Ethnic gaps in Swedish upper secondary school completion:

Is ‘immigrant optimism’ the problem?

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In many Western countries, researchers have documented ‘immigrant optimism’ in education, i.e., the tendency for immigrant-background students to choose academically more demanding routes than others at given levels of grade point averages (GPA). For some, this indicates structural integration, while others alert against an ‘immigrant optimism trap’ when ambition trumps ability, leading to high risks of non-completion. Using longitudinal Swedish population data (n≈90,000), we estimate the upper secondary ‘completion gap’ to 12% to the detriment of immigrant-background students. We then address the ‘trap hypothesis’ via two counterfactual analyses. The first shows that if immigrant-background youth made similar educational choices as other students at the same GPA, the completion gap would shrink by 3.4 percentage points. The second analysis suggests that restricting admission to programmes based on prior GPA, which would lead to a massive relocation of low- and mid-GPA students to vocational programmes, would 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 immigrant optimism, and optimistic choices are likely to be a net positive for structural integration.

Keywords: Integration, education, immigrant optimism, drop-out, early school leaving

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Introduction

In several Western countries, school performance and educational choice are counteracting forces in the educational careers of immigrant-background youth (e.g., Heath and Brinbaum, 2014). While their school performance is, on average, worse than that of majority-background youth, 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 ‘immigrant optimism’ (Kao and Tienda, 1995) is a potentially positive force that may reduce gaps in educational attainment between majority- and immigrant-background youth. Thereby, it may contribute to structural integration, provided that the ambitious choices among those with immigrant origin also lead to formal qualifications (Jackson, Jonsson, and Rudolphi, 2012, p. 175). However, recently researchers have warned that the optimistic choices often result in failure to obtain such qualifications, and that high aspirations therefore in fact represent a ‘double edged sword’ (J.F. Birkelund, 2020) or an ‘optimism trap’ (Tjaden and Hunkler, 2017), leading immigrant-background youth 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 (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 higher, they are supposedly more vulnerable than other students to the risk of non-completion.

There is tentative support for the ‘trap’ narrative, both from recent analyses on Germany (Dollmann and Weißmann, 2020) and Denmark (J.F. Birkelund, 2020). In particular, those studies, as earlier ones (Colding, Husted and Hummelgaard, 2009; Kalmijn and Kraaykamp,

2003; 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 immigrant youth. Implicit in the ‘immigrant optimism trap thesis’ is the presumption that there are alternative routes that these ‘optimistic’ immigrant-background youth 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 majority-background youth. As far as we know, there is no empirical evidence that the ‘optimistic’ immigrant youth would succeed better in, e.g., vocational rather than academic programmes, and that this would in turn lead to less inequality in completion between immigrant- and majority-background youth. While it may appear obvious 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 explicitly considering counterfactual models to estimate the ‘immigrant optimism gap’. We outline two distinct models that we test against empirical data. They build on two different 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 emphasizing the advantages with vocational schooling, 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 counterfactuals for estimating the ‘optimism trap’ effect with greater precision than hitherto.

This leads us to ask three main questions in this study, the first of which is descriptive, but fundamental for the others, and the second and third corresponding to our two counterfactual analyses:

- (1) Do immigrant-background youth have lower upper secondary completion rates?

(2) How much of this ethnic completion gap is due to “immigrant optimism”, defined as immigrant-background youth’s more high-aspiring choices at 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 characterised 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 majority-background youth. 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, e.g., England, Finland, France, Germany, the Netherlands, Norway, Sweden and Switzerland (e.g., Brinbaum and Cebolla-Boado, 2007;

Fekjær and G. E. Birkelund, 2007; van de Werfhorst and van Tubergen, 2007; Kristen and Dollmann, 2010; Jonsson and Rudolphi, 2011; Kilpi-Jakonen, 2011; Jackson, 2012; Jackson et al., 2012; Jonsson, Kilpi-Jakonen, and Rudolphi, 2014; Dollmann, 2017; Tjaden and Scharenberg, 2017; Rudolphi and Salikutluk, 2021). A common finding is also that ethnic minorities show higher transition rates to upper secondary and tertiary education, respectively, throughout the grade distribution (Jackson et al. 2012, for Sweden).

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, J.F. 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 (Battin-Pearson et al., 2000; Bradley and Lenton, 2007; Jonsson et al., 2014; Rumberger and Larson, 1998).

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 ‘Germanic’ 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 9th 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 six major academic and around twelve vocational programmes, all three years long. The choice was mainly unconstrained, encouraging both students’ and parents’ active involvement. 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% 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 were enrolled in tertiary education within three years (Skolverket, 2020). The latter was mostly, probably, due to a selection of students according to educational plans, but general eligibility for tertiary education was also more complicated to obtain for students in vocational programmes, and tertiary level 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.

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 councillors (cf. van de Werfhorst and van Tubergen, 2007). An additional strategy would be to 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 percent 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, Figure A3.1). Their wages also tend to be high in a comparative perspective (OECD, 2020, Figures A5.1, 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 introduce 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 utilize these counterfactuals to study 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, whereof 12,583 (13.5%) have immigrant background. This is the population used in Figure 1. In

all analyses after Figure 1, we focus on completion among those eligible for and enrolled in upper secondary school (N=84,243, whereof 10,577 (12.6%) have immigrant background).

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 most of their comprehensive education in the Swedish system, thereby excluding those who have immigrated two years after normal school starting age, that is, at age 9 and older (5.2% of the student cohort). This group has dramatically lower grades than the majority (the gap is 99% 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 the analyses we show, we identify two groups: Students of Swedish versus immigrant background. The latter are 13.5% of our population, around half of them drawn from the Middle-East and Africa, and nine out of ten of non-Western background. Appendix Table A1 displays the distribution over regions of origin in our analytical population. In the text, we sometimes refer to ‘group differences’ and ‘group-specific’ distributions, etc., by which we refer to the difference between those two groups.

Grade point average (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 three core subjects and in five (vocational programs) or nine (academic programmes) additional subjects. In the case of shortage of places GPA can be used as a selection instrument, but in practice this is more consequential for school choice than for programme choice.

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 social science (21%) and natural science

(15.1%) programmes, which were the most popular, and the rest (with business economics being the biggest at 11.1%), adding up to the remaining 31.7%. Against these 67.8%, the vocational path attracted 32.2%, but no programme more than 5% of this student cohort, and we therefore treat them as one category. They are mostly 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 & recreation, health & social care). All programmes are listed in Appendix Table A2.¹

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 program without sufficient grades to obtain a diploma. In order to obtain such diploma, three core subjects, an individual thesis, and most of the graded courses (2250 course points out of 2500) had to be given at least a 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 mainly *non-completion*, because we want to test the hypothesis that 'optimistic choices' are detrimental for students of immigrant background; very few of the ten percent who did not make the transition to upper secondary level – (1) above – could make a choice (over 99% of those eligible chose to go to upper secondary school). Nevertheless, we will also show analyses of the 'total' outcome, that is, graduation. In our analyses, we do not distinguish between (2) and (3) as we know that (2) is unusual – 88 percent 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, Tab. 2; own calculations).

¹ 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.

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 one 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 program 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 later 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.

Finally, we include students' *sex* in our models.

Results

GPA, enrolment and graduation

When leaving compulsory school, the average GPA of immigrant-background youth is almost a fifth of a standard deviation (sd) lower than that of majority youth – in our study population, immigrant-background youth have an average of 206 (sd=64), while the average of other students is 217 (sd=59).

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% (23+22+25) of them enrol in these programmes, while the corresponding figure for youth of Swedish origin is 62% (13+19+30). Moreover, immigrant-background youth are much more likely to choose the most demanding natural science programme (23% vs 13%). A higher proportion (13% vs 7%) of immigrant-background youth do not enrol in upper secondary education (the gap is 5.4 percentage points using non-rounded numbers), but the most dramatic difference is in the proportion taking the vocational path: 31% of Swedish-background youth do so, but only 18% of immigrant-background youth.

[Figure 1 here]

The contrast between enrolment and graduation is stark. The second panel of Figure 1 reveals that in our full population, 37% of students with immigrant background did not obtain an upper secondary degree four years after starting, compared to 23% 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 immigrant-background youth, 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% among immigrant-background youth and 18% among Swedish-background youth. The ethnic completion gap is 12.5 ppt, a gap which is largely constant across the programme types.² The share of the full student cohort graduating from an academic programme is approximately half of each group, but whereas one out of four of Swedish-background youth graduate from a vocational programme, it is only one out of eight students with an immigrant background who do.

Enrolment in programme types by GPA

Figure 2 shows the proportion choosing a given programme type at different GPA among immigrant- and Swedish-background youth. Throughout the GPA distribution, Swedish-background youth are more likely than immigrant-background youth to choose the vocational programme, while immigrant-background youth are more likely to choose the natural science programme. The social science programme and other academic programmes are more popular among Swedish-background than among immigrant-background students with relatively high GPA, but at low GPA levels they are more popular among immigrant-background students. So choices of all programme types reflect the higher academic ambitions of immigrant-background youth: 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.

[Figure 2 here]

² This gap (12.5) shrinks slightly to 11.9 when we remove the small group that is formally not eligible but is registered in upper secondary education. This group will be excluded from all further analyses.

GPA distribution within programme types

The combination of between-group GPA differences and the choice structure in Figure 2 means that immigrant-background youth 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.

[Figure 3 here]

Completion rates by programme type and GPA

We saw in Figure 3 that immigrant-background youth 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 immigrant-background youth is not enough to explain the higher non-completion rates in any of the programme types. Instead, immigrant-background youth have lower completion rates (y-axis) than Swedish-background youth at each programme type (differentiated by colour) *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.

[Figure 4 here]

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 Swedish- and immigrant-background youth: (1) Differences in GPA; (2) differences in programme choice at a given GPA; (3) 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 (5 categories) by k , the overall completion rates Q for Swedish- (S) and immigrant- (I) background youth, 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 Appendix Table A3.)

By replacing one of the components $p1$ to $p3$ at a time with that of the other group, while holding the other components fixed, we obtain the counterfactual completion rates in Table 1, panel 2-3. Furthermore, by contrasting these counterfactual rates, we can parse the components of the total gap as in panel 4.

[Table 1 here]

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. In fact, it explains only 28% of the ethnic completion gap. Lower GPA is an even minor part of the explanation (8.5%). The gap is instead mostly (63%) 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 and discrimination, 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 suggests 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 gaps between immigrant- and majority-background youth?

Again, we turn to a counterfactual analysis in simulating the introduction of 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%. This translates to a GPA of 245 for natural science, and 215 for all other academic programmes. With this threshold, 65% of all who left grade 9 (64% of majority-background and 69% of immigrant-background) have a GPA that would bar them from entering the natural science programme, and 47% (46% vs 52%) 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 immigrant-background youth would be prevented from pursuing their optimistic choices, and we do not suggest that entry thresholds like these would be desirable or realistic as real-life reforms.

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% of Swedish-background youth who chose the natural science programme, 82% would still be able to do so; 12% would not, but would have to go to some other academic, or to a vocational programme, and 6% 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 in the natural science programme (the highest-threshold one) 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 chose 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 students of Swedish origin.

[Table 2 here]

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

In step 1, we specify five different potential choices ($c = 1$ to 5) of upper secondary programme: (1) natural science, (2) social science, (3) any other academic programme, (4) any vocational programme, and (5) 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 sex, immigrant background and GPA as oneself, i.e.:

$$P_{ci} = P_c(\text{sex}_i * \text{immigrant background}_i * \text{GPA}_i),$$

Where sex is a 0/1 indicator, immigrant background is a 0/1 indicator, and GPA is a set of 17 0/1 indicators of a student's GPA level.³ The individual-level probabilities P_1 to P_5 sum to 1.

To adapt P_1 to P_5 to *the counterfactual scenario*, we set P_1 to zero if GPA is less than 245, and P_2 and P_3 to zero if GPA is less than 215, and then re-weight the remaining probabilities to sum to 1, i.e.:

$$\text{If } \text{GPA}_i \geq 245: CP_{ci} = P_{ci}$$

$$\text{If } \text{GPA}_i \geq 215 \text{ \& } < 245: CP_{1i} = 0; CP_{2i} = P_{2i}/(1-P_{1i}); CP_{3i} = P_{3i}/(1-P_{1i}); CP_{4i} = P_{4i}/(1-P_{1i}); CP_{5i} = P_{5i}/(1-P_{1i})$$

$$\text{If } \text{GPA}_i < 215: CP_{1i} = 0; CP_{2i} = 0; CP_{3i} = 0; CP_{4i} = P_{4i}/(P_{4i} + P_{5i}); CP_{5i} = P_{5i}/(P_{4i} + P_{5i})$$

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

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

³ 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.

Figure 5 shows the actual (lower line) and counterfactual (upper line) completion from upper secondary education by GPA and immigration background. The two vertical lines indicate the thresholds for entry to academic programmes other than natural sciences (215) and to natural science (245), respectively. The counterfactual completion rate is clearly higher than the actual for students with GPA below the lowest threshold as they are shifted from academic to vocational programmes. Among immigrant-background youth, the counterfactual completion rate is also slightly higher for those with grades in the range 215 to 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 counterfactual 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 counterfactual world.

[Figure 5 here]

Figure 5 tells us that immigrant-background students would likely complete upper secondary education to a higher extent if they chose less academically demanding routes, but – crucially – it tells us that the same holds for those of Swedish background. The graph is however not informative about the change in the gap between immigrant- and majority-youth, 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 immigrant-background youth, we find that their overall counterfactual completion rate would be 75.5, which is 5.2 percentage points higher than their actual completion rate (70.3). For Swedish-background youth, the counterfactual completion rate would be 85.2 which is 2.9 percentage points higher than their actual completion rate (82.2). Figure 6 shows that these changes are due to a very large growth of the proportion with vocational diplomas, especially among immigrant-background youth.

[Figure 6 here]

We conclude that 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 Swedish-background youth, the ethnic completion gap would only be reduced from 11.9 to 9.7 in

the counterfactual state. This is not a negligible reduction, but it must be considered unimpressive in view of the substantial restrictions of choice that the counterfactual 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.

Obviously, this counterfactual analysis is a thought experiment, and the realism of the estimates hinges on the relatively strong assumption that group- and programme-specific completion rates are independent of the choice structure. If, for example, students of immigrant origin with mediocre grades, who would have a high probability to fail their preferred academic programme, instead were forced into a vocational programme with demands that match 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 upper secondary school systems have seen this lead to a surge in the demand for such qualifications, and foremost among the ambitious have often been children of immigrant origin. While some have viewed this as a positive thing, promising structural integration and a reduction in ethnic gaps in opportunities and living conditions (e.g., Jackson et al., 2012), others have pointed to the risks involved when aspirations trump ability. Students of immigrant background, in this more pessimistic scenario, would do better by adjusting their aspirations to their proven school performances instead of getting caught in an ‘optimism trap’ (Tjaden and Hunkler, 2017; cf. J. F. Birkelund, 2020). Such an adjustment could, it is assumed, help this group to complete an upper secondary degree, non-completion being a reality for 31% of them in the cohort we analyse.

In this paper we have examined to what extent immigrants' ambitious educational choices lead them into too demanding upper secondary programmes and subsequent failure to complete their studies, and perhaps to ethnic disadvantages in educational attainment. We profited from longitudinal school register data (GPA, programme choice, completion) on a full Swedish cohort leaving compulsory school in 2012 ($n \approx 90,000$), with matched administrative information on immigrant origin, to analyse upper secondary school careers. Our descriptive analysis gives some initial support to the pessimistic narrative. Immigrant-background youth, who on average chose 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 counterfactual analyses. In the first, we asked how much of the completion gap is due to different choices of programmes at given GPA, and our results suggest that the 'optimistic choices' of immigrant-background youth can only explain 3.4 ppt out of 11.9, or 28% of the gap in completion. 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 be reduced by these 3.4 ppt.

Instead of persuasion, in the second analysis we ask what would happen if the optimistic choices would be 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% graduate). Against the backdrop of the ensuing massive 'forced' 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 with no more than 2.2 ppt. In sum, moving a large number of students from academic to vocational schooling, as advocated by Tjaden and Hunkler (2017), 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 over-estimated. Because our counterfactual model follows a straightforward matching-on-observables logic, the results are vulnerable to unobservables: In particular, 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 more likely to be a positive force, 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 counterfactual exercises 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 councillors 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 following 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.

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Tables and Figures

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).

1. Factual completion rates	ppt	%
(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 (p _{1S} set to p _{1I})		81.4
(Q _{S2}) ...same programme choice as immigrant-background (p _{2S} set to p _{2I})		79.0
(Q _{S3}) ...same completion at given programme & GPA as immigrant-background (p _{3S} set to p _{3I})		74.9
3. Immigrant background, counterfactual completion rate: Assuming...		
(Q _{I1}) ...same GPA distribution as Swedish-background (p _{1I} set to p _{1S})		71.5
(Q _{I2}) ...same programme choices as Swedish-background (p _{2I} set to p _{2S})		73.8
(Q _{I3}) ...same completion at given programme & GPA as Swedish background (p _{3I} set to p _{3S})		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	-	-

Figure 1: Enrolment, graduation, and completion from upper secondary school programmes by Swedish or immigrant background. Cohort who left compulsory school 2012. Enrolment in 2012, graduation and completion up to 2016. Graduation refers to the entire cohort, completion refers to the part of the cohort who enrolled in upper secondary school.

Note: Students with missing information on GPA or immigrant background (N=1,014) are excluded.

Figure 2: Enrolment in different upper secondary programmes, by GPA and Swedish or immigrant background. Vertical lines show GPA mean (215) and ± 1 std deviation (60).

Note: Sw = Swedish background, Imm = immigrant background, NA = Natural science programme, SA = Social science programme, Acad else = Other academic programme, Voc = Vocational programme.

Figure 3: Grade 9 GPA distribution among those enrolling in different upper secondary programmes, by Swedish or immigrant background. Left panel: Academic vs. vocational. Right panel: Different academic programmes.

Note: Sw = Swedish, Imm = immigrant, NA = Natural science programme, SA = Social science programme, Acad else = Other academic programme.

Figure 4: Completion of upper secondary education by programme type, GPA and Swedish or immigrant background. Vertical lines show GPA mean (215) and ± 1 std deviation (60).

Note: Sw = Swedish background, Imm = immigrant background, NA = Natural science programme, SA = Social science programme, Acad else = Other academic programme, Voc = Vocational programme.

Figure 5: True and counterfactual % with completed upper secondary education in the 2012 grade 9 cohort, four years after finishing grade 9. By Swedish or immigrant background.

Note: Sw = Swedish background, Imm = immigrant background.

Figure 6: True and counterfactual % with upper secondary degrees from different programme types in the 2012 grade 9 cohort, four years after finishing grade 9. By Swedish or immigrant background.

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 started upper secondary education.

Appendix

Table A1: Country or region of origin of in our cohort. N and %.	32
Table A2: Upper secondary programmes. N and % of those who left compulsory school in spring 2012 who started these programmes in autumn 2012.....	33
Table A3: Components for calculating the contributions to the completion gap between Swedish-background and immigrant-background youth: Distribution across GPA, across programs at a given GPA, and completion rates per combination of program and GPA.....	34

Table A1: Country or region of origin of in our cohort. N and %.

Country of origin	N	%
Sweden	80,912	86.54
Finland	536	0.57
Else Scandinavia	243	0.26
Northern Europe	373	0.4
Ex Yugoslavia	2,373	2.54
Else Ex Eastern Europe	770	0.82
Southern Europe	101	0.11
Else Europe	23	0.02
Canada, USA, Australia, New Zealand	40	0.04
Chile	295	0.32
Southern and Middle America	297	0.32
Africa	1,497	1.6
Iran	659	0.7
Iraq	1,654	1.77
Turkey	858	0.92
Else Middle East	1,537	1.64
East Asia including Japan, China	171	0.18
Else Asia	1,156	1.24
Total	93,495	100

Table A2: Upper secondary programmes. N and % of those who left compulsory school in spring 2012 who started these programmes in autumn 2012.

Program	N	%
Social science	18,045	21.0
Natural science	13,016	15.1
Other academic		
Business economics	9,517	11.1
Technology	8,217	9.5
Arts	7,948	9.2
Humanities	922	1.1
International Baccalaureate	716	0.8
Vocational		
Electricity and energy	4,208	4.9
Building and construction	4,009	4.7
Vehicle & transport	2,757	3.2
Natural resource use	2,393	2.8
Handicraft	2,300	2.7
Child & recreation	2,159	2.5
Health and social care	2,097	2.4
Trade and administration	1,966	2.3
Restaurant management & food	1,900	2.2
Industrial technology	1,487	1.7
HVAC and property maintenance	1,110	1.3
Hotel & tourism	1,012	1.2
Other	272	0.3
Total	86,051	100

Note: 8 percent (n=7,444) in our analytical sample did not enrol in an upper secondary program

Table A3: Components for calculating the contributions to the completion gap between Swedish-background and immigrant-background youth: Distribution across GPA, across programs at a given GPA, and completion rates per combination of program and GPA.

		Swedish-background youth					Immigrant-background youth						
		% of Swedish background with a given GPA who go to different programme types					% of immigrant background with a given GPA who go to different programme types						
GPA	% in GPA	NA	SA	Acad else	Voc		Voc	Acad else	SA	NA		% in GPA	GPA
10-160	6%	0%	5%	10%	85%		71%	14%	14%	2%		7%	10-160
165-170	7%	1%	8%	16%	75%		54%	22%	21%	3%		6%	165-170
175-180	8%	1%	11%	20%	67%		41%	26%	27%	6%		8%	175-180
185-190	7%	2%	16%	25%	57%		29%	30%	32%	9%		9%	185-190
195-200	7%	2%	21%	31%	46%		24%	30%	33%	13%		8%	195-200
205-210	7%	4%	23%	35%	39%		17%	32%	34%	17%		8%	205-210
215-220	7%	5%	25%	39%	31%		13%	35%	35%	18%		7%	215-220
225-230	7%	8%	26%	40%	26%		10%	35%	31%	24%		7%	225-230
235-240	7%	10%	28%	43%	20%		6%	37%	30%	27%		7%	235-240
245-250	7%	13%	28%	42%	16%		7%	36%	26%	31%		6%	245-250
255-260	6%	16%	29%	42%	13%		2%	31%	27%	39%		6%	255-260
265-270	5%	21%	27%	42%	9%		5%	34%	19%	42%		5%	265-270
275-280	5%	25%	28%	40%	7%		3%	27%	20%	51%		4%	275-280
285-290	4%	31%	25%	38%	6%		3%	25%	21%	51%		4%	285-290
295-300	4%	37%	25%	34%	4%		1%	22%	14%	63%		3%	295-300
305-310	3%	46%	22%	29%	3%		0%	22%	14%	64%		3%	305-310
315-320	4%	60%	16%	22%	2%		1%	16%	9%	75%		3%	315-320
	100%	13%	21%	32%	34%		20%	29%	26%	25%		100,0%	
		% of Swedish background with a given GPA enrolled in a given programme type who graduate					% of immigrant background with a given GPA enrolled in a given programme type who graduate						
GPA category		NA	SA	Acad else	Voc		Voc	Acad else	SA	NA		GPA category	
10-160		24%	27%	27%	46%		36%	26%	28%	18%		10-160	
165-170		21%	43%	42%	69%		59%	33%	39%	11%		165-170	
175-180		33%	54%	53%	78%		66%	44%	48%	33%		175-180	
185-190		41%	64%	62%	83%		76%	54%	47%	27%		185-190	
195-200		49%	70%	70%	89%		76%	51%	67%	43%		195-200	
205-210		69%	77%	76%	90%		82%	64%	72%	49%		205-210	
215-220		66%	82%	80%	93%		83%	70%	76%	62%		215-220	
225-230		78%	85%	84%	95%		88%	79%	77%	70%		225-230	
235-240		81%	90%	88%	95%		90%	79%	82%	72%		235-240	
245-250		83%	93%	91%	96%		98%	84%	85%	67%		245-250	
255-260		89%	94%	94%	97%		100%	84%	90%	82%		255-260	
265-270		93%	95%	93%	98%		88%	86%	93%	88%		265-270	
275-280		93%	95%	95%	97%		92%	89%	94%	88%		275-280	
285-290		95%	97%	95%	99%		100%	92%	91%	89%		285-290	
295-300		96%	97%	96%	98%		100%	93%	100%	91%		295-300	
305-310		97%	98%	96%	99%		100%	90%	97%	97%		305-310	
315-320		98%	97%	96%	98%		100%	93%	100%	97%		315-320	
		90%	84%	82%	79%		65%	69%	70%	77%			
		% of Swedish background who completed a program type of all who started upper secondary					% of immigrant background who completed a program type of all who started upper secondary						
		11.7%	17.6%	26.3%	26.6%		12.9%	19.9%	18.2%	19.4%			
		% total completion of all Swedish-background who started upper secondary					% total completion of all Immigrant-background who started upper secondary						
		82.2%					70.3%						