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Explaining the attainment of the second-generation: When does parental relative education matter?

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ABSTRACT

How can we understand unexplained variation in the educational outcomes of the children of immigrants? A growing literature posits that standard educational transmission models fail to explain national origin differences in attainment because they ignore immigrant selectivity – the degree to which immigrants differ from non-migrants in their sending countries. The *immigrant selectivity hypothesis* is usually tested using indicators of parents' *relative* or “contextual” educational attainment, measuring their rank in the educational attainment distribution of their country of origin. However, using this proxy, current support for the hypothesis is mixed. We outline three conditions for the use of educational selectivity as a proxy for relative social positioning among the children of immigrants. We test our conditions using an adult and a youth sample from a large household panel survey in the UK. We supplement our analyses by exploring relative education data from prior research on Italy, France and the United States. Triangulating these varied sources, we illustrate cases when our three conditions do and do not hold, providing evidence from the UK and other contexts. We provide guidelines on the use of relative education as a measure of relative social standing in cross-national research as well as an assessment of the immigrant selectivity hypothesis in explaining second-generation educational outcomes.

1. Introduction

How can we understand the considerable unexplained variation in the educational outcomes of the children of immigrants? A broad literature documents that standard models of intergenerational educational mobility have less predictive power for immigrant families. For instance, immigrants frequently have lower average levels of education than receiving country natives, may be unfamiliar with the receiving country language, and often experience occupational downgrading after migration - yet in many countries, their children have better educational outcomes, a phenomenon known as the “immigrant achievement paradox” (Bowe, 2020; Lee and Zhou, 2015). Moreover, comparisons of intergenerational educational transmission between the foreign and the native-born document a weaker association between the education of parent and child in immigrant families (Luthra and Soehl, 2015). The result is that standard educational transmission models frequently leave large residual national origin differences in attainment unexplained (Heath et al., 2008). Seeking to explain these differences, a growing body of literature posits that immigrant selectivity – that is, the degree to which immigrants differ from non-migrants in their sending countries - may underlie unexplained variation in second generation educational attainment (see Feliciano [2020] for a review).

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The point of departure for the immigrant selectivity hypothesis is the fact that absolute and relative social position may not align for many foreign-born individuals in wealthy receiving countries (Feliciano, 2020). Despite having lower levels of absolute education in the receiving country, immigrants may nevertheless be positively selected – more educated and/or from a higher social class – relative to the sending country distribution. Simply put, the immigrant selectivity hypothesis anticipates that immigrants will carry the class habitus, aspirations, and educational “toolkits” associated with their relative position in the sending country stratification system – a position potentially only poorly captured by measures of their absolute attainments in the receiving country – and thus their relative education (or other positional measures relative to the sending country) will exert an independent influence on their outcomes and those of their children. In this case the usual “controls” for parents’ absolute education level conceal differences in social positioning, which could account for some unexplained variation in the outcomes of native-origin children and the children of immigrants from different countries.

Researchers empirically test this hypothesis by including measures of the relative social position of immigrants in their home countries as an additional explanatory variable in studies of second-generation educational outcomes. Capitalizing on internationally standardized data on educational distributions across the world, most notably the Barro-Lee Educational Attainment Dataset introduced in 2013 (Barro and Lee, 2013), the vast majority of this literature proxies immigrants’ relative social position in their home countries with their educational selectivity. This is an indicator of relative or “contextual” educational attainment, which measures an individual’s rank in the educational attainment distribution of their country of origin (for individuals with the same gender and in the same age group).

Using this proxy, current support for the hypothesis is mixed. Whereas relative attainment has been shown to explain some of the “paradox” of higher educational attainment of the children of immigrants in the United States (Feliciano and Lanuza, 2017), results in Europe have been more equivocal. On the one hand, research on educational attainment in France (Ichou, 2014), school continuation in Italy (Brunori et al., 2020), and on achievement scores and secondary school choice in Europe (van de Werfhorst and Heath, 2019), demonstrates a positive association between these outcomes and immigrant parents’ educational selectivity. On the other hand, some recent scholarship casts doubt on the relationship between parental educational selectivity and the final attainment of the second generation. In Sweden, for instance, Engzell (2019) finds that the children of positively selected immigrants have higher ambitions, but often lack the means to attain them. In fact, there is evidence from several countries that the more ambitious educational choices of the children of immigrants do not always lead to higher attainment (Birkelund, 2020; Dollmann and Weißmann, 2020; Ferrara, 2023), or to more prestigious post-secondary educational choices (Borgen and Hermansen, 2023).

Generalizing results across studies is stymied by a lack of comparability in the data and methods used. Some studies only examine the impact of parental educational selectivity on the educational outcomes of the second generation (Brunori et al., 2020; Ichou, 2014), whereas others also include the children of receiving country natives (Feliciano and Lanuza, 2017; Borgen and Hermansen, 2023). Moreover, these studies examine different birth cohorts at different ages, from different country contexts, and with different educational outcomes. As our knowledge base on the intergenerational effects of educational selectivity continues to grow, we believe it is time to take a step back and examine under which conditions the use of educational selectivity is appropriate as a measure of relative social positioning in immigration and social stratification research.

This task is the goal of this paper. We first outline two conditions for the use of educational selectivity as a proxy for relative social positioning among the children of immigrants. We next define a third condition for the measure specifically to explain differences in educational attainment across migration backgrounds. Using data from a uniquely rich and large household panel survey in the UK, we test these necessary conditions with two different cohorts (an adult sample aged 25 to 55, and a youth sample aged about 14) across a wide range of educational outcomes. To maximize comparability with prior studies, we investigate the impact of parental contextual attainment on children’s educational outcomes for the children of immigrants separately and in a sample also including the children of UK-born parents. We further supplement our analysis with an exploration of relative education data on immigrant and native-born parents from prior research in other prominent receiving country contexts: Italy, France and the United States (Brunori et al., 2020; Feliciano and Lanuza, 2017; Ichou, 2014). Triangulating these varied sources, we illustrate cases when the conditions do and do not hold, providing evidence from the UK and other contexts that can inform future studies in the burgeoning field of immigrant selectivity research.

2. Background

2.1. Unexplained variation and mechanisms in second generation attainment

In some countries, such as the United States (Kao and Tienda, 1995), the United Kingdom (Zuccotti, 2015) and Norway (Hermansen, 2016), the children of immigrants have higher attainment than the children of natives, especially when parental characteristics are adjusted for. Comparisons between the children of immigrants of different national origins show similarly high levels of unexplained variation, with some groups experiencing strong upward mobility whereas others stagnate or even decline relative to their parental backgrounds (Heath and Brinbaum, 2007). To explain these differences, scholars point to several potential explanations.

A common explanation for a second generation advantage over the children of the native born is the higher educational aspirations reported by their parents (Brinbaum and Cebolla-Boado, 2007; Engzell, 2019; Salikutluk, 2016); there is however substantial heterogeneity across national origin groups, for instance in France (Brinbaum and Cebolla-Boado, 2007) and in Germany (Salikutluk, 2016). A large body of research documents how aspirations and expectations – of both self and parents – are associated with educational performance and attainment. In both immigrant and native-born families, high expectations are associated with greater effort in school, including teacher rated effort (Domina et al., 2011). Aspirations are also associated with more ambitious school

choices: in more stratified systems such as Germany or the Netherlands (Jackson, 2012), but also in the UK (Fernández-Reino, 2016; Khattab, 2015), high educational aspirations help explain the greater likelihood of pursuing academic and general education even in the face of lower test scores and primary school performance among some immigrant groups. Although there is growing evidence of higher drop-out due to these ambitious choices (Dollmann and Weißmann, 2020), we would expect the positive association of aspirations and expectations with both effort and educational transitions to result in higher degree completion for the children of immigrants overall.

Second, underlying these higher aspirations and expectations, researchers note that immigrants may place a higher value on upward mobility, although again with significant variation across national origin groups [see for instance Hadjar and Scharf (2019); Lee and Zhou (2015); Becker et al. (2022)]. Parents may frame the migration project of their family as an “immigrant bargain”, whereby downward mobility and parental sacrifice is justified by upward mobility and the intergenerational gains of children (Foner and Dreby, 2011; Relikowski et al., 2012). Scholars in the UK further suggest that experiences of blocked mobility among immigrant parents in the receiving country labor market leads them to emphasize the educational attainment of their children to buffer them from anticipated discrimination (Li, 2018). These explanations are not mutually exclusive and may be complementary, with both leading to higher educational expectations that can translate into more familial resources being devoted to educational aims and stronger norms of achievement within the family (via parents, siblings, and wider family members).

A third potential source of second generation variation in educational attainment is the immigrant context of reception (Portes and Rumbaut, 2001), a concept that operates at both the level of individual families and across national origin groups (Luthra et al., 2018) and comprises their legal, societal, and co-ethnic reception. Although less explored in the European context, parental legal status has been shown to influence the educational attainment of the children of immigrants, in particular undocumented status may negatively impact the educational support parents can provide for their children (Bean et al., 2011). Stereotypes arising from societal discrimination is a second element that has been shown to predict variation in teacher treatment, for instance, both within [by language for instance, see Triventi (2020) for the second generation in Italy] and across national origin groups [for Germany, see Wenz and Hoenig (2020)]. A recent review of field experiment research finds that discrimination against non-white and Muslim groups is ubiquitous, although the degree of disadvantage varies across other individual level markers and receiving societies (Quillian and Midtbøen 2021).

A final element of the context of reception are the characteristics of the national origin co-ethnic community. The insight here is that, despite having lower levels of economic capital and potentially facing discrimination from receiving country natives, immigrants may have other forms of capital that compensate and lead to better educational outcomes—most notably “ethnic” capital as well as social capital more generally. Many relatively disadvantaged immigrant groups in Europe, such as the Pakistanis or Chinese in the UK (Modood, 2004), are from countries where strong familial relationships and strict enforcement of behaviour are normative. These cultural orientations can provide a form of ethnic capital for immigrant families that allows them to support educational achievement in the home, such that families with higher home country language use, religiosity and family orientation have higher effort in school (Friberg, 2019). Outside of the family, immigrants may also have more access to social capital within their co-ethnic community, loosely defined as resources available through a person’s social network (Lin, 1999). Research particularly on the Swedish context has found that the transnational as well as local social networks of immigrants can offer more diverse information and support (Andersson et al., 2018). Especially for Asian and Southeast European groups, these more diverse and high prestige networks help explain the better educational performance of second-generation children (Nygård and Behtoui, 2020). Research in other contexts, however, finds that immigrants have a less advantaged co-ethnic community. Immigrants and ethnic minorities from Belgium (Verhaeghe et al., 2013) and the UK (Li et al., 2008) document especially lower levels of the “bridging” diverse social ties that lead to broader information fields and wider job opportunities.

2.2. Immigrant selectivity

The immigrant selectivity hypothesis posits that many of these mechanisms of second-generation variation in educational success may be explained by relative social positioning. Starting with the first mechanism, if the foreign born are positively selected from the sending country stratification system, then variation in the aspirations and expectations can be understood as straightforward socioeconomic transmission of their (usually unobserved) social standing. In the UK as well as in many other countries, high educational expectations (Jackson, 2013) and ambitious educational choices (Breen and Goldthorpe, 1997) are socially stratified characteristics, more concentrated among those at the top of the educational or occupational distribution. In terms of the second mechanism, we might also expect greater familial investment in children’s education among immigrants with higher relative education: in both the UK (Berrington et al., 2016) and many sending countries such as India (Gupta 2023), parental involvement in schools, homework assistance and participation in shadow education programs are strongly stratified by socioeconomic background. Finally, the legal context of an immigrant group is often itself a positive selection mechanism, with visas requiring high levels of education that lead to co-ethnic communities with plentiful educational resources [for instance the “hyperselectivity” among Chinese immigrants in the United States (Zhou and Lee, 2017)]. While some forms of ethnic capital, as well as societal discrimination, may be shared by all members of specific national origin groups, access to co-ethnics with greater receiving country capital (occupational status, language, knowledge of schools, etc) (Li et al., 2008), as well as some forms of discrimination (Wenz and Hoenig, 2020), are still stratified by relative social standing.

Researchers have devised a variety of measures to test the immigrant selectivity hypothesis [see for instance Feliciano (2005); De Heus and Donkers (2008); Pong and Landale (2012)], usually documenting a positive association between immigrant selectivity and second-generation outcomes. After the publication of Ichou’s seminal paper in 2014 (Ichou, 2014), researchers have increasingly relied on the Barro and Lee (2013) international data on educational attainment distributions to create an individual-level measure of

educational selectivity for immigrant parents. The foreign born in receiving country datasets are matched to the Barro-Lee data for their sending country, creating a measure that is computed as the percentage of people of the same country of origin, sex, and age group who have a lower level of educational attainment, plus half the percentage of people with the same level of education. This indicator ranges potentially from 0 to 100 and measures the position of parents in the educational distribution of their country of origin. For immigrant parents, this indicates the extent to which they are positively selected in terms of educational attainment, which is expected to be positively associated with second generation educational outcomes.

Research on educational attainment in France (Ichou, 2014) and drop out in Italy (Brunori et al., 2020) does find this expected association, even after controlling for sending country region and the absolute level of parental educational attainment. Similar work in the United States has documented that relative educational attainment helps to explain the higher educational aspirations and higher attainment of the children of immigrants relative to the children of native-born parentage with the same socioeconomic characteristics (Feliciano and Lanuza, 2017; Tong and Harris, 2021). On the other hand, using Swedish data, Engzell (2019) finds that although the children of immigrants with higher levels of relative education have higher aspirations, the low absolute levels of attainment of these parents inhibits their ability to support their children in school, which may reduce their final attainment. In Norway, Borgen and Hermansen (2023) find that parental relative education does not explain the more prestigious post-secondary educational choices of the children of immigrants relative to the children of natives.

These papers draw on data from different receiving country contexts, with immigrant populations from different origins and arrival cohorts. Moreover, while some focus on gaps between the children of immigrants and natives ((Borgen and Hermansen, 2023; Feliciano and Lanuza, 2017; Tong and Harris, 2021), others focus on variation within the second generation (Brunori et al., 2020; Ichou, 2014), an analytic decision which is consequential as we will demonstrate below. All these authors suggest that more research in countries with different migration regimes and educational systems is required to examine the wider applicability of the selectivity hypothesis. However, as yet, no paper has systematically tested the conditions necessary for the use of the relative education measure itself and for the immigrant selectivity hypothesis to be confirmed, nor demonstrated the consequences when they are not satisfied.

2.3. Necessary conditions for the use of relative education to confirm the selectivity hypothesis

Drawing from the discussion above, we argue that for relative education to serve as proxy for relative social position, two conditions must hold: (a) there must be variation among immigrants and between immigrants and natives in their level of relative education/educational selectivity, (b) there must be sufficient variation in immigrant selectivity within absolute educational categories to statistically identify a net effect of relative education after adjusting for absolute education. A third condition, specific to the use of relative education as an explanation for educational inequalities, is that (c) there must be a correlation between immigrant relative education and mechanisms of educational success identified in the literature, such as aspirations, values, social networks, or others.

Before discussing each condition in detail, we emphasize some differences between them. The first two are necessary preconditions to be able to reliably test the role of educational selectivity in explaining differences in educational attainment in regression models. As we will show below, when these conditions are not fulfilled, statistical models may run into problems like multicollinearity and will not be able to reliably estimate the impact of educational selectivity. Since collinearity is usually observed with diagnostics after models are run and depends on various contingent factors like sample size and additional covariates that will vary for each analysis (Hill and Adkins, 2001), we refrain from proposing strict indicators and thresholds but instead illustrate the problem and provide some suggestions and general guidelines in assessing the extent to which it biases results.

Since Conditions 1 and 2 concern variability in relative education, their confirmation partly depends on the quality of the measures used. Survey items may not capture absolute educational attainment with a sufficient level of detail and in comparable ways for different migrant groups, creating measurement error. This in turn can reduce the variability detected in both absolute and relative education. Beyond these measurement and statistical considerations, as the discussion below will show, the fulfilment of the first two conditions depends on real-world factors with a substantive meaning, like the selectivity of a country's migration regime and the composition of its migrant population. Given the first two conditions to reliably use relative education as an independent proxy for social standing in addition to absolute measures of education, the third condition is necessary to confirm the selectivity hypothesis specific to the explanation of educational inequality. This condition has a more substantive interpretation since it ties educational selectivity to underlying mechanisms that should affect educational attainment. The condition is required to find a positive association between educational selectivity and second-generation attainment and explain differences in attainment across migration backgrounds.

2.3.1. Variation among immigrants and natives

For educational selectivity to serve as a proxy for variation in relative social standing, relative education must vary both among foreign-born parents and also between foreign-born and native-born parents. If all immigrants are similarly positively – or negatively – selected on educational attainment, relative education cannot capture any differences in habitus, expectations or social capital that might explain variation in second generation success. This condition can be investigated by comparing the mean and variance of relative education across migration backgrounds and national origin groups.

The degree to which this condition holds is a function of many factors including geographic location, migration policy, and historical migration ties. For instance, island countries with restrictive and targeted migration policies, such as Japan or Australia, have relatively low levels of variation in selectivity among recent migrants (Belot and Hatton, 2012). In contrast, much like the rest of Europe, migration to the UK was characterized by an initial period of relatively high labor migration from former colonies following the second world war, followed by family reunification and refugee migration streams (Van Mol and de Valk, 2016), and more recently

“super-diversity” (Vertovec, 2007), with larger influxes of student migrants, skilled visa holders, and higher levels of intra- EU migration. This diversity in origin and migration motivation leads to variation in educational selectivity (Luthra and Platt, 2023).

Condition 1. Relative education must vary among foreign-born parents and between foreign-born parents and native-born parents.

2.3.2. Orthogonality between absolute and relative education

For parental relative education to explain variation in the outcomes of children net of parental absolute education, we must have enough variation in the two measures, and they must be sufficiently orthogonal. In other words, for relative education to serve as an indicator of relative position over and above absolute education, we must have an immigrant population with variation in absolute educational credentials, as well as variation in relative education within each level of absolute education.

This condition is illustrated in the hypothetical example in Fig. 1. On the X axis is the level of absolute education attained. For each level of X, the lower Y axis plots the share of individuals with that level of absolute attainment, while the upper Y axis plots distributions of relative education through box and whisker plots. To test the immigrant selectivity hypothesis, we must measure an independent association between second generation educational attainment and both parental absolute education (for instance, having secondary education) and parental relative education (for instance, being more educated than 75% of similar individuals in the sending country). In other words, we need to observe variation in both the bottom and upper panel.

In receiving country A, in the left panel of Fig. 1, this condition is upheld: there are substantial proportions of immigrants at all levels of absolute education, and within these categories the box and whisker plots span a large range of relative education in the Y axis. In receiving country B, in the right panel, we see a strong concentration of immigrants with only the highest levels of credentials, and that within educational levels, there is little variation in relative education. In this case, we will not be able to identify the effect of one form of education while controlling for the other. Condition 2 can be partly evaluated by observing the correlation between parental absolute and relative educational attainment. However, producing a plot like Fig. 1 provides more informative results on the source of correlation between the two variables in the specific context being investigated [see for example Fig. 1 in Ichou (2014) and Engzell (2019)].

Variation in relative attainment within levels of absolute attainment can stem from two sources: variation across national origins due to inequalities in educational system development across countries or variation across birth cohorts from the same country due to educational expansion over time. In the case of the UK, a substantial proportion of the foreign-born parents of the adult second generation are from former colonies such as India, Pakistan, Bangladesh or Jamaica - countries which experienced relatively little educational expansion across immigrant parents' birth cohorts, with the exception of attainment at the lowest levels (Roser and Ortiz-Ospina, 2016). The result is that most individuals from these countries will be highly positively selected, and we would expect cohort-driven variation in relative education only among those with the lowest absolute levels. This would make the UK like hypothetical country B, making it difficult to identify an independent association between relative and absolute education for these parents.

This contrasts with other cases where educational selectivity has displayed the expected association with second generation outcomes. For example, Ichou (2014) investigates a highly heterogeneous sample of mostly lower- and middle-educated immigrants to France arriving between the 1960s and the 1980s from a very wide range of African, European, and Asian countries. Immigrants in

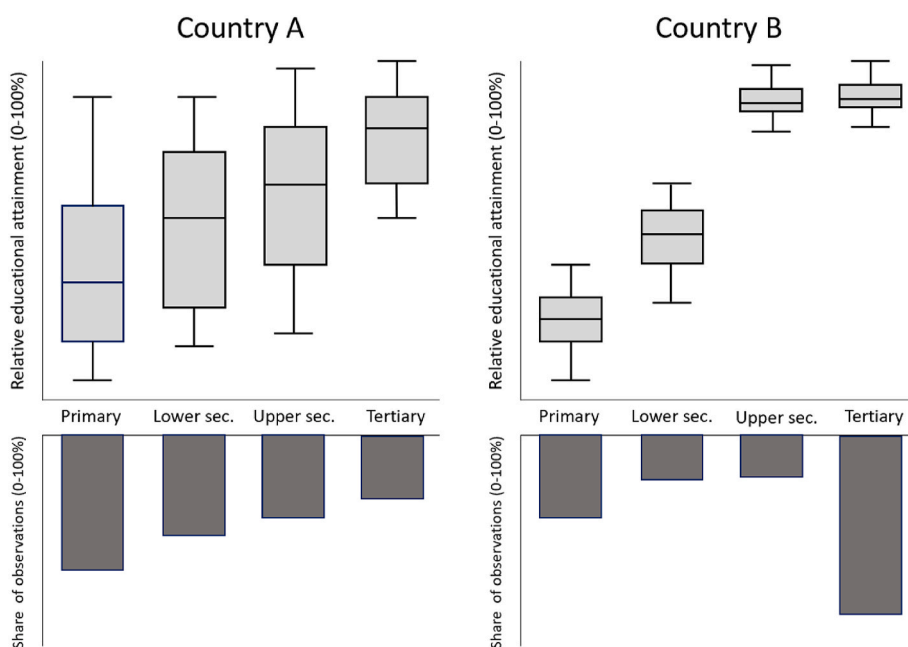


Fig. 1. Conceptual representation of the variation in relative and absolute educational attainment.

Italy analyzed by Brunori et al. (2020), are mostly low-skilled and from countries with disparate educational profiles: the largest groups are Albanians, Chinese, Moroccans, and Romanians. The US case, investigated by Feliciano and Lanuza (2017), however, is more similar to the British one: the foreign-born in the US also stem disproportionately from less developed countries, and show a highly bifurcated skill distribution.

We therefore conduct an empirical validation of the second condition, first for the UK data we focus on, and then also replicating previous studies from France, Italy, and the US.

Condition 2A. In studies of the immigrant second generation, there is sufficient variation in parental absolute educational attainment and in relative educational attainment within absolute educational levels to identify an independent association between both measures and child educational outcomes.

A further implication of Condition 2 arises in studies where a native-origin comparator group is included, as in studies of the US (Feliciano and Lanuza, 2017; Tong and Harris, 2021) and Norway (Borgen and Hermansen, 2023). For this group, the only source of variation in contextual attainment within absolute levels of education arises from changes across birth cohorts as there is no cross-country difference to exploit. In this case, we expect absolute and relative education measures to be highly correlated, both a statistical and a substantive issue that is exacerbated when the native-origin group comprises the bulk of the sample.

Condition 2B. In studies comparing the attainment of the children of immigrants and natives, condition 2A also holds for native-born parents and their children.

2.3.3. Parental relative education and mechanisms of second-generation educational success

The third condition, which is required to confirm the immigrant selectivity hypothesis for second-generation educational inequality, is that parental relative education should be positively associated with some mechanisms of educational success, on top of parental absolute education. The literature identifies aspirations and social networks as two key mechanisms, but others could be considered, such as disparities in health outcomes or study habits (Hsin and Xie 2014; Feliciano, 2020). Using our data, we are able to test this condition by investigating the association between parental relative education and various intermediate educational measures that should be associated with families' socio-economic position at origin, their mobility aspirations and involvement in their children's education, and should also predict children's educational attainment. In the UKLHS youth sample, relevant measures include respondents' educational and occupational aspirations, as well as measures of school effort like truancy and time spent doing homework (Berrington et al., 2016; Lareau, 2002; Morgan, 2005). Given that previous literature documents a positive association between educational selectivity and these outcomes in other country contexts (Engzell, 2019; Feliciano and Lanuza, 2017), and that that earlier research has documented both positive immigrant selectivity (Luthra and Platt, 2023) and higher aspirations of the second generation in the UK (Bowe, 2020; Modood, 2004), we also expect to see this association in the UK.

Condition 3. Parental relative education will be positively associated with educational expectations and school-related behaviors of second-generation youth on top of parental absolute education.

3. Data and methods

3.1. Data and analytical samples

The main data source is the sixth wave (2014–2015) of Understanding Society: the UK Household Longitudinal Study (UKHLS) (University of Essex, ISER, 2022). Understanding Society is a large nationally representative household panel study of the UK that started in 2009/10 and included an Immigrant and Ethnic Minority Boost in the sixth wave, making this the most recent data with the largest coverage of the immigrant-origin population in the UK. To answer our research questions, we build two samples from the UKHLS.

The “adult sample”, which we use to investigate adult educational attainment, is restricted to individuals aged 25 to 50 in the sixth wave of the UKHLS to ensure that they have completed their education and to enforce comparability in age between second-generation and native-origin samples (85% of the children of immigrants in the sample are under the age of 50). Starting from this population, Table A1 in the Appendix describes how we progressively obtain our analytical sample. First, we exclude individuals with missing information on either parents' country of birth (8% of the sample) and individuals with one foreign born and one UK-born parent (5% of the sample). Then, among those with two native-born parents, we drop those who did not self-identify as White British (0.8% of the sample), in line with the literature that contrasts the children of immigrants with a “White British” comparison group. We label this group as the 3rd+ generation. Among those with two foreign-born parents, we drop those who migrated after the age of 5 (20% of the sample) and those whose parents migrated before the age of 18 (4% of the sample). This is done to align with the literature on second generation education that restricts analysis to those that attended most of their education in the destination country, while their parents were mostly educated in their country of origin (Engzell, 2019; Ichou, 2014). We refer to this population as the 1.5/2nd generation. Missing data for this sample was imputed using multiple imputation with chained equations (White et al., 2011), and design weights and controls for sampling strata were applied at both the imputation and estimation stages of our analysis. The final analytical sample is composed of about 12,600 individuals, out of which about 1,070 were children of immigrants.

To analyze Condition 3 described above, and to test the first two conditions for a more recent cohort, we build a “youth sample” composed of individuals in UKHLS households aged 10 to 15 who answer a specific youth questionnaire. We define the 1.5/2nd generation and 3rd+ generation using the same criteria as the adult sample; Table A2 summarizes this process for the youth sample. We

pool data from waves 1 to 11 to ensure sufficient statistical power, keeping the most recent observation from each individual. The youth sample was matched to data from their parents (biological and adoptive) residing in their household who answered the adult questionnaire. We use the dominance criterion for parental information whenever both parents were present in the household and from the single parent (35% of cases) otherwise. We control for single parent households and results are also robust to the use of maternal data only (results available in the Appendix). The analytical sample is composed of 7,480 3rd+ generation individuals and 809 1.5/2nd generation individuals.

We use the [Barro and Lee \(2013\)](#) dataset to create measures of parental and respondent relative educational attainment. The dataset contains the distribution of educational attainment in the adult population by gender and five-year age group in six categories (no formal education, incomplete primary, complete primary, lower secondary, upper secondary, and tertiary education) in 146 countries

Table 1

Descriptive statistics.

	Adult sample				Youth sample			
	1.5/2 nd gen		3 rd + gen		1.5/2 nd gen		3 rd + gen	
Main independent and dependent variables								
Parental relative educational attainment	76.62	(1.82)	66.62	(0.39)	81.42	(0.96)	56.06	(0.58)
Respondent relative educational attainment	63.25	(1.64)	54.15	(0.36)				
Aspire to attend university					0.85	(0.02)	0.73	(0.01)
Parental absolute educational attainment								
Primary or less	0.33	(0.03)	0.18	(0.01)	0.05	(0.02)	0.02	(0.00)
Some secondary					0.10	(0.02)	0.12	(0.01)
Complete secondary	0.29	(0.03)	0.29	(0.01)	0.25	(0.03)	0.43	(0.01)
Some tertiary	0.20	(0.03)	0.37	(0.01)	0.16	(0.03)	0.15	(0.01)
Complete tertiary	0.18	(0.02)	0.16	(0.00)	0.44	(0.04)	0.29	(0.01)
Parental occupational status at age 14								
Upper class occupation	0.18	(0.02)	0.20	(0.01)	0.23	(0.03)	0.27	(0.01)
Intermediate class occupation	0.27	(0.03)	0.40	(0.01)	0.33	(0.03)	0.45	(0.01)
Lower class occupation	0.42	(0.03)	0.34	(0.01)	0.33	(0.04)	0.23	(0.01)
Unemployed	0.09	(0.01)	0.03	(0.00)	0.11	(0.02)	0.05	(0.01)
Other	0.03	(0.01)	0.03	(0.00)				
Maternal country or region of origin								
United Kingdom	0.00		1.00		0.00		1.00	
Ireland	0.17	(0.03)	0.00					
India	0.23	(0.03)	0.00		0.16	(0.02)	0.00	
Pakistan	0.14	(0.02)	0.00		0.11	(0.02)	0.00	
Bangladesh	0.05	(0.01)	0.00		0.05	(0.01)	0.00	
Jamaica	0.09	(0.02)	0.00					
Advanced economies	0.08	(0.01)	0.00		0.10	(0.01)	0.00	
East Asia Pacific	0.03	(0.01)	0.00		0.07	(0.02)	0.00	
Europe Central Asia	0.02	(0.01)	0.00		0.18	(0.01)	0.00	
Latin America Caribbean	0.05	(0.02)	0.00		0.03	(0.01)	0.00	
MENA	0.03	(0.01)	0.00		0.05	(0.01)	0.00	
South Asia	0.01	(0.01)	0.00		0.06	(0.03)	0.00	
Sub-Saharan Africa	0.10	(0.01)	0.00		0.17	(0.03)	0.00	
Respondent and family characteristics								
Respondent age	41.73	(0.52)	40.78	(0.11)	13.54	(0.10)	13.98	(0.03)
Female	0.51	(0.03)	0.53	(0.00)	0.53	(0.03)	0.50	(0.01)
Siblings in household	0.14	(0.03)	0.05	(0.00)	1.66	(0.11)	1.26	(0.04)
Mixed foreign parents	0.22	(0.03)	0.00		0.08	(0.01)	0.00	
First generation	0.15	(0.02)	0.00		0.31	(0.03)	0.00	
Parent moved age 18-25	0.59	(0.03)	1.00		0.38	(0.03)	1.00	
Single parent household					0.35	(0.03)	0.31	(0.01)
Parental minimum arrival cohort								
Pre-1960	0.19	(0.02)	N.A.	N.A.				
1961–1970	0.48	(0.03)	N.A.	N.A.				
1971–1980	0.31	(0.03)	N.A.	N.A.				
Post-1980	0.08	(0.02)	N.A.	N.A.				
Pre-1990					0.10	(0.01)	N.A.	N.A.
1990–1995					0.12	(0.03)	N.A.	N.A.
1995–2000					0.25	(0.03)	N.A.	N.A.
2000–2005					0.33	(0.04)	N.A.	N.A.
Post-2005					0.20	(0.02)	N.A.	N.A.

Notes: Estimates shown for countries of origin with at least 50 individuals in each sample, otherwise they were aggregated in macro regions. For this reason, estimates for Irish and Jamaican parents in the Youth sample are not shown. Estimates for the Adult sample obtained from 20 imputed datasets. The number of observations varied marginally across the 20 samples - approximately 12,600 for the 3rd + and 1070 for the 1.5/2nd generation. The Youth sample was composed of 7,480 3rd+ generation individuals and 809 1.5/2nd generation individuals. Estimates produced using survey weights and controlling for UKHLS complex data structure.

Source: UKHLS wave 6 adult sample and waves 1–11 pooled youth samples, and [Barro and Lee \(2013\)](#) dataset, own calculations.

from 1950 to 2010 by five-year periods.

3.2. Measures

3.2.1. Parental absolute and relative attainment

In the adult sample, information on maternal and paternal absolute educational attainment was reported by respondents. In the youth sample, we matched the information from reports from parents in their household. Response categories varied across samples, so we harmonized them to match with educational categories in the Barro-Lee dataset (as described in Tables A3 and A4 in the Appendix). We tested alternative matchings of absolute education categories in the UKLHS and the Barro-Lee dataset and our results were robust (see Tables A12 and A13).

We match Understanding Society data with Barro-Lee to define parental relative education as described above and defined in Ichou (2014). We compute the measure for UK-born parents comparing their educational attainment to the UK distribution (for individuals with the same sex and age group). In our analyses, we use the dominance criterion for parental absolute and relative educational attainment separately, but we also ran robustness checks using only maternal or paternal data.

3.2.2. Outcome variables

In our analyses with the adult sample, the outcome variable is respondents' relative educational attainment. This is measured using the same procedure outlined for parental relative educational attainment, except that the educational attainment of respondents is always compared to the UK distribution (again, for individuals with the same sex and birth cohort). We used this measure to account for the fact that respondents in our sample belonged to different birth cohorts and obtained their degrees at different times. We also ran all analyses also using an indicator for whether respondents obtained a tertiary degree as our dependent variable. Results were similar and are available upon request.

In the youth sample, we focus on a binary indicator of the aspiration to attend University after finishing school, as educational aspirations are the most studied mechanism in the selectivity literature, and the only variable in the youth questionnaire of Understanding Society that is asked every year. We also explore a range of more distal educational outcomes, including a binary indicator for the aspiration to start working at age 16; a binary indicator for the aspiration to attain an upper-class occupation after leaving school (managers or professionals in the Standard Occupational Classification); a binary indicator for ever having played truant in school; and a measure of the average daily hours spent doing homework. Results for these outcomes are found in the Appendix.

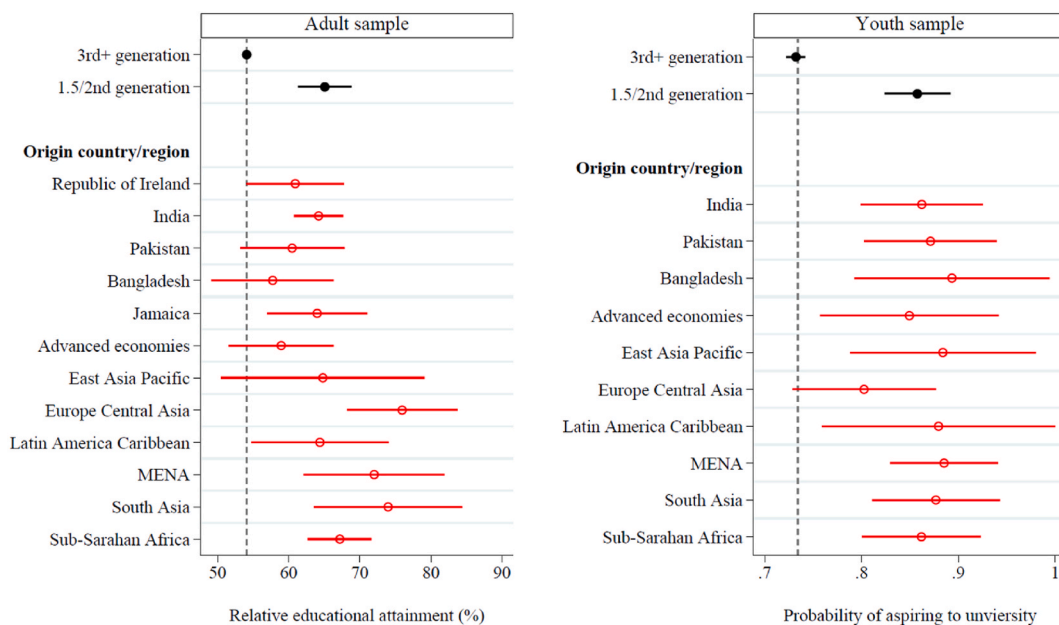


Fig. 2. Variation in respondent outcomes in the adult sample (relative educational attainment) and the youth sample (aspirations to attend university) net of standard SES controls

Notes: Estimates from OLS models controlling for parental absolute educational attainment, parental occupational status when respondent was aged 14, respondents' sex, age, number of siblings in the household, and an indicator of whether they were born in the UK or not. In the youth sample analyses we also control for whether both parents were present in the household. The adult sample estimates are produced from models fit on 20 imputed datasets. The number of observations varied marginally across the 20 samples - approximately 12,600 for the 3rd+ and 1070 for the 1.5/2nd generation. The Youth sample was composed of 7480 3rd+ generation individuals and 809 1.5/2nd generation individuals. Estimates produced using survey weights and controlling for UKHLS complex data structure.

Source: UKHLS wave 6 adult sample and waves 1–11 pooled youth samples, and Barro and Lee (2013) dataset, own calculations.

3.2.3. Control variables

We include controls for sex, age, number of siblings, an indicator of whether they were born in the UK or not, an indicator for whether their parents came from different countries, and an indicator for whether their parents migrated between the ages of 18 and 25. As measures of parental socioeconomic status, in addition to parental absolute educational attainment, we also controlled for parental occupation (measured at age 14 for the adult sample and current age in the youth sample). We used the dominance criterion and a four-category scheme (unemployed, upper, intermediate, and lower-class). In some models we also control for maternal region of origin defined in the Barro-Lee dataset, which includes Advanced Economies, East Asia and Pacific, Europe and Central Asia, Latin America and Caribbean, Middle East and North Africa, South Asia, and Sub-Saharan Africa. For models that include only the 1.5/2nd generation group, we also control for parental arrival cohorts. In youth sample analyses we always control for whether both parents were present in the household.

Table 1 describes the main variables used for the adult and youth samples. As seen, the adult sample mostly covers the children of immigrants arriving in the 1960–1980 period, while in the youth sample, most parents arrived after 1990, when UK immigration laws became increasingly restrictive. This difference is reflected in parental educational composition of the samples: 44% of the second-generation have a tertiary educated parent in the youth sample, compared to 18% in the adult sample, and 33% of parents in the adult sample had at most a primary degree. Nevertheless, 1.5/2nd generation individuals and their parents had a higher relative educational attainment than those from the 3rd+ generation in both samples. Comparing the adult and youth samples also reveals that recent migration is more varied in terms of countries of origin and includes more immigrant parents from European and Sub-Saharan countries.

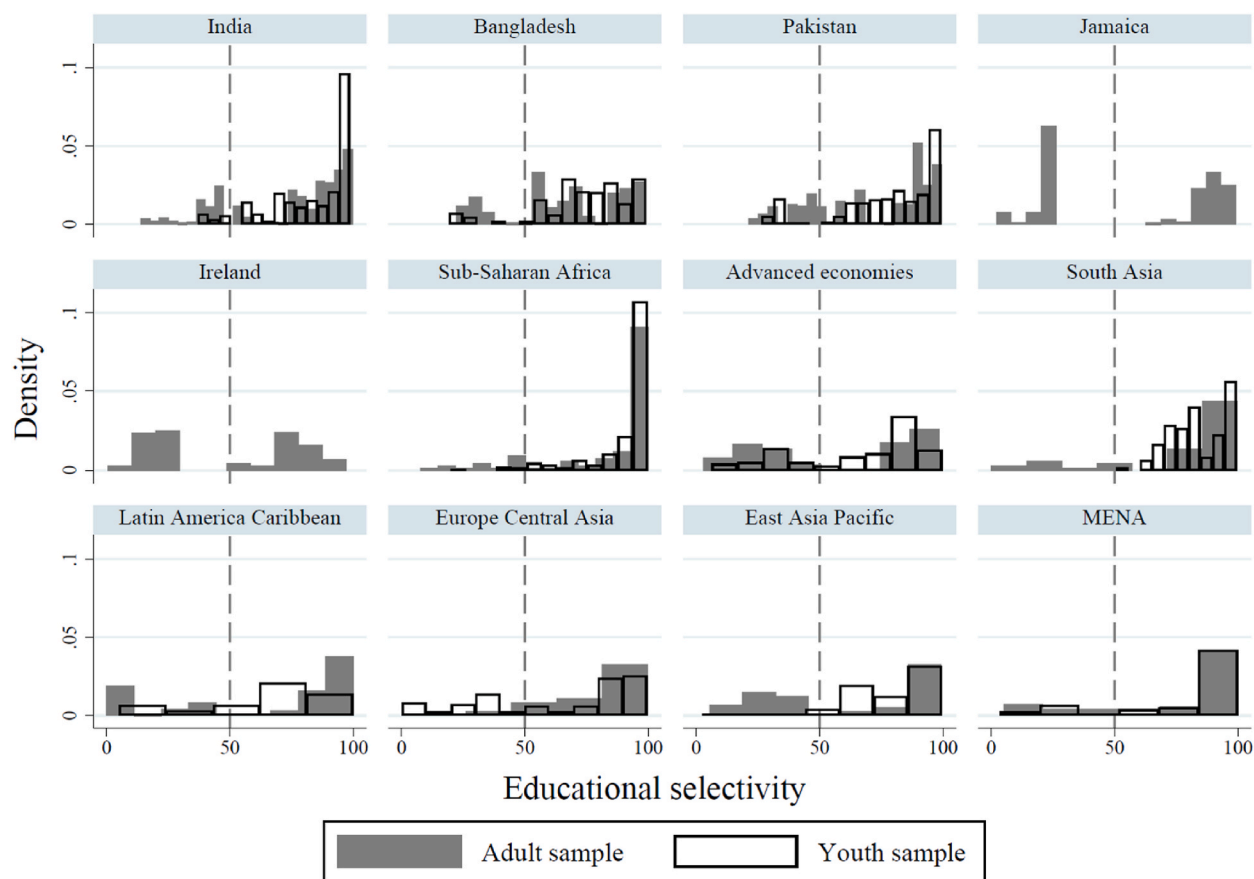


Fig. 3. Educational selectivity of immigrant parents in the youth and adult samples, by country of origin and sample

Notes: Adult sample estimates were produced using a randomly selected dataset out of the 20 imputed ones. Statistics are based on the full sample of immigrant mothers and fathers (adult sample: $N = 2,180$, youth sample: $N = 1,618$). The vertical dotted line represents the median level of relative educational attainment. Immigrants on the left of this line are negatively selected in terms of educational attainment, since they have less education than 50% of the population from their same country of origin, with their same sex and born in the same cohort. Immigrants on the right of this line are positively selected, since they have more education than 50% of the population from their same country of origin, with their same sex and born in the same cohort.

Source: UKHLS wave 6 adult sample and waves 1–11 pooled youth samples, and Barro and Lee (2013) dataset, own calculations.

3.3. Analytical strategy

We assess the conditions outlined above in our analytical samples. [Condition 1](#) is examined by describing parental relative education by origin group in the youth and adult samples. Then, we examine Condition 2, on the orthogonality of parental absolute and relative educational attainment, by investigating variations in parental relative educational attainment across categories of absolute educational attainment in the youth and adult samples. To situate this finding, we examine the condition in other countries that have been previously investigated in the literature. We use the French Trajectories and Origines (TeO) dataset following [Ichou \(2014\)](#), the Italian SCIFC dataset following [Brunori et al. \(2020\)](#), and the American National Longitudinal Study of Adolescent to Adult Health (AddHealth) data following [Feliciano and Lanuza \(2017\)](#). A description of the datasets and analytical samples are provided in the online Appendix. We assess [Condition 3](#) by analyzing the extent to which parental relative education is associated with mechanisms of educational success in the youth sample. We conclude by demonstrating the bias that arises when the conditions do not hold and relative education is used. All analyses are conducted on the full 1.5/2nd generation and 3rd + generation sample, and for a sample restricted to 1.5/2nd generation individuals.

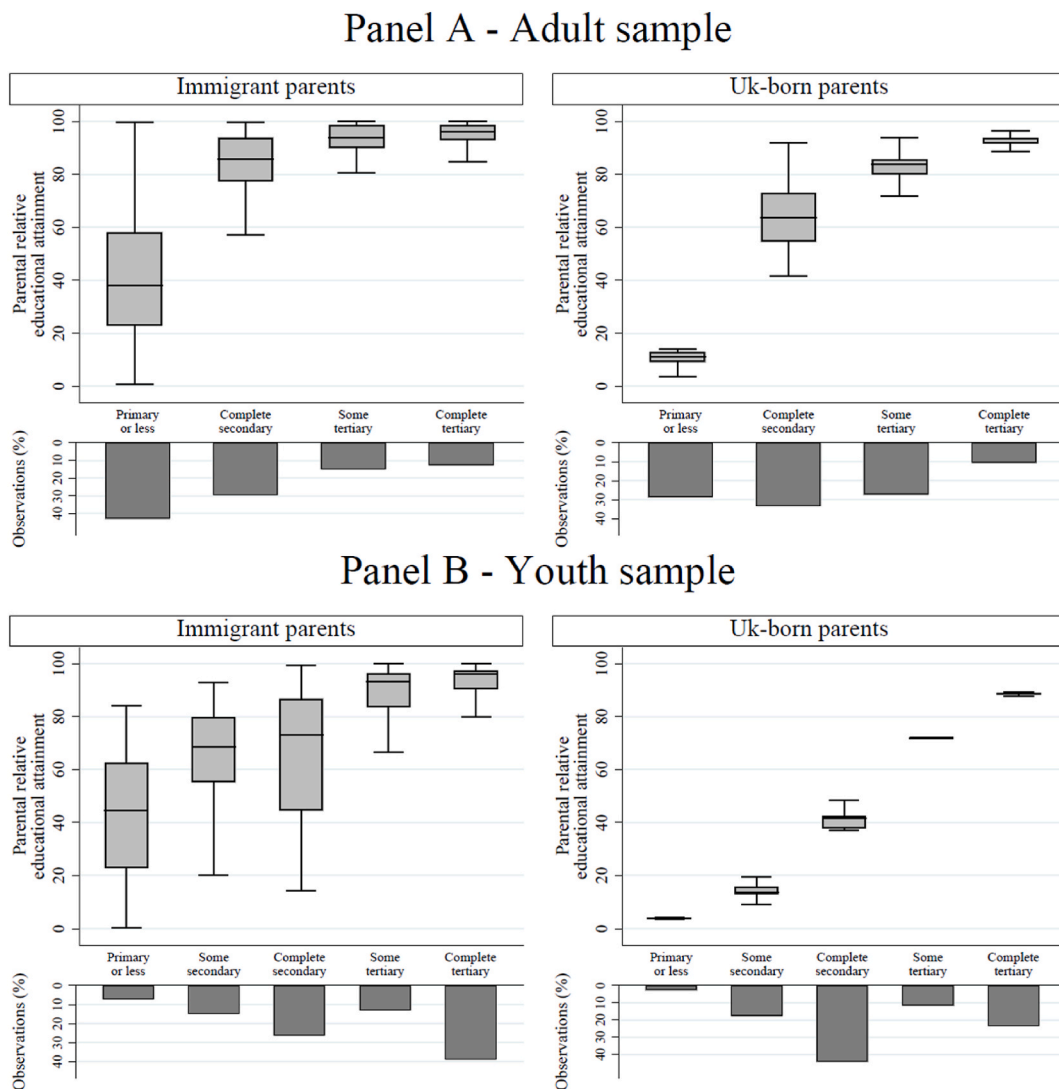


Fig. 4. Distribution of parental relative educational attainment in each category of absolute educational attainment in the Youth and Adult samples. Notes: Adult sample estimates were produced using a randomly selected dataset out of the 20 imputed ones. Statistics are based on the samples of native and foreign-born parents (adult sample: $N = 25,200$ and $N = 2,180$, youth sample: $N = 14,960$ and $N = 1,618$). Box plots represent the 25th, 50th, and 75th percentiles, as well as lower and upper adjacent values of fathers' relative educational attainment in each category of absolute educational attainment. Estimates produced using survey weights and controlling for UKHLS complex data structure.

Source: UKHLS wave 6 adult sample and waves 1–11 pooled youth samples, and [Barro and Lee \(2013\)](#) dataset, own calculations.

4. Results

We begin by establishing unexplained variation in educational outcomes in the UK adult and youth samples. Fig. 2 reports educational attainment in the adult sample and university aspirations in the youth sample by immigrant background and controlling for standard socioeconomic measures, including parental absolute educational attainment. We find substantial unexplained variation in both the adult and youth samples: 1.5/2nd generation adults have a 11-point (on a scale of 100) higher relative educational attainment than 3rd+ generation adults, and the 1.5/2nd generation youth are 10 percentage points more likely to aspire to attend university, net of controls. Moreover, outcomes vary sizably across national origin groups in both samples, although coefficients are not precisely estimated. For example, the children of Bangladeshi immigrants had a relative educational attainment that was about 18 points lower than the children of migrants from other Southern Asian countries. Having confirmed unexplained variation in adult and youth outcomes in models with standard socioeconomic controls, we next assess the necessary conditions for parental educational selectivity to explain remaining gaps.

4.1. Condition 1: describing immigrant parents' educational selectivity

We have already observed that immigrant parents are, on average, positively selected in both the adult and youth samples. Table 1 shows that immigrant parents have a higher relative educational attainment compared to native-born parents, especially in the youth sample. Fig. 3 provides further detail, describing the relative educational attainment for immigrant parents by country or region of origin. Results show that immigrant parents from most world regions are positively selected. For example, 70%–80% of immigrant parents from India and Pakistan had an educational selectivity of over 50%. The distribution for other countries, such as Ireland and Jamaica, was bimodal with both negatively and positively selected immigrants. Distributions were comparable in the adult and youth samples, but the latter included more parents in the top deciles of relative educational attainment.

Overall, our results confirm variation in educational selectivity among the second generation as a whole (Condition 1) but also show the sensitivity of this condition to which sending countries are included. For certain regions, distributions are extremely left-skewed with little or no density for middle and low levels of relative educational attainment. For example, parents from Sub-Saharan Africa in the adult sample had an average educational selectivity of 82%, and only one tenth of them were negatively selected.

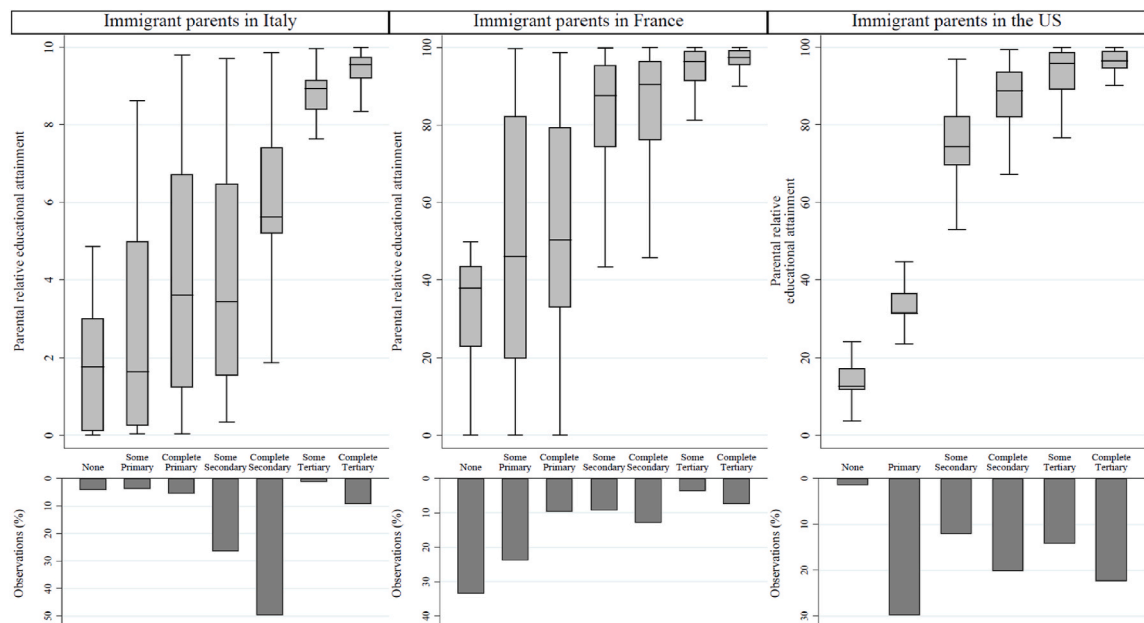


Fig. 5. Distribution of immigrant parents' relative educational attainment in each category of absolute educational attainment in the French, Italian and US samples

Notes: Box plots represent the 25th, 50th, and 75th percentiles, as well as lower and upper adjacent values of parents' relative educational attainment in each category of absolute educational attainment. Estimates produced from analytical samples replicated from Ichou (2014) for France, Brunori et al. (2020) for Italy and Feliciano and Lanuza (2017) for the United States. For a detailed explanation of how these are derived, see the Appendix.

Source: French Trajectories et Origines (TeO) dataset; Italian Social condition and integration of foreign citizens dataset; National Longitudinal Study of Adolescent to Adult Health (Add Health); Barro and Lee (2013) dataset, own calculations.

4.2. Condition 2: variation in parental relative and absolute education

Next, we assess [Condition 2A](#) for our adult and youth samples in [Fig. 4](#), which displays the distribution of relative education within absolute educational categories, for immigrant and UK-born parents. In the adult sample, we found a positive correlation between the absolute and relative educational attainment of immigrant parents ($r = 0.77$), which was similar in magnitude to previous studies [[Engzell \(2019:92\)](#); [Feliciano and Lanuza \(2017: footnote 13\)](#)]. However, Panel A of [Fig. 4](#) shows that [Condition 2A](#) may not be confirmed in the adult sample. The Figure shows that immigrant parents in the top three categories of absolute educational attainment (about 60% of the sample) were highly positively selected: almost all had an educational selectivity of over 80%, with very little variation in relative education in these groups. Almost all of the variation in parental relative educational attainment was in the lowest level of absolute attainment – completing primary education or less – which included the remaining 40% of the sample. In the youth sample, the correlation between the absolute and relative educational attainment of immigrant parents was slightly lower ($r = 0.72$), and the distribution of the two variables was different ([Fig. 4](#) Panel B). Although half of the sample of immigrant parents was tertiary educated, we find that relative educational attainment varied significantly for parents with primary, some secondary, and complete secondary absolute education. This reflects both the greater selectivity of recent immigration policy in the UK as well as the greater variety of immigrant groups in more recent migrant cohorts captured in this sample. Overall, we find greater support for [Condition 2A](#) in the youth sample.

To situate these results, we replicate this analysis with data from the French, Italian and US cases ([Brunori et al., 2020](#); [Ichou, 2014](#); [Feliciano and Lanuza, 2017](#)) in [Fig. 5](#). In the French and Italian samples, the relative educational attainment of immigrant parents varies significantly within each category of absolute attainment and especially in the lower and middle categories where most immigrant parents fall. The American data is much more like the UK adult sample, with small differences in relative education among those with at least a secondary degree and little overlap between the low and moderate-highly educated.

We also investigated [Condition 2B](#) on the covariation of relative and absolute educational attainment of native-born parents in the UK adult and youth samples, as well as in the French and US samples (the Italian data does not contain a representative sample of Italian parents). [Fig. 6](#) shows that the French data covers a wide range of parental birth cohorts during a period of educational expansion, which provides some independent variation in relative and absolute education. [Fig. 4](#) shows that the UK *adult* sample also

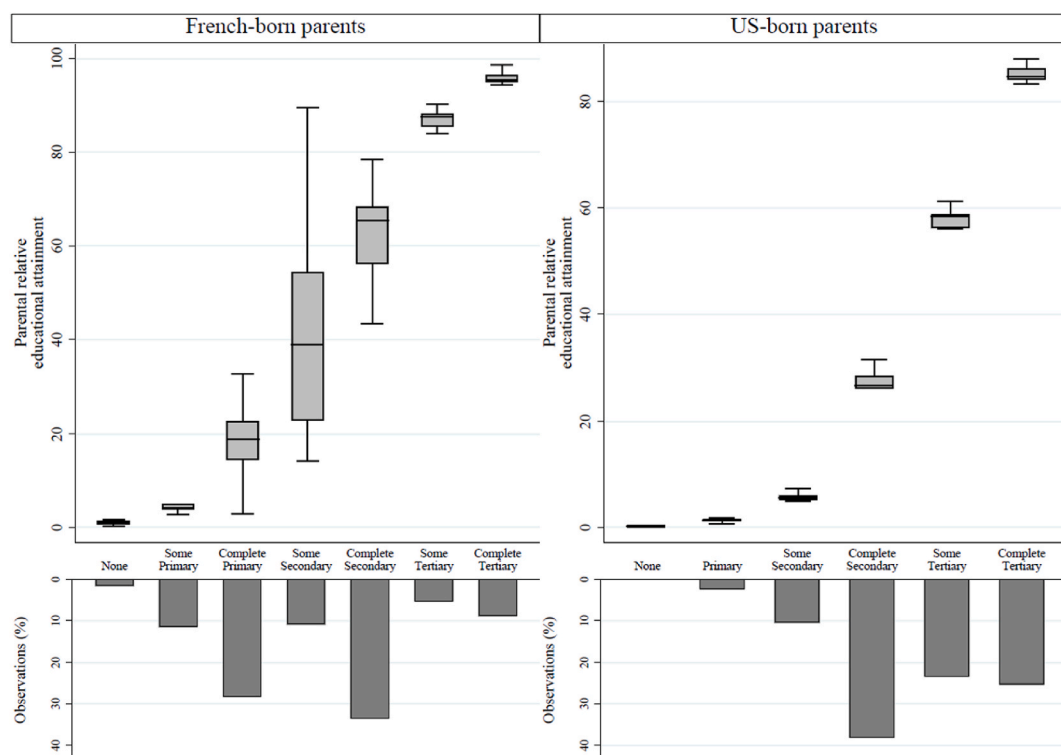


Fig. 6. Distribution of non-migrant parents' relative educational attainment in each category of absolute educational attainment in the French and US samples

Notes: Box plots represent the 25th, 50th, and 75th percentiles, as well as lower and upper adjacent values of parents' relative educational attainment in each category of absolute educational attainment. Estimates produced from analytical samples replicated from [Ichou \(2014\)](#) for France and [Feliciano and Lanuza \(2017\)](#) for the United States. For a detailed explanation of how these are derived, see the Appendix.

Source: French Trajectories et Origines (TeO) dataset; National Longitudinal Study of Adolescent to Adult Health (Add Health); [Barro and Lee \(2013\)](#) dataset, own calculations.

covers a period of educational expansion, so we find a similar pattern but significantly lower variation of relative educational attainment within categories of absolute attainment (the correlation between the two measures was 0.93). In the UK *youth sample*, the relative and absolute educational attainment of UK-born parents are almost perfectly correlated ($r = 0.97$). This violation is even more severe in the US AddHealth data (Fig. 6): as a cohort study focusing on adolescents across only 6 school years, with relatively little variation in parental birth cohorts, relative and absolute attainment are almost perfectly correlated for US-born parents. The authors of this study reported that collinearity was not impacting the estimation of standard errors in their models, and we surmise that this is due to their choice to include a large number of 2.5 generation observations, unlike the other studies reviewed and made possible by the longer duration of mass migration to the United States.

Overall, we find strong evidence that **Condition 2B** is violated in our data and in the US study. This raises concerns about using parental absolute and relative education jointly in a regression on the full sample of 3rd+ generation and 1.5/2nd generation individuals, especially if the former greatly outnumbers the latter in the sample (as is the case in most general use surveys). This is because for these analyses, the majority of the sample will have nearly perfect collinearity in the two key independent variables of interest, absolute and relative education, making it impossible to reliably estimate the regression coefficients of either.

4.3. Condition 3: parental relative attainment and youth outcomes

We next test **Condition 3** on the impact of parental educational selectivity on the educational expectations and school-related behaviors of second-generation youth using the youth sample. Table 2 shows that 1.5/2nd generation youths were 11 percentage points more likely to aspire to university than 3rd+ generation youths (Model 1). After controlling for parental relative educational attainment (Model 3), this gap was reduced by half, and drops to a non-statistically significant difference of about 4 percentage points when controlling for maternal region of origin (Model 4). We next estimated the impact of parental relative educational attainment on university aspirations in the 1.5/2nd generation sample only (Models 5–8). The results of model 8, which includes the full set of controls, suggests that a 10-point increase in parental educational selectivity was associated with a 3 percentage point higher likelihood of children aspiring to university in the 1.5/2nd generation sample. This provides support for **Condition 3**.

We estimated the same models for other youth educational outcomes (albeit on slightly different samples since the variables were not available in all survey waves) and results are presented in Tables A5–A9 in the Appendix. Our coefficients were generally in the expected direction, although they were mostly not statistically significant after including the full set of control variables. Overall, we find support for **Condition 3** for youth university aspirations, while we do not find evidence of a net association between parental educational selectivity and other youth educational outcomes.

4.4. Assessing the use of relative education to explain second generation variation in educational outcomes

In the final section, we examine the use of parental relative education to account for variation in educational attainment among

Table 2

Linear regressions of respondent aspirations to attend university on parents' relative educational attainment and control variables in the youth sample (full sample and 1.5/2nd generation sample).

	Full sample				Immigrant-origin sample			
	1.5/2 nd & 3 rd + generations				1.5/2 nd generation only			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1.5/2nd generation	0.116*** –0.019	0.126*** –0.027	0.066* –0.033	0.037 –0.054				
Parent absolute edu (ref: ≤Primary)								
Some secondary		0.011 –0.063	–0.014 –0.064	–0.015 –0.065		0.121 –0.15	0.158 –0.147	0.148 –0.139
Complete secondary		0.069 –0.062	–0.019 –0.069	–0.026 –0.07		0.153 –0.138	0.17 –0.149	0.153 –0.149
Some tertiary		0.105 –0.066	–0.056 –0.085	–0.071 –0.089		0.117 –0.155	0.146 –0.169	0.121 –0.165
Complete tertiary		0.187** –0.062	–0.012 –0.09	–0.031 –0.096		0.208 –0.157	0.213 –0.166	0.178 –0.174
Parent relative edu (10 pct pt change)			0.025** –0.008	0.028** –0.009	0.036*** –0.005	0.024** –0.009	0.022* –0.01	0.029* –0.013
Observations	8289	8289	8289	8289	809	809	809	809
Respondent and parent controls	No	Yes	Yes	Yes	No	No	Yes	Yes
Origin control	No	No	No	Yes	No	No	No	Yes
Arrival cohort	No	No	No	No	No	No	No	Yes

Notes: Estimates from OLS models. Respondent and parental controls include: respondents' sex, age, number of siblings in the household, an indicator of whether they were born in the UK or not, an indicator for whether both of respondents' parents were present in the household, an indicator for whether their parents came from different countries, and an indicator for whether their parents migrated between the ages of 18 and 25. Estimates produced using survey weights and controlling for UKHLS complex data structure.

Source: UKHLS waves 1–11 pooled youth samples and Barro and Lee (2013) dataset, own calculations.

Table 3

Linear regressions of respondent educational attainment on parents' relative educational attainment and control variables in the adult sample (full sample and 1.5/2nd generation sample).

	Full sample				Immigrant-origin sample			
	1.5/2 nd & 3 rd + generations				1.5/2 nd generation only			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1.5/2nd generation	9.095*** (1.758)	10.984*** (2.760)	7.040* (2.966)	5.464 (4.783)				
Parent absolute edu (ref: ≤Primary)								
Complete secondary		6.417*** (0.976)	−3.438 (2.790)	−4.209 (2.891)		3.775 (5.697)	3.479 (5.087)	3.511 (5.302)
Some tertiary		9.397*** (0.979)	−4.005 (3.580)	−5.033 (3.736)		4.663 (6.201)	2.879 (5.715)	3.643 (5.830)
Complete tertiary		19.120*** (1.240)	3.821 (4.075)	2.631 (4.244)		23.397*** (5.445)	17.615** (5.520)	18.109** (5.953)
Parent relative edu (10 pct pt change)			1.852*** (0.476)	1.989*** (0.500)	2.155** (0.759)	0.701 (1.077)	0.433 (0.936)	0.172 (1.039)
Respondent and parent controls	No	Yes	Yes	Yes	No	No	Yes	Yes
Origin control	No	No	No	Yes	No	No	No	Yes
Arrival cohort	No	No	No	No	No	No	No	Yes

Notes: Estimates from OLS models fit on 20 imputed datasets. Respondent and parental controls include: respondents' sex, age, number of siblings in the household, an indicator of whether they were born in the UK or not, an indicator for whether their parents came from different countries, and an indicator for whether their parents migrated between the ages of 18 and 25. The number of observations varied marginally across the 20 samples - approximately 12,600 for the 3rd+ and 1,070 for the 1.5/2nd generations. Estimates produced using survey weights and controlling for UKHLS complex data structure.

Source: UKHLS wave 6 adult samples and Barro and Lee (2013) dataset, own calculations.

3rd+ and 1.5/2nd generation individuals in the UK adult sample. We compare results for the adult sample, where [Conditions 2A](#) and [2B](#) were not fulfilled, to the results from the youth sample, where [Condition 2A](#) was fulfilled. We also compare results from the 1.5/2nd generation sample and the full sample (also including the 3rd+ generation) for both adults and youth, to demonstrate how including the highly collinear relative and absolute education measures for the 3rd+ generation group impacts our conclusions.

The right-hand panel of [Table 3](#) shows that there is no association between parental and 1.5/2nd generation relative educational attainment, although [Table 2](#) shows that there is a relationship between parental relative education and second-generation educational aspirations. This has a potential substantive and statistical interpretation. On one hand, like the results of [Engzell \(2019\)](#), the fact that most of the variation in relative education in the adult sample is identified from the lower educational categories could mean that despite high aspirations, the parents of these adult 1.5/2nd generation members could not provide the means to attain them. On the other hand, the fact that we observe more variation in relative education for the youth sample ([Condition 2A](#) fulfilled) may explain why we identify an independent effect for the aspiration outcome, but not for educational attainment in the adult sample ([Condition 2A](#) not fulfilled). Unfortunately, we do not have measures for both outcomes for both the adult and youth samples to allow a full comparison.

Turning to comparisons between the full and 1.5/2nd generation samples, we note that in both the youth and adult analyses, the coefficients for absolute education become negative with the addition of relative education to the models for the full sample (see the coefficients change from model 2 to 3 in both [Tables 2 and 3](#)). The negative sign and large uncertainty associated with the coefficients on absolute parental education in Models 3 and 4 suggest that our estimates could be biased by issues of collinearity in the full sample ([Hill and Adkins, 2001](#)). Moreover, whereas parental relative education is significantly associated with educational attainment in the full sample (Model 4, [Table 3](#)) it has no association net of absolute education for educational attainment in the 1.5/2nd generation sample (Models 6–8, [Table 3](#)). Rather, Model 3 in [Table 3](#) with the full set of controls suggest that the strongest predictor of educational attainment for 1.5/2nd generation individuals is whether at least one parent had tertiary education. The children of immigrants with tertiary education had a 16-point higher relative educational attainment (on our scale from 0 to 100).

In [Fig. 2](#) above, we have shown that among the 3rd+ generation, there is insufficient variation in parental relative educational attainment within categories of absolute educational attainment to measure an independent effect of the former (unfilled [Condition 2B](#)). The 3rd+ generation sample is also about ten times larger than the 1.5/2nd generation one in both the youth and the adult samples. These two results together suggest that results in the full sample could be driven by collinearity between parental absolute and relative education in the 3rd+ generation sample.

We tested for multicollinearity in Models 1 to 3 for both the full adult and youth samples using the Variance Inflation Factor (VIF). We found that the VIF was significantly above conventional levels of 10 for parental absolute and relative educational attainment, which confirms the existence of multicollinearity (results available upon request). To further corroborate these results, we ran the same models on new samples composed of the 1.5/2nd generation adult and youth respondents and a random sample taken from the 3rd+ generation respondents. We took the random sample to be double the size of the largest foreign-origin group (the children of Indian immigrants). This guaranteed enough power for the analyses but kept a balance in the relative size of the 3rd+ generation and 1.5/2nd generation samples, so that results are not dominated by the 3rd+ generation sample. Results presented in [Figs. A2 and A3](#) of the

Appendix show that for both adult and youth analyses, the coefficients for relative education are no longer statistically significant when the highly collinear 3rd+ generation population is reduced in size. In line with our results from the analyses of the 1.5/2nd generation only, in this new combined adult sample, parental educational selectivity was not significantly associated with respondents' educational attainment. The 1.5/2nd generation advantage is reduced slightly when we control for parental educational selectivity, although the difference is not statistically significant.

5. Discussion

The educational selectivity hypothesis has gained attention in the migration and social stratification literature, because of its potential to account for the substantial unexplained variation in the education, labor market and health outcomes of immigrants and their descendants (Feliciano, 2020). Along with it, migrant relative education has become the most widely used measure of migrant selectivity in applied research. However, empirical assessments of the link between parental relative education and second-generation educational attainment have been equivocal. We contribute to this evidence base by identifying the necessary conditions for relative education to serve as proxy for relative social position and to test and confirm the selectivity hypothesis for educational outcomes. These include (1) sufficient variation in relative education among and between immigrants and natives; (2) orthogonality between absolute and relative education; and (3) an association between parental relative education and mechanisms of second-generation educational success. We assess these conditions using two representative samples from the UK.

We confirm earlier research which shows unexplained variation in the educational outcomes of the children of immigrants in the UK (Bowe, 2020). We demonstrate the first condition for the use of educational selection as a proxy for variation in relative social standing, demonstrating variation in the relative education of parents in the UK. However, we find limited support for conditions 2A and 2B, on the independence of absolute and relative education in the 1.5/2nd and 3rd+ generation samples. As a result, in analysis of the relative educational attainment of second-generation adults, we cannot identify an independent association between respondent educational attainment, absolute parental education, and relative parental education. Moreover, the violation of Condition 2B combined with the larger size of the 3rd+ generation sample cause significant collinearity issues that produce misleading results.

We find partial evidence for Condition 3 on the pathways between relative education and second-generation attainment. We only observe a positive association between relative education and a single educational outcome – aspirations – and primarily for those with parents with the lowest levels of absolute education (see additional analyses presented in Appendix Table A11). Our findings thus align with existing research from Sweden that demonstrates how relative education varies most among those with the lowest levels of absolute education, with more positive selection leading to higher education aspirations among those lacking the means to support higher educational achievement (Engzell, 2019).

Examining the conditions for the use of relative education as an explanation for multiple educational outcomes, with two different samples from the UK as well for other major immigrant destination countries, our paper gives greater nuance to our understanding of for whom, and under what conditions, relative parental relative education may explain educational attainment. Our work has several implications for this growing field of research. The first is that scholars must attend to the historical and geographic specificity of the use of relative education as a measure of immigrant selectivity. For relative education to be an informative measure for education or migration research, the foreign-born population within a receiving country must contain a high proportion from countries that have recently undergone educational expansion, be extremely diverse in its sending country composition, and/or contain immigrants with a wide range of educational qualifications. The UK and its increasingly selective migration policies have progressively restricted the immigrant population to highly skilled migrants. Moreover, many of them have migrated from countries that have experienced slow educational expansion, making all but the lowest educated very highly selected in terms of educational attainment. Relative education is therefore a poor measure of immigrant selectivity in the British case. Whether these characteristics apply in any receiving country will be a function of current and past migration policy as well as historical relationships between sending and receiving states.

A second implication is for the use of relative education more generally. Our analyses raise concerns about using the measure of parental relative educational attainment for the children of native-born parents. Since native-born parents all come from the same country, their educational attainment is always compared to the same educational distribution. The only variation in their relative educational attainment arises from changes in that educational distribution across birth cohorts. In other words, to have sufficient variation of relative educational attainment independent of absolute educational attainment, one must have a varied sample of native-born parents in terms of birth cohorts, ideally covering a period when the country was experiencing educational expansion. This might not always be available, and will be harder for future research, as the educational distribution of migrant destination countries have become more stable over time.

Researchers must further be attentive to the general educational reproduction system in the receiving country. Our results show how increasing inequality between the highest tertiary educated groups and those with less schooling (Richards et al., 2016) may influence the applicability of relative education as a measure. In cases where the children of parents with the highest attainment levels have categorically different educational outcomes than the rest of the population, relative education may matter less if variation is concentrated in more middling and lower levels of absolute education.

A third implication of work is the need to explore new measures of immigrant selectivity. In the end, we continue to believe that unexplained variation in second generation educational performance in many countries, including the UK, may be related to migrant selectivity: the children of immigrants in the UK have consistently outperformed the children of UK-born parentage for several decades, even during periods where low skilled migration dominated. However, this success might simply not be related to the measure we use - relative education – but rather selectivity on other characteristics such as grit or determination [although see contradicting evidence in Polavieja et al. (2018)]. While it is beyond the scope of this paper to evaluate other measures, we plan to assess measures of

selectivity in health and values in the future.

Our analyses come with some limitations. First, some key variables in our analyses had to be imputed in the adult sample because of missing data, although we ran several robustness checks and alternative matchings with the Barro-Lee dataset to confirm our findings. Second, we could not test all conditions on the same sample, as we only observe aspirations and behaviors among second generation youth, and final attainment among a separate group of second-generation adults. Moreover, the youth sample had additional limitations, such as the high rate of missing data on key variables for fathers in the sample. At the same time, observing the two samples offers advantages because we could compare different cohorts of immigrant parents in the UK and observe how educational selectivity has changed over time. Future research on the topic should use longitudinal data to investigate how parental selectivity impacts second generation educational outcomes over the life course.

Based on our findings and this discussion, we propose some guidelines for future research adopting the measure of educational selectivity. First, we recommend that our three conditions be verified in the specific sample being used by applying the general tests that we have provided. [Conditions 1 and 2](#) should be addressed before running any models to verify that results can be reliably interpreted. [Condition 3](#) should be tested to verify some of the mechanisms underlying the impact of educational selectivity and confirm its validity – either using intermediate variables such as aspirations for education research, or other mechanisms appropriate to the immigrant or second generation stratification outcome being explained. Second, we encourage particular attention to [Condition 2B](#) and careful considerations on whether it makes sense to use both parental absolute and relative education in models including the children of foreign- and native-born individuals. Third, and more generally, we suggest that researchers should reflect about the historical and geographic specificity of the context they are investigating when investigating the role of educational selectivity.

As the size and proportion of the population with an immigrant background continues to grow in the UK, as in many other countries, there is an increased recognition that standard socioeconomic transmission models may need to be altered to accommodate sending country characteristics and other features of the migration process. The selectivity hypothesis is one promising avenue of this larger endeavor, and it is important to document its underlying conditions and assess in which cases these will hold. This paper provides the first such assessment, hopefully paving the way for further work looking across birth cohorts, migration regimes and receiving countries.

CRedit authorship contribution statement

Alessandro Ferrara: Writing – review & editing, Writing – original draft, Visualization, Methodology, Formal analysis, Data curation, Conceptualization. **Renee Luthra:** Writing – review & editing, Writing – original draft, Methodology, Formal analysis, Data curation, Conceptualization.

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Appendix A. Supplementary data

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