Child's age at migration, high school course-taking and higher education

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ABSTRACT

The study examined the effect of child age at migration on high school course-taking and higher education attainment, focusing on Former Soviet Union (FSU) immigrants who arrived in Israel at primary-school age. Based on a representative Israeli national sample, combining data from Israel's Central Bureau of Statistics, Ministry of Education, and higher education institutions, we applied multinomial regression models. The data did not support the 'critical age' hypothesis, according to which the educational outcomes of immigrant children start to decrease after a distinct age at migration when the ability to learn a new language begins to shrink. However, children who were older at migration and thus arrived closer to the stage when curricular differentiation begins in lower secondary education had higher chances of enrolling in less prestigious educational programs. Age at migration was not related to the chances of attaining an academic degree.

1. Introduction

Most studies exploring the effect of a child's age at migration on her/his education prospects in the country of destination concentrate on the relationship between the age at migration and either local language proficiency or educational achievements in secondary school (e.g., Cahan, Davis, & Staub, 2001; Conger, 2009; Cortes, 2006; Heath & Kilpi-Jakonen, 2012; Stevens, 2015). A few of these studies consider the effect of age at migration on the total years of schooling and post-secondary academic attainment (e.g., Beck, Corak, & Tienda, 2012; Basu, 2018; Böhlmark, 2009; Clarke, 2018). The latter set of studies were mostly conducted in the framework of economics research and/or in the United States context. Furthermore, earlier studies on this topic generally limited their scope to considering the effect of child age at migration on the vertical dimension of educational stratification (e.g., years of education or degree attainment). The effect of age at migration on the horizontal dimension of educational stratification (e.g., school track in secondary education or field of study in higher education) remains almost completely unresearched. Economics research by Rangel and Shi (2019), focusing on the relationship between age at migration and specialization in science, technology, engineering, and mathematics (STEM) subjects in high school and college among immigrant children in the US, is a notable exception.

Seeking to address this lacuna, the present study focused on the effect of child age at migration on placement in different curricular programs in high school – a key mechanism shaping stratification patterns in both secondary and higher education. Examining the issue from a sociological point of view, the study extends our understanding of the barriers and challenges that young immigrants of different ages encounter upon entering the educational system of a new country of residence and the potential impact of these barriers and challenges on their future educational opportunities.

Specifically, to advance existing knowledge on the effect of child age at migration on educational outcomes in adolescence and beyond, we explored the following questions:

1. Is child age at migration associated with the hierarchy of high school course-taking, and if so, to what extent?
2. Is child age at migration associated with higher education attainment, and if so, to what extent?
3. Does high school course-taking mediate the relationship between child age at migration and higher education attainment, and if so, to what extent?

Our theoretical expectations of the effect of a child's age at migration on educational outcomes are based on three theoretical explanations: 'critical age' at migration (for a detailed discussion, see Beck, Corak, & Tienda, 2012), the role of structural features of secondary education (Bar-Haim & Feniger, 2021), and the immigrant instrumentalist approach to education (Chachashvili-Bolotin, 2007, 2011). We

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examined the effect of child age at migration on high school course-taking and higher education attainment in the Israeli context.

The mass arrival of a new immigrant population from the Former Soviet Union (henceforth FSU) to Israel in 1990–1991 presents a unique opportunity to examine the effect of child age at migration on subsequent educational outcomes within a relatively homogenous group of immigrants – not only in terms of place of origin but also, and equally importantly, in terms of period of arrival.[1] The latter makes it possible to control for potential differences between groups stemming from time-related changes in the socio-economic situation of the country of destination and its immigrant integration policies and practices.

We used a large representative Israeli national sample, combining data from several administrative sources including Israel's Central Bureau of Statistics, Ministry of Education, and higher education institutions. Merging data provided by these sources, we tracked child immigrants arriving in Israel from the FSU during 1990–1991, through high school and into higher education. We focused on the effect of age at migration for children who immigrated at primary school age; in other words, these were 1.5-generation immigrants (Rumbaut, 1997, 2004).

The rest of the paper is structured as follows. We start with a brief overview of earlier research exploring the effect of child age at migration on educational outcomes. We then discuss the three approaches informing our theoretical expectations: the 'critical age' at migration hypothesis, the role of the structural features of Israeli secondary education, and the instrumentalist approach of FSU immigrants to education. This section of the paper ends with our theoretical expectations of the effect of child age at migration on high school course-taking and higher education attainment. We then present the data and the findings of our empirical analyses. Finally, we conclude with a discussion of our findings in the context of the theoretical framework and suggest implications for educational policy.

2. Previous research

Earlier studies on child age at migration effects underline a negative relationship between child age at migration and a range of educational outcomes, including language acquisition and proficiency in the destination country, secondary school educational achievements, total years of schooling, and highest educational attainments (e.g., Böhlmark, 2009; Cahan, Davis, & Staub, 2001; Conger, 2009; Heath & Kilpi-Jakonen, 2012; Söhn, 2011; Stevens, 2015). However, the precise quantum of the negative effect of child age at migration on educational outcomes depends, to a significant degree, on ethnic origin, linguistic dissimilarities between the country of origin and the country of destination, economic conditions, and the educational standards of both the country of origin and the country of destination (Chiswick & DebBurman, 2004; Gonzalez, 2003; Heath & Kilpi-Jakonen, 2012; Van Ours & Veenman, 2006). Most research has identified a negative effect of migration during the later stages of childhood on higher education attainment (e.g., Hermansen, 2017; Lee & Edmonston, 2011). Yet some studies have suggested that even when they encounter disadvantages in schooling outcomes during their compulsory education period, when assessed in terms of their final academic attainment, children who migrate at an older age tend to catch up with their peers who migrate at a younger age (Böhlmark, 2009).

In a discussion of previous research on the effect of age at migration for children, it is appropriate to mention pioneering sociological studies on the acculturation of immigrants that refer to child immigrants as 1.25-, 1.5-, and 1.75-generation immigrants. This division into sub-generations emphasizes the meaningful differences between the three age-at-migration groups, including differences in educational attainments (Oropesa & Landale, 1997; Rumbaut, 1997, 2004). Immigrants who are 13–17 years old at the time of arrival in the destination country are defined as 1.25-generation immigrants; those who are 6–12 are 1.5-generation immigrants; those younger than 6 are 1.75-generation immigrants. Using Rumbaut's (2004) terms, we focused on the effect of age at migration for 1.5-generation immigrants (6–12 years of age at the time of migration). Within this population, we operationalized age at migration according to single years of age, following researchers who have suggested avoiding grouping age at arrival into broader categories (Lee & Edmonston, 2011; Myers, Gao, & Emeka, 2009).

Notably, previous research has tended to focus on language acquisition and proficiency as the major mechanism linking age at migration and subsequent educational outcomes. However, as argued by Heath and Kilpi-Jakonen (2012), poor language proficiency in high school (due to the relatively advanced age at time of migration) is not the only, or even the most important, factor influencing educational attainment.[2] Rather, high school sorting and tracking practices exercise the most crucial influence on the future educational prospects of *all* students, including immigrants. As noted earlier, with the exception of Rangel and Shi (2019), no previous study has examined the association between child age at migration and high school sorting and tracking practices. Rangel and Shi (2019) studied the association between age at migration and course-taking in secondary education in the US from an economics perspective; they reported that students arriving after the age of 10 tended to concentrate on mathematics and science because of their language difficulties. This tendency extended to the choice of the STEM fields in higher education.

3. Theoretical framework

In the following, we discuss the three explanations used to develop our theoretical expectations of the effect of child age at migration on educational outcomes for FSU immigrants in Israel. We then present these hypotheses.

3.1. Critical age at migration

The 'critical age' hypothesis, derived mainly from child development literature, suggests that age at migration has no effect on language acquisition – and, consequently, on educational outcomes – if migration occurs before a distinct threshold ('critical age'), after which the ability to learn the new language begins to shrink. According to this argument, if migration occurs after the critical age, age at migration tends to exert a negative effect on language proficiency and educational outcomes (for a detailed discussion, see Beck, Corak, & Tienda, 2012). For example, a study of Swedish siblings (Böhlmark, 2008) found a strong negative effect of age at migration on school performance only for child migrants who arrived in Sweden after about age nine. Yet a sibling study by Lemmermann and Riphahn (2018) suggested that in Germany where elementary school grades can have pivotal long-lasting effects on further educational outcomes, the critical age at migration for overall educational attainment is not higher than six or seven years. Beck, Corak, and Tienda (2012) found the likelihood of dropping out of school started to rise in line with age at migration for children who arrived in the US after the age of eight. Basu's (2018) sibling study in the US similarly demonstrated that the critical age at migration for English language proficiency was eight. However, the negative effect of age at arrival after

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[1] In 1990–1991 about 332,000 FSU immigrants arrived in Israel, most of them from European republics of the former USSR (Central Bureau of Statistics, 1992; Gorodzeisky & Semyonov, 2011). The average level of education of FSU immigrants who arrived in Israel during 1990–1991 was higher than that of FSU immigrants who arrived in 1992 and later. See the discussion of the research population in the Methodology section.

[2] Akgül's (2021) study examining immigrant student adaptation in five countries suggests that according to teachers' evaluations immigrant students with low and high proficiency in the receiving country language have similar problem areas.

the age of eight varied across immigrant ethnic groups. Excluding Asian immigrants from the general immigrant sample increased the magnitude of the effect of age at arrival on high school graduation; the exclusion of Mexican immigrants reduced the magnitude of this effect. Myers, Gao, and Emeka's (2009) findings suggested that the critical age at migration for Mexican immigrants in the US, with respect to various educational outcomes, ranged from six to nine.

In an Israeli study of 14-year-olds who arrived in Israel in 1952–1970, Cahan, Davis, and Staub (2001) found a monotonic decrease in academic achievements in line with age at migration, starting at age seven. The decrease was sharper for children who immigrated from countries in Europe and America than for those coming from countries in Asia and Africa – with the caveat that academic achievements were higher in the former group than the latter. The results of more recent Israeli studies (Haim, 2016, 2021) of eleventh-grade Russian-speaking (i.e., FSU) immigrants who acquired Hebrew as a second language also implied, albeit indirectly, that age seven can be seen as the 'critical age' for immigrants to Israel. Haim (2016, 2021) reported that eleventh-grade FSU immigrants who arrived before age seven scored significantly higher on various aspects of Hebrew proficiency than those who arrived between the ages of seven and 12.

3.2. Israeli secondary education and the role of curriculum differentiation in stratification processes

Secondary education in Israel is characterized by curricular differentiation. Academic versus non-academic (mainly vocational) tracks and between-subject differentiation whereby students choose their area of specialization (Ayalon & Gamoran, 2000; Ayalon, 2006; Lucas, 1999) are the most relevant forms of differentiation for the present discussion. Previous research demonstrates that studying in a vocational track, as compared to an academic track, reduces the likelihood of eligibility to a matriculation diploma, a general prerequisite for higher education admission, and especially to a matriculation diploma that enables enrolment in more selective institutions and programs (Ayalon & Shavit, 2004). Between-subject differentiation in high school has been the major form of differentiation in the Israeli secondary educational system in recent decades (Ayalon, 2006, Ayalon & Yogev, 1997; Bar-Haim & Feniger, 2021). Students choose from a range of subjects offered at the same – usually advanced – level. Even though the subjects themselves are not formally stratified, informal stratification processes are in operation. Students, parents, and teachers value the exact and natural sciences more than the humanities and social sciences, because of a perception that advanced courses in the exact and natural sciences ultimately create better opportunities, as high school graduates specializing in these subjects are more likely to enrol in higher education (Addi-Raccah & Ayalon, 2008; Bar-Haim & Feniger, 2021; Feniger, Mcdossi, & Ayalon, 2015).

Research in Israel shows that native-born members of privileged groups (i.e., children with academic parents, Jews of American and European origin, and boys), together with students with stronger academic abilities, tend to enrol in academic tracks and specialize in the exact and natural sciences. Enrolment in vocational tracks and specialization in the humanities and social sciences tend to be the province of less able or socially underprivileged native-born students (Ayalon, 2006; Ayalon & Shavit, 2004). Enrolment in selective programs in high school is usually predicated by selection into high–ability groups in English and mathematics in junior high school (lower secondary school). Students placed in low ability groups tend to enrol in less selective and prestigious specializations in senior high school (Feniger, Bar-Haim, & Blank, 2021).

It is difficult to delineate common trends of disadvantages/advantages in the overall immigrant population (as compared to native-born Israeli Jews) in the Israeli education system, as there are significant differences in terms of educational attainment between immigrant groups of different origins. (The next section discusses the position of FSU immigrants in the Israeli educational system.) Yet considering the role played by the structure of the secondary education system in Israel, it is reasonable to propose that immigrant children who arrive in Israel at ages closer to the beginning of the sorting and curricular differentiation process in middle school will be less likely to enrol in the more academically prestigious and selective programs than those who arrive at a younger age. This is so because the former, as newcomers, will be faced with more barriers and challenges in the educational system than the latter. While language difficulties can play a role in these challenges, the line of reasoning we suggest here focuses on the interaction between the structure of the system on the one hand, and the appreciation of the nuances of a differentiated curriculum by immigrant students and their families on the other. In other words, we suggest that newcomers will suffer from knowledge gaps about the system and will thus be in an inferior position, compared to children who migrated at an earlier age, when making curricular decisions or negotiating placement in ability groupings with school personnel.

3.3. Immigrants from the FSU in the Israeli education system and the instrumentalist approach to education

Israel experienced a significant immigration wave from the FSU starting in 1989, when Jews were permitted to leave the country due to the political changes that ultimately led to the collapse of the Soviet Union. Since then, more than one million FSU immigrants have arrived in Israel; they currently comprise about 15% of the total population and about 20% of its Jewish majority. Research on the incorporation of FSU immigrants into the Israeli educational system is relatively limited, and findings reveal complex and contradictory patterns. These patterns are sometimes explained by the instrumentalist approach taken by FSU immigrants to the issue of education, reflected in their tendency to choose educational careers with a higher likelihood of providing an immediate economic safety net and direct access to employment (Chachashvili-Bolotin, 2007, 2011; Chachashvili-Bolotin, Shavit, & Ayalon, 2011). Following this line of reasoning, a previous study suggested that FSU immigrant parents encourage their children to choose practical technological tracks in secondary education (Gluzman, 2003).

Bodovski and Benavot (2006) examined educational outcomes of FSU immigrant students in four Israeli cities, focusing on high school attendance and high school track placement. They reported that compared to native-born Jews, FSU immigrant students studied in lower proportions in the high-status academic and low-status vocational tracks, but in larger proportions in the semi-professional/technological tracks. Compared to FSU immigrant boys, FSU immigrant girls had a lower likelihood of dropping out of high school and a higher likelihood of enrolling in the high-status academic tracks in high school. FSU children of mothers with academic education had higher chances of being enrolled in the high-status academic and semi-professional tracks than FSU children of mothers without academic education (Bodovski & Benavot, 2006).

Drawing on a representative sample of students in the Israeli education system, Levin and Shohamy (2008) compared the Hebrew and mathematics achievements of FSU immigrant students to those of native-born students. Focusing on the fifth, ninth, and eleventh grades, they found that FSU immigrant students performed more poorly in both subjects than non-immigrant students (except for mathematics in the ninth grade). Feniger (2017) used data from the international PISA 2006 study to compare the school-related attitudes, aspirations, and science achievements of 15-year-old immigrants from the FSU with those of the native-born population in Israel. The study revealed that compared to non-immigrant Jews, FSU immigrants had, on average, higher scores in the standardized science test and higher aspirations for science-related careers in the future. Lissitsa and Chachashvili-Bolotin's (2019) study, however, demonstrated similar enrolment rates in advanced level courses in physics for both FSU immigrant students and native-born students (third generation in Israel).

Chachashvili-Bolotin (2007, 2011) studied high school completion, high school course-taking, and matriculation diplomas for FSU immigrants. Using a large representative sample of Israelis who graduated from high school in the mid-1990s, Chachashvili-Bolotin found a polarized pattern. While FSU immigrants were more likely than native-born Israelis to drop out, those who did not (the overwhelming majority of the sample) were more likely to obtain an advanced matriculation diploma. In addition, FSU immigrants had a greater likelihood than native-born students of specializing in either less selective vocational tracks or highly selective academic scientific subjects in high school. The specialization in the vocational track is one example of the instrumentalist approach that FSU immigrants take to education. Although less selective (than, for example, the humanities), these tracks promise certain occupational skills that are of use to new entrants to the labour market immediately after completing high school. More recently, Feniger, Mcdossi, and Ayalon (2015), analysing a large representative sample of Israeli youth, found that FSU immigrants eligible for the matriculation diploma were less likely to enrol in higher education than non-immigrant Jews. None of the above-mentioned studies considered child age at migration as an explanatory variable.

3.4. Theoretical considerations and hypotheses

In this paper, we seek to bridge the gap between the vast literature on curriculum differentiation in high school as an important mechanism of social stratification and the literature on the effects of age at migration on educational achievement and attainment. As noted earlier, we considered three theoretical frameworks in developing our hypotheses on the effects of age at migration on placement in different curricular programs and on attaining higher education degrees.

The first of these frameworks is the 'critical age' argument, which claims that the ability to gain fluency in and mastery of the language of the host country declines with age at migration if migration occurs after a certain threshold. We consider age seven to be the 'critical age' for FSU immigrants to Israel, following previous Israeli studies proposing that after this age, proficiency in Hebrew language acquisition starts to decline (Cahan, Davis, & Staub, 2001; Haim, 2016, 2021). It should be noted that there is a vast linguistic distance between Russian and Hebrew. This line of reasoning leads us to expect that *enrolment in the most selective and prestigious high school tracks will decrease as age at arrival increases due to lower educational achievements stemming from language challenges, starting at age seven (H1a)*. Furthermore, *the likelihood of enrolment in the least selective programs or of completing high school without being eligible for a matriculation diploma increases as age at arrival increases, starting at age seven (H1b)*.

While the 'critical age' hypothesis emphasizes the linguistic dimension of immigration at a young age, the educational structural argument presented above may lead us to expect a decline in the rate of specialization in the most selective subjects during high school for immigrants who arrive closer to age 12. At around age 12, students in Israel enter middle school (lower secondary education). At this stage of education, students usually study in heterogeneous classes (at least in the Jewish sector) but most of them are sorted into ability groups for English and mathematics. As mentioned earlier, this type of curriculum differentiation is informal (i.e., it is not linked to different credentials or formal tracks), but it has an important effect on later tracking decisions in high school. Immigrant students who complete most of their elementary education in a different education system and who are not proficient in the local language are at a disadvantage in the likelihood of being accepted into high-ability and selective groups at this stage. They and their parents will have had limited opportunities, timewise, to adjust to the new educational system, with its requirements and expectations, before these sorting and tracking processes take place. Moreover, the ability of parents to communicate and negotiate with school personnel on ability grouping placement decisions may be constrained by their lack of proficiency in the local language and their limited understanding of school

policies and pedagogical culture. This may have a concomitant negative impact on the chances of immigrant students who arrive at an older age to enroll in selective academic tracks during their upper secondary education. Thus, based on *the structural argument, we expect a decline in the odds of entering the most selective high school tracks for immigrant students arriving in Israel close to age 12 (H2)*.

As mentioned above, FSU immigrants in Israel have been found to take an instrumentalist approach to education (Chachashvili-Bolotin, 2007, 2011; Chachashvili-Bolotin, Shavit, & Ayalon, 2011, Feniger, 2017). Thus, they tend to have much less appreciation for programs in the humanities and social sciences, while vocational programs – despite being generally less selective in the Israeli educational system – are more valued by them. We expect that the *appreciation of vocational programs and devaluation of humanities and social sciences programs will be more pronounced among immigrant students arriving at an older age, as they will be newcomers when the decision about their high school specialization is made (H3)*. Students who arrive at an older age and thus have spent less time in Israel before making decisions about high school courses are less likely to be aware of the limitations related to the vocational specialization track in the Israeli educational system. The same will be true for their parents. An overestimation of the advantages of the vocational specialization in the Israeli system, and an underestimation of its disadvantages may direct immigrant students arriving at an older age to the vocational track, regardless of their academic abilities. At the same time, immigrants who arrived at an older age may be expected to avoid specialization in the humanities and the social sciences, because of the low value these subjects are accorded within the context of an instrumentalist approach to education and given their relatively high demand for local language proficiency.

Since high school course-taking in Israel correlates strongly with subsequent enrolment in higher education (Ayalon, 2003; Bar-Haim & Feniger, 2021; Feniger, Mcdossi, & Ayalon, 2015), we expect that *immigrant students arriving in Israel at an older age will have lower rates of academic education attainment (H4)*. This expectation is based on the following reasoning. First, immigrant students who arrive at an older age are expected to have lower rates of specialization in the most selective subjects, together with higher rates of high school completion in the least selective tracks, than those who arrive at a younger age. Second, immigrant students who arrive at an older age are expected to have higher enrolment rates in the vocational specialization track—associated with lower rates of securing a full or university-qualifying matriculation diploma[3] (Ayalon & Shavit, 2004). Third, immigrant students who arrive at an older age are expected to have lower rates of enrolment in humanities and social sciences programs. These programs, although less selective than the exact and natural sciences tracks, yield relatively high rates of students with a university-qualifying matriculation diploma, compared to the vocational specialization. On the other hand, we expect *higher rates of post-secondary non-academic education for immigrant students arriving at an older age (H5)*. This is associated with the vocational high school track and can be seen as an outcome of an instrumentalist approach to education.

4. Data, sample, and variables

The dataset used in this study was prepared by the Israeli Central Bureau of Statistics (CBS). It combines data from the 1995 Israel population census with newer data from Ministry of Education, National Institute for Testing and Evaluation, and tertiary education institutions (updated in 2017). The dataset is based on information drawn from a representative sample of 20% of the Israeli households that participated in the 1995 national census.

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[3] The university-qualifying matriculation diploma provides access to universities, whereas the 'plain' full matriculation diploma provides access to less-esteemed forms of postsecondary education (Ayalon & Shavit, 2004).

In the current study we focused on Israelis born between 1978 and 1985. The main analysis was restricted to FSU immigrants who arrived in 1990 and 1991 and who studied in high schools in Jewish state and Jewish state-religious sectors. Independent schools in the ultra-Orthodox sector were omitted from the analysis; they absorbed very few FSU immigrants, and their curriculum differs markedly from that of mainstream state and state-religious schools. The data on the family and parental characteristics refer to 1995, and the data on children's educational outcome (in adolescence and adulthood) are updated to 2017. The analytical sample of FSU immigrants is made up of 5409 individuals who arrived in Israel between the ages of six and 12. The age of arrival covers the age range of primary school.[4]

To situate the educational outcomes of the FSU immigrants in the general Israeli context, the descriptive analysis also includes native-born Israeli Jews from the same cohort, who also studied in state and state-religious schools (114172 individuals).

4.1. Dependent variables

High school course-taking was represented by a series of dummy variables, based on attaining a high school matriculation diploma in the following advanced subjects:

1) STEM (science, technology, engineering and mathematics) – the most prestigious and selective specializations in Israeli high schools, including advanced courses in technology, exact and natural sciences, such as computer science, physics, chemistry, and biology.
2) Humanities and social sciences: less selective specializations, including advanced courses in the humanities and social sciences, such as psychology, sociology, geography, literature, and history.
3) Vocational: specializations in vocational subjects, including advanced courses in electronics, machinery, office management, etc.
4) No advanced courses: students completing only basic-level high school courses.
5) Non-matriculated: students with no matriculation data, either because they drop out of high school or they complete high school without taking all the matriculation exams.

Students who took advanced courses in both STEM and the humanities, the social sciences or vocational subjects were assigned to the STEM category. This is a standard decision in the operationalization of high school course-taking in the Israeli educational system because the STEM category is the most selective (see, e.g., Feniger, Mcdossi, & Ayalon, 2015). A combination of humanities and social sciences with vocational subjects was very rare. In such cases, students were assigned

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[4] The decision to restrict the analysis to FSU children who arrived in Israel in 1990 and 1991 and, consequently, to the age range of primary school is based on the following considerations. The average educational level of FSU families who arrived in Israel in 1990 and 1991 (1989 was the first year of this wave of immigration with a small number of cases in the sample) was substantially higher than the level of those who arrived 1992 and later. Examining a short period of arrival specifically 1990–1991, allows not only focusing on a relatively homogenous population of immigrants, but also avoiding potential differences between groups stemming from time-related changes in the socio-economic situation of Israel and its immigrant integration practices and resources. In addition, due to the focus on this short period of arrival we were able to neutralize a compositional effect driven by the correlation between age at arrival and year of arrival in the population of FSU immigrants in Israel born between 1978 and 1985. Because the initial sample included 1978–1985 birth cohorts, 1990 and 1991 are the years of arrival that cover only FSU students who immigrated at primary-school age, between six and 12 (there are no FSU children in the relevant birth cohorts who arrived in Israel at an older age in either 1990 or 1991). Finally, restricting year of arrival to 1990–1991 meant we could measure family and parental characteristics (these data were collected in 1995) after the period of first adjustment in Israel.

to the vocational category.

Higher education was represented by a series of dummy variables: academic degree, post-secondary non-academic diploma, and secondary education.

4.2. Independent variables

Age at migration, the focus of our investigation, was represented by a series of dummy variables pertaining to each age at migration from six to 12.

To accurately estimate the effect of age at migration on educational attainment, in the multivariate analysis, we controlled for year of birth, number of siblings, parental education, and family's standard of living. It was necessary to control for year of birth because older immigrant students in the sample had a longer period of time to complete their higher education – or, if necessary, to have a second chance to improve their matriculation diploma. This is especially important in Israel, where the average age of B.A. completion is relatively high due to mandatory military service. We included number of siblings because earlier research in the sociology of education found a negative effect of number of siblings on educational attainment; a higher number of siblings leads to a smaller amount of parental resources allocated to each child (e.g., Blake, 1989; Park, 2008; for Israel, see Feniger & Shavit, 2011). In the case of immigrant populations, younger siblings may especially reduce parental resources allocated to older children. Because immigrant children arriving at an older age are more likely to have younger siblings than those arriving at a younger age, we argued that it is especially important to control for number of siblings when estimating the effect of child age at migration. We included parental education in the multivariate analysis, because Clarke (2018) demonstrated that estimations of educational attainment as a function of child age at migration without controlling for parental education tend to meaningfully overestimate the disadvantage of children who arrive at an older age, mostly because of the negative correlation between parental education and children age at migration.

Finally, we included the family's standard of living. Despite being disproportionately characterized as having an academic education, FSU adult immigrants who arrived in Israel in 1990–1991 experienced a substantial earning disadvantage compared to other Jewish sub-populations (Gorodzeisky & Semyonov, 2011). Arriving at a time of mass migration and having trouble finding suitable jobs, most of these FSU immigrants experienced substantial downward occupational mobility upon arrival (Friedberg, 2000; Stier & Levanon, 2003). FSU immigrant parents with an academic degree who suffered downward occupational mobility worked longer hours to compensate for their low per-hour income (Remennick, 2012). Arguably, the ability of parents to work longer hours to achieve a higher standard of living depends to certain extent on the age of their children. In addition, studies in Israel have demonstrated a meaningful association between the family's standard of living and children's educational outcomes (Ayalon & Shavit, 2004; Feniger, Mcdossi, & Ayalon, 2015). Thus, we argue for the need to control not only for parental education but also for the family's standard of living when testing the association between child age at migration and educational outcomes.

Birth year was operationalized as a continuous variable ranging from 1 (for those born in 1978) to 8 (for those born in 1985).

Number of siblings was also a continuous variable.

Parental education distinguished between families in which at least one parent had an academic degree and families in which neither parent had such a qualification.

Family's standard of living was based on the number of household goods in the possession of the household: phone, video, washing machine, clothes dryer, microwave, dishwasher, computer, air conditioner, water heater. The measure was constructed by adding the values for each item, weighted by its scarcity. Thus, the weight for each item was calculated as $1 - p$, where p is the proportion of households in the sample

that possess the item (see Semyonov & Lewin-Epstein, 2001).

To address the issue of missing data for parental education and standard of living, we included two additional dummy variables: missing information on parental education and missing information on standard of living.

5. Data analysis strategy

Following earlier studies demonstrating gender differences in incorporation patterns among FSU immigrants who arrived in Israel as children (Feniger, Gorodzeisky, & Krumer-Nevo, 2019; Gorodzeisky, Sarid, Mirsky, & Slonim-Nevo, 2014), we offer separate empirical analyses for boys and girls.

Before examining the main question – whether educational outcomes are associated with child age at migration, we first situate the educational outcomes of FSU immigrants arriving at ages 6–12 within the general Israeli context. To do so, we present descriptive statistics on the educational outcomes of FSU immigrant girls and boys in comparison to the outcomes of the native-born Jewish population from the same age cohort.[5] Then, we examine the association between child age at migration, high school course-taking, and higher education attainment among FSU immigrants. In the multivariate analysis, we estimate a series of multinomial logistic regression models. In the first model, we examine the effect of age at migration on high school course-taking for FSU girls and boys, net of year of birth, number of siblings, parental education and family's standard of living. In the second model, we estimate the effect of age at migration on higher education attainment net of year of birth, number of siblings, parental education and family's standard of living. To examine whether high school course-taking mediates the relationship between age at migration and higher education attainment, we add high school course-taking to the model predicting higher education attainment (third model). We calculate and present average marginal effects (AME) derived from the models. Average marginal effects allow a comparison of the effects between groups and models (Mood, 2010). Thus, we can compare results for boys and girls and the effect of age at migration on higher education attainment between the models with and without high-school course taking. In the main text, we present the AME of age at migration. The full regression results are available in online Appendixes B and C.

6. Findings

6.1. Educational outcomes: FSU immigrants who arrived as children versus Native-Born Jews

The descriptive results on the relative (dis)advantages of FSU immigrant students in the Israeli educational system relating to high school course-taking and higher education attainment are presented in Table 1 and Table 2. In general, the findings for high school course-taking (presented in Table 1) suggest four main conclusions. First, FSU immigrants who arrived in Israel between the ages of six and 12 are more likely than native-born students to take advanced courses in the most selective high school programs (e.g., STEM). This relative advantage is quite sizable among FSU girls and minor among FSU boys. Second, FSU immigrant girls and boys are more likely to enroll in the vocational programs than their native-born peers. Third, FSU immigrant

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[5] The presentation of the relative (dis)advantage of FSU immigrant children compared to the rest of the Jewish population will put the findings on the effect of age at migration into perspective and contribute to a better understanding of the outcomes associated with child age at migration. In addition, the findings on the educational outcomes of the FSU immigrant population under study (as compared to the native-born population) are especially important, because results of earlier studies on FSU immigrant students in this Israeli educational system are somewhat inconsistent.

Table 1
Track by immigration status (%).

	Girls		Boys	
	Native born	**Immigrants**	**Native born**	**Immigrants**
STEM	25.8	34.4	32.6	35.5
Humanities and social science	37.1	27.4	18.4	10.8
Vocational	2.7	4.2	6.1	11.1
No advanced courses	6.9	8.1	7.9	7.1
No matriculation	27.4	25.9	35.0	35.6
N	60,658	2,887	53,514	2,522

Table 2
Educational attainment by immigration status (%).

	Women		Men	
	Native-born	**Immigrants**	**Native-born**	**Immigrants**
Secondary education	44.6	42.0	56.3	54.5
Post-secondary nonacademic diploma	7.2	10.5	4.5	5.7
Academic degree	48.2	47.5	39.2	39.8
N	60,658	2,887	53,514	2,522

boys and girls are less likely to enroll in advanced courses in the humanities and social sciences. Fourth, there is no significant difference between FSU immigrants and native-born students in the percentage who do not fulfil the requirements for a matriculation diploma.

The descriptive statistics results for higher education attainment are presented in Table 2. There is almost no difference in rates of academic degree attainment between FSU immigrants who arrived at ages 6–12 and native-born Jews, regardless of gender. However, the percentage of FSU immigrants who attain non-academic post-secondary education is somewhat higher than that of native-born students, with the difference especially pronounced for women.

The relatively high educational outcomes of FSU immigrants should be considered alongside differences between native-born and FSU immigrant populations in family characteristics. The results of the descriptive statistics for family characteristics variables for FSU immigrants and native-born populations are available in online Appendix A. On average, FSU immigrant children (who arrived in Israel in 1990 and 1991) grow up in homes with higher levels of education and fewer siblings, but lower levels of standard of living, than native-born children. More specifically, a higher percentage of FSU immigrant children have parents with academic education (39% and 40% of mothers and fathers, respectively) than native-born children (20% and 23% of mothers and fathers, respectively). The average number of siblings for FSU immigrant children is 1.56, compared to 2.35 for native-born children. The average standard of living index for FSU households is 0.69, compared to 0.73 for native-born households.

6.2. Age at migration and high school course-taking

The descriptive results presented in Fig. 1a demonstrate that FSU immigrant girls arriving in Israel at ages 10–12 are less likely to enroll on the most selective high school programs (STEM) than those arriving at a younger age. In addition, the rates for participation in the vocational specializations and for completing high school without obtaining a full matriculation diploma seem to be relatively high for FSU girls arriving at ages 11–12 compared to those arriving at a younger age. The results presented in Fig. 1b imply similar patterns for FSU immigrant boys. Those arriving in Israel at ages 10–12 are less likely to enroll in the most selective tracks (STEM) and more likely to enroll in the vocational track.

While informative and interesting, these descriptive results do not take into account family characteristics (number of siblings, parental
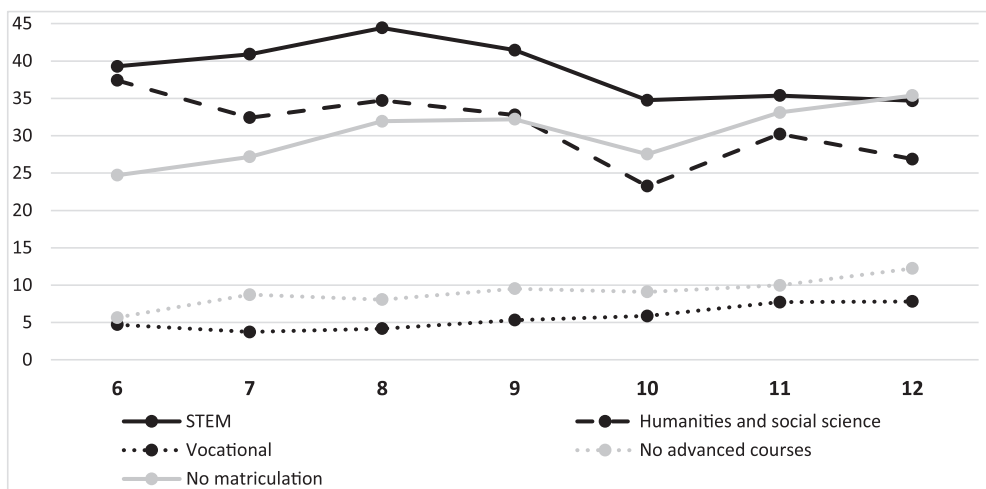
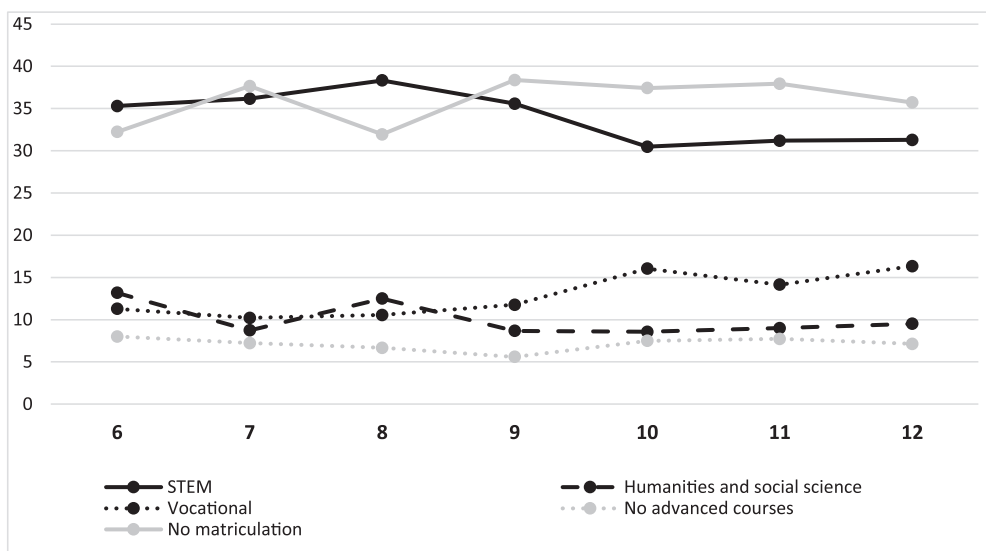**Fig. 1a.** Track by age of immigration, FSU **girls**, unadjusted.

Fig. 1b. Track by age of immigration, FSU **boys**, unadjusted.

education, and family's standard of living) and consequently may overestimate the disadvantage related to an older age at migration vis-à-vis educational achievements. The findings of multivariate analysis presented in Table 3a demonstrate that after controlling for year of birth and family characteristics, age at migration does not exert a statically significant effect on the probability of taking advanced courses in STEM subjects among **FSU immigrant girls**. Yet in line with our expectations, the probability of taking advanced courses in the humanities and social sciences is lower for FSU immigrant girls arriving at ages 10–12, than for those arriving at age six. In contrast, the probability of specializing in vocational subjects seems to be higher for FSU girls who arrived at ages 10–12 than for those who arrived at age six. Moreover, the results imply a quite steep and linear increase in the probability of enrolling in a vocational program associated with age at migration, starting at age nine.

The findings also highlight that the probability of completing high school without a matriculation diploma seems to increase in line with age at migration, starting at age eight. Although the coefficients for ages 11 and 12 are not statistically significant, their size and sign, as well as their general trend, suggest uncertainty in the estimation rather than the lack of an effect.

The results of multivariate analysis for **FSU immigrant boys**

(Table 3b) demonstrate that when controlling for year of birth and family characteristics, age at migration exerts a statistically significant negative effect on the probability of taking advanced courses in the most selective subjects. The probability of enrolling in STEM programs for FSU immigrant boys arriving in Israel at ages 10–12 tends to be lower than that of boys arriving at age six. Moreover, there is a pattern of a linear decrease in the probability of enrolling in STEM in line with age at migration, from age 10 onwards.

In contrast, after controlling for year of birth and family characteristics, age at migration does not exert a statically significant effect on the probability of FSU immigrant boys specializing in vocational subjects or in humanities and social sciences. There is weak evidence of a greater likelihood of FSU immigrant boys who arrived at ages 9–12 completing high school without a full matriculation diploma, compared to those who arrived at age six. However, the standard errors imply that the estimations are very imprecise.

Looking at the findings for girls and boys together leads to the following two clarifications. With respect to the probability of FSU immigrant boys taking advanced courses in vocational subjects, even though the coefficients for the ages at migration 10–12 are not statistically significant, they are somewhat comparable in size to the coefficients for girls. With respect to the probability of FSU immigrant girls

Table 3a
Average marginal effects (standard errors) of age at migration (age 6 as category of comparison) on high school course-taking, controlling for year of birth and family characteristics, FSU immigrant **girls**.

Age at migration	7	8	9	10	11	12
STEM	−0.01	−0.01	−0.06	−0.07	−0.12	−0.17
	(0.04)	(0.05)	(0.07)	(0.08)	(0.10)	(0.10)
Humanities and social sciences	−0.06	−0.08	−0.11	−0.17**	−0.18*	−0.22**
	(0.04)	(0.05)	(0.07)	(0.08)	(0.10)	(0.10)
Vocational	0.003	0.01	0.04***	0.08***	0.15**	0.20*
	(0.005)	(0.01)	(0.01)	(0.03)	(0.07)	(0.11)
No advanced courses	0.03	0.02	0.03	0.04	0.03	0.04
	(0.02)	(0.02)	(0.03)	(0.04)	(0.05)	(0.06)
No matriculation	0.04	0.07**	0.11**	0.12*	0.12	0.15
	(0.03)	(0.03)	(0.05)	(0.06)	(0.08)	(0.11)

Note: The full model includes controls for year of birth, number of siblings, parents' education, and family's standard of living, see online Appendix B.
*** $p < 0.01$.
** $p < 0.05$.
* $p < 0.1$.

Table 3b
Average marginal effects (standard errors) of age at migration (age 6 as category of comparison) on high school course taking, controlling for year of birth and family characteristics, FSU immigrant **boys**.

Age at migration	7	8	9	10	11	12
STEM	−0.03	−0.06	−0.13	−0.20**	−0.23**	−0.25**
	(0.04)	(0.06)	(0.08)	(0.09)	(0.10)	(0.12)
Humanities and social sciences	−0.03	0.01	−0.02	−0.02	−0.02	−0.02
	(0.03)	(0.03)	(0.05)	(0.06)	(0.07)	(0.08)
Vocational	−0.005	0.005	0.02	0.07	0.07	0.11
	(0.02)	(0.03)	(0.04)	(0.06)	(0.07)	(0.10)
No advanced courses	0.001	0.003	0.0002	0.03	0.04	0.04
	(0.02)	(0.02)	(0.03)	(0.04)	(0.06)	(0.08)
No matriculation	0.06*	0.04	0.12*	0.12	0.14	0.11
	(0.04)	(0.05)	(0.06)	(0.08)	(0.10)	(0.12)

Note: The full model includes controls for year of birth, number of siblings, parents' education, family's standard of living, see online Appendix B.
** $p < 0.05$.
* $p < 0.1$.

taking advanced courses in STEM subjects, even though the coefficients for the ages at migration 11–12 are not statistically significant, they are somewhat comparable in size to the coefficients for boys. That said, these estimations are too imprecise to be considered evidence of the effect of age at migration.

6.3. Age at migration and higher education attainments

The descriptive results in Figs. 2a and 2b demonstrate a certain decrease in the rate of academic degree attainment in line with age at migration for FSU immigrants, regardless of gender. There is also a slight increase in the rate of secondary education with age at migration, especially around ages 10–12, for FSU immigrant girls. Among FSU immigrant boys, however, there is an increase in the attainment of a post-secondary nonacademic diploma with age at migration, starting at age nine. Yet as mentioned earlier, these descriptive findings may overestimate the disadvantage associated with older age at migration, as they do not take into account year of birth or family characteristics.

Tables 4a and 4b present average marginal effects of age at migration from the model predicting the likelihood of higher education attainment, controlling for year of birth, parental education, family's standard of living, and number of siblings for girls and boys respectively. The
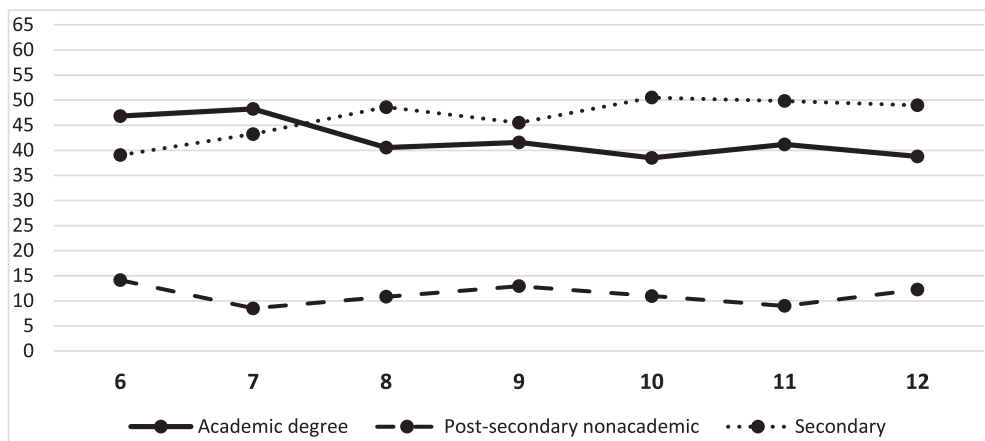
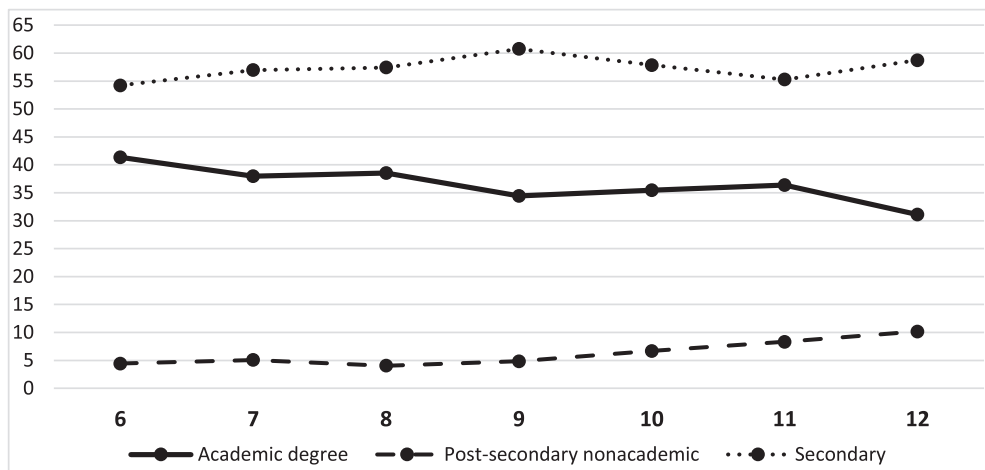**Fig. 2a.** Higher education attainment by age at migration, FSU immigrant **women**, unadjusted.

Fig. 2b. Higher education attainment by age at migration, FSU immigrant **men**, unadjusted.

Table 4a
Average marginal effects (standard errors) of age at migration (age 6 as category of comparison) on higher education attainment, controlling for year of birth and family characteristics, FSU immigrant **girls**.

Age at migration	7	8	9	10	11	12
Academic degree	−0.01	−0.02	−0.03	−0.07	−0.10	−0.10
	(0.04)	(0.05)	(0.07)	(0.09)	(0.11)	(0.13)
Post-secondary	−0.01	−0.04	−0.04	−0.04	−0.04	−0.04
	(0.03)	(0.03)	(0.04)	(0.05)	(0.05)	(0.06)
Secondary	0.02	0.05	0.07	0.11	0.14	0.14
	(0.03)	(0.04)	(0.06)	(0.08)	(0.10)	(0.12)

Note: The full model also includes year of birth, number of siblings, parents' education, family's standard of living; see online Appendix C.

Table 4b
Average marginal effects (standard errors) of age at migration (age 6 as category of comparison) on higher education attainment, controlling for year of birth and family characteristics, FSU immigrant **boys**.

Age at migration	7	8	9	10	11	12
Academic degree	0.03	0.05	0.01	0.05	0.02	0.01
	(0.04)	(0.06)	(0.07)	(0.09)	(0.11)	(0.13
Post-secondary	−0.07*	−0.04	−0.03	−0.05	−0.07	−0.04
	(0.04)	(0.04)	(0.06)	(0.07)	(0.07)	(0.10)
Secondary	0.03	−0.01	0.02	0.0005	0.05	0.03
	(0.04)	(0.06)	(0.07)	(0.09)	(0.11)	(0.13)

Note: The full model also includes year of birth, number of siblings, parents' education, family's standard of living; see online Appendix C.
* p < 0.1

findings in Table 4a do not provide enough evidence to suggest that age at migration among FSU immigrant girls influences the likelihood of the attainment of an academic degree, net of year of birth and family characteristics. There is also no statistically significant effect on the probability of attaining only secondary or lower levels of education. While the size of the coefficients for ages 11 and 12 implies a certain increase in the attainment of only secondary level of education, large standard errors point to a high degree of uncertainty in the estimates. The findings for boys presented in Table 4b are similar, but more conclusive. The findings clearly suggest that net of year of birth and family characteristics, age at migration does not exert any statistically significant or substantial in size effect on the probability of FSU immigrant boys attaining an academic degree. It seems that the probability of FSU immigrant boys who arrived in Israel between ages six and 12

attaining either an academic degree or a non-academic post-secondary diploma does not change in line with their age at migration.

The inclusion of high school course-taking in the model (see online Appendix D) does not change the results showing an absence of a statistically significant effect of age at migration. Because age at migration does not affect the attainment of an academic degree or a post-secondary non-academic diploma among FSU immigrants who arrived at the ages of 6–12, the high school course-taking, although very influential for higher education attainment, does not play the role of a mediating mechanism.[6]

7. Discussion and conclusions

The present study sought to bridge the gap between the vast literature on curriculum differentiation in high school as an important mechanism of stratification in secondary and higher education and the literature on the effects of age at migration on educational achievement and attainment. Specifically, we examined the effect of child age at migration on high school course-taking (i.e., the horizontal dimension of educational stratification) and on higher education attainment (i.e., the vertical dimension of educational stratification), focusing on FSU immigrants who arrived in Israel between the ages of six and 12 and thus defined as 1.5-generation immigrants. Our preliminary analysis revealed that the educational outcomes of this specific group of young immigrants do not fall below, and in some aspects even exceed, those of native-born Israelis. For example, FSU 1.5-generation immigrants are more likely to take advanced courses in the most selective high school programs (i.e.., STEM) than their native-born peers. Even though they attain academic education at the same rate as native-born students, FSU 1.5-generation immigrants attain non-academic post-secondary education at higher rates than native-born students. These differences are especially pronounced among girls.

We based our theoretical expectations regarding the effect of child age at migration on educational outcomes on three theoretical explanations: 'critical age' at migration, the role of structural features of secondary education, and the immigrant instrumentalist approach to education.

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[6] To examine whether the effect of child age at migration on educational outcomes in adolescence (both high school course-taking and higher education attainment) varies across parental educational levels, we re-estimated all the models including interaction terms between child age at migration and parental education. There was no evidence of any systematic differences in the effect of child age at migration among children of parents with and without academic education.

The results for high school course-taking provided almost no evidence supporting the 'critical age' hypothesis that, based on the previous research in the Israeli context, could be read as suggesting a decrease in educational outcomes in line with age at migration, starting at around age seven. The decrease in the enrollment in the most selective tracks for FSU boys occurs much later than the 'critical age' hypothesis proposes. (The estimations of such a decrease for FSU girls are too imprecise to be considered as strong enough evidence of an effect of age at migration.) Specifically, FSU boys arriving in Israel at ages 10–12 are less likely to enroll in the most selective STEM programs than those arriving at a younger age; the disadvantage that appears at around age 10 increases with every additional year of age at migration. Following our structural explanation, such a decrease can be explained by the disadvantageous position of immigrant children who arrive in the new country very close to a period when the Israeli educational cycle is characterized by curricular differentiation, around the age of 12.

Our results may suggest that the 'critical age' hypothesis, stemming as it does from the argument about the critical age for language acquisition, is less relevant for the horizontal dimension of stratification in secondary education (reflected in high school course-taking) then for academic achievements at primary and secondary school. As we stated, our study is one of the first attempts to examine the effect of child age at migration on the horizontal dimension of stratification in secondary education.

The findings for FSU immigrant girls on the effect of age at migration on course-taking strongly supports claims of immigrants' instrumentalist approach to education. FSU immigrant girls who arrive at age 10 and older are more likely to take advanced courses in the vocational specialization, compared to those arrive at a younger age. Immigrant girls arriving at an older age have not only a higher likelihood of enrolling in the vocational track (perceived as more practical and more clearly aligned with labor market prospects immediately after completing high school), but also a smaller likelihood of enrolling in programs perceived as least practical and promising in terms of immediate labor market incorporation (i.e., humanities and social sciences). It should be noted that in Israel, as in many other countries, girls are overrepresented in the humanities and social sciences tracks in high schools. That aside, specialization in the humanities and social sciences requires a high level of Hebrew language proficiency, compared to other specializations; this constraint may also reduce the enrolment of immigrant students who arrive at an older age in advanced courses in these fields. The results for FSU immigrant boys do not provide enough evidence to either confirm or reject the instrumentalist approach thesis.

We did not find any effect related to age at migration on the higher education attainment of FSU immigrants who arrived in Israel at ages 6–12. These results are in line with Böhlmark's (2009) study in Sweden. Böhlmark (2009) found that although immigrant children who arrived in Sweden at an older age performed more poorly in compulsory education then those arrived at a younger age, the former caught up substantially by the time of the final educational attainment.

We suggest that family characteristics of FSU immigrant students may explain, at least in part, the absence of any negative effect of age at migration on higher education attainment in Israel. As our findings indicate, compared to native-born students, FSU immigrant students have a relatively small number of siblings and are more likely to have parents with an academic level of education. These family features might help FSU immigrant students experiencing disadvantage – due to their relatively advanced age at the time of arrival in high school in a new educational and social setting – to overcome such disadvantage in higher education attainment. Research in the sociology of education has found a negative effect of the number of siblings and a positive effect of parental education, on educational attainment (for Israel, see Feniger & Shavit, 2011). An additional possible explanation for the findings demonstrating that age at migration affects educational outcomes in secondary education but not in higher education is the established Israeli framework for second-chance educational opportunities. Such frameworks (i.e., academic preparatory programs and external matriculation examination) give students a second chance to complete secondary school or to improve their completion status (Bar-Haim & Blank, 2019; Shavit, Ayalon, & Kurlaender, 2002).

Admittedly, our study has some limitations. Although examining the short period of arrival, 1990–1991, allowed avoiding potential differences between groups stemming from time-related changes in the socio-economic situation of Israel and its immigrant integration practices and resources, it also restricted the age range of immigrant students in the study. Because the initial sample included 1978–1985 birth cohorts, 1990 and 1991 arrival years only cover FSU students who immigrated at primary-school age, between six and 12 (there are no children in these birth cohorts who arrived in Israel at an older age in 1990–1991). The expansion of the range of child age at migration to include 1.25-generation immigrants (aged 13–17 at time of arrival) in the study of the effect of child age at migration on high school course-taking is a promising line for future research.

In addition, our arguments were tested in the Israeli education system where selection processes for school tracking start in lower secondary (junior high) school. Thus, we cannot answer the question whether structural explanations play the same role in educational systems in which selection processes start earlier or later. It would be interesting to test this theoretical argument in other contexts. We also suggest examining whether child age at migration affects the field of study or type of institute in higher education (i.e., horizontal dimension of educational stratification in higher education), and not only the amount of higher education obtained.

8. Implications for education policy

This study has important implications for education policy on the incorporation of immigrant children in the education system. As noted above, although previous studies on the effects of child age at migration have tended to focus on language acquisition as a main mechanism for educational success, we emphasize the role of curricular differentiation. Curricular differentiation, i.e., placement in different educational programs, has been known for decades as one of the main mechanisms of social reproduction, largely because marginalized social groups have less access to knowledge on the short- and long-term implications of placement in less-prestigious curricular programs (e.g., Barone et al., 2018; Oakes, 2005). Our findings suggest that immigrant students who arrive in Israel closer to the stage when curricular differentiation begins (in lower secondary education) are more likely to end up in less-prestigious programs, possibly because they and their parents lack formal information on the Israeli education system and do not know yet the cultural codes of the Israeli education system. These findings call for greater awareness of school personnel to possible difficulties newcomers may have navigating a complex system of curricular differentiation that requires knowledge about procedures and a more subtle understanding of school culture (e.g., Pérez et al., 2021). To raise awareness, education systems need to invest in culturally responsive teachers, as well as counsellor training and professional development that include specific attention to new immigrant families. A broader implication of this study relates to the vast literature on curricular differentiation that consistently shows that postponing the sorting of students into different programs until they are older may attenuate the negative consequences of curricular differentiation for disadvantaged social groups (e.g., Knigge et al., 2022; Van de Werfhorst, 2019).

CRediT authorship contribution statement

Anastasia Gorodzeisky: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Visualization, Writing – original draft, Writing – review & editing. **Yariv Feniger:** Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Writing – original draft, Writing – review & editing. **Hanna Ayalon:** Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Visualization, Writing – review & editing.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

The authors do not have permission to share data.

Appendixes A, B, C and D. Supplementary material

Supplementary data to this article can be found online at https://doi.org/10.1016/j.childyouth.2023.107188.

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