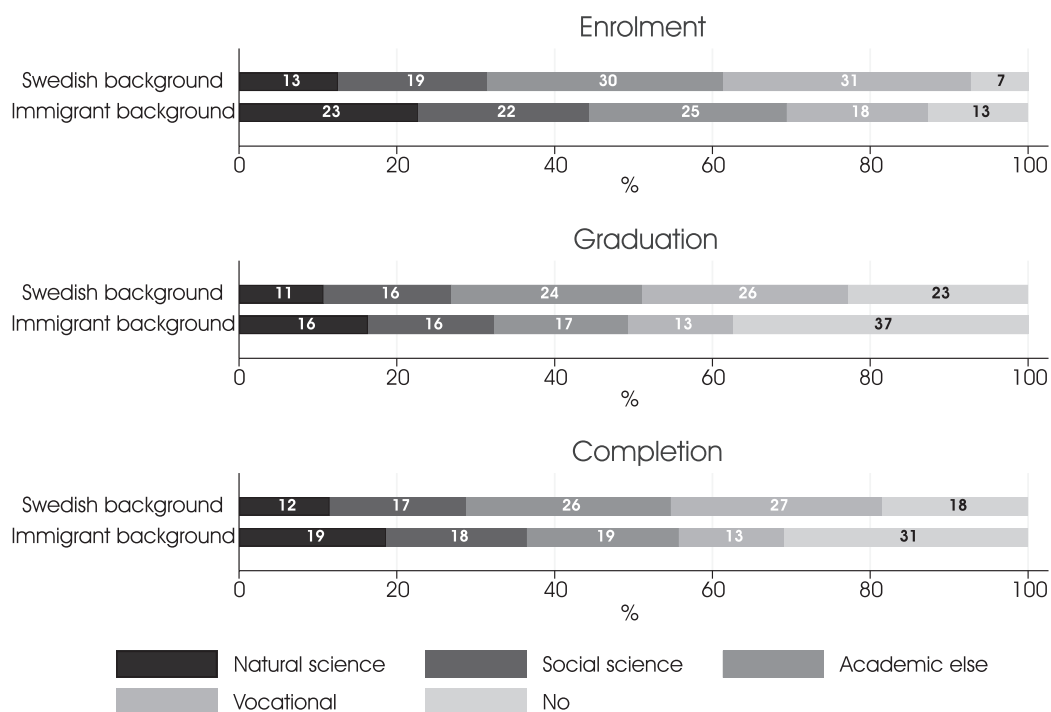
Figure 1 Enrolment, graduation, and completion from upper secondary school programmes by Swedish and immigrant background, respectively. Note: cohort who left compulsory school 2012. Enrolment in 2012, graduation and completion up to 2016. Graduation refers to the entire cohort, normally born in 1996, completion refers to the part of the cohort who enrolled in upper secondary school.

text, we sometimes refer to 'group differences' and 'group-specific' distributions, etc., by which we refer to the difference between those two groups.

GPA

The GPA from the final year of compulsory school (in reality a grade sum, *meritvärde*) ranges from 0 to 320 with the average in our study population being 215 (sd 60; min 10, max 320), comprising teacher-assigned grades in 16 subjects. Eligibility to upper secondary programmes requires 'pass' in English, Swedish, and Mathematics, and in addition in 5–9 other academic subjects, varying across programme types (lowest demands for vocational programmes, highest for the natural science programme). In the case of shortage of places GPA can be used as a selection instrument.

Programme type

In our analyses we use a four-category categorization, which we call 'programme type'. Thus, we divide the academic programmes into three. The two most popular were the most prestigious natural science programme (15.1 per cent of students) and the social science programme (21 per cent), respectively. The third group consists of the rest grouped together, with business economics the biggest at 11.1 per

cent, adding up to the remaining 31.7 per cent. Against these 67.8 per cent, the vocational path attracted 32.2 per cent, but no programme more than 5 per cent of this student cohort, and we therefore treat them as one category. They are similar in their GPA profile, but with regard to content they represent a mix of traditional male skilled worker areas (e.g. electricity, construction, vehicle mechanics) and traditional female programmes (e.g. handicraft, child and recreation, health and social care). All programmes are listed in Supplementary Appendix, Table A2.[2]

Upper secondary graduation and completion

The group without an upper secondary degree consists of:

(1) Those who did not start upper secondary school within our time window,
(2) those who started but left school early, and,
(3) those who did not leave school early but finished the programme without sufficient grades to obtain a diploma. In order to obtain such a diploma, three core subjects, an individual thesis, and most of the graded courses (2,250 course points out of 2,500) had to be given at least the grade 'pass'.

We define *non-graduation* as all three categories, while *non-completion* refers to (2) and (3). For individual's life-chances, just as for the total inequalities between those of foreign- and native-born origin, non-graduation is of course the prime concern. However, our focus here is *non-completion*, because we want to test the hypothesis that optimistic choices are detrimental for students of immigrant background; very few of the 8 per cent who did not make the transition to upper secondary level—(1) above—could make a choice (over 99 per cent of those eligible chose to go to upper secondary school). We show the gap in the 'total' outcome, that is, graduation, and while it should be kept in mind that the 'graduation gap' is somewhat larger than the 'completion gap', it is completion that is the relevant concept given our questions and theoretical framework. In our analyses, we do not distinguish between those who left upper secondary school early and those who stayed on but failed to obtain a diploma (2 and 3 above), as we know that (2) is unusual—88 per cent of non-completion in our cohort is about failing to get a pass in enough subjects rather than about leaving upper secondary school early (Skolverket, 2017, Table 2; own calculations). Therefore, it is more appropriate to think of the process as one of not passing the exam rather than one of dropping out.

We measure completion after four school years, meaning that we include students with normal school-leaving timing and students with a lag of up to 1 year. By including late leavers, an additional 6 per cent in our studied cohort graduate. In the analysis of completion we do not include (1) delayed entrants, as these would not have had the same time available for completing, or (2) the small number who appear in an upper secondary programme despite being formally classified as ineligible.

A small group of students change programme types (e.g. from vocational to academic) during upper secondary school. Those who change programme types and complete their studies are defined as completers of *the latter programme type* while those who change programme type and do *not* complete any of the programmes are treated as non-completers of the first programme type.

Model

It is not clear how to define 'immigrant optimism'. In the previous literature some analyse unconditional ethnic differences while others use models with a large numbers of predictors. Most, however, interpret the optimism, or 'choice effects', as the ethnic differences as estimated when holding constant for test scores or grades. The reason for this is that these are the strongest predictors of both educational choice and success. This goes particularly for grades, as they are more visible for students and parents (Erikson and Rudolphi, 2010). However, it is theoretically possible that family resources would impact not only performances but also choices. For example, having highly educated parents may increase the estimated probability of success because parents could help with the studies (Erikson and Jonsson, 1996). Following this line of thinking, there is no self-evident model to prefer when studying the optimism trap issue (we can imagine innumerable circumstances that could impinge on choices and performances). We have chosen, pragmatically, to go for a parsimonious model, which we believe to have considerable interpretational advantages. This model defines immigrant optimism (and the trap) as the ethnic differences controlling for GPAs. In order to test whether this simplification would hide important information, we also ran the analyses controlling in addition for parents' education (highest of four levels). This increased the level of immigrant optimism, or the ethnic differences in aspirations (which is not our main issue), but importantly made no major difference for the optimism trap, which is what we set out to test (see Supplementary Appendix, Table A3).

Results

GPA, enrolment, and graduation

When leaving compulsory school, the average GPA of students of immigrant background is 206 (sd = 64) while the average of other students is 217 (sd = 59), that is, a difference of almost a fifth of a standard deviation. Despite this, those of immigrant origin have a much stronger preference for academic programmes, as can be seen in the upper panel of Figure 1. No less than 70 per cent (23 + 22 + 25) of them enrol in these programmes, while the corresponding figure for youth of Swedish origin is 62 per cent (13 + 19 + 30). Moreover, those of immigrant background are much more likely to choose the most demanding programme, natural science (23 vs 13 per cent). A higher proportion (13 vs 7 per cent) of youth of immigrant background do not enrol in upper secondary education (the gap is 5.4 percentage points using non-rounded numbers). However, the most dramatic difference is in the proportion taking the vocational path: 31 per cent of youth of Swedish background do so, but only 18 per cent of immigrant background.

The contrast between enrolment and graduation is stark. The second panel of Figure 1 reveals that in our full population, 37 per cent of students with immigrant background had not obtained an upper secondary degree four years after starting, compared to 23 per cent of those with Swedish

background—a 'graduation gap' of 14.6 percentage points (ppt) using non-rounded numbers. Recall that 5.4 ppt of this gap is due to higher non-enrolment rates of youth of immigrant background, so non-completion accounts for just over 9 ppt of the total graduation gap.

Expressed as the *proportion of those who enrolled* in upper secondary education (the third panel), non-completion is 31 per cent among youth of immigrant background and 18 per cent among those of Swedish background. The ethnic completion gap is 12.5 ppt, a gap which is largely constant across the programme types. This gap shrinks slightly to 11.9 ppt when we remove the small group that is formally not eligible but is registered in upper secondary education.[3] The share of the full student cohort graduating from an academic programme is approximately half of each group, but whereas one out of four students of Swedish background graduate from a vocational programme, only one out of eight students with an immigrant background do so.

Enrolment in programme types by GPA

Figure 2 shows the proportion choosing a given programme type at different GPA among youth of immigrant and Swedish background. Throughout the GPA distribution, those of Swedish background are more likely to choose the vocational programme, while those of immigrant background are more likely to choose the natural science programme. Among students with relatively high GPA, the social science programme and other academic programmes are more popular among those of Swedish background than those of immigrant background, but at low GPA levels it is the other way around. Thus, choices of all programme types reflect the higher academic ambitions of youth of immigrant background: they have a strong preference for natural science, and at low GPA they tend to choose one of the other academic programmes rather than a vocational one.

GPA distribution within programme types

The combination of between-group GPA differences and the choice structure in Figure 2 means that youth of
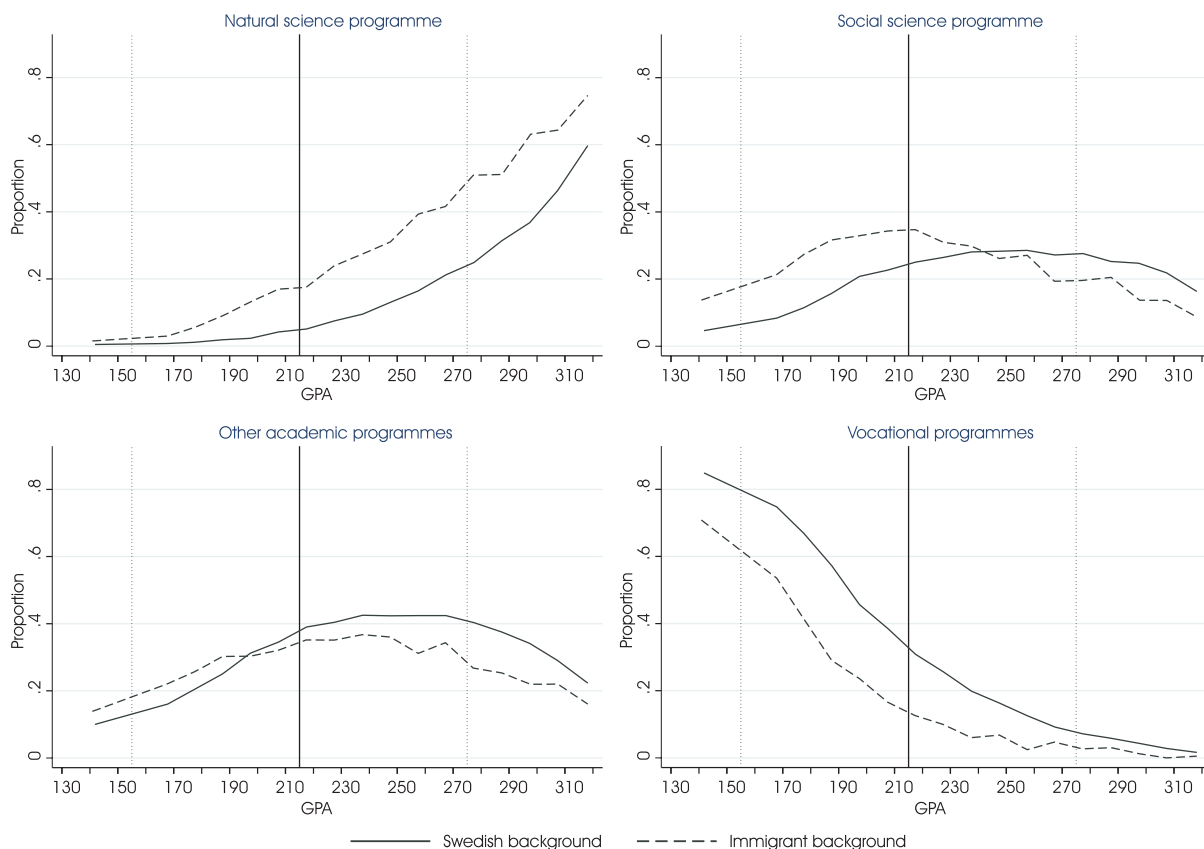
Figure 2 Enrolment in different upper secondary programmes, by GPA and Swedish and immigrant background, respectively. Note: vertical lines show, for students in all programmes combined, GPA mean (215) and ±1 std deviation (60).
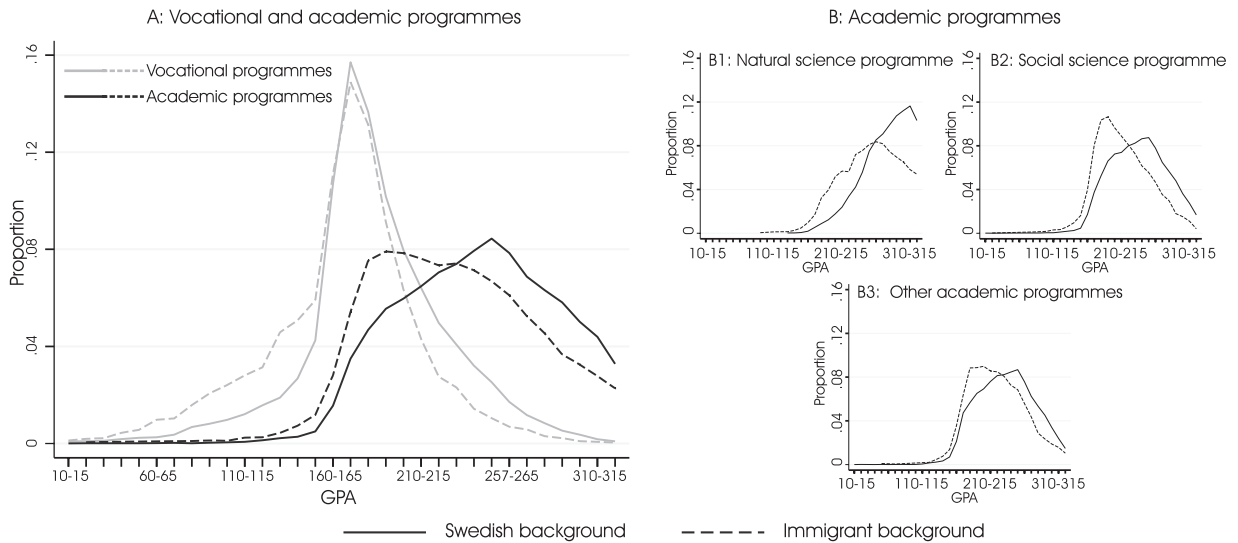
Figure 3 Grade 9 GPA distribution among those enrolling in different upper secondary programmes, by Swedish and immigrant background, respectively. Panel A: academic vs. vocational. Panel B: different academic programmes.

immigrant background are at a GPA disadvantage within each programme type. The left-hand part of Figure 3 shows this pattern for students entering the vocational programme, as compared to those in an academic programme (and the graph also reveals the great overall GPA differences between vocational and academic programmes). The right-hand side of Figure 3 displays the further differentiation within academic upper secondary programmes. Looking separately at the GPA distributions within the two largest, and all other collapsed, it is evident that a more positively selected (i.e. high GPA) group enter the natural science programme. This is true both among students of immigrant and non-immigrant background, although in the latter group a particularly large proportion in the natural science programme have outstanding grades.

Completion rates by programme type and GPA

We saw in Figure 3 that youth of immigrant background have lower previous performance within each upper secondary programme type. Does this perhaps account for the ethnic completion gap? Figure 4 demonstrates that the lower GPA of students of immigrant background is not enough to explain their higher non-completion rates in any of the programme types. Instead, they have lower completion rates (y-axis) at each programme type *at similar levels of GPA* (x-axis). The figure does however indicate that shifting students across programme types has the potential of boosting completion rates: at a given GPA, completion rates are generally higher for the less academically demanding programmes, and at low GPAs the differences are substantial.

How much of the completion gap is due to 'immigrant optimism?'

The results above have laid out the three components of the upper secondary completion gap between youth of Swedish and immigrant backgrounds: (i) Differences in GPA; (ii) differences in programme choice at a given GPA; (iii) differences in completion rates at a given programme and GPA. To estimate the role of immigrant optimism (component 2) relative to the other two components, we now decompose the gap into these three components. Denoting each combination of GPA level (17 categories) and programme type (4 categories) by k, the overall completion rates Q for students of Swedish (S) and immigrant (I) background, respectively, are equal to:

$$Q_S = \sum_{k=1}^{K} p1_S \times p2_S \times p3_S$$

$$Q_I = \sum_{k=1}^{K} p1_I \times p2_I \times p3_I$$

where p1 is the proportion at the given GPA level, p2 is the proportion in the given programme type of those at the given GPA level, and p3 is the completion rate within the given GPA level and programme (the components are listed in Supplementary Appendix, Table A4).

By replacing one of the components p1–p3 at a time with that of the other group, while holding the other components fixed, we obtain the counterfactual completion rates in Table 1, panels 2–3. Furthermore, by contrasting these counterfactual rates, we can parse the components of the total gap as in panel 4. Our calculations are based on observable variables,
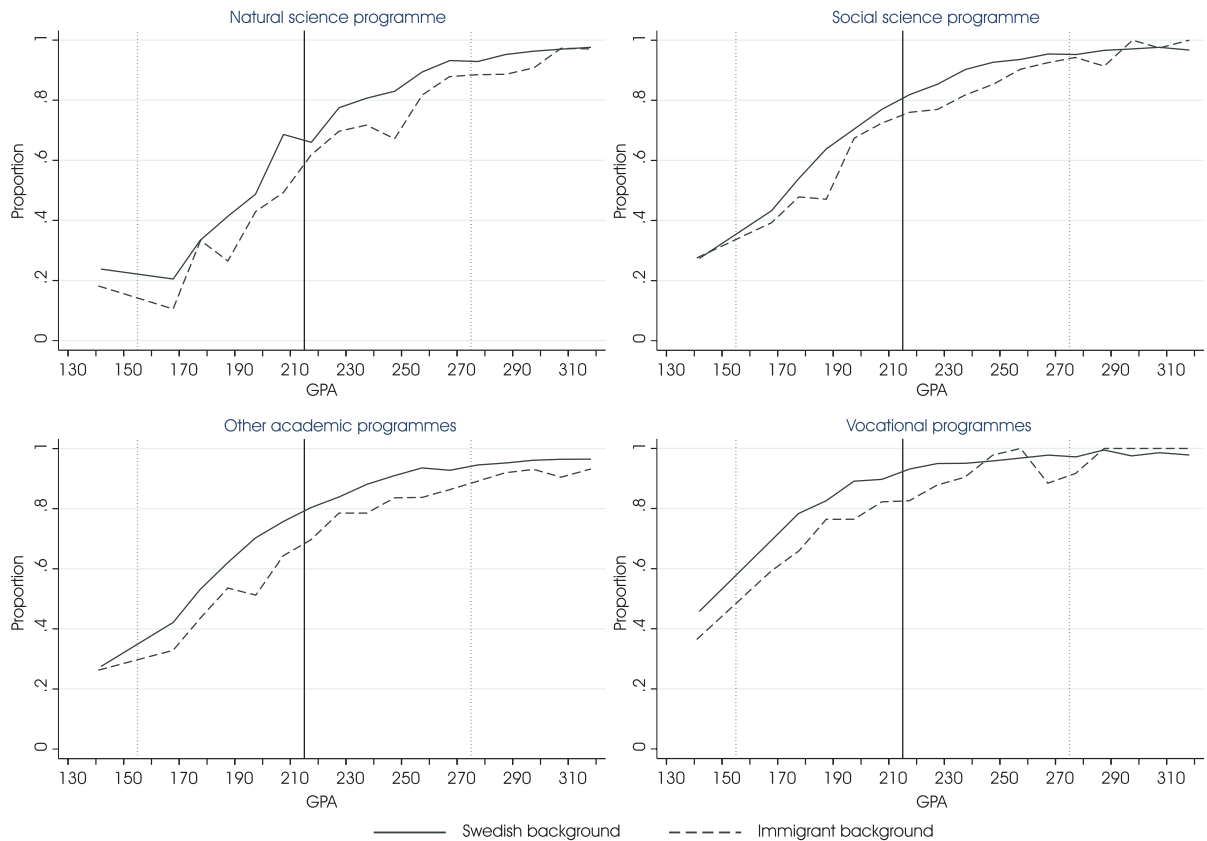
Figure 4 Completion of upper secondary education by programme type, GPA, and Swedish and immigrant background, respectively. Note: vertical lines show, for students in all programmes combined, GPA mean (215) and ±1 std deviation (60).

so the results depend on the assumption that altering the relations between ethnic group and the distribution of GPA and programme choice, respectively, and their interaction, would not change the ethnic group-specific completion rates. But would, for example, students of immigrant origin gain the same completion rates as those of Swedish origin if they suddenly had the latters' higher GPA? Maybe they would not study so hard, which could reduce their chance to complete.

The decomposition shows that 'immigrant optimism' is not the full or even the main mechanism behind higher non-completion rates among students of immigrant origin. It explains 28 per cent of the ethnic completion gap, which, in relative terms, sounds like a non-negligible contribution to the gap, but is, in absolute terms, quite modest at 3.4 ppt. Ethnic differences in GPA is an even smaller part of the explanation (8.5 per cent or 1 ppt). The gap is instead mostly (63 per cent) driven by the fact that youth of immigrant background less often complete their studies *given* GPA *and* programme type. Reasons for this

may include lack of family resources. However, when we run an OLS regression on non-completion, adding parents' education as a predictor after controlling for programme choice and GPA, the ethnic completion gap is not reduced by much. Other explanations for the remaining gap might be unobserved individual and family characteristics or ethnic discrimination (e.g. by teachers in upper secondary education), but an analysis of these processes is outside the scope of the present paper.

What would happen if the school curbed optimistic choices?

The results above suggest that if we somehow could persuade students of immigrant origin to reduce their optimism in programme choice to the level of those of native origin, this would not reduce the ethnic completion gap much. In the next step, we ask what would happen if educational policy or schools intervened and limited places at the more demanding upper secondary school programmes. What would a *numerus clausus* system do

for completion rates and for the completion gap between youth of immigrant and majority backgrounds?

To address this, we turn to a simulation analysis where we introduce grade limits in the upper secondary school system. We set a hypothetical threshold for entry to the academic programmes at a point in the grade 9 GPA distribution where the observed programme-specific completion rate in our data is approximately 75 per cent. This translates to a GPA of 245 for natural science, and 215 for all other academic programmes. With this threshold, 65 per cent of all who left grade 9 (64 per cent of majority background and 69 per cent of immigrant background) have a GPA that would bar them from entering the natural science programme, and 47 per cent (46 vs 52 per cent) have a GPA that would bar them from all academic alternatives. The point of this model is to study, by means of a thought experiment, whether the ethnic completion gap would be reduced if students of immigrant background were prevented from persuing their optimistic choices, and we do not suggest that entry thresholds like these would be desirable or realistic as real-life reforms. The assumptions behind this simulation model are that the introduction of grade limits would not change the group-specific GPA distribution or choice patterns, nor the group-specific completion rates at given grade levels and programmes. These are strong assumptions, but reasonable to make in the absence of any data on behavioural responses such a system

would engender. We return to the issue of assumptions in our interpretation of the results.

Among eligible students who started upper secondary school in 2012, the scenario under this hypothetical threshold is depicted in Table 2. This shows, to take the uppermost row, that out of the 14 per cent of youth of Swedish background who chose the natural science programme, 82 per cent would still be able to do so; 12 per cent would not, but would have to go to some other academic, or to a vocational programme; and 6 per cent would only have vocational options. The table verifies that eligibility criteria like the one we use would have a massive impact on the relative size of the respective programme categories. The proportion students in the natural science programme (the one with the highest threshold) decreases in the counterfactual state, while the proportion enrolling in the other academic programmes would depend on the balance between the size of the group barred from natural science moving to another academic programme, and the size of the group barred from all academic alternatives. What is striking is that a large proportion who in the existing open system choose other academic programmes than natural science, would need to move to vocational studies. This proportion would also be particularly high among students of immigrant origin—almost every second student, against almost a third of Swedish origin.

Table 1 The role of 'immigrant optimism' for the ethnic gap in completion. Real and counterfactual completion rates at Swedish upper secondary school, for children of immigrant and non-immigrant origin, divided into three components: (1) GPA differences, (2) choice of programme type, given GPA, and (3) completion given (1) and (2).

	ppt	%
1. Factual completion rates		
(Q_S) Swedish background		82.2
(Q_I) Immigrant background		70.3
2. Swedish background, counterfactual completion rate: Assuming…		
(Q_S1) …same GPA distribution as immigrant-background ($p1_S$ set to $p1_I$)		81.4
(Q_S2) …same programme choice as immigrant-background ($p2_S$ set to $p2_I$)		79.0
(Q_S3) …same completion at given programme & GPA as immigrant-background ($p3_S$ set to $p3_I$)		74.9
3. Immigrant background, counterfactual completion rate: Assuming…		
(Q_I1) …same GPA distribution as Swedish background ($p1_I$ set to $p1_S$)		71.5
(Q_I2) …same programme choices as Swedish background ($p2_I$ set to $p2_S$)		73.8
(Q_I3) …same completion at given programme & GPA as Swedish background ($p3_I$ set to $p3_S$)		78.0
4. Relative weight of components for the ethnic completion gap		
(1) $0.5*(Q_S–Q_S1) + 0.5*(Q_I1–Q_I) = 0.5*0.8 + 0.5*1.2$	1.0	8.5
(2) $0.5*(Q_S–Q_S2) + 0.5*(Q_I2–Q_I) = 0.5*3.2 + 0.5*3.5$	3.4	28.3
(3) $0.5*(Q_S–Q_S3) + 0.5*(Q_I3–Q_I) = 0.5*7.3 + 0.5*7.7$	7.5	63.2
Total gap:	11.9	100

Note: Percentages are calculated on unrounded numbers.

Table 2. Consequences of introducing GPA thresholds (Natural science programme (NA): 245; Social science (SA) and other academic: 215) for eligibility to academic programmes by background group.

	% who chose in our cohort	% of these who would still be able to do so	% forced to go to	
			Other academic or vocational (GPA 215–245)	Vocational (GPA <215)
Choosing NA				
Swedish background	14	82	12	6
Immigrant background	27	65	19	16
Choosing SA/other academic				
Swedish background	53	70	—	30
Immigrant background	54	55	—	45
Choosing vocational				
Swedish background	33	100	—	—
Immigrant background	19	100	—	—

So, how would this affect the ethnic gaps in upper secondary completion? We model the simulated scenario in three steps:

In step 1, we specify five different potential choices (c = 1–5) of upper secondary programme: (i) natural science, (ii) social science, (iii) any other academic programme, (iv) any vocational programme, and (v) no upper secondary education. An individual's predicted probability *P* of each of these choices c *in the absence of a threshold* is estimated non-parametrically as the proportion among those eligible for upper secondary education after grade 9 in 2012, who go to programme *c* and has the same immigrant background and GPA as oneself, that is:

$$Pc_i = Pc\,(immigrant\ background_i * GPA_i),$$

where immigrant background is a 0/1 indicator, and GPA is a set of 17 0/1 indicators of a student's GPA level.[4] The individual-level probabilities P1–P5 sum to 1.

To adapt P1–P5 to *the counterfactual scenario,* we set P1 to zero if GPA is less than 245, and P2 and P3 to zero if GPA is less than 215, and then re-weight the remaining probabilities to sum to 1, while keeping their ratios constant, that is:

If GPA$_i \geq$ 245: $CPc_i = Pc_i$

If GPA$_i \geq$ 215 & **< 245:** $CP1_i = 0$; $CP2_i = P2_i/(1 - P1_i)$; $CP3_i = P3_i/(1 - P1_i)$; $CP4_i = P4_i/(1 - P1_i)$; $CP5_i = P5_i/(1 - P1_i)$

If GPA$_i$< 215: $CP1_i = 0$; $CP2_i = 0$; $CP3_i = 0$; $CP4_i = P4_i/(P4_i + P5_i)$; $CP5_i = P5_i/(P4_i + P5_i)$

In step 2, we estimate a simulated completion rate for each available choice as the completion rate among those who match the individual in terms of immigrant background and GPA, and who enrolled in the programme in question.

In step 3, the product of the individual's simulated choice probability and completion rate is calculated for each programme and then aggregated over individuals to an overall simulated probability of completion. These probabilities are identical for all individuals who share the same combination of immigrant background and GPA.

Figure 5 shows the actual (lower line) and simulated (upper line) completion from upper secondary education by GPA and immigration background. The two vertical lines indicate the thresholds for entry into natural science (245), and other academic programmes (215), respectively. The simulated completion rate is clearly higher than the actual one for students with GPA below the lowest threshold as they are shifted from academic to vocational programmes. Among youth of immigrant background, the simulated completion rate is also slightly higher for those with grades in the range 215–245, following the shift of some natural science students to other academic programmes. Above the high threshold (on the right-hand side of the figure), the actual and simulated completion rates are the same, given that all students on this side of the achievement distribution are eligible to attend any programme, in the actual as well as in the simulated world.

Figure 5 tells us that students of immigrant background would probably complete upper secondary education to a higher extent were they to choose less academically demanding routes, but—crucially—it reveals that the same holds for those of Swedish background. The graph is, however, not informative about the change in the gap between youth of immigrant and majority backgrounds, as this requires considering not only completion at a given GPA, but also the GPA distribution in the two groups. Averaging over the GPA distribution among youth of immigrant
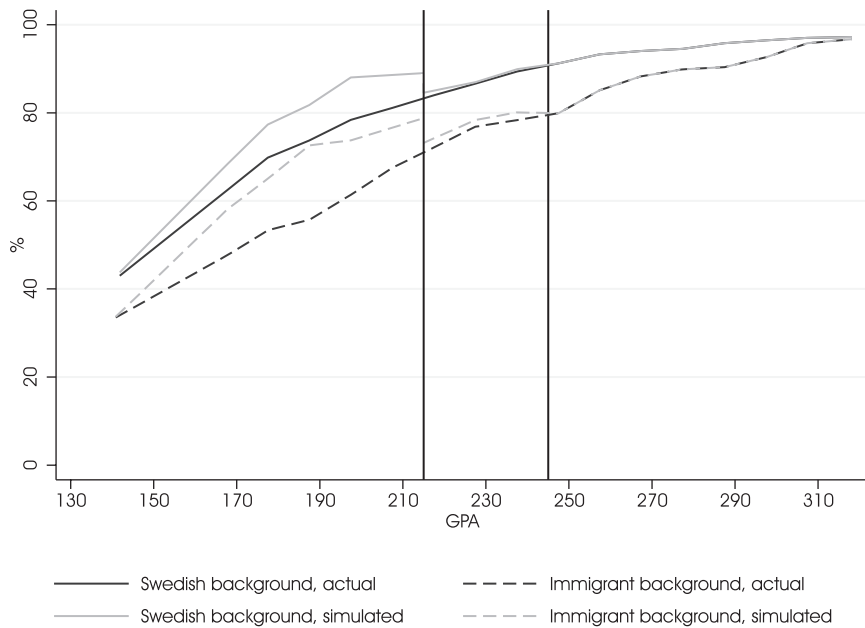
Figure 5 Actual and simulated percentage with completed upper secondary education in the 2012 grade 9 cohort, four years after finishing grade 9. By Swedish and immigrant background, respectively. Note: vertical lines show (hypothetical) GPA thresholds (Natural science programme: 245; Social science programme and Other academic programmes: 215).
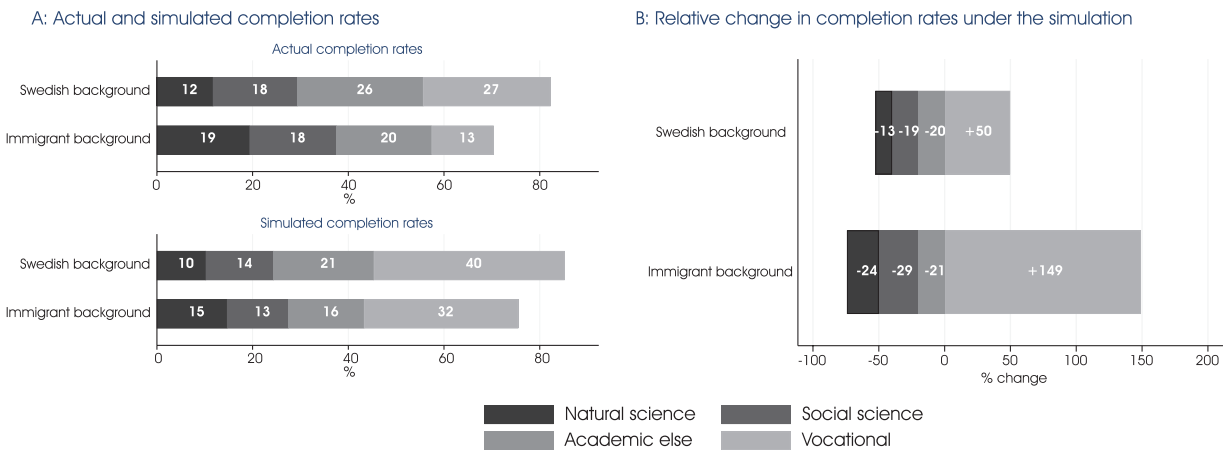

Figure 6 Actual and simulated percentage with upper secondary degrees from different programme types in the 2012 grade 9 cohort, four years after finishing grade 9 (panel A) and relative change in completion rates under the simulated model (panel B). By Swedish and immigrant background, respectively. Note: only students who were eligible for and started upper secondary school. Students with missing information on GPA or immigrant background are excluded. Numbers differ slightly from Figure 1, panel 3, because we here exclude the small number of formally ineligible students who nevertheless started upper secondary education.

background, we find that their overall simulated completion rate would be 75.5 per cent, which is 5.2 ppt higher than their actual completion rate (70.3 per cent). For those of Swedish background, the corresponding figures would be 85.2 per cent or 2.9 ppt higher than their actual completion rate (82.2). Both panels in Figure 6 show that these changes are due to a very large growth of the proportion with vocational

diplomas, especially among youth of immigrant background.

We conclude that, under our simulation model, introducing GPA limitations in admission to upper secondary school programmes would boost immigrant background completion rates by around 5 percentage points, because many in this group would be forced to enrol in less demanding, primarily vocational

programmes. However, because completion rates would increase also among youth of Swedish background, the ethnic completion gap would only be reduced from 11.9 to 9.7 ppt. This reduction must be considered unimpressive in view of the substantial restrictions of choice that the simulated situation entails.

We have tried alternative thresholds in the GPA range between 195 and 255, and although the completion rates fluctuate by one or two percentage points, the ethnic completion gap is rather stable at around 10 percentage points. Thus, while many students would improve their chances of completion if they chose a programme more aligned with their GPA, and may thus be said to be too optimistic for their own good, our results do not lend much support for the hypothesis of an optimism trap for youth of immigrant background.

As mentioned, this simulation is a thought experiment, and we can only speculate about behavioural responses to the introduction of grade limits. If, for example, students of immigrant origin with mediocre grades, who would have a high probability of failing their preferred academic programme, instead were forced into a vocational programme with demands that matched their GPA, it is far from certain that their motivation would be enough to reach the completion rates of those who actively chose the same vocational programme.

Conclusion and discussion

Open school systems, based on students' (and their families') choices of which type of education to pursue, leave the door open for ambition and aspirations to play out. Several Western school systems have seen this lead to a surge in the demand for upper secondary and tertiary qualifications, and foremost among the ambitious have often been students of immigrant origin. While some have viewed this as a positive thing, promising socio-economic integration and a reduction in ethnic gaps in opportunities and living conditions (e.g. Jackson, Jonsson and Rudolphi, 2012), others have pointed to the risks involved when aspirations trump ability. Students of immigrant background, in this more pessimistic scenario, would probably do better by adjusting their aspirations to their proven school performances instead of getting caught in an 'optimism trap' (Tjaden and Hunkler, 2017; cf. Birkelund, 2020). Such an adjustment would, it is assumed, improve the chances of this group to complete an upper secondary degree (and even a tertiary degree), non-completion being a reality for 31 per cent of those in the cohort we analyse. Furthermore, as Heisig and Schaeffer (2020) note, even if immigrant children succeed at the chosen educational track, they usually do this at a lower skill level because they entered at a lower level. This could lead to (statistical) employer discrimination and may be detrimental for socioeconomic integration.

In this paper we address the first of these issues, the possibility of an ethnic optimism trap. We examine to what extent ambitious educational choices lead students of immigrant origin into too demanding upper secondary programmes and subsequent failure to complete their studies; and as a consequence, perhaps lead to ethnic disadvantages in educational attainment. We profit from longitudinal school register data (GPA in grade 9; programme choice at and completion from upper secondary school) on a full Swedish cohort leaving compulsory school in 2012 ($n \approx 90{,}000$), with matched administrative information on immigrant origin. In total, our results can be generalized to the cohort who graduated from comprehensive school in 2012 (that is, who were eligible for upper secondary school), with the exception of those who immigrated at the age of 9 or older.

Our descriptive analysis gives some initial support to the pessimistic narrative. Youth of immigrant background, who on average choose more demanding academic tracks at given grades, complete upper secondary education less often than other students—the 'ethnic completion gap' is 11.9 percentage points.

But the crucial issue in the argument of an immigrant optimism trap is whether students of immigrant background would be better off in relation to other students by scaling down their ambitions, either by persuasion or by enforced rules on enrolment. To address this, we undertook two different types of analyses. In the first, we asked: How much of the completion gap is due to different choices of programmes at given GPA? Our results suggest that the optimistic choices of youth of immigrant background can only account for 3.4 out of 11.9 ppt, or 28 per cent of the gap in completion. Even if we could persuade students of immigrant origin into making the same educational choices as other students at the same level of GPA, the ethnic completion gap would (under the model assumptions) be reduced by no more than these 3.4 ppt.

Instead of persuasion, in the second analysis we ask what would happen if the optimistic choices were curtailed by educational or school policy. We exemplified this by simulating the consequences of introducing a grade limit that would shut the door to the more academically demanding programmes for those with poorer grades (the limit set at the GPA at which 75 per cent graduate). Against the backdrop of the ensuing massive enforced relocation of students from academic to vocational programmes, the completion rates of students of immigrant origin would increase with 5 ppt under this model. However, because students of majority origin would improve almost as much, the ethnic completion gap would be reduced by a mere 2.2 ppt. In total, moving a large number of students from academic to vocational schooling would reduce non-completion by just over 3 ppt, and would have a marginal effect on

the ethnic completion gap. Even these small effects are probably overestimated. Because our simulation model follows a straightforward matching-on-observables logic, the results are vulnerable to unobservables: for example, forcing those with academic inclination into vocational programmes may lead to reduced motivation and therefore lower completion rates.

On balance, then, we believe that immigrant optimism in education rather than being a trap is likely to be a springboard, with the potential for structural integration and, especially via university degrees, for increased ethnic diversity in high-status occupations. While we have reached this conclusion partly via a simulation exercise based on restriction of programme choices at upper secondary school, we want to repeat that this is just an appropriate analytical strategy rather than a realistic policy alternative. In practice, introducing grade limits would hardly be possible in a school system such as the Swedish where free choice is a cornerstone. A more 'realistic' level of ambition in students could alternatively be sought by persuasion strategies such as strong recommendations by teachers or study counsellors on the basis of student GPA, but as we have shown, not even a successful intervention along these lines would have any noteworthy effects. More importantly perhaps, most schools would find it ethically problematic to discourage students from pursuing their interests and aspirations, and our result that a non-trivial number of students with unexceptional GPA still make it at the most demanding programmes underscores this. In addition, directing discouragement to specific groups, such as those of immigrant origin, would appear particularly problematic.

Although we study the consequences of optimistic choices in the Swedish context, we believe that our results are also—at least partially—applicable to other contexts. In Germany, for example, with a quite different school system, we also observe optimistic choices among immigrants, which do not necessarily lead to upper secondary degrees (Dollmann and Weißmann, 2020). However, the German vocational training system is also characterized by rather high drop-out rates of about 30 per cent (BIBB, 2020), also among immigrants (Beicht and Walden, 2013). Therefore, one may expect similar results also in this context, but we need additional studies with a similar setup also in other countries to address the issue of transferability of results.

Notes

1. Besides higher educational aspirations due to 'immigrant optimism' other explanations of immigrants' ambitious educational choices are, among others, blocked opportunities or anticipated discrimination on the labour market. Although these explanations are theoretically plausible, empirically, immigrants' ambitious educational choices seem to be almost completely related to their high educational aspirations (e.g. Fernández-Reino, 2016; Dollmann, 2017, 2021).

2. By upper secondary programme we only refer to the regular national programmes. Students with low grades can start a so-called individual programme (IM) where the aim is to try to catch up and start one of the regular programmes. This group is here defined as not in upper secondary school.

3. This group will also be excluded from all further analyses (n = 1,808), meaning that 11.9 ppt is our preferred estimate of the ethnic completion gap.

4. We use dummies to allow for a non-linear effect of GPA. We have also used a model with 32 indicators of GPA level, with similar results. A model including sex gives results that are as good as identical.

Supplementary Data

Supplementary data are available at *ESR* online.

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