Second Generation Success: What Do Positively Selected, Low-Status Immigrants Transmit to their Children?

ABSTRACT

Children of immigrants are a group of principal concern for educational policy in countries across the industrialized world. As their parents are often socio-economically disadvantaged, educational success is seen as an important indicator of whether these children will be able to overcome marginalisation and integrate into the social mainstream. Research provides a mixed picture, with many groups underperforming yet opting for academic education at surprisingly high rates. Studies have also explored educational selectivity – from where in the source country’s educational distribution parents are drawn – as a proxy for unobserved skills and traits that may aid assimilation. I unify these research strands drawing on rich microdata from Sweden together with aggregate educational statistics from more than 100 countries of origin. Educational selectivity, while associated with children’s career aspirations, attitudes to education, and application to academic tracks, does little to predict school grades or performance on standardized tests over and above parents’ years of schooling. Given that many groups are, on average, less educated than the native majority but more educated than the population at origin (positively selected), these results provide a compelling explanation for the pattern of low performance but high aspirations documented for immigrant minorities across a large number of destination countries.

3.1 INTRODUCTION

During the past half century, Western countries have seen dramatic changes in the scope and composition of immigration. Accompanying this is a heightened concern with the integration of transnational migrants and their children into mainstream society. Successful integration would benefit not only the individuals concerned, reducing marginalization and deprivation, but also the economy at large, and is therefore a

Submitted manuscript.
key political objective (Alba, Sloan, and Sperling 2011). On the flip side, there is worry that a failure to integrate newly arrived minorities might create lasting discord or, at worst, entrenched conflict (Heath and Demireva 2014).

Following these developments, issues of migration and integration have moved to a center stage not just of policy and public debate, but also of social science. The last decade has seen considerable advances in comparative efforts to gauge the adaptation of migrants and their children in education systems and labor markets in countries of destination (Heath and Cheung 2007, Alba and Waters 2011, Alba and Holdaway 2013, Heath and Brinbaum 2014). These efforts have yielded important insights and recently sparked a first generation of dedicated projects aimed at collecting fully harmonized data across immigration countries (Crul, Schneider, and Lelie 2012, Kalter et al. 2013, Diehl et al. 2016).

For many observers, the decisive test of integration is how children of immigrants, not their parents, fare in the receiving country (Portes and Zhou 1993, Zhou 1997). Whereas several factors may hold back immigrants of adult age – such as limited knowledge of language and institutions, poor transferability of skills, or lack of social networks – these should, it is hoped, apply with less force to their children who are often born and experienced most of their upbringing in the country of destination. Given the importance of schooling for socioeconomic outcomes, early indicators of educational success are a critical source of information about future ethnic stratification, and have given rise to a large literature (Heath, Rothon, and Kilpi 2008).

Among the most important predictors of children’s outcomes is the socioeconomic status of their parents (Coleman et al. 1966). Despite this, survey research has been remarkably poor at gauging the educationally relevant resources that immigrant parents bring. We rarely know what jobs these parents held in the country of origin, for example – which, for some outcomes at least, should arguably be a better predictor than current status. Recent studies have tried to overcome this problem by situating parents’ educational attainment in the context of the source country’s aggregate distribution as a proxy for pre-migration status (Felicianio 2005b, Ichou 2014). The conclusion that emerges is that parents’ relative place in the source country distribution, or educational selectivity, does seem to im-
pact positively on children’s education, but the coarse nature of previous analyses makes it hard to establish any underlying mechanisms.

Focusing on the case of Sweden – a country that has experienced extensive and diverse immigration for several decades – I address two outstanding questions: is educational selectivity more predictive of some outcomes than others? And, do conclusions about second generation (dis)advantage in education change once selectivity is taken into account? To foreshadow somewhat, I find that when parents’ absolute education is controlled for, selectivity exerts none or even a negative association with children’s cognitive and language skills, while positive associations are found for attitudes to education, occupational aspirations, and application to academic tracks. As immigrants are often positively selected – higher educated than stayers – yet low educated in absolute terms, these findings provide a compelling explanation for the pattern of ‘immigrant optimism’ (Kao and Tienda 1995) or ‘weak performance but strong determination’ (Jonsson and Rudolphi 2011) found across a wide range of integration contexts.

3.2 BACKGROUND AND PREVIOUS LITERATURE

With growing immigration, the demographic of young people in Europe is shifting toward that of the more traditional immigrant countries of North America. This section summarizes what we know about the educational careers of newcomer ethnic minorities in Europe, and briefly describes the Swedish context.

*High ambitions counterweigh low achievement*

Research on the school integration of immigrant youth across Europe paints a remarkably coherent picture, despite local variations in policy or the timing and composition of migration flows. Many groups of non-European origin find themselves at an achievement disadvantage, and Sweden is no exception (Schnepf 2007). But to the extent that educational systems allow individual choice to influence educational careers, this disadvantage is reduced or even reversed by the high aspirations of these same groups. In Sweden, for example, following nine years of compulsory school, a disproportionally large share of minority children opt for academic secondary tracks, the established route to university (Jonsson and
Rudolphi 2011). The same pattern reappears at entry to university (Jackson, Jonsson, and Rudolphi 2012, Urban 2012) and is echoed by similar findings in England, France, and several other countries (Heath and Brinbaum 2014).

This pattern has puzzled researchers, as it stands in contrast to social class differentials in education that are typically reinforced by both performance and choice (Jackson 2013). A range of competing explanations have been offered (Salikutluk 2016), including: the strength of social networks in ethnic communities (Zhou and Bankston 1994), underestimation of the obstacles to academic success (Kao and Tienda 1998), desire to avoid ethnic discrimination which is supposedly greater in blue-collar work (Heath and Brinbaum 2007), or some latent ‘ambition’ or ‘drive’ determining both parents’ migration decision and their children’s aspirations (Kao and Tienda 1995). A more mundane explanation, to be explored here, is failure to adequately control for the socioeconomic background of immigrant parents – in particular, their educational selectivity.

Evidence on educational selectivity

In a series of seminal publications based on US data, Feliciano (2005b, 2006) has elaborated the view that understanding where migrants ranked in the social stratification system of their source country is crucial when assessing the progress made in educating their children. As immigrants often shoulder a burden of downward social mobility, their current occupation is unlikely to fully reflect this status (Chiswick, Lee, and Miller 2005, Rooth and Ekberg 2006, Redstone Akresh 2008). In contrast, attained education does not usually change as a consequence of migration, but its interpretation might (Feliciano 2005b, Ichou 2014). Because countries differ in aggregate education, a given education can signal a different standing in sending and receiving countries. Conventional survey measures might therefore provide a biased picture of the social class origins of these parents, and the traits and resources that they are able to transmit to their children.

Previous analyses suggest that immigrants are more often positively selected on education than not (Feliciano 2005a, Lessard-Phillips, Fleischmann, and van Elsas 2014), and that the degree of selectivity impacts favorably on offspring’s education (Feliciano 2005b, Ichou 2014). Feliciano’s seminal study (2005a) relied on aggregate educational statistics from 32
source countries to calculate a net difference index (NDI, Lieberson 1976), reflecting the probability that a migrant from a given country will be higher educated than someone who did not migrate. Subsequent studies demonstrated positive associations of this measure with educational expectations and attained higher education in the second generation (Feliciano 2005b, 2006). The method has recently been extended to European data with similar results (van de Werfhorst, van Elsas, and Heath 2014).

A severe limitation of the NDI is that it allows comparison between, but not within, immigrant groups. Luthra and Soehl (2015) have recently shown that such aggregate strategies risk biasing conclusions about individual-level processes substantially; ideally, we would like to know how each individual migrant compares to the staying population. To date, only one previous study has achieved this. Ichou (2014) showed in the French context that for several nationalities, migrants are drawn from the two tails of the education distribution, strengthening the case for considering selectivity individually. He also confirmed an association of individual selectivity with offspring’s attained level of education, but regrettably his data did not include any intermediate outcomes so the analytical purchase is again limited.

Selected, on education and what else?

The above studies point to an impact of educational selectivity, but the mechanisms remain unclear. Feliciano hypothesizes that “immigrants who were of high status in the home country may facilitate the achievement of the next generation in order to attain a similar class position” (2005b: 844) and that “identities of highly educationally select immigrant groups may be based on a sense that they are entitled to mainstream success” (2006: 295–96). Similarly, Ichou (2014) mentions “subjective social status” as a potential transmission channel. According to this view, a desire to make up for status that parents have presumably lost in migration explains selectivity’s association with second generation outcomes.

Extant evidence is consistent with other hypotheses, however. Economic literature postulates that immigrants self-select on skill, and literature on earnings often portrays immigrants as highly able individuals who surmount initial obstacles to eventually capitalize on their ability (Chiswick 1978, Duleep and Dowhan 2002). Thus, Ichou (2014: 751) reasons that:
immigrants with high levels of relative education [also] are likely to possess academically useful resources … comprising both cognitive skills (such as familiarity with written language and abstract reasoning) and non-cognitive skills (such as motivation and taste for academic studies).

In a cross-country study of returns to schooling, Hanushek and Zhang (2009) motivate their use of a closely related measure in a similar way. Arguing that “an individual of cohort $c$ who completes school level $s$ on average has higher ability than any individual of the same cohort who completes a school level less than $s$”, they regard selectivity as “effectively a broad index of ability” (p. 118). Note that even if highly selected parents transmit academic skills to their children, this might not translate immediately into educational performance; school grades could be downward biased due to language and adaptation difficulties, poor instruction, teacher bias, or the like. In this scenario, seemingly ambitious choices might arise as a compensation for the biased signal of ability that school grades provide. An important element in the analyses to follow is the inclusion of a non-verbal cognitive ability test carefully designed to minimize cultural and linguistic bias to allow an assessment of this explanation.

Finally, it is common to assume that immigrants are positively selected on traits such energy, drive, ambition, or perseverance (Jasso and Rosenzweig 2006, Portes and Rumbaut 2006). If these traits predict educational attainment across both generations, they could explain the apparent impact of selectivity. This can be seen as a distinct hypothesis or subsidiary to that of skill selection, depending on one’s definition of skill (cf. Chiswick 1999). The relation between education and selection on such traits is ambiguous, however; if we grant that both independently affect the probability of migration, education and ‘drive’ might well be negatively correlated among those who successfully manage to migrate (see Morgan and Winship 2007: 65–67, for an analogous example). In other words, even if unobserved selection aids the assimilation of immigrants more generally, this may or may not be captured by educational selectivity.\footnote{1 I owe this point to Carina Mood (personal communication).}
The Swedish context

I expand on a rich tradition of using Swedish microdata to shed light on general processes of educational transmission and stratification (Breen and Jonsson 2007, Hällsten 2011). Sweden, while being a relatively new immigrant country, boasts a considerable minority population. Of recent school age youth, about 25 percent have either immigrated themselves or have at least one parent who did so. These figures are in the upper range of industrialized countries and closer to the US than to European averages (OECD 2016). While labor migration was a dominant source until the 1970s, more recent arrivals tend to be refugees and their kin. Sweden ranks among the top five receivers of asylum claims in the OECD and is unrivalled in per capita terms (UNHCR 2016). In 2016, temporary restrictions on asylum rights were passed to curb what was then perceived as an untenable inflow.

The absence of specific institutional ties through, say, geographical affinity (as in the US–Mexico case), a colonial past (France and North Africa), or systematic labor migration (Germany and Turkey) means that immigration to Sweden is not only extensive, but also exceedingly diverse. In this sense, the country represents a ‘microcosm’ of global migration patterns with rich source country variation. At the same time, Sweden is clearly an outlier in terms of public goods provision. One way to interpret the results is therefore as a ‘best case’ scenario of what can be achieved with generous childcare services, fully subsidized education, and a system with few academic dead ends. This is not to paint an idealized picture; housing and school segregation in urban areas is severe, and accentuated by liberal school choice policies (Böhlmark, Holmlund, and Lindahl 2016, Östh, Andersson, and Malmberg 2013). Immigrants to Sweden also face a particular challenge as few of them arrive with prior knowledge of the language.

Following previous literature I focus on outcomes at age 14–15 (e.g., Erikson and Rudolphi 2010). This marks the end of compulsory schooling and the first major branching point into subsequent academic education – as well as the first time that students are awarded school grades in all subjects. Over 90 percent of students not only complete this stage but proceed to some form of secondary education. Of particular interest is the final grade sum in school year nine, functioning as the main selection instrument into secondary education; and the choice of whether to apply for a program
conferring university eligibility. These outcomes, available in population registers and used in previous studies, are complemented with curriculum-independent test scores and survey data available for a subset of the sample.

3.3 DATA AND ANALYTICAL STRATEGY

To interpret previous findings we need a better grasp of how parents’ relative education (selectivity) relates to conventional, absolute measures, and what implications each has for outcomes in the second generation. In a first step, I compile Swedish population register data on immigrant parents whose children finished compulsory school in 2008–2012. These cohorts range from $N = 115,655$ to $N = 155,290$, yielding a total sample of $N = 686,621$, of which $N = 113,775$ children of immigrants (here defined as children with two parents born abroad, regardless of own birthplace). Linkage across registers and identification of family ties are made possible by a unique identification number that each Swedish resident uses in dealings with public services. Restricting analysis to those who immigrated beyond age 25, to make it plausible that the highest education is completed in country of origin, yields an analytical sample of $N = 77,767$.

First I describe these parents’ educational attainment in absolute (years of schooling) and relative (selectivity) terms, across and within immigrant groups. Thereafter I focus on a subsample of the 2012 cohort who took part in the recent cils4eu survey, to examine how these aspects of parents’ education predict various achievements and behaviours in their children. Following the studies of Feliciano (2005b, 2006) and Ichou (2014), this part of the analysis seeks to explain differences within the population of immigrant children, rather than vis-à-vis the majority (cf. Harris, Jamison, and Trujillo 2008, Levels, Dronkers, and Kraaykamp 2008). The survey sample amounts to $N = 5,025$ children nested in 228 school classes (126 schools), but restricting attention to children with two immigrant parents narrows the number down to $N = 1,856$. I compute partial correlations of each education measure with a range of child outcomes net of the other, as described in greater detail below.

By following Feliciano’s and Ichou’s earlier studies, I extend on their findings. The approach comes closest to that of Ichou (2014) but including

---

2 The register also contains a variable for graduation year but this information is missing for the majority of adult immigrants.
a larger number of sending countries and, in particular, child outcomes. A separate question is what can be learned about immigrant–non-immigrant disparities by using selectivity as a covariate, and this is addressed separately. Because countries differ widely in their educational distributions, selectivity was recently held by Luthra and Soehl (2015: 564) to provide a potentially “more universal control [than years of schooling] when making adjusted comparisons of second-generation outcomes”. The perspective taken in this paper is that the question is empirical and depends, in part, on which measure(s) appear to predict a given outcome better within each population group. Returning to the full register-based sample and outcomes therein, I show how different strategies can yield qualitatively different conclusions and, in the light of the preceding analysis, common ethnic disparities may be generated by positive selectivity combined with low absolute levels of schooling.

It is beyond the scope of this study to consider community effects or endogenous social processes such as those outlined by Lee and Zhou (2015). As they stress, the positive stereotypes that have come to surround groups of Asian origin in the US may act as a kind of symbolic capital, leading teachers to hold high expectations that eventually become self-fulfilling. Another cornerstone in sociological research on minority achievement consists of social networks embedded in ethnic communities (Zhou and Bankston 1994, Zhou and Kim 2006). A speculation is that these various group-level processes might be less pronounced in the context studied here, where ethnic enclaves are not a prominent feature of residential segregation (Andersson 2007) and most groups lack a significant presence extending farther than two generations back in time.

**Parental education: absolute and relative**

The data on parental education stem from the Swedish Education Register (ureg). This population register draws on multiple sources, but for immigrants of adult age the most important ones are interviews from the last Census in 1990, and special immigrant surveys conducted by Statistics Sweden first in 1995 and then annually since 1999 (Statistics Sweden 2011). Additional data are gathered from public services such as the Unemployment Agency (Arbetsförmedlingen), Introductory Language Training (sfi), Municipal Adult Education (Komvux), or through validation of
foreign credentials by the Higher Education Authority (HEA). The multiple sources entail that information is missing for less than 5 percent of the current sample. While overreporting is usually a problem in educational data, this concern is minimized by the fact that responses are elicited at a high level of detail and classified by trained staff, rather than by respondents directly.

The register provides a detailed version of the international ISCED-97 classification consisting of 50 levels (sun2000), from which I construct two separate measures. First, I assign an approximate years of schooling to each level, ranging from “Compulsory education shorter than 9 years” (here assigned 5 years) to “Doctoral degree” (19 years). To assess educational selectivity I collapse the original levels into 7, corresponding to the detail of Barro and Lee’s (2013) dataset on worldwide educational attainment. The Barro–Lee data gather information on aggregate educational attainment for populations in 146 countries within 5-year intervals from 1950 to 2010, separately by gender and age. The information stems from UN Demographic Yearbooks, UNESCO Statistical Yearbooks, national statistical publications, with interpolation for missing years, and is arguably the most comprehensive source of comparative data on educational attainment available.

I then calculate the average cumulative proportion or ridit (Bross 1958, Agresti 2010) reflecting each parent’s percentile in the source country education distribution. For this measure, two components are needed: a person’s educational category \( j \in 1, 2, \ldots, J \), and the proportion of individuals within a relevant reference group belonging to each of the \( J \) categories. The reference group is defined as persons of the same gender born within a five year window in the sending country, and a percentile assigned as:

\[
\pi_{ij} = \left( \sum_{j^* < j} p_{j^*} + \frac{1}{2} p_j \right) \times 100, \tag{3.1}
\]

where \( p_j \) indicates the proportion of the reference group with attainment level \( j \). In other words, I take those who are lower educated plus half those with an equivalent education. The resulting measure ranges from 0 to 100 save for truncation due to the coarseness of observed categories. In later analyses, I construct corresponding variables for native-born parents and here the same procedure is used, that is, relative education is based on the estimates reported by Barro and Lee (2013) for Sweden. For both years
of schooling and educational selectivity, the variable used in analyses is an average of both parents’ values (alternatively, the only non-missing).

*Ethnic origin and other covariates*

Information about parents’ country of birth and year of immigration is available from the Register of the Total Population (rtb). Some countries with small numbers have been collapsed to preserve anonymity, and in this case I use a population-weighted average to estimate selectivity.\(^3\) Analyses using the survey subsample rely on more detailed self-reports and are not subject to this problem. I also define a grouped variable following the protocol of Jonsson and Rudolphi (2011), used both as a control variable and to estimate ethnic disparities in subsequent analyses. The categories are: Nordic countries, Western countries, Southern Europe, Eastern Europe, Middle East, Iran, Africa, Asia, and Latin America. If parents have different birth countries, region is assigned based on that closest to Sweden if such a judgment is possible, else mother’s country of birth. Children of intermarriage (i.e., one parent Swedish born) are excluded. Based on the year of immigration and prioritizing the parent with longest presence in Sweden I also construct a measure of *duration since migration*, used as a control variable.

Because independent variation between the two education measures stems mainly from between-country differences in educational makeup, a reasonable worry is that they might pick up unobserved source country characteristics that are independently associated with children’s outcomes. To alleviate this concern, two strategies are employed. As a broad control for the level of economic and educational development, I use the Human Development Index (HDI) from the United Nations’ 2012 Human Development Report. This composite measure is highly correlated with macro variables pertaining to the overall level and quality of education including the adult literacy rate \((r = 0.85)\), and mean \((r = 0.87)\) or expected \((r = 0.90)\) years of schooling. Analyses using these related measures, as well as economic ones such as GDP per capita \((r = 0.75)\), yielded similar results. In addi-

---

\(^3\) A small number of countries are also lacking from the Barro-Lee dataset (notably, Ethiopia, Eritrea, Lebanon, Palestine, Somalia), in these cases a population-weighted average of the surrounding region is used. Excluding these countries does not alter the substantive conclusions.
tion, I enter the grouped origin variable as a set of fixed effects, eliminating the influence of any unobserved characteristics shared by these groups.

**Second-generation outcomes**

To be able to assess a wide range of child outcomes I turn to the CILS4EU: Children of Immigrants Longitudinal Study in Four European Countries (Kalter et al. 2013). The Swedish part of this survey consists of a stratified random sample of the most recent cohort in my data. Schools were drawn with a probability proportional to size, downweighting those with less than 10 percent minority pupils. About two classes in each school were selected and surveyed twice prior to completion of compulsory school (in 2010–2011 and 2011–2012, respectively). Restricted-use files contain linked register data on parental education and educational outcomes allowing for the same register-based analyses as for the full sample. In addition, classroom interviews gathered data on cognitive skill, language proficiency, self-reported behaviour, attitudes, and aspirations not available elsewhere.

The instrument for *cognitive skill*, similar in design to Raven’s Progressive Matrices, was administered at the wave one survey in 2010–2011. The test focuses on visual puzzles, making it largely independent of verbal ability, and was designed specifically to avoid cultural bias (Weiß 2006). It comprises 27 items to be completed in 7 minutes; the score equals the total number of correct answers (mean 15.8, s.d. 5.23). A similar multiple-choice test of *Swedish language proficiency* comprised of 30 items was administered at the same occasion (mean 15.3, s.d. 4.97). Besides being crucial outcomes in their own right, cognitive ability and language knowledge are likely to be important determinants of school performance. In particular, the availability of curriculum-independent cognitive tests allows some leverage on the question of whether educational selectivity proxies for ability or something else.

As an indicator of non-cognitive determinants of educational achievement, I measure *school behaviour* based on the self-reported incidence (at wave one) of coming late to school, arguing with teacher(s), getting punished in school, and skipping lessons without permission. Answers were given on a 5-point scale, ranging from “every day” to “never”. I extracted the first component from a polychoric principal components analysis accounting for the ordinal nature of the response scale (Kolenikov and An-
Additionally, I experimented with alternative measures of non-cognitive skill including locus of control (cf. Groves 2005) and time preference (cf. Golsteyn, Grönqvist, and Lindahl 2014). All these measures yielded minor associations with parental education, and only the results for self-reported behaviour are reported here in the interest of space.

Educational decisions are liable to beliefs about own ability and the expected value of education (cf. Erikson and Jonsson 1996). A measure of students’ self-assessment taps their confidence that they can “do well at school”, “get good grades at school” (wave one and two), “succeed at upper secondary school, academic track”, and “succeed at university” (wave two only), while the perceived value of education draws on the following Likert-type items: “Education is very important for getting a good life later on”, “It is very important for me to get good grades” (wave one), “University education is very important for getting a good job”, “I would be willing to study at university even if it means that I have less money to live on for several years”, “Getting a full-time job is just as good as getting more education” [reverse coded], and “To get the education I want, I would be willing to move” (wave two). For both sets of items, answers are on a 5-point scale and I retain the first polychoric principal component of each.

As part of the wave two questionnaire, career aspirations were elicited using an open question: “What occupation would you like to have as an adult?”. Students were asked to provide an occupational title which was converted into the 2008 International Socio-Economic Index of Occupational Status (ISEI), an estimated latent value that maximizes the mediating role of occupations in converting education to income (Ganzeboom and Treiman 1996). Although nonresponse on this item was understandably higher than for closed-format items it is included as a check on the argument that educational selectivity essentially proxies for class origin – assuming that transmission of occupational preferences is an important conduit of class reproduction (cf. Jonsson et al. 2009). A related set of questions about educational aspirations was omitted from analysis because, the vast majority aspiring for university, distributions were too skewed to be informative.

Lastly, I turn to final measures of educational success and here I follow previous studies of the Swedish context in definition and measurement. The student’s final grade sum is the total score among his or her sixteen best subjects of about twenty at the end of compulsory schooling (mean 199.9, s.d. 65.1). These grades, which are teacher-assigned, are the main selec-
tion instrument in applying for post-compulsory schooling. In grading, teachers are encouraged to make a holistic assessment based on written examinations as well as their observation of the student during the preceding school year. After compulsory school, the vast majority of students proceed to secondary education (gymnasium) and here a watershed exists between the four tracks that provide general access to most university programs and those that offer narrower study options or prepare mainly for the labour market. I construct a binary indicator for application to the academic track (mean 0.40).

3.4 Results

Figure 3.1 displays the correspondence between the two education measures at the individual and group level. The top panel plots individual values on the two measures against each other. There is a strong correlation at the individual level ($r = 0.76$). The bottom panel displays the same information at the group average level, and here the correspondence becomes weaker. The size of the circles reflects the groups’ relative representation in the sample. Notably, nearly all groups are on average more educated than the population at origin (they lie above the 50th percentile, horizontal line) but less educated than the corresponding group of native parents (average about 12 years, vertical line).

Selectivity and second-generation outcomes

Methodological literature has failed to produce consensus on how to assess predictors’ relative importance (Grömping 2015). In the absence of a natural metric, I compute partial correlations of absolute and relative education with the outcomes described earlier, and their associated $p$-values. The partial correlation is the remaining Pearson correlation ($r$) after covariance with other variables has been partialled out. Its square reflects the independent contribution made by each variable toward explaining variance in the outcome, or equivalently, the loss of $R^2$ that would result from excluding it. A significant partial correlation entails that omission would result in a significantly worse model fit. Partial correlations are simple to estimate and

---

4 Natural Sciences (NA), Social Sciences (SA), Technology (TE), Business Economics (EK), and the International Baccalaureate (IB).
Figure 3.1. Top panel: scatterplot of immigrant parents' education as percentile position in country of origin (vertical axis) and years of schooling (horizontal axis), averaged over both parents. Bivariate correlation $r = 0.76$. Bottom panel: group averages of immigrant parents' educational selectivity and years of schooling; circles represent the relative size of each group. Top panel $N = 7,776$ (10 percent random sample); bottom panel $N = 77,767$. 
interpret, but results have been tested robust to a number of other measures such as standardized $\beta$-coefficients, $t$-values, or the variance decomposition advocated by Thomas, Hughes, and Zumbo (1998).

The results, shown in Table 3.1, are easily summarized and not appreciably altered by the introduction of statistical controls. Contrary to speculations that educational selectivity might proxy for cognitive skill, there is no positive association between parents’ relative education and the child’s cognitive test score. The same pattern holds for language proficiency. (It is possible that this measure to some extent taps into a general cognitive dimension, too, given that so few immigrants arrive with prior knowledge of the language.) For school behaviour there is no clear association with either education measure. This is in line with previous studies that report a weak correlation of non-cognitive skills with parental characteristics (e.g., Mood, Jonsson, and Bihagen 2012), but measurement error is also a likely explanation as the measure draws on few items with skewed distributions. For grades, results are reminiscent of those for test scores, with the difference that the point estimate for relative education is positive, albeit statistically insignificant.

Thus far, selectivity appears to add little in terms of explanatory power over and above parents’ absolute years of schooling. The picture changes dramatically when we turn from ability measures to examine outcomes more closely related to attitudes and educational decision-making. Estimates for academic self-assessment and perceived value of education, while weak, are clearly in favour of selectivity. The pattern becomes more evident for career aspirations and application to the academic track. The findings for occupational aspirations in particular are notable as they fit well with the social reproduction hypothesis of Feliciano (2003b, 2006) and Ichou (2014). More direct evidence on parents’ occupational status or income rank before migration would be useful to shed further light on this issue.

I also performed a number of alternative specifications and robustness checks that can be briefly summarized (results not shown). To further preclude the possibility of language bias in the cognitive test, I reestimated associations including language proficiency as a control, with no major changes. I also estimated a regression for grades controlling for test scores (cognitive and language tests). Save for testing unreliability, the residualized grade might be seen as a catch-all measure of traits that are rewarded
Table 3.1. Partial correlations of immigrant parents’ educational selectivity and years of schooling with various child outcomes reported in the Swedish cils4eu. Region of origin is categorical variable encompassing 9 groups of countries. Duration since migration is a categorical variable distinguishing 6 equispaced groups (using a continuous variable or polynomials thereof does not alter the substantive results). For further details and definitions refer to the running text.

<table>
<thead>
<tr>
<th>Model</th>
<th>Cognitive test</th>
<th>Language test</th>
<th>School behavior</th>
<th>Grade sum</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Years of schooling</td>
<td>.188 (.000)</td>
<td>.146 (.000)</td>
<td>.024 (.345)</td>
</tr>
<tr>
<td></td>
<td>Educational selectivity</td>
<td>-.082 (.002)</td>
<td>-.042 (.106)</td>
<td>.001 (.972)</td>
</tr>
<tr>
<td></td>
<td>R²</td>
<td>0.05</td>
<td>0.03</td>
<td>0.01</td>
</tr>
<tr>
<td>Model 2</td>
<td>Years of schooling</td>
<td>.106 (.000)</td>
<td>.089 (.002)</td>
<td>.016 (.580)</td>
</tr>
<tr>
<td></td>
<td>Educational selectivity</td>
<td>-.008 (786)</td>
<td>.005 (.875)</td>
<td>.003 (.918)</td>
</tr>
<tr>
<td></td>
<td>Human development (HDI)</td>
<td>.104 (.000)</td>
<td>.086 (.003)</td>
<td>-.024 (.390)</td>
</tr>
<tr>
<td></td>
<td>R²</td>
<td>0.05</td>
<td>0.04</td>
<td>0.01</td>
</tr>
<tr>
<td>Model 3</td>
<td>Years of schooling</td>
<td>.098 (.001)</td>
<td>.113 (.000)</td>
<td>.016 (.580)</td>
</tr>
<tr>
<td></td>
<td>Educational selectivity</td>
<td>.003 (.910)</td>
<td>-.018 (.545)</td>
<td>.016 (.516)</td>
</tr>
<tr>
<td></td>
<td>Human development (HDI)</td>
<td>.025 (.391)</td>
<td>.006 (.835)</td>
<td>.000 (.992)</td>
</tr>
<tr>
<td></td>
<td>Region of origin</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Duration since migration</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>R²</td>
<td>0.09</td>
<td>0.13</td>
<td>0.03</td>
</tr>
<tr>
<td>N</td>
<td>1,622</td>
<td>1,631</td>
<td>1,856</td>
<td>1,829</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Model 1</th>
<th>Self-assessment</th>
<th>Perceived value</th>
<th>Career aspiration</th>
<th>Academic track</th>
</tr>
</thead>
<tbody>
<tr>
<td>Years of schooling</td>
<td>.000 (.990)</td>
<td>-.084 (.001)</td>
<td>-.043 (.197)</td>
<td>-.039 (.128)</td>
</tr>
<tr>
<td>Educational selectivity</td>
<td>.073 (.005)</td>
<td>.100 (.000)</td>
<td>.141 (.000)</td>
<td>.166 (.000)</td>
</tr>
<tr>
<td>R²</td>
<td>0.01</td>
<td>0.01</td>
<td>0.03</td>
<td>0.05</td>
</tr>
<tr>
<td>Model 2</td>
<td>Years of schooling</td>
<td>.011 (.706)</td>
<td>-.067 (.017)</td>
<td>-.015 (.686)</td>
</tr>
<tr>
<td>Educational selectivity</td>
<td>.061 (.030)</td>
<td>.071 (.011)</td>
<td>.081 (.027)</td>
<td>.121 (.000)</td>
</tr>
<tr>
<td>Human development (HDI)</td>
<td>-.025 (.375)</td>
<td>-.047 (.097)</td>
<td>-.100 (.006)</td>
<td>-.071 (.011)</td>
</tr>
<tr>
<td>R²</td>
<td>0.01</td>
<td>0.04</td>
<td>0.08</td>
<td>0.05</td>
</tr>
<tr>
<td>Model 3</td>
<td>Years of schooling</td>
<td>.042 (.136)</td>
<td>-.046 (.102)</td>
<td>-.009 (.809)</td>
</tr>
<tr>
<td>Educational selectivity</td>
<td>.028 (.319)</td>
<td>.056 (.049)</td>
<td>.077 (.037)</td>
<td>.089 (.002)</td>
</tr>
<tr>
<td>Human development (HDI)</td>
<td>-.031 (.269)</td>
<td>-.009 (.761)</td>
<td>-.104 (.005)</td>
<td>-.049 (.082)</td>
</tr>
<tr>
<td>Region of origin</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Duration since migration</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>R²</td>
<td>0.04</td>
<td>0.04</td>
<td>0.08</td>
<td>0.08</td>
</tr>
<tr>
<td>N</td>
<td>1,856</td>
<td>1,856</td>
<td>1,071</td>
<td>1,856</td>
</tr>
</tbody>
</table>
in school over raw ability (e.g., non-cognitive skills or effort). In this specification, relative education made more of a contribution, about equal to that of years of schooling. Finally, I modeled track choice net of grades as an indicator of aspirations at given levels of performance (cf. Jackson 2013), resulting in a marginally negative association for absolute schooling but otherwise no marked changes.5

Consequences for ethnic disparities

Perhaps the most common use of parental education in studying second generation educational outcomes is as a control variable when assessing disparities compared to the ethnic majority. A typical specification in this literature (see Heath and Brinbaum 2014, and references therein) predicts some outcome $y_i$ by means of ethnic group membership $g_i$, a measure of parental schooling $s_i$ and a set of additional controls $x_i$:

$$y_i = \alpha + \beta s_i + \sum_k \gamma_k g_{ik} + \gamma' x_i + \epsilon_i \quad (3.2)$$

with individuals $i$ nested in $K$ exhaustive and mutually exclusive groups defined by ethnicity or national origin, and $\alpha$ indexing the ethnic majority as the reference group. The main interest is then in the parameters $\gamma_1, \ldots, \gamma_k$, capturing the contribution of ethnicity net of observable characteristics. According to Heath and Brinbaum (2014: 11), such estimates “tell us how members of each minority compare with their peers from the majority group with similar socioeconomic backgrounds [and] indicate the extent of the ethnic penalties or, where positive, ethnic premia experienced by each ethnic group”. Having ‘controlled for’ parental characteristics in this way, we are often led to look outside the family for factors to explain remaining differences, such as school quality, peer groups, or discrimination.6

5 This negative association becomes understandable once we realize that parents with high absolute education at given levels of selectivity are likely to be in skilled trades rather than professions, so if their children’s program choices are similar, they will not take a traditionally academic track.

6 Compare Kao and Thompson (2003: 421): “when racial and ethnic differences persist after taking parental socioeconomic background into account, sociologists often fault unmeasured differences in quality of schooling or other unmeasured differences”.
Although researchers are usually less than explicit about which characteristics measures like $s_i$ are intended to capture, these arguably include things like genetic endowment, verbal and cognitive stimulation in the home, taste for abstract intellectual activities, and so on. A pragmatic solution is to say that $s_i$ acts as a control for everything that accounts for differences in child outcomes along parental education $s_i$ within each population group. It is well known that as long as $s_i$ is only a proxy and not the target variable(s), it will only imperfectly remove differences attributable to the latter (Bohrnstedt and Carter 1971, Shear and Zumbo 2013). Nevertheless, one might use this strategy in the hope of getting closer to unbiased estimates (Wickens 1972). Even this intuition relies on the strong assumption that any variance in the proxy not accounted for by the attributes proxied for consists of pure noise, uncorrelated with other regressors and the regression outcome.

While $s_i$ in the regression above tends to be measured in terms of nominal credentials or years of schooling, Luthra and Soehl (2015) speculate that relative education might be more appropriate to adjust for, given large differences in educational stratification across countries. If this argument is correct, using absolute levels will introduce a systematic bias and violate the white noise assumption because the difference between the two will vary in direction and magnitude across countries. In this case, using the wrong operationalization might increase the omitted variable bias and/or introduce spurious group differences where none exist. Conversely, the same applies if absolute education is the causally relevant construct but relative education is used in its place. A technical appendix provides a more thorough discussion of these issues.

Figure 3.2 displays estimated differences in educational performance and academic track choice for the second generation compared to the children of two native-born parents, broadly in line with previous results for Sweden and affirming the by now familiar asymmetry between performance and choice (Heath and Brinbaum 2014, Jonsson and Rudolphi 2011). The left panel displays average grade sums ($z$-standardized), while

---

These estimates refer to the two most recent cohorts only to keep variable definitions consistent with survey data; a reform that took place in 2011 reconfigured the system of academic tracks (Statskontoret 2012). The number of observations is larger than in Figure 3.1 because native majority children are included as the reference group.
the right panel estimates the probability of academic track choice, net of achieved grades. Of main interest is how these estimates change when parental education is introduced into the model, measured either as years of schooling or educational selectivity. For the groups who are disadvantaged in performance absolute education controls tend to decrease the differences while relative controls increase them (left panel). For track choice (right panel) the reverse holds true: minority advantage in academic track enrolment increases with absolute and decreases with relative educational controls.

For some groups (Southern Europe, Middle East, Iran) opposite conclusions are actually reached depending on the strategy of analysis: keeping parents’ years of schooling constant, all of these groups outperform majority children slightly in grade sums – but when educational selectivity is held constant, they seem on the contrary to be lagging behind. Given the large sample sizes, these differences are distinguishable from chance at any conventional significance level (results not shown). These patterns are not straightforward to predict from the unadjusted ethnic differences. For example, prior to statistical adjustment the South European and Middle Eastern groups suffer raw disadvantages, while the Iranians are actually outperforming the majority. Some notable exceptions to the general pattern in track choice are apparent as well. While most groups increase their advantage under absolute educational controls, this change is slight for the groups of East European and Iranian descent, and reversed for children of Western origin.

On balance, the findings seem to suggest that educational selectivity, or whatever parental characteristics it proxies for, goes some way toward explaining the high aspirations of immigrant youth. At the same time, Figure 3.2 shows that most of the minority ‘advantage’ in application propensities persists even when educational selectivity is taken into account. It would be tempting to attribute the remaining differences to other unobserved factors, but this impulse should be resisted given that the ridit score is at best only a weak proxy for concepts that are arguably more sociologically meaningful. If we take it to reflect a continuous place in an underlying education distribution, for example, its detail is inevitably constrained by the number of measured categories. A similar argument applies if it is taken to reflect social class or status before migration, in which case occupational stand-
Figure 3.2. Estimated group differences in educational outcomes compared to the native majority (two parents born in Sweden). Second generation immigrants only. Left panel: final grade sum (z-standardized), right panel: probability of academic track choice, net of achieved grades (linear probability model). Models with varying controls for parental education: None, Years of schooling, Educational selectivity. 2011–2012 cohorts, N = 334,892.
ing is usually thought a more encompassing index (cf. Breen and Jonsson 2005).

3.5 CONCLUSION

In this paper I have explored two different aspects of immigrant parents’ education to disentangle mechanisms behind disparities in the educational attainment of their children. Apart from parents’ absolute years of schooling, I constructed a measure of their relative position in the education distribution at origin, similarly to the recent study by Ichou (2014). Unlike earlier studies, I was able to assess a broad set of educational outcomes in the second generation, including curriculum-independent cognitive and language test scores and survey indicators of non-cognitive skills and aspirations, as well as more conventional measures of academic success such as school grades and track choice in the transition to academic secondary education.

This study was thereby the first to provide direct evidence about the specific pathways whereby migrant parents’ educational selectivity impacts on intergenerational assimilation. I find that ability transmission appears to play a minor role, if any, in these patterns. Instead the variables that stand out as most pertinent are orientations toward future attainment, and aspirations for socially desirable positions. The findings are consistent with speculation in previous studies that educationally selective migration largely results from selection on socioeconomic resources and that a status reproduction motive is the mechanism through which it influences second-generation assimilation.

Of course, this should not be taken to suggest that those children whose parents are positively selected on education do not benefit from this fact in terms of skills. They are still better off compared to the counterfactual scenario of no selection, because parents who are more educated in relative terms will also be so in absolute terms. But the important lesson is that this effect appears to be channeled mainly through parents’ absolute level of education, and selectivity per se adds little of interest once this is controlled.

---

Mathieu Ichou (personal communication) reports correlations between relative education and isei occupational status in the French Trajectories and Origins Survey (teo) that generally do not exceed $r \approx 0.5$. Any attempt to use relative education as a proxy for pre-migration status would have to take these low correlations into account.
for. Therefore, if the goal is to control for parents’ cognitive resources in a regression framework, it is more appropriate to include their absolute schooling.

In terms of policy, the lessons to be learned are in equal measures encouraging and daunting. On a positive note, there is little to suggest that educational institutions, at least in the context examined here, systematically undervalue the ability of minority children. The deck is not, so far as we can tell, ‘stacked against them’. On the contrary, while selectivity exerts no positive influence on standardized ability instruments, it does so for teacher-assigned grades after controlling for measured ability – suggesting that teachers if anything have a compensatory role in translating high aspirations into achievement. Needless to say, we have to be cautious about generalizing this particular finding to other countries, as Sweden is a positive outlier in terms of welfare state intervention and compensatory resource allocation.

The less encouraging corollary, however, is that it is hard to suggest any ‘quick fix’ for the underperformance of minorities in Western countries. If helping these students was mainly a matter of overcoming language limitations or teacher bias, easy remedies would be forthcoming. The results suggest that performance differences cut deeper than that; in particular, their parents’ low absolute education is likely continue to hold back these young people despite high aims. Attempts to improve outcomes by targeting non-cognitive traits such as motivation or self-esteem are unlikely to have much bite as these traits are already in high supply. The policies most likely to be successful are instead those that seize on the ambitions already there and work through supplemental instruction or similar remedial measures.
REFERENCES


Statkontoret. (2012). *Organisationskrafs konsekvenser av Gymnasiereformen 2011*. [Organisational Implications of the Up-


To see how use of different socioeconomic proxies might bias estimates of ethnic disparities, reconsider Equation 3.2 and suppose that the parameters we would like to estimate are given by an analogous regression, but directly including the unobserved attributes. To avoid notational complexity I denote these by a single scalar $s_i^\ast$, with no loss of generality implied:

$$y_i = \delta + \zeta s_i^\ast + \sum_k \lambda_k g_{ik} + x'_i \psi + \eta_i \tag{3.3}$$

Further suppose that the proxy and its proxand(s) are related by the equation:

$$s_i = \upsilon + \zeta s_i^\ast + u_i \tag{3.4}$$

which will allow us to assess bias in $\gamma_k$ as an estimate of $\lambda_k$. A convenient but often incorrect assumption is that the error $u_i$ is unrelated to anything but $s_i$ (to which it is correlated by construction). If so, running a regression like Equation 3.2 would lead us to estimate:

$$\hat{\lambda}_k = \gamma_k = \lambda_k - \lambda_k \varphi_k \tag{3.5}$$

where $\varphi_k$ is the partial regression coefficient for category $g_k$ from regressing $u_i$ in Equation 3.4 on all the explanatory variables in Equation 3.2. This and following equations refer to sample statistics, but in the interest of brevity I abstract from sampling error and use notation corresponding to population analogues. If $u_i$ is just white noise, the interpretation is simple: $s_i$ will partly, but only partly, remove the omitted variable bias resulting from inability to observe $s_i^\ast$. In this case, even though controlling for $s_i$ will not recover unbiased estimates, it is guaranteed to bring us closer to the target parameters than leaving it out would (Wickens 1972).

The considerable group differences in absolute and relative education explain why different or even opposite conclusions might be drawn depending on the control used. For example, if relative education satisfies the white-noise assumption but absolute education is used in its place there will be systematic error because one will be an underestimate of the other in countries with low absolute levels of schooling. The above expression then still holds but the direction of bias depends on the substantive relationship between $s_i$, $s_i^\ast$, and $y_i$. An even more more complex situation arises if $s_i$ has
independent predictive value for $y_i$, so that a correlation obtains between the error terms $u_i$ and $\eta_i$. In this case, we are led to estimate:

$$\hat{\lambda}_k = \gamma_k = \lambda_k - \lambda_k \varphi_k + \omega_k \quad (3.6)$$

where $\omega_k$ is the partial regression coefficient for category $g_k$ from regressing $\eta_i$ in Equation 3.3 on all the explanatory variables in Equation 3.2. In this case, there is bias of an indeterminate direction and magnitude coming from two sources, and little can be said about the extent to which the parental characteristics proxied for underlie observed groups differences or not.

Proof. Gather the predictors from Equations 3.2 and 3.3 in two $n \times m$ matrices $P^* = [1, X, s^*, g_1, \ldots, g_k]$ and $P = [1, X, s, g_1, \ldots, g_k]$, and let $U = P - P^*$. The correct parameter vector is $\theta^* = (P^*/P^*)^{-1}P^*/\gamma$, with $\gamma$ being an $n$-dimensional vector of outcomes. Running a regression on $P$ will estimate:

$$\theta = (P'P)^{-1}P'\gamma$$

$$= (P'P)^{-1}P'(P^*\theta^* + \epsilon)$$

$$= (P'P)^{-1}P'(P\theta^* - U\theta^* + \epsilon)$$

$$= \theta^* + (P'P)^{-1}P'(-U\theta^* + \epsilon)$$

$$= \theta^* + (P'P)^{-1}P'U(-\theta^*) + (P'P)^{-1}P'\epsilon$$

where $\epsilon = [\epsilon_1, \ldots, \epsilon_n]' = \gamma - P^*\theta^*$. Because only one column of $U$ is nonzero (all other entries are identical across $P^*$ and $P$) we can replace $U$ with $u = [u_1, \ldots, u_n]' = s - s^*$, and get:

$$\theta = \theta^* + (P'P)^{-1}P'u \odot (-\theta^*) + (P'P)^{-1}P'\epsilon$$

$$= \theta^* - \theta^* \odot (P'P)^{-1}P'u + (P'P)^{-1}P'\epsilon,$$

with $\odot$ used to denote elementwise (Hadamard) multiplication. Writing $q_k$ for the $m$-dimensional unit vector with 1 in the $k$th place we have:

$$q_k'\theta = \gamma_k$$

$$q_k'\theta^* = \lambda_k$$

$$q_k'(P'P)^{-1}P'u = \varphi_k$$

$$q_k'(P'P)^{-1}P'\epsilon = \omega_k$$

127
with \( \gamma_k, \lambda_k, \varphi_k, \) and \( \omega_k \) defined as above. And so:

\[
\gamma_k = \lambda_k - \lambda_k \varphi_k + \omega_k
\]

as in Equation 3.6. If the assumption that \( u_i \) is unrelated to all variables except \( s_i \) holds, then the regression of \( \varepsilon_i \) on observed covariates \((P'P)^{-1}P'\varepsilon\) will, at the limit, yield a null vector and \( \omega_k \) drops out of the equation to produce the expression \( \gamma_k = \lambda_k - \lambda_k \varphi_k \) shown in Equation 3.5.