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Abstract

How immigrants and their families fare after settling in a destination country is a question of great policy relevance. It is increasingly recognized that integration is multidimensional and can only be assessed by taking a long-run perspective, beyond the study of adult immigrants. Because adult immigrant trajectories after arrival may be due to selection or reverse causality, studies of immigrants who migrate as children (G1.5) and the native-born children of immigrants (G2), enable researchers to understand the link between exposure to destination—based on age at arrival or generational status—and individual integration-related outcomes. Prior research suggests that age at arrival is a key determinant of different outcomes that may be seen as markers of integration, but has either focused on single outcomes or outcomes at one stage in life. Here we seek to establish the link between migration background—age at arrival, country of birth and reason for migration—and early adult life course trajectories across multiple domains of life, including education, work, and family formation. We use latent class analysis, generalised linear models and family fixed effects to analyse administrative data for the whole population of Sweden, giving a study population of more than 118,000 members of G1.5 and G2. Results suggest that the descendants of immigrants follow broadly one of four different trajectories: 'high SES', 'medium SES', 'low SES', and 'early childbearing', where the latter are a particularly disadvantaged group, especially at younger ages. Increased exposure to Swedish society is associated with increased likelihood of following a more advantaged life course trajectory, even after controlling for family fixed effects. Our study highlights patterns of early adult disadvantage among the children of immigrants and refugees and how they vary across multiple domains of life.

Keywords: *Integration, adaptation, children of immigrants, children of refugees, age at arrival, generation 1.5, second generation, life course trajectories, education, work, family formation, latent class analysis, family fixed-effects, Sweden*

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Introduction

Enabling the successful integration of immigrants is a fundamental challenge for high-income societies across the globe. In Europe, immigrant integration has emerged as an increasingly pressing issue on the political agenda. However, it is increasingly recognised that integration is a complex concept (Drouhot & Nee, 2019a) and scholars have defined and operationalized integration in a number of different ways (Garcés-Mascareñas & Penninx, 2016). Various scholars have moved away from what might be seen as a normative framework and deployed definitions that lend themselves to analytical investigation (Boswell & D'Amato, 2012; Esser, 2004; Heckmann, 2005). The European Commission defines integration as a multidimensional two-way process covering rights and obligations of both the individual immigrant and the destination society (European Commission, 2016). Building on this and similar definitions (OECD, 2015), policy makers are increasingly recognising that integration cannot be described fully by focussing on one domain of life, but can only be understood by comparing and contrasting different domains. At the same time, integration cannot be evaluated comprehensively by examining these domains at only one point in time due to the dynamic nature of the life course (Kulu & González-Ferrer, 2014). As such, there is a need for research that takes a holistic longitudinal view of the lives of immigrants and their children, particularly in order to develop theories of integration and to identify how best to design policies to reduce immigrant inequalities.

The idea that integration is multidimensional, and that multiple domains of life need to be incorporated to explore its causes, is not new. Researchers have provided overviews of immigrants' lives before, not only for countries in North America (Bean & Tienda, 1987; Massey, 1981; Waters & Jiménez, 2005) and Europe (Heckmann & Schnapper, 2003), but also comparisons across all OECD countries (OECD, 2015). However, the difficulty of measuring integration has meant that progress has been impeded by a scarcity of common measures (Harder et al., 2018). Here we address this shortcoming by attempting to operationalize a pragmatic definition of integration, which is focussed on parsimony and replicability, as opposed to being comprehensive. Rather than trying to measure all aspects of integration, at all points in time, we narrow our focus to study what we refer to as 'early adult integration trajectories across life course domains'. Prior research often uses single indicators to discuss and evaluate integration. For example, the OECD (2015) assess integration using single indicators relating to work, education, poverty, housing, health, civic engagement and social cohesion. Here, we take some of the most prominent of these single indicators, that measure different domains of life, and combine them using latent class analysis. In this manner, we take a multidimensional perspective, while also addressing the difficulty of estimating "universal" measures of integration that can be used across contexts. We also build upon prior research by taking a longitudinal perspective, thereby going beyond the vast majority of multi-domain comparisons, which are cross-sectional and do not cover developments over time in individual immigrant's lives. As argued elsewhere (Drouhot & Nee, 2019b), there is a need for more longitudinal (life course) research, not least because the integration of immigrants is based on how their behaviour and experiences change over time, alongside the prevailing conditions in their destination context.

In an effort to better understand the persistence of disadvantage among immigrants, and how they adapt to life in a new destination after arrival, scholars have not only focused on immigrants, but also on their children. Some have gone so far as to suggest that the only way to understand the legacy of immigration, and the persistence of immigrant inequalities over the long-run, is to examine the lives of descendants of immigrants (Hirschman, 2005; Portes & Rumbaut, 2001). Many researchers expect that the children of immigrants will be less likely to experience disadvantage compared to native-born to native-born parents – and more likely to converge toward the destination average – than their parents do because they experience greater exposure to the destination (including people and institutions), as compared with their parents (Alba & Nee, 1997). The same reasoning lies behind the expectation that childhood immigrants who arrive earlier in life (e.g. in infancy) will be more likely to resemble the ancestral native-born than those who arrive later in their childhood (e.g. as teenagers). A fundamental question is therefore whether increased exposure to the destination context predicts differences in life course trajectories.

Studies of immigrants' children also offer a unique opportunity to gain insights about theories of immigrant integration, not at least because avoid issues such as self-selection into migration (Adserà et al., 2012; Adserà & Ferrer, 2014). Thanks to the results of several studies in high income countries (Adserà et al., 2012; Åslund et al., 2015; Beck et al., 2012; Bleakley & Chin, 2010; Guven & Islam, 2015; Hermansen, 2017), it is known that age at migration is a determinant of immigrant outcomes in different domains. This evidence is based on studies of immigrants who arrived as children (G1.5), who are advantageous to study because their migration is not endogenously related to their adult outcomes. For example, it is much easier to study fertility convergence by focusing on the G1.5 (Mussino et al., 2021; Tønnessen & Wilson, 2020). This is because patterns of adult immigrant fertility behaviour close to that of ancestral native-born, may be due to selection, including the anticipation of migration and/or delays in birth timing. However, despite what we know about the link between age at arrival and early-adult outcomes, prior research has either focussed on singular outcomes, or on outcomes at one stage in life, for example at age 30 (Hermansen, 2017).

In order to address the aforementioned gaps in knowledge, we are interested in understanding whether children of immigrants fall into distinct life course trajectories (classes) across domains. This is important because it can help identify the links between patterns of disadvantage across multiple domains, and how these vary over the life course, including to show whether disadvantage is more temporary or permanent. Our first research question (RQ1) is therefore explorative. The rest of our investigation (RQ2-RQ4) examines the extent to which migration background—age at arrival, country of birth and reason for migration—are associated with early adult life course trajectories. More specifically, our research questions are as follows:

RQ1. What are the different types of early adult life course trajectory that are experienced by the children of immigrants?

RQ2. How does exposure to a destination country (Sweden), as measured by the age at arrival, determine the life course trajectories of children of immigrants?

RQ3. What is the role of country of birth in determining the life course trajectories of children of immigrants?

RQ4. Does reason of migration, in particular refugee background, also play a role in determining the life course trajectories of children of immigrants?

To answer these questions requires longitudinal data that links migration background with time-varying information on multiple domains of life. It also requires that there are a large enough number of children of immigrants to examine specific aspects of migration background—such as age at arrival and country of birth—as well as to enable robust statistical analysis, for example via the estimation of family fixed effects models. These requirements pose strict limits on the data that can be used, and consequently on the contexts that can be studied. In fact, Sweden is one of the few countries of the world in which such a study could take place.

Despite policies that support immigrant integration, and guarantees of equal access to most spheres of society, immigrants to Sweden and their children are known to experience inequality (Bevelander, 1999; Bevelander & Pendakur, 2014; Pettersen & Ostby, 2013). Many prior studies have examined single domains of life for immigrants or their children, typically comparing these against the same domain for the Swedish-born population (or children of the Swedish-born). However, far fewer have made longitudinal comparisons across domains, especially alongside an examination of the role of migration background in determining patterns of disadvantage across the early adult life course. For example, a multidimensional approach would appear to be crucial if we are to gain a more thorough understanding of how exposure to destination determines life course trajectories. Moreover, as argued by recent research (Zhou & Gonzales, 2019), there is a need for more research that makes within-group comparisons in order to understand heterogeneity between the life course trajectories of different children of immigrants.

In the analysis that follows, we generate a summary measure of how five domains of life vary over the early adult life course. We not only analyse outcomes that are typically seen as measures of integration – relating to education, employment and social welfare – but also outcomes that are a key part of the integration process. We include citizenship, which some researchers see as a measure of civic engagement (OECD 2015), and others see as an integral determinant in a process of social and cultural assimilation (Drouhot & Nee, 2019b). We also include family formation, which here represents a measure of early childbearing (given that we focus on ages 30 and under, and the mean age at first birth was 29 for Swedish women between 2001 and 2018). We argue that the inclusion of family formation creates a richer picture of 'early adult integration trajectories across life course domains', not only because it is interrelated with the other indicators, but also because early childbearing is associated with disadvantage, both in general (Leonard & Stanley, 2020; Waldfogel, 1997) and for the children of immigrants (Rumbaut, 2005).

By generating a multidimensional measure, we believe that we can gain insights that go beyond those that can be gained by examining each of these indicators individually. In the first step of our analysis (our measurement model), we use latent class analysis (LCA), to analyse administrative data for the whole population of children of immigrants in Sweden who were born between 1972 and 1986 and observed at all ages from 20-30. In the second step of our analysis we use generalised linear models and family fixed effects to examine the link between migration background—age at arrival, country of birth and reason for migration—and life course trajectories across multiple domains of life. For the children of immigrants who were born abroad and arrived in Sweden as children (G1.5), we examine the role of age at arrival (during childhood) in determining life course trajectories. We also examine the role of country of birth and reason for migration, not least because we expect these to be sources of heterogeneity. For the children of immigrants who are born in Sweden (G2), we expect to see similar trajectories to the G1.5 who arrive at early ages (e.g. as infants), essentially because all G2 individuals have the same exposure to the destination.

Theoretical approaches

Over the past decades, many European countries have considered how to ensure that newly arrived immigrants can settle in their destination. This process of integration is complex, such that it has been theorised using a diverse range of conceptual frameworks and many divergent definitions. There is increasing consensus, however, that integration cannot be described by any one characteristic, but is instead a combination of a number of different aspects of life that require efforts in many policy areas (European Commission, 2016). Recent research has argued that the absence of a 'standard' measure of integration has impeded progress in both research and policymaking (Harder et al., 2018). As a reaction to this gap, researchers have begun to create instruments that can be applied across time and space to measure how newcomers fare in their new destination.

Integration is a *process* that occurs over time and across generations. As such, it occurs in tandem with life course developments that young adults experience. A life course approach recognizes that the timing of events are likely to impact subsequent life events and therefore need to be analysed over time (Elder, 1985; Mayer, 2009). In essence, this approach is interested in when, during the individual's life course, social disadvantage materialises, and how this is linked with migration background. Given that integration can only be achieved over time, it is vital to analyse integration issues taking a life course perspective. Taking a life course approach for demographic outcomes and has gained ground due to its many advantages. When considering educational the domains we examine here—such as education, employment or family formation—a life course approach has been shown to provide the theoretical foundation for understanding immigrant integration (Kulu & González-Ferrer, 2014). This is for several reasons, but not least because different domains of life are interrelated. For instance, an individual's decision to pursue higher education, or her labour market trajectory, is well-known to be associated with her timing of first birth (for example see Andersson & Scott, 2005 for evidence relating to Sweden, 2007).

The advantages of a life course approach for the study of demographic behaviour in general, apply equally to immigrants as well, but can also provide several additional benefits.

By definition, immigrants have had a specific life course event—an international relocation—that may greatly impact the timing and realisation of other life course events. In addition, for immigrants, the timing of life course outcomes are likely to relate to the timing of migration in the destination country. For example, with respect to immigrant fertility, a growing literature has used a life course perspective to show the interdependence between migration and childbearing (Toulemon, 2004). In another example, Wingens et al. (2011) state that questions regarding integration are directly linked to life course processes, whether integration is studied across one generation (in terms of individual trajectories) or by comparing two generations (Wingens et al., 2011). Nevertheless, most investigations into immigrants' position after migration refer to specific demographic events, such as timing of first birth (Andersson & Scott, 2005; Gonzalez-Ferrer, 2005), and there remains a lack of studies that examine multiple domains simultaneously in order to understand how immigrant life trajectories develop and are determined by migration background.

When considering integration through a life course lens, studying the children of immigrants has many advantages. While adult migrants may be disrupted in for instance their family formation and labour market trajectories, these are processes that can be captured in full by focusing on children of immigrants (G1.5 and G2). Children of immigrants are also less likely to be selected into specific life course trajectories based on their migration history because they are much less likely to be the decision-makers behind a migratory event. Another advantage of studying children of immigrants, specifically those who are born abroad (G1.5) is that unlike other groups of immigrants' descendants, such as G2, who are born in the destination, G1.5 arrive at different ages. This source of within-group variation enables researchers to examine the role of exposure to a destination, as well as the role of arrival at critical ages. Here, the G1.5 are defined as those who arrive between 0 and 18 years of age.

Choosing multiple indicators

Migration scholars and others have examined various indicators that might be seen as measures or markers of integration. In order to create a multidimensional measure of 'early adult integration trajectories across life course domains' we therefore need to try and select from these indicators. In the following section we discuss how we have derived our selection, while also discussing prior research on single indicators, with a focus on prior research in Sweden. Rather than aiming to be comprehensive, we merely seek to provide enough background knowledge to help the reader evaluate our indicators and how they may contribute toward our multidimensional measure.

Education

Educational attainment and success is one of the most studied outcomes for childhood immigrants. In general, previous studies have found that first generation have worst outcomes compares to natives. However, findings about the second generation are less clear, with some groups (e.g. children of Asian immigrants) outperforming children of the native-born in both Europe and US (Heath et al., 2008; Kao & Tienda, 1995). Böhlmark (2008), studying childhood immigrants in Sweden, finds that age at arrival is a strong negative predictor of school grades, in particular for children who arrive after 8-years-old. However, only considering early

achievements may provide a misleading picture, as childhood arrivals caught up when considering long-term educational achievements (Böhlmark, 2009). Similar evidence is found for Norway, where Hermansen (2017) finds a stronger disadvantage for education (and other economic outcomes) in adulthood among those who arrive later in childhood (compared to earlier). He also reports that this effect of exposure is stronger among those who arrive from more distant regions with lower economic development. In Finland, there are substantially lower levels of attained education among immigrant children than children of the Finnish-born (Ansala et al., 2019). These authors argue that differences stem from lower parental incomes and poorer neighbourhood quality among children of immigrants.

Employment and other labour market outcomes

In most OECD countries, immigrants have lower employment rates and weaker labour market attachment than the native-born population (OECD, 2019), which is especially apparent when considering probabilities of entering the labour market (van Tubergen et al., 2004). Key determinants of entering and remaining in the labour market are language acquisition, context-specific knowledge, and social networks that may increase with longer time in the destination country (Borjas, 1985; Chiswick, 1978; Helgertz, 2010). Some previous studies compare different groups of immigrants on the basis of their reason for migration. This makes sense, as there are strong selective forces impacting differences between economic migrants and refugees (Birgier et al., 2016; Connor, 2010; Ortensi, 2015). Much of the literature concerning the labour market attachment of second generation immigrants had focused on intergenerational economic mobility (Solon, 1999). Previous studies of Sweden found that the second generation have higher risks of being unemployed, even if when they have same socio-economic characteristics and the same family background (Behtoui, 2004; Rooth & Ekberg, 2003).

Receipt of social welfare/benefits

Most studies on the economic integration of children of immigrants focus on income, earnings and employment. There is less research on the receipt of social welfare and benefits. Several studies in Sweden have focused on different usage of social insurance among immigrants, such as parental leave (Mussino & Duvander, 2016), sick leave benefits (Bengtsson & Scott, 2006) or disability pensions (Österberg & Gustafsson, 2006). With respect to social welfare linked to housing and income poverty, immigrants in Sweden are often more likely to receive these benefits because they are often more likely to be living in poverty (Obućina, 2014). In Sweden, immigrants have a higher probability of receiving social welfare than the Swedish-born population, and this difference actually increases with longer duration of residence in Sweden (Hansen & Lofstrom, 2009). In Norway, older arrivals have higher risk of being on social welfare assistance and this pattern was stronger among those arriving during adolescence than among childhood arrivals (Hermansen, 2017).

Family formation

The timing of childbearing and number of children born to immigrants and their children is often different from the mainstream norm (Kulu & González-Ferrer, 2014). Researchers have studied these differences for a variety of reasons, not only to understand the contribution of immigrants to overall fertility patterns in the destination, but also because for most people the

transition to parenthood is a significant life event, with material impacts on other domains of life (Rumbaut, 2005; Waldfogel, 1997). Researchers have therefore tried to understand the role of migration background in determining individuals' childbearing behaviour, and this includes studies of age at arrival for children of immigrants (Adserà et al., 2012; Adserà & Ferrer, 2014; Mussino et al., 2021).

Citizenship

Citizenship can be considered a measure of long-term integration (Mossaad et al., 2018), partly because it eliminates legal differences between children of immigrants and the mainstream population. The benefits of Swedish citizenship include the fact that only Swedish citizens have an absolute right to live and work in the country, the right to vote in the elections for the Swedish Parliament, and the right to join certain occupations, for example the police or armed forces (Swedish Migration Agency, 2022b). Beyond this, those who have a permanent residence permit have the same rights and obligations as Swedish citizens. Citizenship differs from the other indicators because Sweden (like most countries) has a time restriction before citizenship can be attained. In general this is 3-5 years. It also differs because some children of immigrants may be entitled to citizenship automatically, depending on the legal framework in the destination country. For children of immigrants born in Sweden, citizenship is only automatically granted if one parent is Swedish-born (i.e. for the G2.5 who are excluded from this study). However, it is relatively easy to obtain citizenship, especially before the age of 18 (Swedish Migration Agency, 2022a). Various types of determinants of citizenship have been explored in a European context and for different groups of immigrants. Higher education and having attained that education in the Netherlands is positively associated with attaining citizenship among refugees (Bevelander & Veenman, 2006). Evidence suggests that citizenship is a predictor of other favourable outcomes. In Canada and Sweden, acquiring citizenship is associated with higher earnings, especially among women (Pendakur & Bevelander, 2014). Using a quasi-experimental approach in Switzerland, (Hainmueller et al., 2017) find that naturalisation does have a positive effect on social integration. Wage premiums of naturalisation have also been found in Germany (Steinhardt, 2012).

Data

The data that we use for this research is whole-population register data for Sweden. More specifically, we use the Migrant Trajectories register data that are available for analysis by researchers at the Stockholm University Demography Unit (based on ethical approval granted in 2017). These data enable us to study the population who were resident in Sweden from 1968-2017. Data are stored at Statistics Sweden and can be accessed via SCB's micro-online access system MONA. Members of the population enter the register when they are born (if they are born in Sweden) or when they receive a resident permit or register their immigration (which is required in order to live in Sweden, and coverage of the population is close to 100% because it is very difficult to live in Sweden without registering – e.g. it is impossible to access public services or hold a bank account). All members of the population have a unique person number, which is available in our data in an anonymized format.

Swedish population registers collect all demographic events, including the date of the event. Children can be linked to their parents using a register of personal identification numbers (as long as the parents have lived in Sweden, either now or at some point in the past). This enables us to distinguish between child migrants (G1.5, who migrated to Sweden as children, aged 0-18) and the second generation (G2, who we define here as those born in Sweden with two foreign-born parents). In order to facilitate our within-group comparison of the children of immigrants by exposure to destination, our study population excludes all other immigrant and native-born groups. We exclude all children of those who are Swedish-born, including those who have both Swedish-born and foreign-born parents (sometimes called G2.5). By excluding these children, we believe that we are better able to compare the children of immigrants who are born abroad with those who are born in Sweden (in absence of differences due to having a Swedish parent). Similarly, this also makes it easier to interpret our findings by age at arrival, country of birth and refugee status. That said, we acknowledge that our findings may not to generalise to the groups who we exclude.

We focus on the early adult life course trajectories of children of immigrants across a range of indicators that are recorded annually in our data: (a) years of completed education, (b) whether employed or not (based on income from work), (c) whether receiving any social welfare or not (based on two different types of benefit), (d) number of children ever born, and (e) whether a Swedish citizen or not. Data on these outcomes are all taken directly from administrative registers. We note that receipt of social benefits is calculated by combining information on housing benefit (*bostadsbidrag*) and social assistance (*socialbidrag*).

Our data measure these indicators from 1990-2016, and we choose to focus on ages 20-30 (such that these ages represent early adulthood in our study). For these reasons, our study population includes only those women and men who were born 1972-1986 (i.e. those who were observed at all ages 20-30 within the period 1990-2016). Moreover, we include only those women and men who were born 1972-1986, and who were alive and resident in Sweden from age 20-30. This makes our results easier to interpret (e.g. when comparing G1.5 and G2), albeit at the potential cost of generalisability (although we return to this issue in the discussion). From this population we then drop all those who are missing maternal or paternal country of birth (less than 4%), the foreign-born with any Swedish-born parents (less than 0.4%), and the Swedish-born with any Swedish-born parents (more than 90%). Of the remaining population, we exclude approximately 7% who are missing data in at least one year for at least one indicator (where the greatest source of missingness is due to missing data on education). As a result, our final study population includes more than 118,000 individuals, 59,637 who were born abroad (G1.5) and 58,734 who were born in Sweden with at least one foreign-born parent (G2).

Method

Measurement models

Our analysis makes use of latent class analysis, generalised linear models and family fixed effects. The first stage of our analysis was to create a ‘measurement model’ to describe the life course trajectories of our study population. To do this we used latent class analysis (LCA) as a means of classifying each member of our study population into several groups (classes) based

on the observation of each of their outcomes at different ages between 20 and 30. Our approach is exploratory, in the sense that the classes are driven entirely by relationships in the data, rather than subject matter knowledge. However, we decided a priori to limit the number of classes to a parsimonious number, rather than allow our modelling strategy to be determined by information criteria (e.g. AIC or BIC) as in some other applications of LCA. The main reason for this was to avoid the estimation of more classes than domains. Given that we have five domains, we therefore had an a priori preference for four classes or fewer, although we were also interested in the extent to which additional classes might distinguish between trajectories of the same domain.

Our measurement models include 55 manifest variables because we measure five domains over eleven different years of age (20-30). Given that our aim is not to model time-interdependence (or domain-interdependence), but rather to let the latent class analysis classify individuals according to their life courses. As such, we do not model the interdependence between different age-specific measures of each outcome (or different domains), but rather we allow LCA to generate classes while accounting for the correlation between outcomes (by year and domain). LCA enables us to jointly estimate an unobserved (categorical) latent variable (Bartholomew et al., 2008; Hand, 1996, 2004), which in this case measures early adult life course trajectories. Here, we estimate a general latent class model using a mixture of (continuous and categorical) distributions for the manifest variables (Masyn, 2013; Nylund et al., 2007). Years of completed education and childbearing are both modelled as continuous variables, while the other domains are all modelled using binary indicators, such that we model whether individuals are employed (or not), receiving any social welfare (or not), and have Swedish citizenship (or not). All analysis for the measurement models (LCA) was carried out using Mplus version 8.6.

Predicted probabilities and structural models

Having finalised our classification, the next step of our analysis is to summarise these results (e.g. see the *Results* section), in particular by creating predicted probabilities of class membership for everyone in our study population. After assigning everyone to their most likely predicted class, we then use this as a variable for analysis. We use generalised linear models to examine how migration background is associated with the predicted membership of different latent classes. The first aspect of migration background that we examine is age at arrival, using models that include controls for birth cohort and sex. We then estimate very similar models using family fixed effects, which are based on a comparison of siblings with the same biological mother (e.g. as in Insert 1), including controls for birth cohort, sex and birth order. The use of within-family comparisons has the advantage of controlling for (observed and unobserved) factors that are shared between siblings, including reasons for migration and parental characteristics. Age at arrival is only observed for G1.5, but our analysis of age at arrival includes G2, in part because they enable us to identify the effects of age at arrival in family fixed effects models conditional on birth cohort (Wilson et al., 2021), but chiefly because they are a useful comparison group. In our study, all of the G2 have spent their entire life course in Sweden (we exclude those who die or emigrate before age 30), and should therefore be most similar to the G1.5 who arrive at younger ages if exposure to destination is a principle

determinant of life course trajectories. Having examined this, and the role of age at arrival more generally, we then explore whether particular origin countries and reasons for migration are linked to disadvantage for the multidimensional measure of early adult life course trajectories that we generate. Except for the measurement models, all analysis used Stata v17.

Results

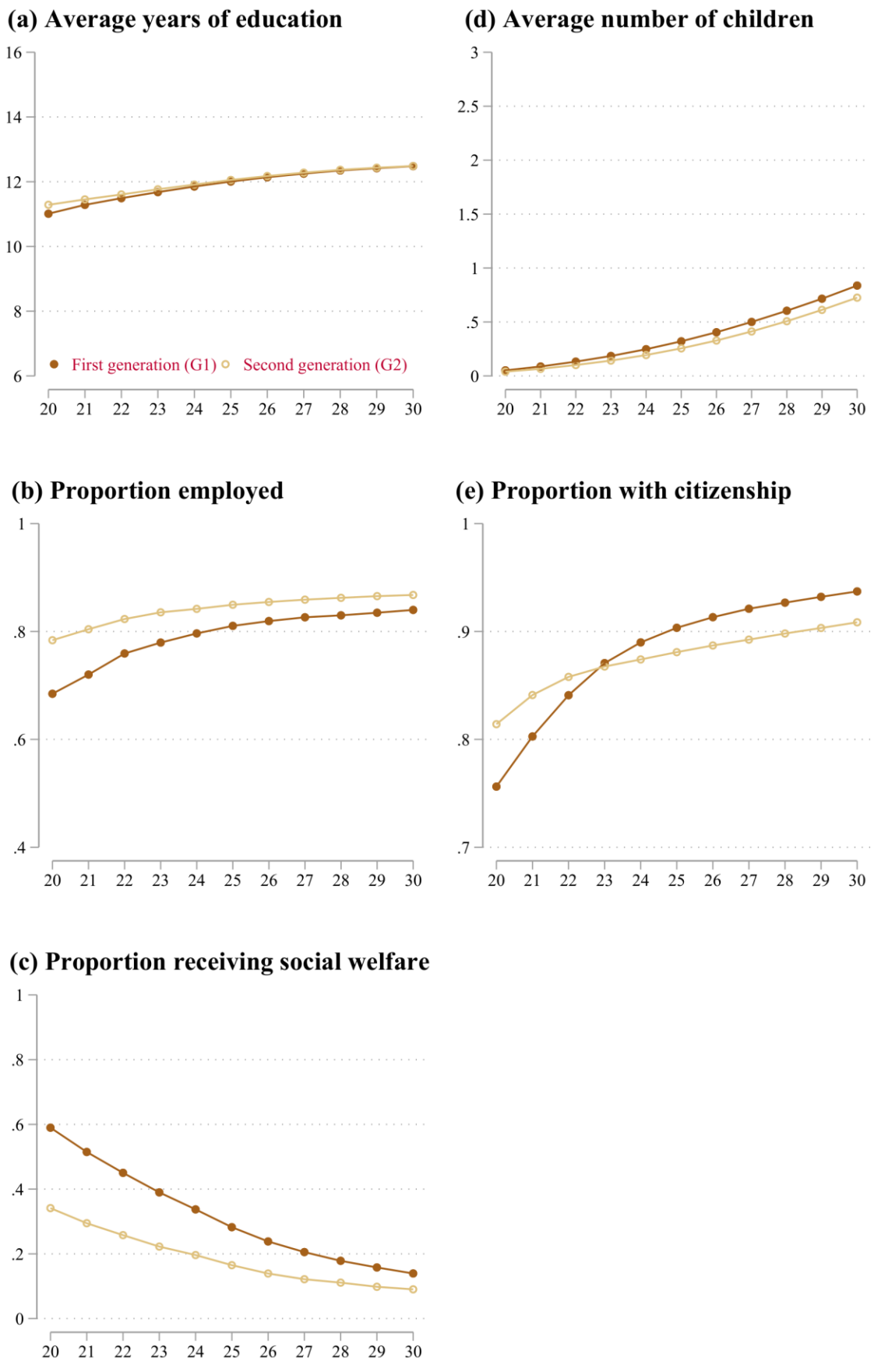
The majority of our analysis focuses on children of immigrants who were born abroad (G1.5), although we also make use of comparisons with the second generation, in particular in order to understand the role of exposure to Sweden in determining life course trajectories. The composition of G1.5 by country of birth is detailed in Table 1. Given that the analysis focuses on those who were born between 1972 and 1986, (because we require all members of our study population to be observed at all ages from 20-30 between 1990 and 2016), the composition largely reflects immigration to Sweden toward the end of the 20th Century. The largest foreign-born group is Iranians, followed by Bosnia-Herzegovina, the rest of Former Yugoslavia, Iraq and Chile. We examine variation in multi-domain life course trajectories by country of birth later in this results section.

Table 1: Immigrants who arrived as children (G1.5) by country of birth

Country	n	Country	n
Iran	8,128	Central America and Caribbean	436
Bosnia-Herzegovina	6,796	Pakistan and Bangladesh	399
Former Yugoslavia *	6,709	UK and Ireland	294
Iraq	5,219	China	293
Chile	4,045	North Africa (except Egypt)	286
Turkey	3,807	Iceland	193
Lebanon	3,773	Former Czechoslovakia	185
Finland	2,225	India, Nepal and Bhutan	159
Syria	2,022	South-East Asia and Pacific (other)	125
Poland	1,948	Sri Lanka	117
Vietnam	1,519	East Asia (other)	103
Romania	1,461	Spain and Portugal	100
South America (other)	1,260	Greece and Cyprus	89
Somalia	852	USA and Canada	81
East Europe (other)	760	Egypt	65
Ethiopia	713	Philippines	59
Denmark	680	Netherlands	57
Africa (other)	669	France, Belgium and Luxemburg	55
Germany, Austria and Switzerland	644	Estonia	49
Afghanistan	571	Italy and Malta	47
Hungary	563	Korea	38
Middle East (other)	521	Thailand	37
Norway	494	Brazil	30
Bulgaria	461	Latvia and Lithuania	27
Eritrea	452	NZ and Australia	21

** Except Bosnia-Herzegovina*

Figure 1: Average outcomes for G1.5 and G2 by age



The average outcomes for all G1.5 are shown in Figure 1, alongside the average for G2. This figure not only shows variation across each domain but also across the early adult life course. For several outcomes—education and childbearing—there is relatively little difference between G1.5 and G2. On average, G1.5 are less likely than G2 to be employed, and more likely to receive social welfare, especially in their early 20s. They are also less likely than G2 to have Swedish citizenship up until age 23, after which they are more likely.

The measurement model

In the first stage of our analysis we use LCA to estimate a measurement model for the entire study population—all members of G1.5 and G2. As outlined in the methods section, our measurement approach is exploratory. Initially, we examined different models specifications, varying the number of classes and the number of time-points (e.g. annual observations versus observations every 1, 2, 3, or 5 years). As a result of this initial modelling, we chose an LCA model with four classes, based on yearly observations of each of the five outcomes. That said, we note that models with fewer time periods yielded similar results in terms of class membership (although they were more likely to be estimated with uncertainty, potentially due to empty cells in the joint distribution). Information criteria are not included here because these were not used as the primary means of guiding our final choice of number of classes.

The four classes

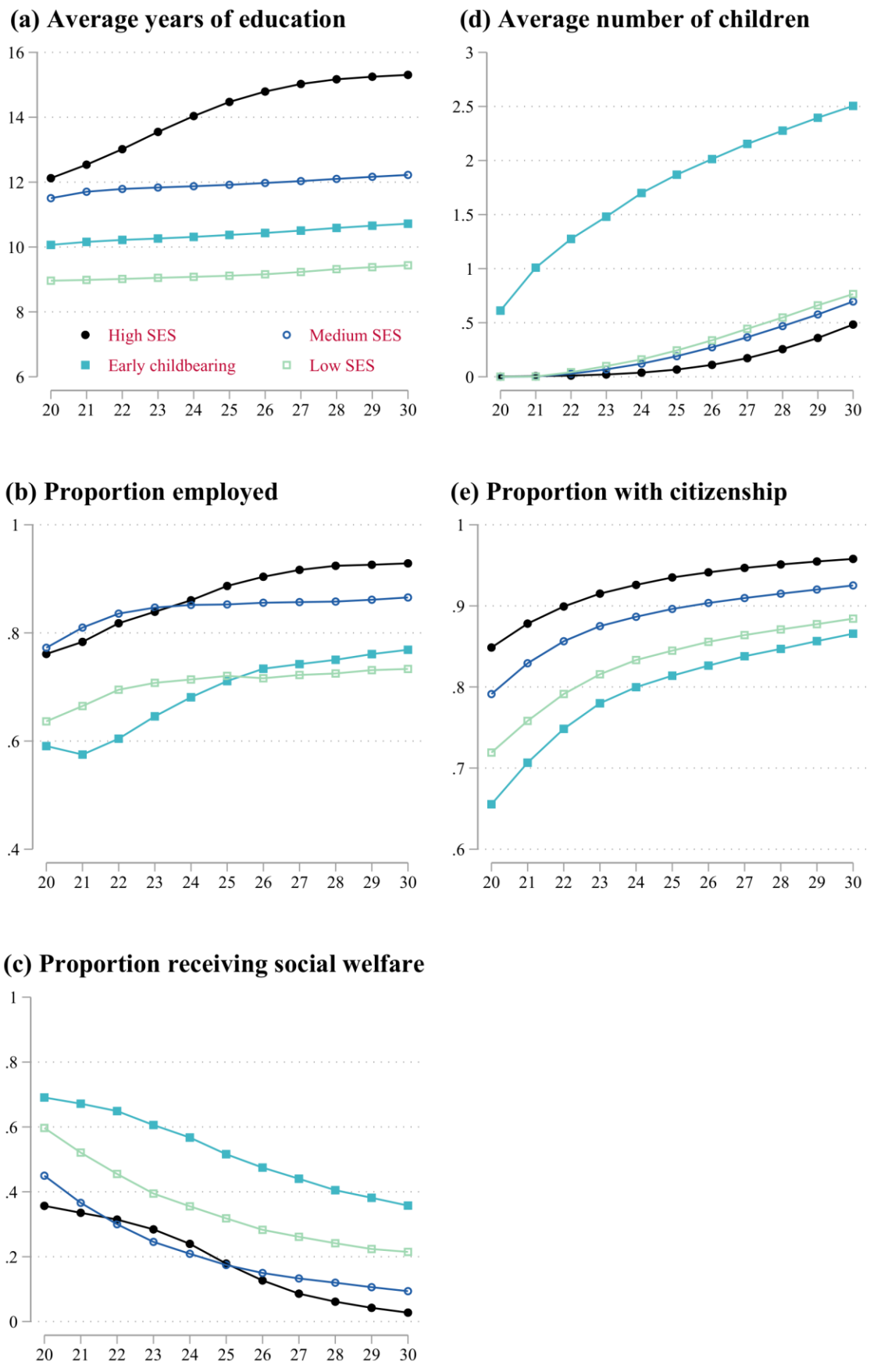
A summary of the classes is shown in Table 2, including the estimated frequencies and percentages in each class based on most likely membership from the estimated LCA model (Table A1 in the appendix provides a similar summary to Table 2 but for a five class model). The classes have also been given descriptive names, based on the analysis shown in Figure 2. All classes contain a reasonable proportion of the study population (none are very small), with the smallest being 'early childbearing', containing 8% of the study population. We note that there is considerable similarity between G1.5 and G2 in terms of the distribution of membership of the different classes. This suggests that the classes are not being determined to any great extent by differences between these two groups (i.e. whether children of immigrants are born in Sweden or not).

Table 2: Summary of the classes

Class	Description	G1.5	%	G2	%	All	%
1	High SES	16,378	27	15,418	26	31,796	27
2	Medium SES	27,989	47	30,497	52	58,486	49
3	Early childbearing	4,945	8	3,680	6	8,625	7
4	Low SES	10,325	17	9,139	16	19,464	16
	Total	59,637		58,734		118,371	

Note: Counts and proportions are based on most likely membership from the estimated LCA model

Figure 2: Average outcome by domain and class



As shown in Figure 2, the classes each differ according to the average outcome trajectories of their members (based on most likely membership). Class 1 (labelled here for convenience as 'high SES') and class 2 (labelled here for convenience as 'medium SES') both have similar levels of education at age 20, but the high SES class is associated with continuing (higher) education. Compared to the medium SES class, the high SES class is also linked with a higher likelihood of employment at age 30 and a slightly greater likelihood of being a Swedish citizen at all ages.

As shown in the panel (d) of Figure 2, there is one class that is clearly distinct with respect to childbearing. Class 3 (labelled here for convenience as 'early childbearing') is not only linked with a higher chance of entering parenthood at an earlier age, and a much higher chance of having more than one child by age 30, but also a higher chance of receiving social benefits (at all ages 20-30). This is in contrast to the other classes, including class 4 (labelled here for convenience as 'low SES'), which is associated with lower average education than the early childbearing class, and a different trajectory of employment (with lower employment probabilities at age 30). As noted in the section on data, we note that the indicator for receipt of social benefits combines information on housing benefit and social assistance, and the eligibility criteria for of both these benefits (in particular housing benefit) is related to whether adults have dependent children (living in the same household). As with the rest of the results, this suggests that the classes we obtain may be a result of interdependencies between the indicators.

Figure A2 in the appendix provides a similar summary to Figure 2 but for a five class model. The main difference appears to be that the five class model identifies two classes that are associated with early childbearing, (one of which is more similar to the early childbearing class in the four class model, and the other being closer to the medium SES class in its non-childbearing outcomes).

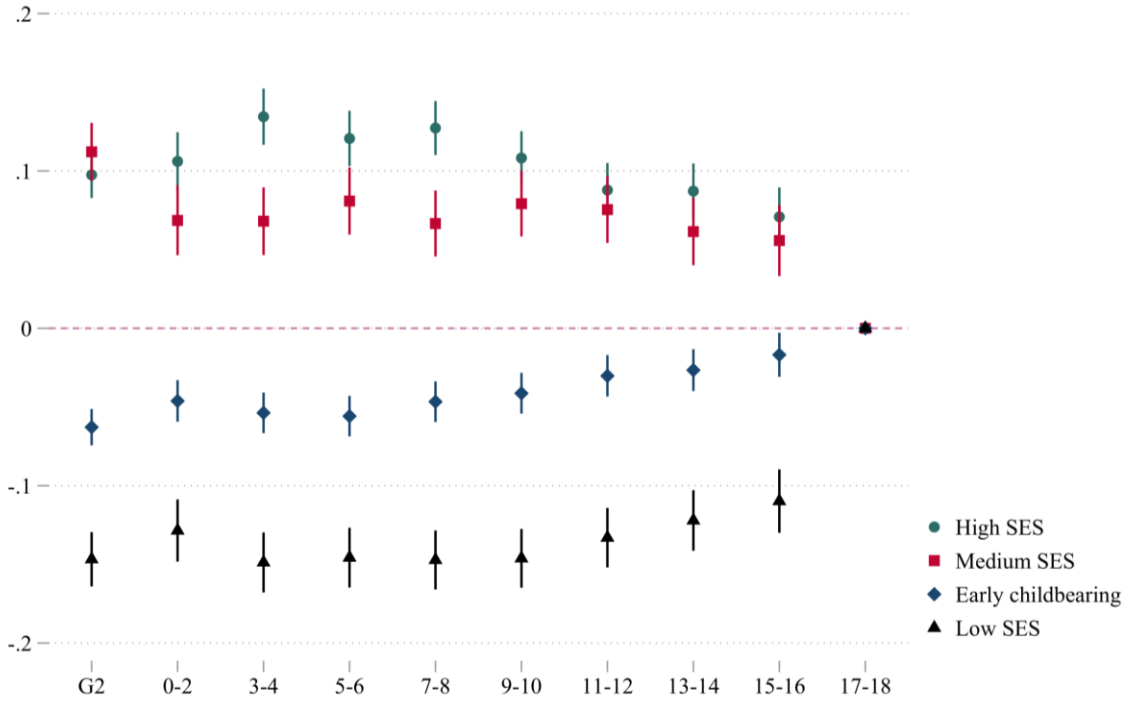
The link between classes and age at arrival

Having completed our measurement model, the next step of our analysis is to examine the link between the multi-domain life course trajectories (the four classes) and several aspects of migration background. We begin by examining the role of age at arrival. First, we use a multinomial model, including controls for birth cohort and sex (see Figure 3, panel 3a). Secondly, this is done using family fixed effects (sibling) models, including controls for birth order, birth cohort and sex (see Figure 3, panel 3a).

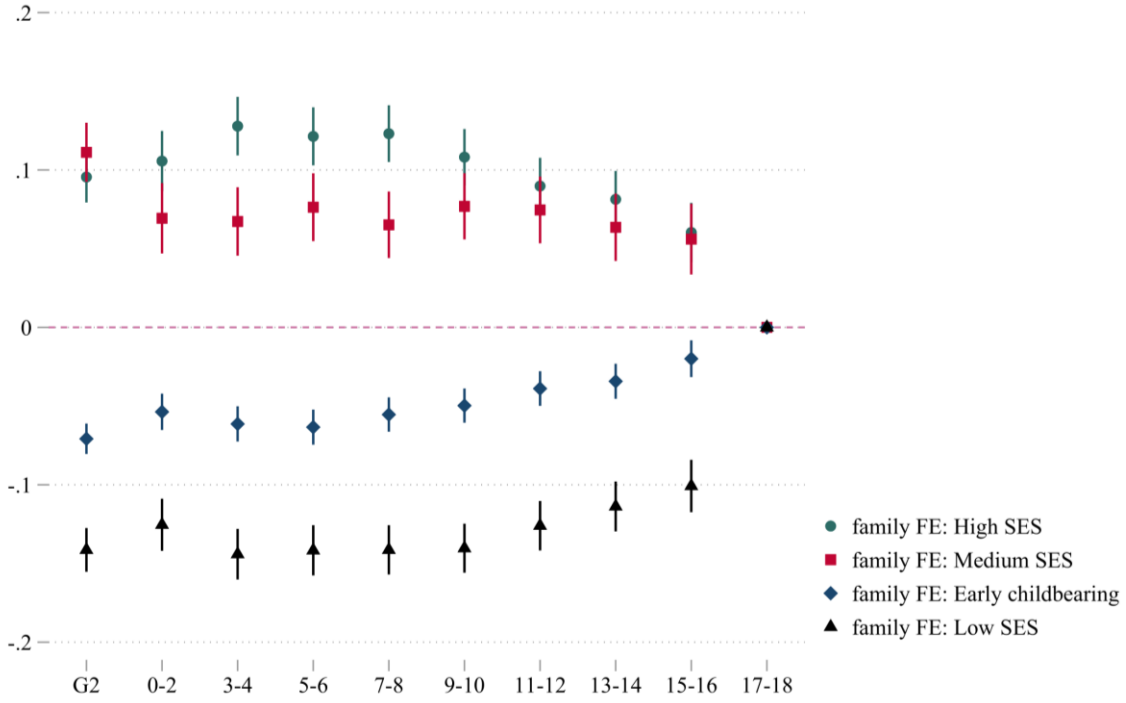
In summary, our results show that foreign-born children of immigrants who arrive as teenagers are far less likely to experience high or medium SES trajectories in early adulthood, and far more likely to experience trajectories that are linked with early childbearing or low SES. Arguably, there are only negligible differences between those arriving at ages under 10. G2 are also quite similar as compared with this group who arrive before becoming teenagers.

Figure 3: Predicted class membership by nativity and age at arrival

3a: Multinomial logistic regression model



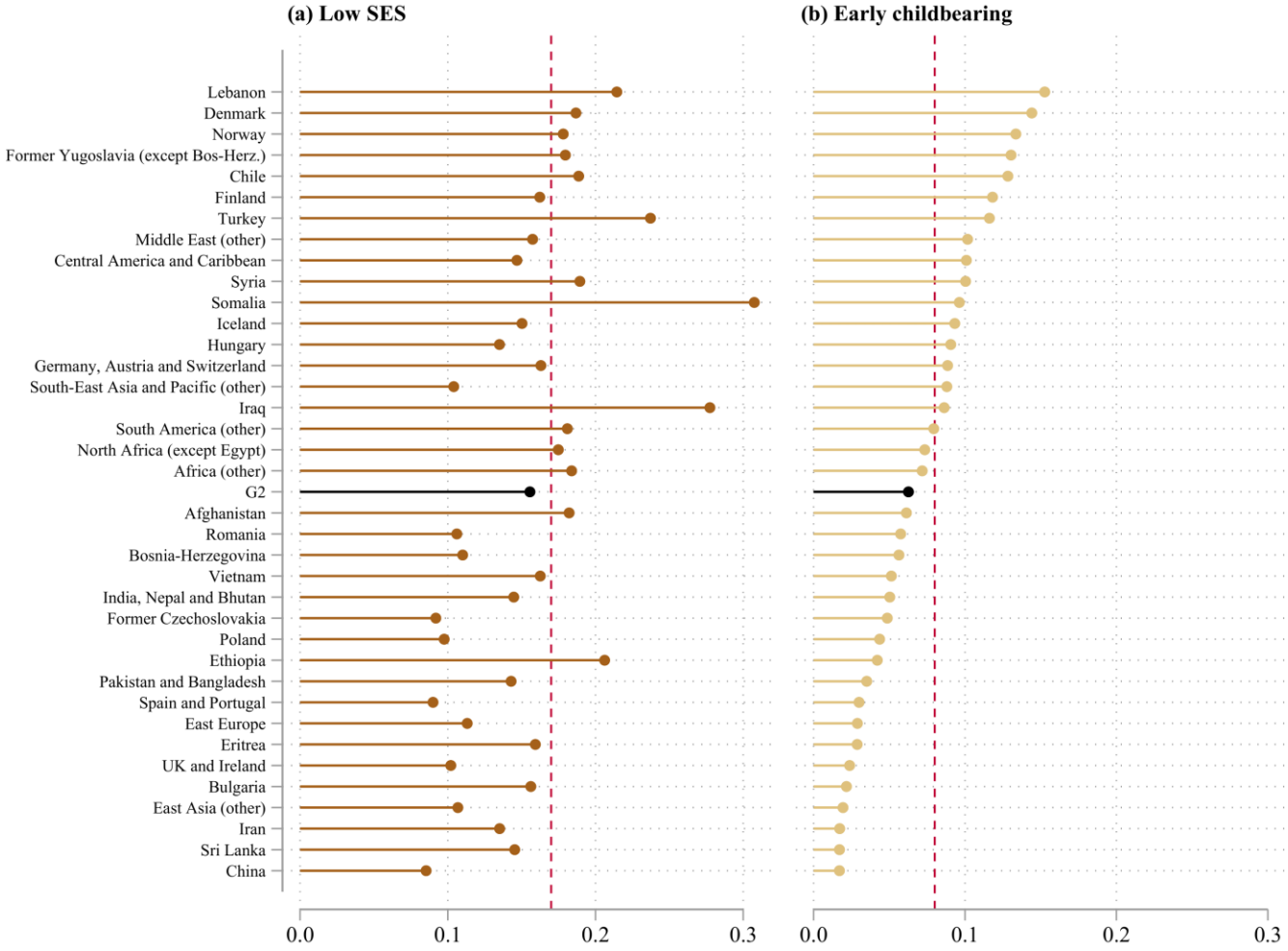
3b: Multinomial logistic regression model with family fixed effects (FEs)



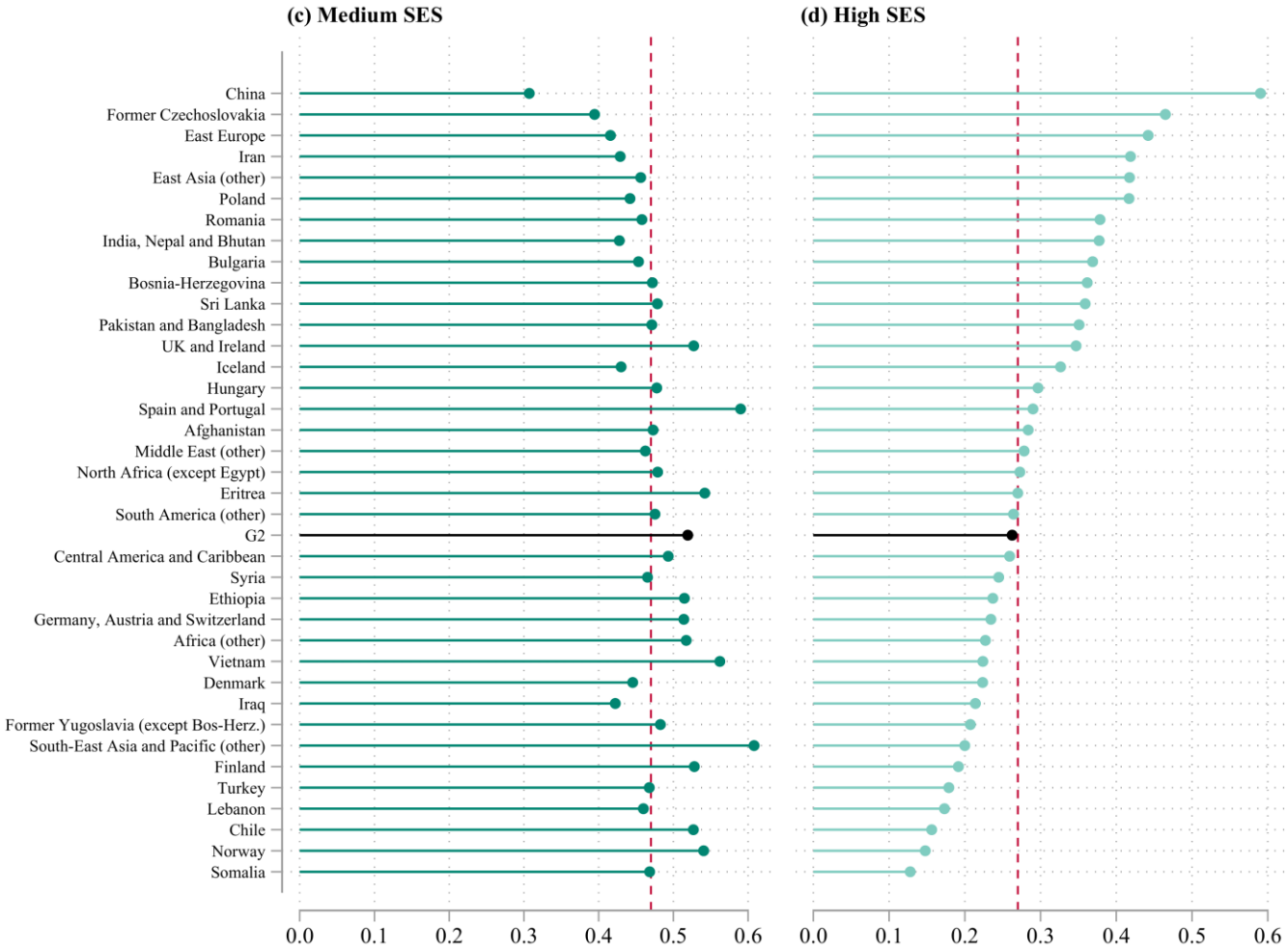
Note: Predicted class membership relative to those who arrive age 17-18

Figure 4: Predicted class membership by country of birth

4a: Less advantaged classes

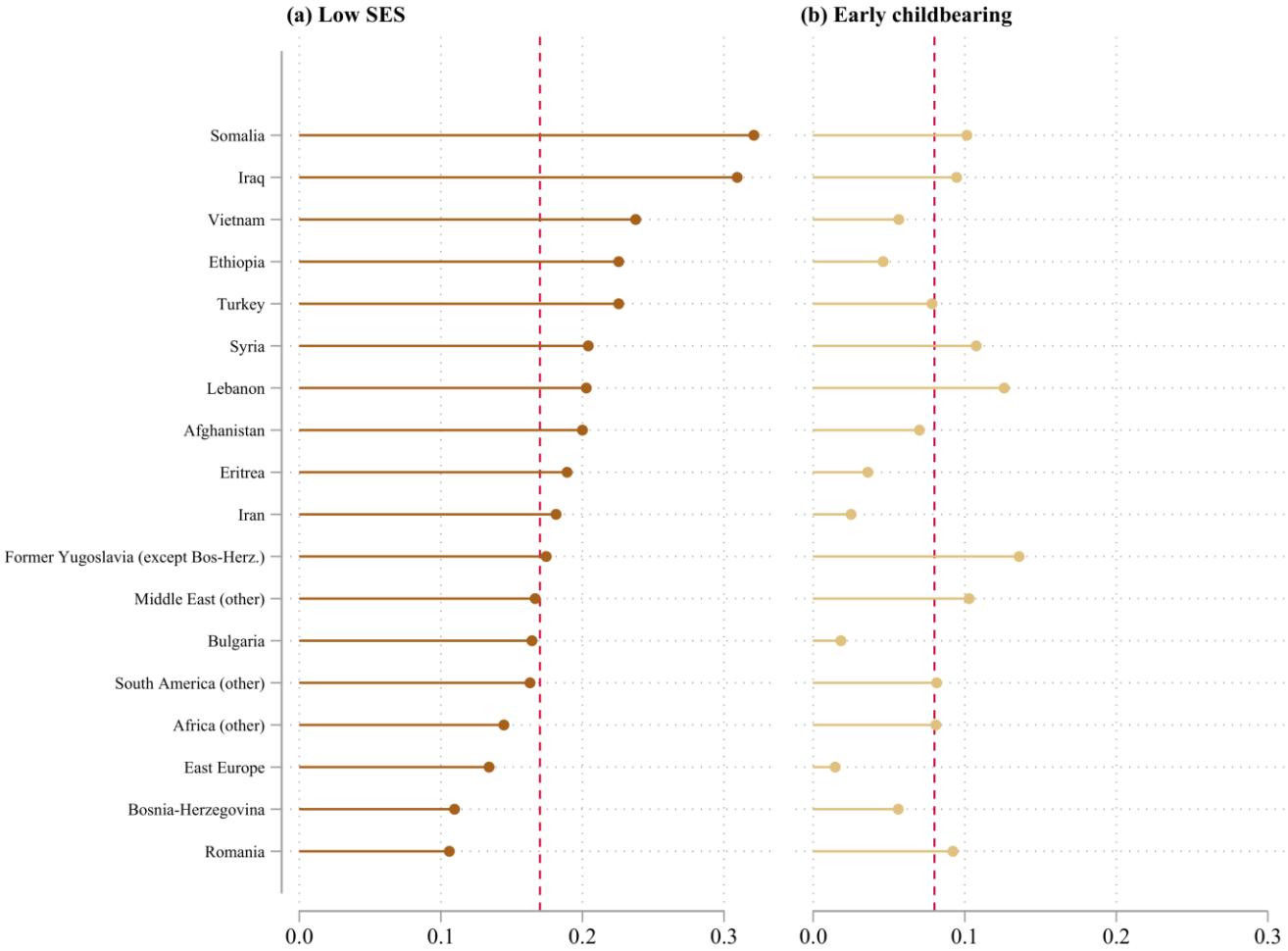


4b: More advantaged classes



Note: This figure includes only those countries of birth with 100 or more people in the study population. It shows the proportion of all those in a given country of birth group who are predicted to be in each specific class, based on most likely membership from the estimated LCA model with four classes. Countries of birth are sorted according to the proportion in the low SES class (panel 4a) or the high SES class (panel 4b). All G2 are shown (in black) for comparison. The dotted (red) lines indicate the average proportion of all G1.5 in each class.

Figure 5: Predicted class membership by country of birth for those with a first residence permit indicating refugee status



Note: This figure includes only those countries of birth with 100 or more people in the study population. It shows the proportion of all those in a given country of birth group who are predicted to be in (a) the low SES class and (b) the early childbearing class, based on most likely membership from the estimated LCA model with four classes. Countries of birth are sorted according to the proportion in the early childbearing class. All G2 are shown (in black) for comparison. The dotted (red) lines indicate the average proportion of G1.5 in each class.

We note that the family fixed effects provide a robust way of examining the association between age at arrival and life course trajectories because they compare siblings who arrived in Sweden at the same time, which presumably controls for many aspects of parental and migration background, including reasons for migration and parental resources on arrival. To complement this analysis, Figure A3 in the appendix provides results from the same analysis as used to produce Figure 3 but for a five class model. In essence, the main finding remains the same: age at arrival is strongly associated with a specific set of multi-domain life course trajectories.

Country of birth

Alongside age at arrival, one of the key sources of variation in foreign-born disadvantage in most national contexts is country of birth. As shown in Figure 4, this also appears to be the case for the early adult trajectories that we estimate here. For example, based on most likely class membership, the percentage of those in the early childbearing class varies from 16% for those born in Lebanon to less than 2% for those born in China, Sri Lanka, Iran, and East Asia (other). The percentage in the low SES class varies from 30% for those born in Somalia to less than 10% for those born in China, Spain and Portugal, Former Czechoslovakia, and Poland.

Panel 4a of Figure 4 also shows that there is not necessarily a strong relationship between the membership of the two classes that are most closely linked with patterns of disadvantage. Some countries of birth with high proportions in the early childbearing class also have high proportions in the low SES class—for example those from Somalia, Turkey and Lebanon. However, this is certainly not true for others, such as those from Finland (who have a higher than average proportion in the early childrearing class but a lower than average proportion in the SES class) or those from Ethiopia (who are vice versa). Indeed, the same heterogeneity is visible when we compare membership of the other classes, (medium and high SES, as shown in Panel 4b). We also note that Figure 4 includes only those countries of birth with 100 or more people in the study population, which helps to minimise the extent to which comparisons are obscured by countries of birth that are rare in the (study) population (i.e. birth cohorts 1972-86).

Reason for migration and refugee background

In Figure 5, we show similar results as in Figure 4, but for only those individuals whose first residence permit in Sweden indicates that they have a refugee background. These individuals may be considered to be children of refugee families, although we note that their 'refugee' status may be on several grounds, including humanitarian grounds, asylum seeking, or as quota refugees. In a minor deviation from the format of the previous figure, countries of birth in Figure 5 are sorted according to the proportion in the low SES class.

In general, the results by reason for migration overlap very firmly with the results by country of birth. To a great extent, this is because having a refugee background is very common for certain countries of birth, and not for others. As in the results for all G1.5, the G1.5 refugees who are most likely to be in the low SES class are from Somalia, Iraq, Turkey and Ethiopia. However, there is one group whose membership of this class becomes relatively more likely when

we focus on children of refugees, and that is those who were born in Vietnam. This may be one group who are worth studying further in future research.

Discussion

In this study, we set out to identify the different types of early adult life course trajectory that are experienced by the children of immigrants, and to examine how these are associated with migration background, including age at arrival, country of birth, and reasons for migration. To do this, we used latent class analysis (LCA), generalised linear models and family fixed effects to analyse administrative data for the whole population of children of immigrants in Sweden (G1.5 and G2) who were born between 1972 and 1986 and observed at all ages from 20-30.

Our findings suggest that the descendants of immigrants follow broadly one of four different trajectories: 'high SES', 'medium SES', 'low SES', and 'early childbearing'. Our identification of the latter group is particularly interesting because it highlights the important link between childbearing and social disadvantage among the children of immigrants (in Sweden). This class is not only linked with a higher chance of entering parenthood at an earlier age, and a much higher chance of having more than one child by age 30, but also a higher chance of receiving social welfare at all ages 20-30. Even if the latter relates to eligibility, the patterns that we observe for this class nevertheless show the link between family formation and social disadvantage that exists for a considerable number of children of immigrants. At the same time, this is not the case for those with the lowest SES (e.g. the lowest levels of education).

Having completed our LCA and identified these four classes, we then showed that increased exposure to Swedish society is associated with increased likelihood of following a more advantaged life course trajectory, even after controlling for many aspects of parental and migration background using family fixed effects. Although this might be expected given prior research on single domains of life, our evidence shows a strong and robust link between age at arrival and early adult life course trajectories across multiple domains of life. Also of interest is the fact that we do not observe strong evidence in support of critical ages, in terms of age at arrival.

We also extend prior research by showing that social disadvantage, based on holistic life course trajectories, is not linked to country of birth or reason for migration in any general sense, but rather that the relationship is complex and heterogeneous, thereby suggesting the importance of accounting for country of birth in evaluating immigrant integration and designing policies to support the children of immigrants. Perhaps surprising is that G1.5 immigrants from high income countries do not appear to be systematically less likely to experience disadvantage than those from low and middle income countries. This includes those who were born in other Nordic countries: Finland, Denmark and Norway. This finding warrants further research, and we note that parental country of birth is the same as country of birth for the majority of G1.5 (i.e. that this result is not explained by the immigration of children born in richer countries to parents born in poorer countries). For example, 98% of our study population who were born in Finland have a Finnish-born mother, while the equivalent figures for Norway and Denmark are 84% and 90% respectively.

There are several limitations of our analysis, most of which could be examined by future research. One limitation relates to our choice of indicators, which could be expanded, especially if different data were used (although Swedish register data also provide additional variables). However, as discussed earlier, we have not aimed to create a comprehensive measure, but rather to create a measure that is based on the principles of parsimony and replicability. Further research might examine the extent to which additional measures would alter our findings, but such research would also need to acknowledge that: (a) the number of potential measures for inclusion is highly numerous, and (b) many alternative measures are either highly correlated with those that we include here, or they are often of low quality, or absent from annual longitudinal data sources.

Considering these issues, we believe that our choice of indicators is justified, especially in order to answer our research questions. However, it is important to note that it is impossible to interpret the causal interrelationships between these indicators from the analysis that we have undertaken. For example, the indicator for receipt of social benefits includes housing benefit, which is related to whether adults have dependent children living in the same household. As with the rest of the results, this suggests that the classes we obtain may be a result of interdependencies between the indicators. Similarly, although our study is limited in the extent to which it examines alternative specifications with respect to both our measurement models and our structural models, we leave it to future research to develop this aspect given that we feel our methods are aligned with our questions and our broader research aims.

Future research may choose to examine the interrelationships between the different domains that we examine, including with respect to temporal dependencies. However, this was not one of our aims here. Similarly, our focus is limited to a specific stage of the life course for a specific cohort of children of immigrants in Sweden. We note that our analysis excludes those children of immigrants who died or emigrated before reaching age 30. The former is a relatively rare event; fewer than 3% of children of immigrants in these cohorts died before age 45. With respect to emigration, this is far less common for the children of immigrants as compared with immigrants who arrive in Sweden as adults (Monti, 2020). In addition, of those children of immigrants who emigrated between ages 0 and 45, more than two-thirds were aged under 18, which is the age at which our observation window begins. It may be that emigration and death are selective, but they are unlikely to have a material impact on our conclusions. Similarly, our study excludes children of immigrants who have one Swedish-born and one foreign-born parent, but their exclusion does not impact our findings, rather it impacts their generalisability. Their inclusion would make interpretation of our findings more complicated, especially given that our aim was to examine within-group variation by exposure to destination for the children of immigrants, (which also explains why our study does not include children of the Swedish-born). Nevertheless, each of these exclusions have the potential to impact the generalisability of our findings, which remain to be investigated by future research.

Despite these limitations, our study highlights patterns of early adult disadvantage among the children of immigrants and how they vary across multiple domains of life. In line with prior

research, we highlight the potential vulnerability of immigrants who arrive as teenagers, such that they are more likely to experience socially disadvantaged life course trajectories as compared with other children of immigrants. This is not only true immediately after their arrival but for more than a decade afterwards. At the same time, we have highlighted that early childbearing is strongly linked with disadvantage for some children of immigrants, whereas for others there is a high risk of experiencing low socioeconomic status in absence of atypical patterns of fertility. We recommend that future research examine the role of early childbearing in determining the life course trajectories of immigrants and their children, not only in early adulthood but also beyond.

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Appendix

Table A1: Summary of the classes (5 class LCA model)

Class	Summary description	Count	%
1	High SES	30,939	26
2	Medium SES	49,328	42
3	Early childbearing Medium SES	13,817	12
4	Early childbearing: Low SES	6,010	5
5	Low SES	18,277	15

Note: Counts and proportions are based on most likely membership from the estimated LCA model. This model was the same as the four class model in the main paper, except that it excluded the indicator for childbearing at ages 21 and 23. This was to avoid issues with model estimation due to singularities and saddle points.

Figure A2: Average outcome by domain and class (5 class LCA model)

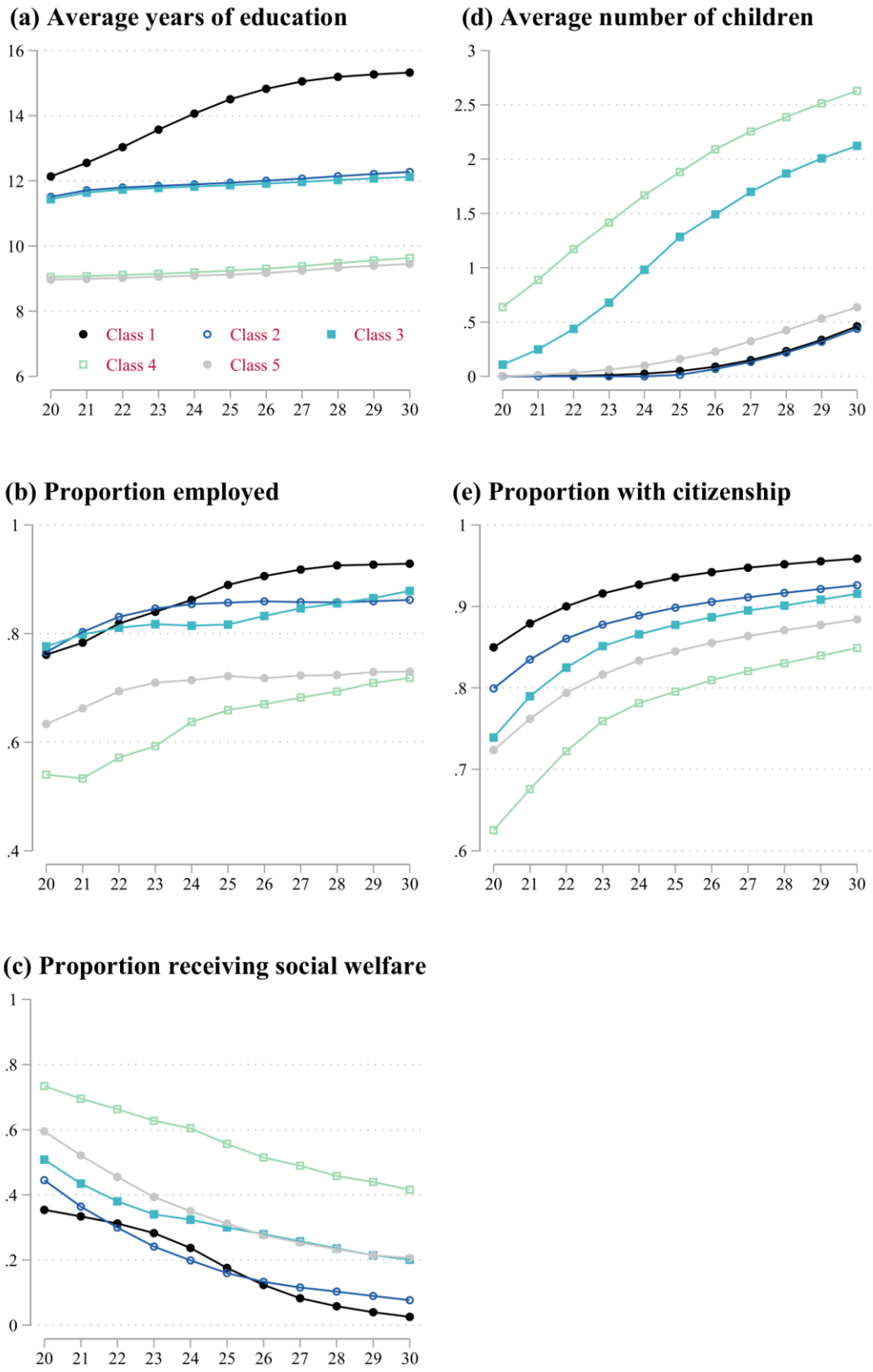
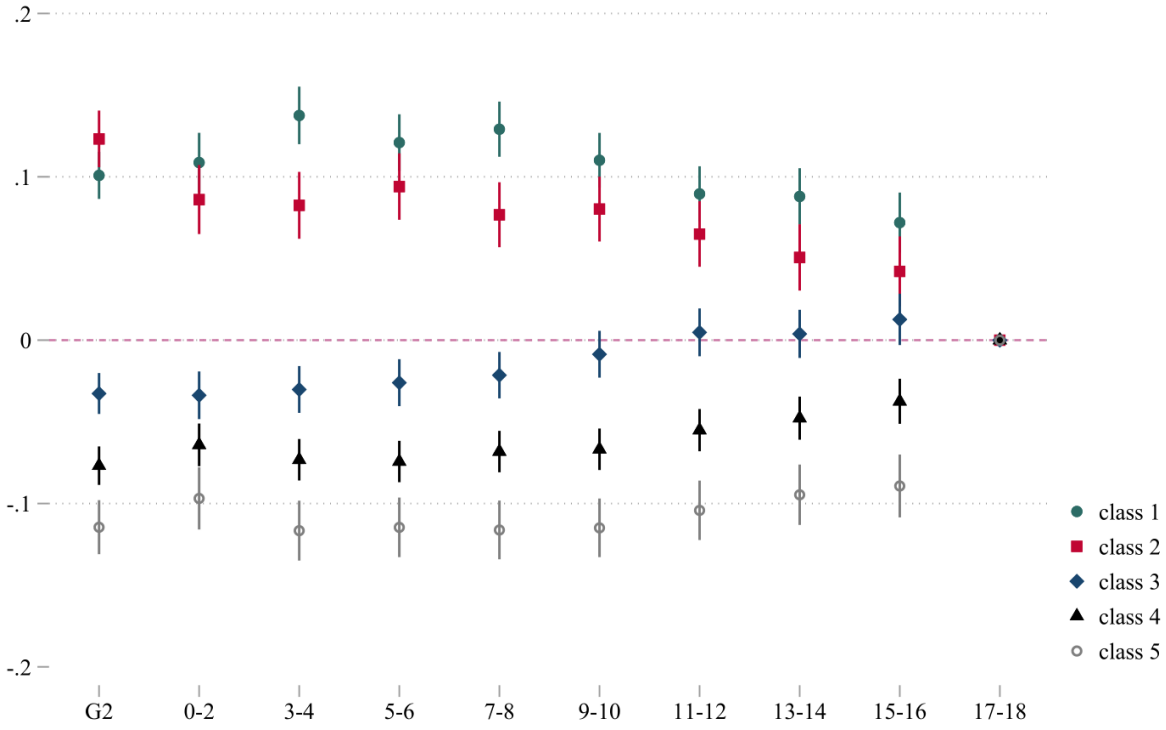
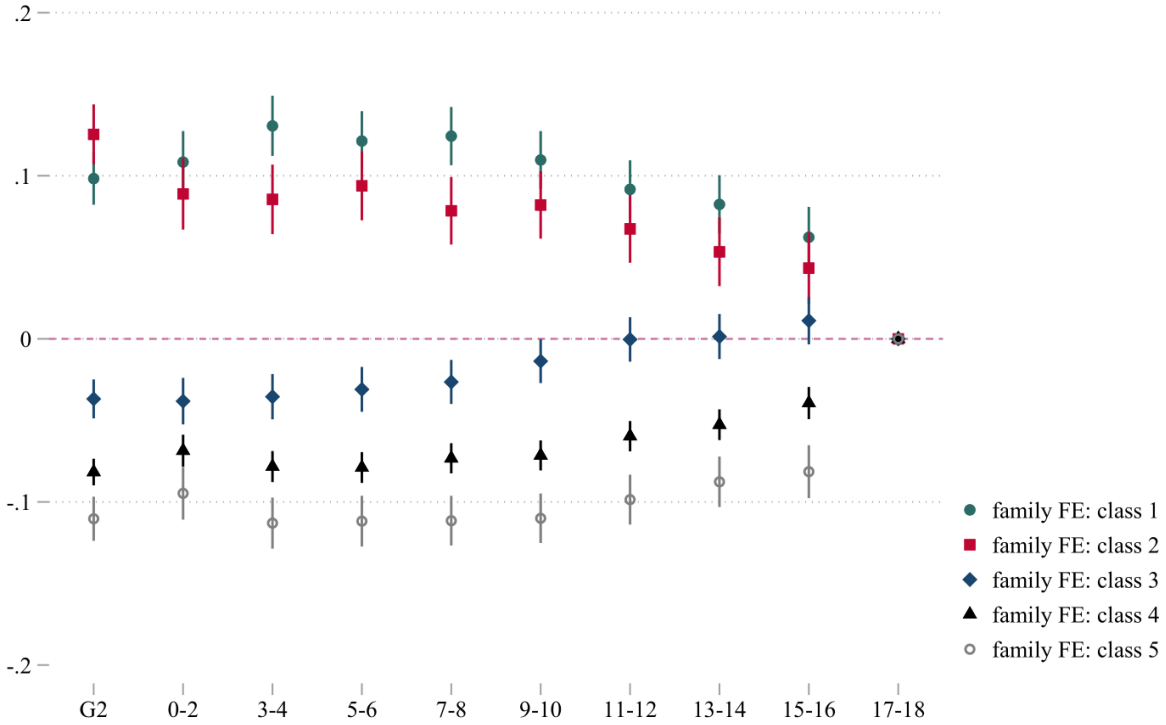


Figure A3: Predicted class membership by nativity and age at arrival (5 class LCA model)

A3a: Multinomial logistic regression model



A3b: Multinomial logistic regression model with family fixed effects (FEs)



Note: Predicted class membership relative to those who arrive age 17-18

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