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Intergenerational Mobility Following a Large Exogenous Shock: Evidence from the Holocaust*

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Abstract

In this paper, we examine the economic outcomes and intergenerational mobility of Holocaust Survivors relative to those who arrived before World War II, a group known as the Fifth Aliyah. We present evidence that in spite of large initial human capital differences between the groups, by the third generation, the survivors enjoy almost complete convergence with the Fifth Aliyah. The survivors exhibit more upward mobility and lower similarity with their parents' outcomes as compared to the Fifth Aliyah. We also compare survivors stratified by age, and find that those who arrived later in life suffered even worse initial economic outcomes, but their children exhibited greater upward mobility. We explore mechanisms for the rapid catch-up by comparing those who received reparations to those who did not, focusing exclusively on the Polish-born. We find that reparations given to the first generation had a large positive impact on the second and third generation, who enjoy complete catch-up with the outcomes of the descendants of the Fifth Aliyah in terms of human capital. The results highlight the effectiveness of providing financial reparations to a previously-persecuted group with a low initial level of human capital.

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I. Introduction

Recent scholarship has documented a substantial decline in intergenerational mobility (IGM) in developed countries. Coincident with this decline, income and wealth inequality have increased dramatically, alarming policymakers and scholars that the prevailing economic system of capitalism is no longer 'fair'. The increasing rigidity of social status has been implicated as a cause of a recent turns towards populism, as observed by recent protesters and political outcomes (the election of Donald Trump, Brexit, rise of far-right movements in the EU, the yellow vests in France, 'social justice' protests of 2011 in Israel, and the rising popularity of Bernie Sanders). Aside from the political implications, the decline in the IGM also represents a moral problem, as it indicates that someone's birth environment is likely to predict very well their adult outcome, irrespective of their innate ability or effort. The clear need to understand what drives IGM and to promote policies that make upward mobility more feasible has led to a growing literature examining the determinants of social mobility.

In recent empirical work, scholars have examined the IGM across sub-populations as a way of identifying the reason for its fall. In a paper that received a great deal of attention, Chetty et al. (2017) demonstrated that the US, once considered the 'land of opportunity', experienced a striking variation over time in its IGM. In subsequent work, scholarship identified race, neighborhood, and geographic region as highly predictive of the outcome of children from poor families (Chetty 2018, Mazmunder 2014). This literature concluded that since children's outcomes today are far more deterministic than they once were, America has experienced a marked decline in the equality of opportunity, calling to a policy change to address this issue.

However, one major issue that this literature fails to address is the potential endogeneity of the initial distribution of human capital. A decline in the IGM can be due to an actual decline in fairness of the economic system, but it could also be because those who are born to poor backgrounds today are different than in previous generations. In a recent paper, Nybom and Stuhler (2014) argues that past success at fostering IGM in Sweden is partly responsible for the country's recent decline in IGM, as the most talented poor were able to escape poverty. In their view, almost the entire decline in IGM can be attributed simply to a change in the latent potential of the poor. Whether the decline in the IGM is due to a decline in fairness or changes in the quality of those born poor has led scholars to seek out natural experiments in which the initial wealth condition is exogenously determined, wherein the concern that the poor are less talented is less plausible. Examples include educational policy changes (Chevalier, 2004), a war (Page, 2006), or a sudden economic

change in context, such as immigration or migration (Chetty and Hendren, 2015). However, these papers generally exploit rather small changes in the initial human capital condition, are not entirely exogenous in nature, or only affect a rather narrow subset of the population.[1] As such, this literature provides limited lessons regarding what influences the IGM, or what facilitates greater social mobility.

In this paper, we exploit a large and exogenous shock to human and physical capital that affected millions of people: The Holocaust. As we will demonstrate, Holocaust survivors in Israel have significantly lower physical and human capital than those who emigrated from Europe prior to the war, but are plausibly similar in terms of culture and potential human capital. The analysis relies on a comparison between the survivors and European Jews who emigrated to Palestine during the 1930s, members of the so-called "Fifth Aliyah". The Fifth Aliyah, as a result of their ethnical similarity to the survivors, represents a natural counterfactual of how the survivors would have fared had they not experienced the systematic dispossession of their assets and the interruption of their education. A comparison of the two groups over generations allows us to understand (a) the speed of the convergence process for human capital following a shock and (b) the factors which facilitate convergence, such as economic reparations.

There are several reasons why the Holocaust represents a powerful natural experiment for analyzing the determinants of IGM. First, the effect of the shock is massive: survivors have on average 1.9 years fewer education than members of the "Fifth Aliyah", they earn 20% lower income, and are observed in neighborhoods with lower Socio-Economic Status by 1.9 quantiles (from a 1-20 ranking system). Second, the Holocaust was indiscriminate in its treatment of European Jewry. Both the rich and poor of European Jewry were affected similarly, whereas in many natural experiments only a subset of the population suffers a shock. Third, the data context in which we operate provides several key advantages. Since all Israelis are assigned a unique identifier, and linkages between parents and children are performed by the administrative staff of the Ministry of Interior, there is no slippage in our connections between parents and children. In many other studies, which rely on either tax

[1] Chevalier (2004) used a small change of one-year increase in minimum school leaving age in Britain in the seventies as source for discontinuity in the parental educational attainment. Chetty et al. (2014) ignore initial wealth influence on children's income, although they add a remark on children of wealthy parents who may choose not to work or may choose lower-paying jobs, which would reduce the persistence of income across generations relative to the persistence of underlying opportunities.

data or survey data, the links are either imperfect or based on much smaller samples.[2] Therefore, our sample is much larger than survey data, and more reliable than studies which use tax records or census samples. Fourth, the Holocaust provides significant variation in the initial capital condition even among survivors, allowing for comparison within the group of survivors. In particular, the survivors who arrived in Israel past the age of 16 were far less able to close the achievement gap with the Fifth Aliyah than their younger counterparts. This allows us to make comparisons among survivors who are otherwise similar except for the magnitude of the negative shock of the Holocaust, sidestepping potential identification problems of comparing survivors to non-survivors.

In the first phase of the analysis, we examine the experience of the children of Holocaust survivors relative to the children of members of the Fifth Aliyah. The children of survivors made remarkable strides in Israeli society, with the gaps in education falling from 1.8 years in the first generation to .64, and eroding further to .35 years in the third generation. Survivors children also catch up in earnings: we find that among the survivors, the return to education is lower, but this penalty is close to zero by the second generation. As a result, the log penalty in wages from being a survivor declines from .23 to .09 in a single generation. However, we find evidence that even among the grandchildren of survivors, there is incomplete convergence. For example, survivors' grandchildren remain 4.4 percentage points less likely to qualify for higher education relative to their counterparts from the Fifth Aliyah.

In the second phase of the analysis, we examine whether the survivors' children enjoyed more mobility than those of the Fifth Aliyah. Indeed, rank-rank estimation, where parents and children are compared in how they rank in the educational distribution, indicates that parental education is significantly less informative for survivors than for the Fifth Aliyah. The survivors also enjoy higher 'absolute mobility', as measured by the expected outcome among the lowest human capital parents. This result is also found when looking *within* survivors. We compare survivors who arrived at older versus younger ages, and as expected, those who arrive older experience the largest penalty from the Holocaust. But interestingly, we also find that children of older-arriving survivors are *least* similar to their parents, and enjoy the highest upward mobility. These findings on mobility are consistent with an interpretation that for Holocaust survivors, their human capital level is a noisier signal of their quality than it is for the Fifth Aliyah, who were able to attend school in a relatively

[2] Abramitzky et al. (2019) linked fathers and sons using information on first and last names, age, and state of birth in baseline samples. Chetty et al. (2018) linked parents and children by claimed as a child dependent on a 1040 tax form.

stable context. The results highlight the importance of understanding the determinants of the initial state of human capital for understanding what is implied by a rising or falling IGM.

In the final phase of the analysis, we examine the role reparations played in accelerating convergence. As we will describe, German's campaign to make restitution payments to those affected by the Holocaust provides a unique opportunity to understand how exogenous cash transfers to a lower human capital group may influence the speed of convergence. This is timely as a policy question, as ongoing debates over reparations (or lack thereof) for African Americans or Syrian refugees implicitly assume there would be a large boost in human capital, following sufficient funding. The Holocaust represents a unique opportunity to evaluate their effectiveness. The empirical results are quite powerful: children of survivors who received reparations are able to converge almost fully with the Fifth Aliyah, and the recipients of reparations also enjoyed more upward mobility. For those who were not eligible for reparations, we see persistent gaps in their human capital and those of the Fifth Aliyah. Overall, the empirical results indicate that reparations were a powerful force in facilitating the convergence of Holocaust survivors and the Fifth Aliyah in terms of human capital.

The rest of the paper proceeds as follows. In Section II, we briefly describe the historical context leading to the Fifth Aliyah and the Holocaust. In Section III we relate to potential selection problems. In Section IV, we present a theoretical framework, modeled after existing models of IGM. Section V describes the data. In Section VI, we examine the changes over the generations in human and physical capital among survivors and the Fifth Aliyah, In Section VII, we compare IGM patterns between survivors and the Fifth Aliyah. In Section VIII, we examine heterogeneity in the survivors. First, we compare the economic outcomes and mobility of young versus old survivors, and then we perform the same exercise using those who received a restitution pension versus those who did not. We conclude in Section IX.

II. Historical Background

A. The Fifth Aliyah and Immigration to Palestine

Jewish immigration into Palestine began in the 1880s, in a movement known now as the 'First Aliyah'. This was followed by subsequent waves of immigration that were comprised of idealistic Jews who believed fundamentally in the Zionist movement. These immigrants arrived in Palestine and faced harsh economic conditions, especially relative to the opportunities available in the United States, which at the time had an open immigration

policy. However, in 1924, the US made a policy shift which effectively shut its borders to new immigrants, especially from Eastern Europe (where most of the Jewish population resided). By the late 1920s, a combination of friendly British policy towards Jewish immigration and an improving economic landscape made Palestine an increasingly logical choice for many European Jews, ushering in a period of mass migration into Palestine known as the 'Fifth Aliyah'.

Between 1929 and 1938, almost 240,000 Jews entered Palestine, more than doubling the local Jewish population (Bachi, 1974). The immigrants came primarily from Poland (40%) and the Central European countries of Germany, Austria, and Czechoslovakia (25%). This massive of influx of Jews into Palestine was different than previous waves of immigration in that it was largely composed of families: almost 60% of the immigrants came with their families, compared with 30% and 44% in the third and fourth immigration waves. Unlike prior immigration waves, most of these immigrants were not motivated by Zionist ideals (Halamish, 2006). They simply were seeking out a better life than what was offered in Europe, which offered little economic opportunity and rampant anti-Semitism. As history unfolded, their decision proved prescient.

B. The Holocaust and its Impact on Human and Physical Capital

The Jews who remained in Europe were subject to the Nazi regime's systematic attempt to annihilate the Jewish population. Aside from the tremendous toll in mortality, the Jewish community was excluded from all economic activities and relieved of all their tangible property, with 2,000 anti-Jewish laws passed between 1933 and 1945. Jewish students were excluded from exams in medicine, dentistry, pharmacy, and law (1934). Nuremberg Laws (1935) denied citizenship rights from German Jews and Jewish property was nationalized or relocated to German citizens. Many Jewish students were removed from German schools and universities (1936), and Jewish children were expelled from German primary schools (1938). In 1939, Jews were evicted from their homes without reason or notice, and all schools closed to Jewish children by 1942. In Poland, Jews suffered from education and occupation limitations since the beginning of 1930s, intensified by severe economic depression. During the war, the German and Polish authorities also deported almost all of Poland and Lithuania's Jews, and disposed their physical property.

C. The Holocaust and its Aftermath: Immigration into Israel

At the conclusion of World War II, roughly 80,000 Jews remained in Poland, relative to an initial population of 3.3 million prior to the war. In Germany, 50,000-60,000 Jews had survived. About 320,000 refugees from across Europe were housed in Displaced Persons (DP) camps in Cyprus, Germany, Austria, and Italy from May 1945 until December 1950 (including Polish Jews who had escaped during the war to Russia and could not return to Poland). The age distribution in DP camps in Germany and Italy was quite young: 16.6% age 0-13, 3% age 14-17, 59% age 18-45, and 10% over age 46. In terms of the skill distribution, there were relatively few highly educated people, as their studies had been interrupted by the war, but the rate of illiteracy was also relatively low (Shaari, 1999).

From Israel's Declaration of Independence in May 1948 until December 1950, when the last DP camp was closed, 180,000 survivors immigrated to Israel, representing roughly two-thirds of the DP camp population, with the remaining third making their way to other countries, primarily the United States (Cohen, 2013). Decisions about where to live after the war were based on practical, personal, and ideological considerations. Both Zionism and a faster immigration processing were mentioned as important factors for choosing Israel as a destination. Another factor in their decision making was the Survivors' wish to be reunited with family members who were already in Israel (Cohen, 2013, interviews with survivors). Aside from this population from the DP camp, roughly 300,000 survivors from other European countries, such as Romania and Hungary, immigrated to Israel. In total, roughly 500,000 Jews displaced from Europe arrived in Israel after World War II with almost no physical capital and significantly diminished human capital.

D. Financial Reparations from Germany

Since the mid-1940s, prior to the end of WWII, Jews around the world started to demand financial indemnification for Holocaust victims. Within a few months after the end of the war, the Jewish Agency made its first formal claim for reparations and property reimbursement to the four Allied powers that controlled Germany: United States, Great Britain, France, and the Soviet Union. The reparations issue provoked heated debate in the new state of Israel since many Holocaust survivors opposed accepting any money from Germany, seeing the reparation receipt as implying a form of 'forgiveness' of the German war atrocities. Despite these objections, a reparation agreement between Germany and Israel was signed in 1953. The agreement required Germany to provide reparations to the State of Israel, and in exchange citizens of Israel would waive their right to apply for a disability

allowance from Germany directly (as was allowed for others harmed by Germany in other countries).

Individuals were able to apply for Holocaust reparations through two programs administered by Germany.[3] The German program was established by the West German Federal Indemnification Laws, or the BEG (Bundesentschadigungsgesetz). Through the BEG, victims of the Nazi regime could file for compensation for a variety of reasons including loss of life, loss of freedom, termination of studies, and dispossession of physical property. The BEG applied primarily to those who were German citizens before the war, or those who took up permanent residence in West Germany after the war. Survivors belonging to the German 'cultural circle' which included individuals who did not reside directly in Germany but had a direct cultural connection to Germany, were also eligible for compensation through the BEG.[4] The BEG provided lump sum payments as well as monthly payments to survivors. As we will discuss, these monthly payments are the focus of our empirical analysis, since data are available from the census samples on recipiency, and they were substantial.

III. Potential Selection Problems

A key assumption for interpreting our results is that Holocaust survivors and members of the Fifth Aliyah are comparable, or similar along unobservable dimensions. One selection issue is generated by people's decision to leave Europe before the war and become part of the Fifth Aliyah. A second possibility is that it may be that those who survived the Holocaust are different than those who perished. A positive selection of Fifth Aliyah members or negative selection of Holocaust survivors could explain the disparity of outcomes. Alternatively, positive selection of Holocaust survivors could explain higher intergenerational mobility.[5]

[3] Survivors could also apply for a program administered by the Israeli government based on disability status. This program is not the focus of my study, since data on recipiency are not available.

[4] Applying for reparation due to BEG laws was a troublesome process because of the strict eligibility requirements and the complicated application procedure. Nevertheless, by 1957, over 200,000 Israeli citizens had applied for monetary compensation (Segev, 2000), with over fifty percent of the claims eventually denied (Teitelbaum, 2008). Issues relating to the potential endogeneity of reparation receipt will be discussed in a later section.

[5] Regarding potential selection among Holocaust survivors, the literature support positive and negative selection. Following the idea of the role of luck in surviving, we assume neither positive nor negative selection within country. We support this assumption with example of similar occupation distribution of Jews in Berlin in 1925, Fifth Aliyah members from Germany and deceased from Berlin in Appendix Table 4. 17.4% agriculture among Fifth Aliyah members includes merchants and people with short training in order to be eligible for Labor certificate.

In the empirical analysis, we attempt to deal with selection in two ways. First, most of our models include country of birth fixed effects, and so at least our comparisons are only among individuals from the same country. Second, the analysis will also involve comparing survivors who only differ in their arrival timing. In this case, issues related to selection in the pool of survivors are eliminated.

A key assumption used in our analysis is also that reparation recipients are otherwise similar to those who did not receive reparations. We defend this assumption in the following ways. First, we rely primarily on German pension payments paid to Polish Jews for loss of health or hardship. This is plausibly more exogenous than reparations based on asset seizure, since having assets before the war is presumably a sign of high potential. Second, in the empirical analysis, we will demonstrate from a survey of Israeli households that prior to the pension, those who did or did not receive it were similar in terms of education and other measures of status.

IV. Theoretical Framework

One of the first and best-known models for examining the distribution of income across generations of a family is the Becker-Tomes model (Becker and Tomes, 1979). In their framework, income in each generation is generated from three sources: the previous generation's investment in their children (such as schooling), the endowments passed to the current generation (eg IQ, bequests), and a component of luck. In each generation, parents maximize utility by choosing an optimal allocation balancing their own consumption needs, and their investment in their children. This maximization is performed subject to the realization of their own earnings, and the expected earnings of their children. In this model, a persistence in income across generations stems from two sources: the transmission of endowments and parents' income. As a result of this maximization, income in any generation depends on the inheritance from the parent's generation and the market return to investment in skill of the current generation.

In the Becker-Tomes framework, the Holocaust will affect children of survivors through two primary channels. First, since parental income is lower, their children will receive less investment in human and physical capital. Therefore, the children will fare worse than if their parents had never experienced the Holocaust. The second channel is that 'family culture' will be altered from the Holocaust. On the one hand, survivors should have trauma and less social capital than the Fifth Aliyah. On the other hand, it is conceivable that a 'survivor mentality' could lead the children to be more ambitious than other children. A key

insight that emerged from the Becker-Tomes setup is that the intergenerational persistence of human and physical capital is driven by the heritability of endowments and the investment decisions of parents; the model also allows for each generation to have their fate determined by pure luck as well. One interesting implication of their framework is that for the Holocaust survivors, their income is less informative of their 'endowments' than for members of the Fifth Aliyah. For example, if the Holocaust prevented parents from investing in their children, then a low observed income could still be compatible with a very high 'social' endowment, such as attitudes towards education or latent intelligence. As such, for a given level of income, Survivors' children may be expected to outperform Fifth Aliyah children of the same income level, since they may in fact have higher endowments but received artificially low levels of parental investment.

V. Data

A. Data Description

The data for this study are derived from extensive administrative data sets, managed by the Israeli Central Bureau of Statistics (CBS). The main data set is the 2000 Population Registry, which is collected by the Ministry of Interior and records each Israeli's year of birth, country of birth, year of entry into Israel, identification numbers of mother and father, and current (or last) address. Our data set comprises all Jewish Israelis ever given an identification number and born between 1900 and 1997. The population registry is then merged with several other data sets that provide me with demographic information and outcomes. These include Israel's census samples (1972, 1983, 1995, 2008), ministry of education data (providing educational attainment, school standardized test scores) and data from the tax authority, providing income data for each individual annually from 1998-2017. This database provides detailed demographic, educational and economic information of 5,567,748 Jewish citizens of Israel.

Finally, we also accessed data from a Savings Survey conducted by the Israeli Central Bureau of Statistics and Israel Central Bank in 1963-1964, provided by Israel Social Science Data Center (ISDC). The survey includes demographic data on German restitution payments recipients and is used to evaluate the initial effect of German reparations on Holocaust Survivors.

B. Defining the Sample Population and Variables of Interest

The 'First Generation' consists of all European Jewish men born between 1909 and 1932,

and immigrated to Palestine/Israel between 1929 and 1952. The sample was stratified into two groups by whether they immigrated before or after the war: Fifth Aliyah members who departed Europe before World War II (1929-1938), and Holocaust Survivors, who arrived in Palestine/Israel between 1946 and 1952. We excluded people who arrived in Palestine during the war, since it may be that entering illegally is associated with unique attributes or resources. As shown in panel A of Table I, in the final sample, we include 96,245 Holocaust survivors and 41,258 members of the Fifth Aliyah. From this pool, we also present the means for the Polish subsample, which includes 37,389/18,767 from each group, respectively.

The 'Second Generation' is composed of 59,659 sons of Holocaust Survivors and 25,657 sons of participants in the Fifth Aliyah. Their sample means are reported in panel B. The 'Third Generation' is comprised of all sons born to the second generation between 1955-1997, of whom 64,800 are Holocaust survivors' grandsons, and 30,917 are grandsons of Fifth Aliyah members. Note that for most of the analysis, we focus exclusively on men, which may fail to reveal differences for women that have been observed in other studies of intergenerational mobility (e.g. Chetty et al. 2016, 2018, Chevalier, 2004).

In Panel A of Table I, we report statistics for the 'First Generation'. Education is taken from the 2008 education registry. Income is the father's household total annual gross income (from labor and other resources) as reported in the 1972 census, which is available for 20% of the sample. Income includes local and foreign pensions, social security and welfare allowances, capital income (from real estate, interest, dividends) and any other permanent income (excluded one-time income as inheritance, compensation, lottery prize). The 1972 income data is potentially problematic, and so most of the intergenerational mobility analysis in this study will focus on years of education, which is easier to measure consistently in the data[6]. Neighborhood Socio-Economic Status was taken from 1983 registry and relates to place of residence in 1983 or last place of residence if a person died before 1983. The data set also contains each individual's Neighborhood Socio-Economic Status (SES) according to their last known address. This variable is used as proxy of physical capital under the

[6] There are two known measurement errors in IGM research which can leads to lifecycle and attenuation biases: the 'First Generation' is on average 51 years old at the time of the 1972 census, while research suggests that lifecycle bias is minimized at around 40 years old. Furthermore, one year income might include a transitory shock and creates an attenuation factor depending on the transitory shock's variations. The 1972 income data seems to be adequate for a comparison between two groups at similar age but probably not good indicator of permanent income, and so the bulk of my analysis relies on years of education. Note also that since the gap between estimated and actual earnings depends on an individual's ability; a larger gap is expected for high-ability persons than for those of low-ability (Lee and Solon, 2009).

assumption of correlation between socioeconomic characteristics of place of residence and dwelling prices. Israel's Central Bureau of Statistics generates this classification in twenty quantiles at the time of each census.

Sample means for the 'Second Generation' are featured in Panel B. Education is measured in years and taken from the 2015 education registry. Income is average annual income from labor (before tax) of employees, taken from the Israel Tax Authority data for the period 1997-2000. This window is ideal, since the average age of the Second Generation at this time is 43 years old, and fluctuations in income are smoothed over the four years, yielding a robust measure of an individual's success in the labor force. Finally, Neighborhood Socioeconomic Status is taken from the 1995 registry; for individuals alive in 1995, this is the economic status of their actual location, and for those who died before 1995, it represents their last known address.

The data for the 'Third Generation' is presented in Panel C. Years of education is reported for men over 32 years old in 2015 (the registration year); this restriction is necessary since many grandchildren of the First Generation have not yet completed schooling by 2015. Since many members of the 'Third Generation' are not yet 32 years of age, we rely on an alternative measure of education, which is whether the individual received their matriculation certification (which occurs at roughly 18). Neighborhood Socio-Economic Status was taken from the 2008 registry.

C. Summary Statistics

Table I reports summary statistics of economic outcomes for three generations, describing their human and physical capital. Panel A reflects the incredible deficit in human and physical capital of the 'First Generation' Holocaust Survivors, as compared with the Fifth Aliyah: 1.9 fewer years of education, 20% lower income and 1.9 lower Neighborhood Socioeconomic Status quantile. These differences are all statistically significant at the 1% level. It is also worth noting that the gap between the survivors and the Fifth Aliyah is a robust finding across different cohorts and different birth countries. As shown in Figure I, the gap is between the two groups is persistent across age groups, and especially large for older Holocaust survivors, who had very little opportunity to compensate for the Holocaust deficit once they arrived in Israel.

In Panel B and C, we report the gaps between the Second Generation and Third Generations of the two groups, and while the survivor's children were able to narrow the gap, it is still very large: survivors' children have 0.6 fewer years of education, 12% lower

income, and 1.0 lower Neighborhood SES values. By the third generation, the penalty is modest though significant – even after two generations, survivors grandchildren earn 0.44 years fewer of education and pass the matriculation exam at a four percentage point lower rate (74% versus 78%).

This result of incomplete convergence is represented visually in Figures II and III for both education and SES. In each panel, we observe a narrowing across generation of the distribution when comparing survivors and the Fifth Aliyah. In the first generation, the kernel density function reveals large distributional gaps between the two groups, and these gaps have not yet disappeared completely even by the third generation. This result is further reinforced by Figure IV, where we plot the average education for the first generation and the matriculation rate for the third generation. The plot reveals a marked decline in these measures of academic success for those arriving after the war. The simple fact that the timing of one's grandfather's arrival in Palestine/Israel is predictive of your chance of qualifying for higher education speaks to the persistence of economic advantage over generations. This phenomenon will be investigated more rigorously in the following sections.

VI. Persistence

In Table II, we build on the findings in Table I to account for several potential confounding factors. In particular, we estimate differences between the groups after accounting for birth cohort, country of origin, and a propensity score matching based on country of birth and birth year. The results are very similar to those in Table I, implying that the differences across generations between survivors and the Fifth Aliyah are not simply a byproduct of differences in when and where they were born. This is highlighted very clearly in the 'Poland Only' sample, in which the gaps are generally larger than in the overall sample. For example, after accounting for cohort and birth country effects, the overall gap between Holocaust survivors and the Fifth Aliyah was 1.8 years, but even higher among the Polish-born (2.4 years). The remainder of the table demonstrates the robustness of the differences reported in Table I, and neither cohort nor country explains the large persistent gaps between the two groups.

In Table III, we focus more narrowly on explanations for the wage gap between the two groups. A natural question is whether the survivors earn lower wages simply because they have lower educational attainment, or whether they have a lower return to education. As shown in Panel A, the survivors experience a significantly lower return to education than the

Fifth Aliyah, suggesting their lower wages are a byproduct of both lower educational attainment and lower productivity for any given level of education. One possible explanation for this finding is the physical and mental trauma of the Holocaust had a considerable impact on human capital and productivity beyond what is reflected in the lower educational attainment (Scharf, 2007). This could lead to a lower return to education. However, for the second generation (in Panel B), the return education is roughly equivalent between the two groups. Their average wage is lower than the children of the Fifth Aliyah, but it is only due to differences in educational attainment – suggesting the negative impact of the trauma is no longer relevant for this group.

In Table IV, we more rigorously investigate the differences that persist for grandchildren. As shown in column 1, grandsons of Holocaust Survivors experience a 4.4 percentage point lower rate of matriculation certification, even after accounting for birth cohort. In column 2, we add fixed effects for the grandfather's birth country and the estimated effect declines to 3.7 percentage points, implying some portion of the difference is attributed to country of origin, with the Fifth Aliyah being from slightly more advantaged countries (e.g. Germany). When we add school fixed effects, the effect drops by roughly a third, and survivors are estimated to have grandchildren with a 2.7 percentage point lower chance of passing the matriculation exam. This suggests that roughly one third of the gap can be explained by grandchildren of the Fifth Aliyah attending slightly better schools, and two thirds attributed to differences within a given school. Note that this result is quite remarkable: two children attending the same school with a grandparent from the same country have a 2.7 percentage point higher chance of qualifying for higher education if the grandparent arrived before the war. Finally, in column 4, we account for school quality in a slightly different manner by including the overall matriculation pass rate of the school, and again find that the results are still significant, with the Fifth Aliyah grandchildren passing at a rate 2.3 percentage points higher. The results in Panel B and C point to the same qualitative conclusion, that matriculation scores and math scores are lower for grandchildren of survivors.

VII. Intergenerational Mobility

A recent literature has documented significant declines in economic mobility in developed countries (Chetty et al, 2017). But one explanation for the decline in mobility is that the initial income distribution is increasingly reflecting low endowments, and so the decline in mobility says little about whether there is a change in 'fairness'. The Holocaust represents a

unique opportunity to examine mobility, since for the survivors the initial endowment of human and physical capital is largely exogenous. Furthermore, they can naturally be compared to the Fifth Aliyah, for whom their initial level of human capital is likely more informative regarding their endowment.

We examine this possibility in Table V, in which we report measures of economic mobility for the two groups. In Panel A, we find that indeed, economic mobility is higher for the children of the Holocaust survivors than the children of the Fifth Aliyah. we estimate the intergenerational elasticity (IGE) for both groups, which is a measure of the similarity of parents and children and find that the IGE is smaller for the survivors (0.12) than for the Fifth Aliyah (0.19). This is sensible, as it indicates that for the survivors, their educational achievement is less reflective of their ability than it is for the Fifth Aliyah. Next, since we wanted to compare the two groups, a rank-rank regression was executed following Chetty et al. (2014, 2018). Following their method, we ranked sons based on their position in their birth cohort education distribution. For a given cohort of sons, we then ranked all the fathers (irrespective of father's birth year). we focus on the 1963-1967 birth cohorts from the Second Generation and the 1976-1980 cohorts from the Third Generation[7]. We then regress the child's rank on the father's rank and find that indeed, by this measure as well, survivors' children are less similar to their parents than the children of the Fifth Aliyah. The OLS regressions yielded a relative mobility estimate (coefficient of father on son in a rank-rank regression) of 0.29 for Holocaust Survivors and 0.42 for Fifth Aliyah members (Figure V), a difference that is statistically significant at the 5% level. Stated differently, a one percentage point increase in parent education rank is associated with 0.29 percentage point increase in the mean rank of a Holocaust survivor's son and 0.42 percentage point increase in the mean rank of Fifth Aliyah member's son. This lower slope means that parental status is less informative on the success of their children, implying more mobility. The rank-rank regression also produces an additional measure of interest – absolute mobility. Absolute mobility measures the average child percentile outcome among children whose fathers are at the lowest part of the distribution. The results indicate that absolute mobility is higher among survivors as well, with the average child placing at the 30th percentile when his father is in the bottom percentile, as compared to the 24th percentile for the Fifth Aliyah parents in the bottom percentile, a difference which is statistically significant at the 10% level. Finally, we measure upward mobility, which is a similar calculation but reports child outcomes whose

[7] We use five-year birth cohorts following Chetty (2014).

parents are at the 25th percentile. Again, survivors' children outperform the children of the Fifth Aliyah after conditioning on parental status – the survivors' children rise to a rank of 37.2 versus only 34.2 for the Fifth Aliyah.[8]

In Panel B, we see a reversal of these patterns. Interestingly, between the second and third generation, the Holocaust survivors exhibit greater similarity to their parents than members of the Fifth Aliyah. However, the difference is insignificant and speaks to the convergence between the two groups. The results suggest that in spite of incomplete convergence between the two groups, mobility measures converge. One possible interpretation of this result is that the generation who experienced the Holocaust, their human capital was such a poor measure of their endowment, it was inevitable that their children would be dissimilar to their parents. However, after that first 'crisis' generation, the Fifth Aliyah can use their wealth to generate higher levels of economic persistence between generations. This would yield the observed result of a large catch-up between the first and second generation, and a more modest catch-up between the second and third generation, and a convergence in mobility between the two groups.

VIII. Heterogeneity among Holocaust Survivors

In this section, we examine factors that influenced the relative success of the survivors and their offspring at catching up economically to the Fifth Aliyah. This is important for two reasons. First, comparisons within the group of survivors allow us to rule out the possibility that our results were driven by an inappropriate comparison between Holocaust survivors and the Fifth Aliyah. So, for this set of exercises, there is no concern that the decision to emigrate to Palestine was endogenous to human capital, as all the individuals remained in Europe. Second, as we will demonstrate, there were key factors that determined mobility that may provide insight into the factors that contribute to economic success more generally.

A. Heterogeneity by Age of Immigration

A visual preview of these comparisons is given in Figure VI, where we compare Holocaust survivors and the Fifth Aliyah based on their age of arrival. The figure demonstrates that for survivors, arriving at a younger age was critical to predicting success in the first generation. This is logical, as they were more able to overcome the initial challenge of being an immigrant. For the Fifth Aliyah, the age at entry was less critical, as the conditions in Europe

[8] Chetty et. al. (2018) found 6.5pp gap in college attainment between white and black men with fathers at the 25th percentile.

prior to the war were not nearly as problematic for human capital accumulation as they were during the war. The figure highlights that the impact of the Holocaust can be examined by stratifying the survivors by age at entry, with older immigrants experiencing a larger initial negative shock than those who arrived at younger ages. These results are further reinforced by Figure VII, in which we plot the differences between survivors and the Fifth Aliyah by age at arrival and for both the first and second generation. For the first generation, the figure reflects the pronounced gap between the survivors and Fifth Aliyah among those who arrived at older ages, and the more modest difference for those who arrived at younger ages. Interestingly, this dynamic no longer holds for the second generation, in which there is a small gap between the two groups, but it is no longer conditioned on the age of the parent's arrival. While the Fifth Aliyah still enjoy an advantage over the survivors, it is no longer related to the age of the survivors' arrival.

In Table VI, we examine the economic mobility of Holocaust survivors from all of Europe (columns 1-5) as well as those from Poland in particular (6-10). The table reveals striking evidence that those whose parents arrived at ages 8-12 exhibited lower absolute mobility than those who arrived at age 19 and older.[9] This is logical, since for survivors who arrived at older ages, their academic achievement revealed very little about their latent potential. This left the greatest opportunity for significant upward mobility for their children. In contrast, for those who arrived at younger ages, their academic achievement was more informative of their actual ability. This is found to be true for the overall sample, and is even more apparent in the Poland-only sample. The results highlight the clear connection between the exogeneity of the initial human capital stock and the potential for advancement – in particular, when the initial condition is simply the byproduct of life circumstances, the next generation has the opportunity to do far better than their parents. The results for relative mobility are largely in line with those for absolute mobility, where the correlation between parents and children is lower among those who arrived at older ages, meaning the children and parents exhibit a lower degree of similarity, indicating that the parents outcome is again uninformative of their children's latent potential.

A graphical version of the differences in mobility by father's arrival age is displayed in Figure VIII. The figure features two plots in which we stratify the fathers by either two groupings, age 8-15 and 16-22, or three groupings, age 8-12, 13-18, and 19+. In both plots, we observe greater absolute mobility among those whose parents arrived later in life,

[9] Abramitzky et al. (2019) calculated 3pp gap between sons of immigrants who arrived at USA at ages 8-16 and fathers arrived at over 16 years old.

consistent with our interpretation that their fathers' outcomes were uninformative regarding their latent potential. In terms of relative mobility, the groups are relatively similar but the flatter curve for those with fathers who arrived later indicates that their children had somewhat less similar outcomes (and were therefore more mobile).

B. Impact of Holocaust Reparations on Intergenerational Mobility

We conclude our analysis with an examination of the consequences of German reparations to individuals on their economic outcomes, and the outcomes of their children. Our focus is almost exclusively on Polish-born Holocaust survivors, so that we can isolate the direct impact of the reparations rather than other factors. In Table VII, we present summary statistics of those who did and did not receive reparations in terms of their demographic and economic outcomes, as well as their children. The table reveals clearly that the survivors who received reparations outperformed those who did not, and the gaps are even larger in the second generation. For example, children of reparation recipients earned 0.42 more years of education than children of non-recipients. They also end up living in nicer neighborhoods, living on average in 1.06 higher quantiles (out of 20) than the children of non-recipients. These results are visually confirmed by Figure IX, where we compare four groups of people: Fifth Aliyah members and Holocaust survivors who did and did not receive German reparations[10]. The figure reveals that the highest-achieving group is the Fifth Aliyah members who received reparations, and the lowest achieving group is the Holocaust Survivors who did not receive reparations. The take-away from the figure is that 'money matters', and that recipients of German funds were able to out-perform non-recipients. In fact, children of survivors who received reparations catch up almost entirely to the members of the Fifth Aliyah without reparations. The results highlight the key role that reparations played in people's economic outcomes, and their ability to improve their children's outcomes, but also beg the question: how did reparation receipt relate to one's initial economic situation?

We examine this issue in Table VIII, where we compare the reparation recipients and non-recipients using a Savings Survey conducted in 1964, not long after the program of initial reparations began. The survey recorded whether an individual received the 'one time' reparation issued by German between 1957-1965, in which Polish-born survivors were given

[10] Note that members of the Fifth Aliyah were eligible for reparations from Germany for seizure of property, loss of education, or for harm done to family relatives. It is also worth noting that I examine 'Polish-born', who may have spent time in Germany or Austria.

these funds mainly for loss of freedom (i.e. being interned at a concentration camp or ghetto). The table reveals that the recipients are more likely to own their own apartment (21 percent versus 13 percent) and enjoy higher log consumption, both of which are statistically significant after adjusting for age. But interestingly, the differences in years of education are not significant; while recipients were slightly more educated than those who did not receive reparations (9.3 versus 8.9 years), the difference is not statistically significant. While the table does not represent a 'silver bullet' against concerns that pension recipiency is endogenous, it suggests that the economic impact of reparations exceeded any differences in human capital between the two groups.

We conclude our analysis with an examination of economic mobility among those who did and did not receive reparations. As shown in Figure X, the children of reparation recipients outperformed the children of those who did not receive reparations at virtually every percentile of the father's educational rank distribution. In fact, the gap grows larger at higher levels of father's rank, suggesting that survivors who were more educated were able to use the reparations to advance the prospects of their children in an expeditious manner. The main finding is that the reparations were helpful to everyone, but especially helpful to those already endowed with education. These findings are confirmed by the results in Table IX, where we examine the rank-rank association between Polish survivors and their children, stratified by reparation receipt. The results are striking, and differ considerably from the results where we stratify the survivors by age. Specifically, we find that pension recipients exhibit higher absolute and relative mobility. The pension funds appear to have allowed recipients to give their children greater advantages and this grew with respect to the parents own education. This result highlights the significant impact that money can have on fostering better human capital outcomes, even in a context of a relatively socialist country like Israel (during this period). Furthermore, the finding that the advantage of reparations grows with respect to fathers education implies that either (a) they were able to use the funds more efficiently or (b) they placed greater value on education and therefore invested a larger portion of their reparation money into child outcomes. This highlights a key mechanism described by the Becker-Tomes framework in which economic outcomes persist over generations both through access to resources, and tastes for investment. For the well-educated Polish Holocaust survivors, the massive impact of reparations when the groups were otherwise similar indicates that 'money matters' in a very important way, even when parental investment tastes are held fixed.

IX. Conclusion

In this paper, we examined the economic outcomes of immigrants into Palestine/Israel and the impact of arriving before or after the Holocaust. As we documented, the Holocaust had a massive impact on the human capital of the affected cohorts, with them lagging considerably behind their peers who emigrated from Europe before the war. Our intergenerational analysis reveals two findings. First, although the children and grandchildren of survivors are able to partially close the human capital gap with the offspring of the Fifth Aliyah, they do not overcome the initial conditions entirely: even among the third generation, there is material advantage to having left Europe before the Holocaust in terms of educational achievement. Second, we find that the children of Holocaust survivors exhibited greater economic mobility than the children of the Fifth Aliya. This is potentially related to the uninformative nature of the survivors' human capital outcomes, and therefore their children were able to exhibit higher absolute mobility.

Our examination of heterogeneity of Holocaust survivors is executed along two dimensions. First, we demonstrate that arriving at older ages left survivors less able to overcome their initially low levels of human capital, but their children exhibited even higher levels of absolute mobility, closing the gap entirely with survivors whose parents arrived at younger ages. Second, we examine the impact of German reparations on human capital outcomes of the children of survivors. The results indicate that reparations were an incredibly powerful mechanism for fostering better human capital outcomes for the second generation, and the advantage gained from reparations were even greater among more educated survivors. This highlights the important role that money can play in overcoming a low initial endowment of human capital.

The lessons of the immigrant experience of the Fifth Aliyah and the Holocaust survivors are somewhat nuanced. While we provide evidence that the initial condition of the survivors persisted for generations, we also find evidence that survivors children were able to close most of the human capital gap. One interpretation is that the convergence process is ongoing, and in another generation, no gap will remain between the two groups. On the other hand, the empirical findings here are surprising in that the convergence process is quite slow – even grandchildren are affected by the initial condition. The final lesson of the analysis is the importance of reparations for promoting convergence. In our sample, the recipients of German funds massively outperformed their peers who received no reparations, highlighting the key role money can play in fostering inter-generational mobility.

The importance of understanding the factors determining intergenerational mobility cannot be overstated. In recent years, inequality by income and by race has become an emergent social issue that merits further analysis. The results here suggest that reparations can be a powerful tool for facilitating economic mobility and increase equality of opportunity.

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Table I

Summary Statistics: Holocaust Survivors and the Fifth Aliyah

	All Countries			Poland		
	Holocaust Survivors	Fifth Aliyah	Difference	Holocaust Survivors	Fifth Aliyah	Difference
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: 1st Generation						
Year of Birth	1920	1917	3.57	1919	1916	3.01
	(6.67)	(6.47)	(0.04)	(6.28)	(6.30)	(0.06)
Years of Education	10.5	12.3	-1.89	9.9	12.3	-2.44
(Education Registry 2008)	(3.94)	(3.66)	(0.06)	(3.75)	(3.42)	(0.09)
Log Income in 1972	11.3	11.5	-0.20	11.3	11.4	-0.17
(2017 NIS)	(0.66)	(0.66)	(0.01)	(0.64)	(0.66)	(0.02)
Neighborhood SES Quantile	13.0	14.8	-1.86	13.3	14.9	-1.57
(1983 registry)	(4.01)	(3.75)	(0.03)	(3.75)	(3.57)	(0.04)
Age at Arrival	28.2	17.8	10.39	29.5	18.5	11.00
	(7.02)	(6.57)	(0.04)	(6.61)	(6.36)	(0.06)
Observations	96,245	41,528		37,389	18,767	
Panel B: 2nd Generation						
Year of Birth	1956	1953	3.02	1955	1952	2.59
	(7.62)	(8.46)	(0.06)	(7.40)	(8.38)	(0.09)
Years of Education	13.9	14.5	-0.59	14.1	14.7	-0.63
(Education registry 2015)	(2.81)	(2.87)	(0.02)	(2.80)	(2.80)	(0.03)
Log Average Wage 1997-2000	11.7	11.8	-0.12	11.8	11.9	-0.10
(2017 NIS)	(1.13)	(1.16)	(0.01)	(1.11)	(1.12)	(0.02)
Neighborhood SES Quantile	13.5	14.5	-1.02	14.0	14.6	-0.65
(1995 registry)	(3.75)	(3.69)	(0.03)	(3.54)	(3.74)	(0.05)
Observations	59,659	25,657		22,756	11,589	
Panel C: 3rd Generation						
Year of Birth	1985	1983	2.26	1984	1982	2.24
	(7.40)	(8.19)	(0.05)	(7.50)	(8.23)	(0.08)
Years of Education 32+	14.1	14.5	-0.44	14.4	14.6	-0.23
(Education registry 2015)	(2.65)	(2.68)	(0.03)	(2.69)	(2.68)	(0.04)
Matriculation Pct.	0.74	0.78	-0.04	0.77	0.79	-0.03
	(0.44)	(0.42)	(0.00)	(0.42)	(0.41)	(0.01)
Neighborhood SES Quantile	11.9	12.4	-0.56	12.5	12.4	0.08
(2008 registry)	(4.31)	(4.53)	(0.04)	(4.14)	(4.70)	(0.05)
Observations	64,800	30,918		24,864	14,592	

Source : Israel Central Bureau of Statistics (1972 and 1995 Census, 2000 Population Registry, Israel Tax Authority)

Notes : First Generation is composed of European-born male cohorts from 1909-1932. The sample is stratified into Holocaust Survivors (immigrants between 1946 and 1952) and Fifth Aliyah (immigrants between 1929 and 1938). Second and Third Generation is composed of sons and grandsons of the First Generation. Neighborhood SES Quantile calculated by the Israeli CBS using 20 quantiles. Years of education in Panel C is reported only for individuals age 32+ . Columns 4-6 are restricted only to those born in Poland (in the first generation).

Table II

Estimating the Impact of the Holocaust on Human Capital Outcomes

	All Countries			Poland	
	Cohort Adjusted	Cohort Adjusted & Country FE	Propensity Score Matching	Cohort Adjusted	Propensity Score Matching
	(1)	(2)	(3)	(4)	(5)
Panel A: 1st Generation					
Years of Education (2008 registry)	-1.92 (0.36)	-1.79 (0.35)	-1.77 (-0.64)	-2.38 (0.09)	-2.35 (-0.09)
Log Income in 1972 (2017 NIS)	-0.26 (0.03)	-0.23 (0.01)	-0.23 (-0.01)	-0.23 (0.02)	-0.22 (-0.02)
Neighborhood SES Quantile	-2.01 (0.27)	-1.64 (0.09)	-1.75 (-0.05)	-1.69 (0.04)	-1.69 (-0.04)
Panel B: 2nd Generation					
Years of Education (Education registry 2015)	-0.71 (0.10)	-0.64 (0.07)	-0.63 (-0.29)	-0.75 (0.04)	-0.75 (-0.04)
Log Avg Wage 1997-2000 (2017 NIS)	-0.09 (0.02)	-0.09 (0.01)	-0.07 (-0.01)	-0.08 (0.02)	-0.07 (-0.02)
Neighborhood SES Quantile	-0.92 (0.21)	-0.73 (0.14)	-0.86 (-0.04)	-0.55 (0.05)	-0.55 (-0.05)
Panel C: 3rd Generation					
Years of Educ. (ages 32+) (Education registry 2015)	-0.46 (0.11)	-0.35 (0.07)	-0.42 (-0.34)	-0.26 (0.04)	-0.27 (-0.04)
Matriculation Pct	-0.04 (0.01)	-0.04 (0.00)	-0.04 (-0.00)	-0.03 (0.01)	-0.03 (-0.01)
Quantile (2008 registry)	-0.48 (0.34)	-0.27 (0.30)	-0.52 (-0.46)	0.18 (0.05)	0.18 (-0.05)

Source : See Table I.

Notes : Each cell in columns 1, 2 and 4 reports the coefficient of a separate regression. The entry is the coefficient on a dummy variable for being a holocaust survivor for the listed outcome. The results in columns 1 and 4 include birthyear and birthyear squared as additional controls, and in columns 2 and 5, birth country fixed effects are added as well. The results in columns 3 and 5 are estimates using propensity score matching, where the impact of the holocaust is estimated after matching on year of birth and country of birth as the predictors of being a holocaust survivor. Matching is performed using the 1 to 20 match option. Robust standard errors are reported in parentheses, and are additionally clustered by country of birth in columns 1-3.

Table III

Differences in the Return to Education between Holocaust Survivors and the Fifth Aliya

	All Countries				Poland		
	Pool	Pool	Holocaust Survivors	Fifth Aliyah	Pool	Holocaust Survivors	Fifth Aliyah
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A: First Generation							
Years of Education	0.060***	0.057***	0.048***	0.059***	0.056***	0.043***	0.060***
	(0.003)	(0.003)	(0.003)	(0.008)	(0.006)	(0.006)	(0.017)
Yrs Ed X Survivor	-0.012***	-0.011***			-0.012***		
	(0.001)	(0.002)			(0.003)		
Observations	3,584	3,584	2,848	736	1,325	1,027	298
R-squared	0.12	0.12	0.09	0.11	0.12	0.08	0.14
Panel B: Second Generation							
Years of Education	0.122***	0.121***	0.126***	0.111***	0.111***	0.119***	0.097***
	(0.005)	(0.005)	(0.003)	(0.007)	(0.003)	(0.003)	(0.005)
Yrs Ed X Survivor	0.002	0.002			0.002*		
	(0.001)	(0.001)			(0.001)		
Observations	57,377	57,377	40,529	16,848	22,974	15,330	7,644
R-squared	0.14	0.15	0.15	0.14	0.13	0.13	0.12
Country Fixed Effec	No	Yes	Yes	Yes	-	-	-

Source : See Table I.

Notes : The dependent variable in panel A is log income in 1972, when the First Generation was on average 53 years of age. The dependent variable in panel B is log average wage between 1997 and 2000, when the Second Generation was on average 43 years of age. In each panel, I report the return to education in the first row and the interaction term between years of education and being a survivor (or a 2nd generation survivor). Each regression includes experience and experience squared, defined as age minus years of education minus nine. Columns 1 and 2 report results of regressions using the pooled sample of survivors and members of the Fifth Aliya, and columns 3 and 4 are estimated with each group separately. Columns 5-7 report results where the sample is restricted only to those born in Poland (in the first generation). See notes to Table I for sample definitions. Robust standard errors are reported in parentheses and standard errors in columns 1-4 are clustered by the birth country of the First Generation. *** p<0.01, ** p<0.05, * p<0.1.

Table IV

Comparing the Grandchildren of Holocaust Survivors and the Fifth Aliya

	(1)	(2)	(3)	(4)
Panel A: Matriculation Qualification (1=yes)				
Holocaust Survivor (1=yes)	-4.39***	-3.72***	-2.70***	-2.25***
	(0.67)	(0.24)	(0.22)	(0.15)
Observations	59,811	59,811	56,724	59,725
Panel B: Matriculation Examination Score				
Holocaust Survivor (1=yes)	-0.82*	-1.44***	-0.91***	-1.20***
	(0.37)	(0.19)	(0.16)	(0.2)
Observations	29,150	24,831	24,828	24,831
Panel C: Math Score				
Holocaust Survivor (1=yes)	-2.6***	-1.8***	-1.2***	-1.4***
	(0.56)	(0.26)	(0.22)	(0.24)
Observations	30,005	24,802	24,799	24,802
Controls				
Birth Cohort Controls	Yes	Yes	Yes	Yes
Country Fixed Effect	No	Yes	Yes	Yes
School FE	No	No	Yes	No
School rank FE	No	No	No	Yes

Source : See Table I.

Notes : Holocaust effect is coefficient from OLS regression of dummy variable for being a Holocaust survivor's grandson over education attainments. School rank was defined by avarage percentage of matriculation rate in 1990-1997, clustered in 20 quantiles. Sample in panel A is 1972-1997 birth cohorts, panel B and C sample is 1984-1997 birth cohorts, due to data limitation. Standarad error in parentheses clustered by the birth country of the First Generation. *** p<0.01, ** p<0.05, * p<0.1.

Table V

Intergenerational Educational Mobility

		Holocaust Survivors	Fifth Aliyah	Difference
		(1)	(2)	(3)
Panel A: Mobility Between 1st and 2nd Generations				
	Intergenerational Elasticity	0.12***	0.19***	
		(0.01)	(0.01)	
	Observations	15,704	5,057	
Rank Rank Association:	Relative Mobility	0.29***	0.42***	-0.13**
		(0.02)	(0.04)	(0.04)
	Absolute Mobility	29.95***	23.67***	6.28*
		(1.14)	(3.02)	(2.52)
	Upward Mobility	37.2	34.2	
	Observations	2,709	895	
Panel B: Mobility Between 2nd annd 3rd Generations				
	Intergenerational Elasticity	0.20***	0.17***	
		(0.01)	(0.01)	
	Observations	20,864	13,127	
Rank Rank Association:	Relative Mobility	0.29***	0.28***	0.02
		(0.01)	(0.01)	(0.01)
	Absolute Mobility	28.19***	31.49***	-3.31
		(1.40)	(0.65)	(1.69)
	Upward Mobility	35.6	38.4	
	Observations	9,269	4,987	

Source : See Table I.

Notes: This table reports estimations of intergenerational mobility measurements: Intergenerational Elasticity (IGE) and Intergenerational Rank Association (IRA). Intergenerational Elasticity (IGE) is the slope coefficients from OLS regressions of son's education on father's education with cohort controls for both generations. Relative and absolute mobility are slope and intercept coefficients respectively, from regressions of son's rank on father's rank in the education distribution. Relative mobility is the difference in mean son's education rank between sons with fathers in the 100th percentile and sons with fathers in the 0th percentile (divided by 100). Absolute mobility is the mean rank of sons with fathers at the lower end of education distribution. Upward mobility is the predicted value at father education rank equal to 25. Column 3 presents coefficients and t statistics of interaction variable of father's rank and dummy for being a Holocaust survivor. Ranks are constructed by ranking all sons relative to others in their birth cohort and ranking their fathers relative to other fathers with sons in same birth cohort. Second Generation includes sons of First Generation from 1962-1967 birth cohorts. Third Generation includes sons from 1975-1980 birth cohorts. See notes to Table I for education and sample definitions. Standard errors in parentheses cluster by birth country of first generation. *** p<0.01, ** p<0.05, * p<0.1.

Table VI

Intergenerational Mobility Among Holocaust Survivors By Father's Age at Immigration

	All Countries					Poland				
	8-12	13-18	19+	Old-Young Diference	Mid-Young Difference	8-12	13-18	19+	Old-Young Diference	Mid-Young Difference
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Relative Mobility	0.34***	0.31***	0.29***	-0.05	-0.03	0.39***	0.30***	0.29***	-0.10*	-0.09
	(0.03)	(0.02)	(0.01)	(0.03)	(0.03)	(0.05)	(0.02)	(0.02)	(0.05)	(0.05)
Absolute Mobility	24.42***	27.71***	30.33***	5.91*	3.29*	24.13***	29.47***	34.22***	10.09***	5.33
	(1.93)	(1.21)	(1.82)	(2.46)	(1.51)	(2.92)	(1.11)	(0.83)	(3.03)	(3.12)
Upward Mobility	32.92	35.46	37.58			33.88	36.97	41.47		
Observations	1,651	9,212	11,223			520	2,408	3,700		

Source : See Table I.

Notes : This table reports coefficients from OLS regressions of child's rank on father's rank in the education distribution (IRA). The IRA is explained in detail in the notes to Table V. Columns 4,5,9 and 10 reports coefficents and t statistics of interaction variables between father's rank and age at arrival group. First Generation includes Holocaust Survivors from 1909-1932 birth cohorts. Second Generation includes sons and daughters of First Generation from 1956-1965 cohorts. Columns 6-10 restricted only to those born in Poland (in the first generation). See notes in Table I for education definitions. Standard errors in parentheses, clustered by birth country of first generation in columns 1-5. *** p<0.01, ** p<0.05, * p<0.1.

Table VII

Summary Statistics: Polish Holocaust Survivors by German Pension Receipt Status

	Received German Pension	Did Not Receive German Pension	Difference	Cohort Adjusted
	(1)	(2)	(3)	(4)
Panel A: First Generation				
Year of Birth	1920	1920	-0.53**	
	(5.64)	(6.19)	(0.17)	
Years of Education	9.6	9.3	0.27*	0.32**
(Education Registry 2008)	(3.34)	(3.54)	(0.13)	(0.12)
Log Income in 1972	11.4	11.2	0.15***	0.15***
(2017 NIS)	(0.64)	(0.61)	(0.04)	(0.04)
Neighborhood SES	14.2	13.2	0.91***	0.95***
Quantile	(3.50)	(3.79)	(0.11)	(0.11)
Age at Arrival	28.7	28.3	0.41*	-0.14***
	(6.05)	(6.51)	(0.18)	(0.03)
Observations	1,544	5,671		
Panel B: Second Generation				
Year of Birth	1955	1956	-1.04***	
	(6.45)	(7.39)	(0.25)	
Years of Education	14.6	14.1	0.43***	0.42***
(Education registry 2015)	(2.72)	(2.82)	(0.10)	(0.10)
Log Income in 1972	11.9	11.8	0.10**	0.04
(2017 NIS)	(1.10)	(1.11)	(0.04)	(0.04)
Neighborhood SES	14.9	13.9	1.09***	1.06***
Quantile	(3.06)	(3.43)	(0.13)	(0.12)
Observations	1,077	4,235		

Source : See Table I.

Notes: First Generation compose of Holocaust Survivors separate by receiving or not receiving monthly payment from the German government according to BEG laws. Survivors identified as pension recipients from 1983 and 1995 Population Survey. Pensions were paid since the early 60s. Columns 1, 2, 6 and 7 reports mean outcomes, in column 3 differences between the groups, in column 4 and 5 adjusted differences. Columns 6-10 restricted only to those born in Poland and their sons. See notes to Table I for variables definitions. Standard deviation in parentheses in columns 1,2,6 and 7. Robust standard errors are reported in parentheses in columns 3,4,5,8 and 9, and are additionally clustered by country of birth in columns 3-5. *** p<0.01, ** p<0.05, * p<0.1.

Table VIII

Holocaust Survivors From Poland by Reparation Receipt Status

	Reparation Recipients	Reparation Non-Recipients	Difference	Age Adjusted Difference
	(1)	(2)	(3)	(4)
Age	47.69	50.39	-2.70*	-
	(11.72)	(9.49)	(1.31)	
Years of Education	9.31	8.89	0.42	0.33
	(3.27)	(2.95)	(0.38)	(0.39)
Log Consumption	13.43	13.05	0.38***	0.38***
	(0.87)	(0.88)	(0.10)	(0.10)
Own Apartment (1=yes)	0.21	0.13	0.08	0.09**
	(0.41)	(0.33)	(0.05)	(0.05)
Observations	229	104	333	

Source : 1963/64 Savings Survey conducted by the Israeli Central Bureau of Statistics and Israel Central Bank.

Notes : Reparation payments are one-time payments by the Gerrman government to Polish-born Holocaust Survivors between 1956 and 1964. Note that reparation payment was generally determined by original residence in German-occupied Poland. Robust standard errors in parentheses. Standard deviation in parentheses in columns 1 and 2. Standard errors in parentheses in columns 3, 4. Consumption is reported in Israeli Lira. *** p<0.01, ** p<0.05, * p<0.1.

Table IX

Mobility of Polish-Born Holocaust Survivors' Sons with German Pension

	Received German Pension	Did Not Receive German Pension	Difference
	(1)	(2)	(3)
Relative Mobility	0.33***	0.26***	0.07
	(0.05)	(0.02)	(0.06)
Absolute Mobility	34.45***	30.75***	3.7
	(0.54)	(0.27)	(3.00)
Upward Mobility	42.65	37.45	
Observations	486	2,105	

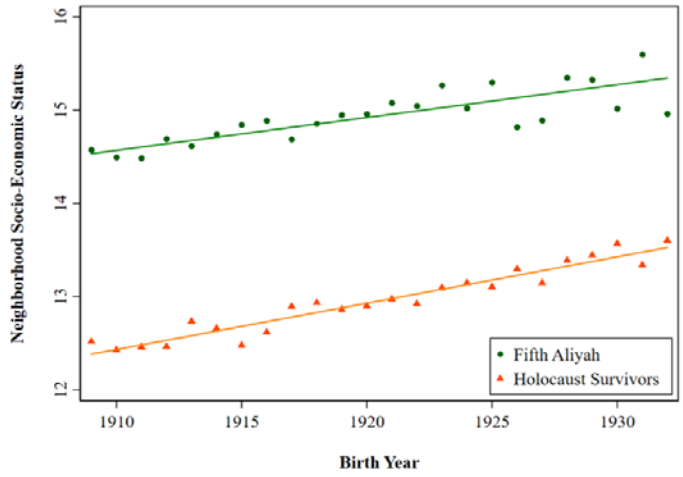
Source : See Table I.

Notes : This table reports estimations of intergenerational mobility measurements: Intergenerational Elasticity (IGE) and Intergenerational Rank Association (IRA). The IGE and IRA are explained in detail in the notes to Table V. Second Generation includes sons of First Generation from 1956-1965 birth cohorts. See notes to Table VII for sample definitions. Robust standard errors are reported in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

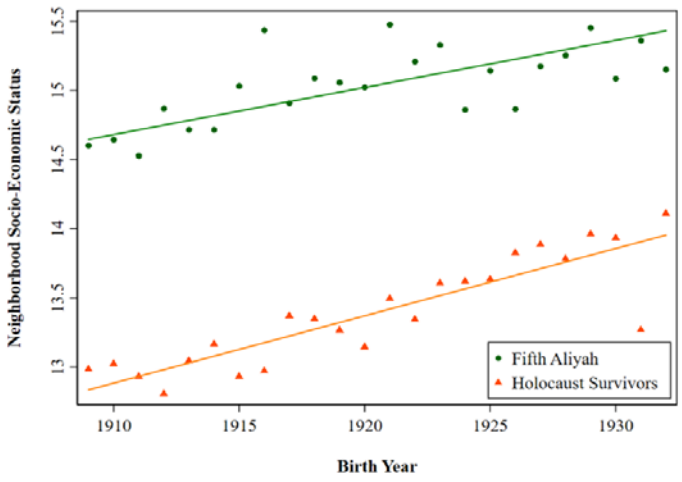
Figure I

Comparing the Socioeconomic Status of Holocaust Survivors and the Fifth Aliya By Year of Birth

A. All countries



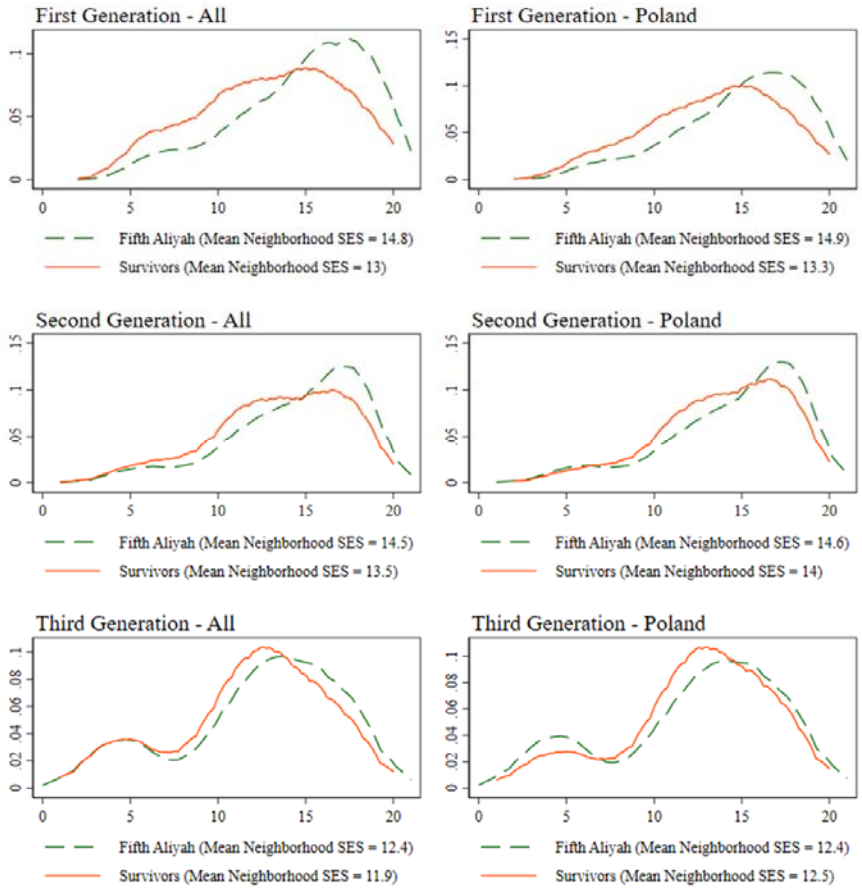
B. Poland



Notes: The plots present socioeconomic status (SES) by birth year, separately for the Fifth Aliyah and Holocaust Survivors. Panel A includes all individuals included in the First Generation sample, and Panel B is restricted to those born in Poland. The sample (and SES) are defined as in Table I.

Figure II

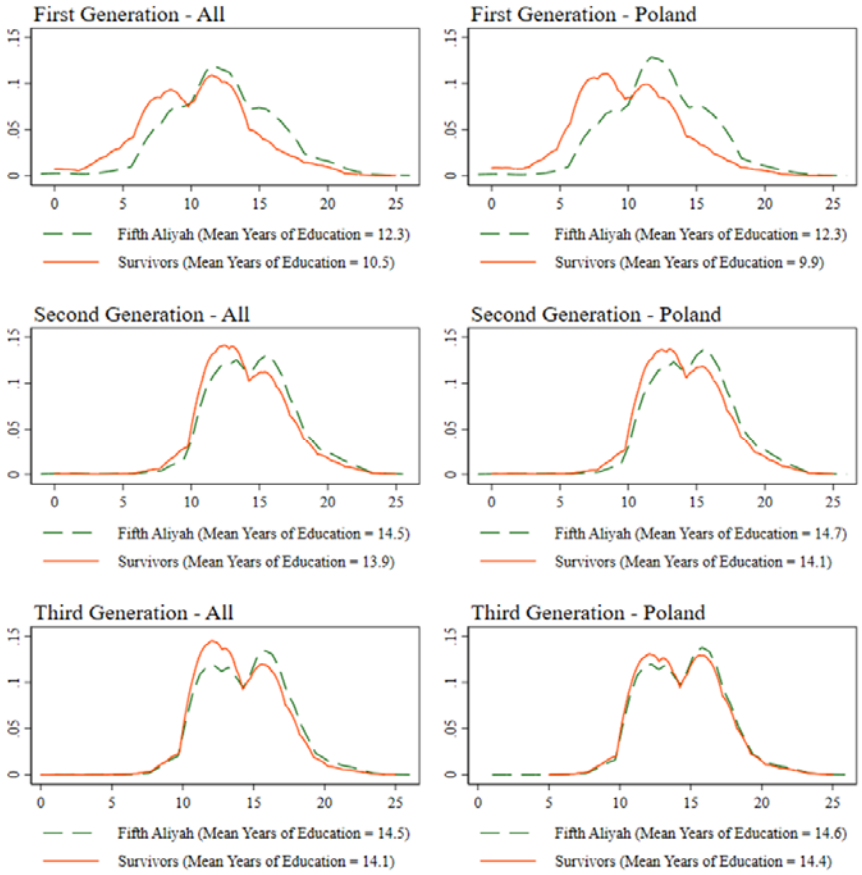
Comparing the Socioeconomic Status of the
Holocaust Survivors and the Fifth Aliya



Notes: These figures present non-parametric estimation of probability density function of socio-economic status (SES), as defined by the neighborhood characteristics of the individual's last known address. The plots are generated using the kdensity command from STATA 16.0, in bins of N=50. The data for the first, second, and third generations are taken from the 1983, 1995, and 2008 population registries respectively. See Table I for the sample selection criteria.

Figure III

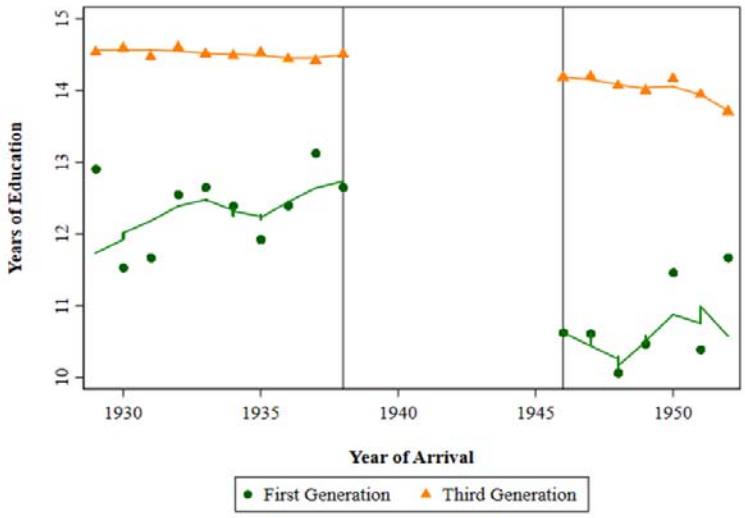
Differences in Education between Holocaust Survivors and the Fifth Aliya



Notes : These figures present non-parametric estimation of probability density function of years of education, separately by generation. See the notes to Table I for sample selection criteria.

Figure IV

Academic Outcomes by Year of Arrival
for the First and Third Generations

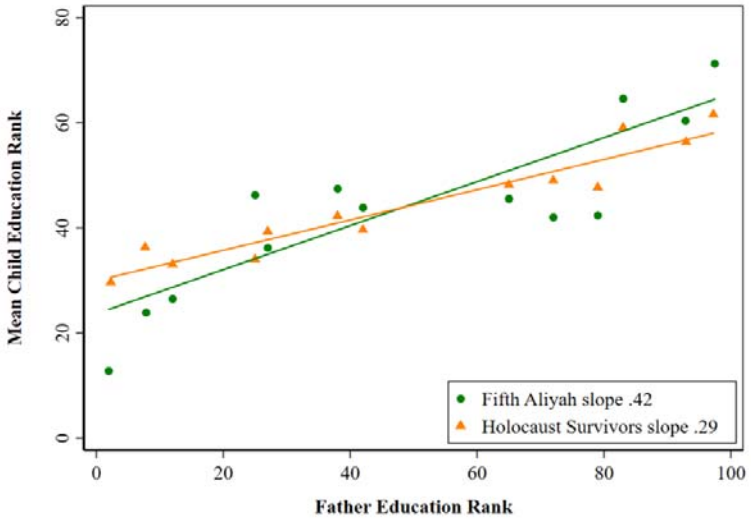


Notes: The plot report the average academic outcome for the first and third generation of the sample, separately by year of arrival into Palestine/Israel. The line is from a locally weighted regression of years of education over year of arrival (bandwidth 0.6). See Table I for sample selection criteria.

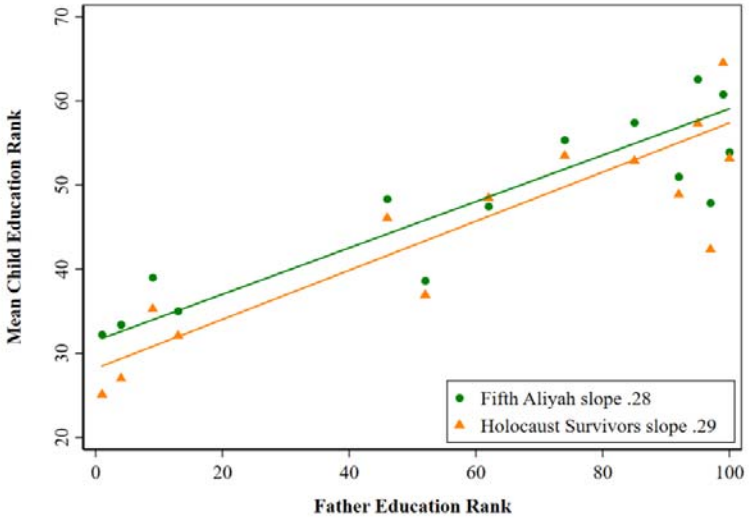
Figure V

Intergenerational Mobility and Education:
Fifth Aliyah and Holocaust Survivors

A. First and Second Generation



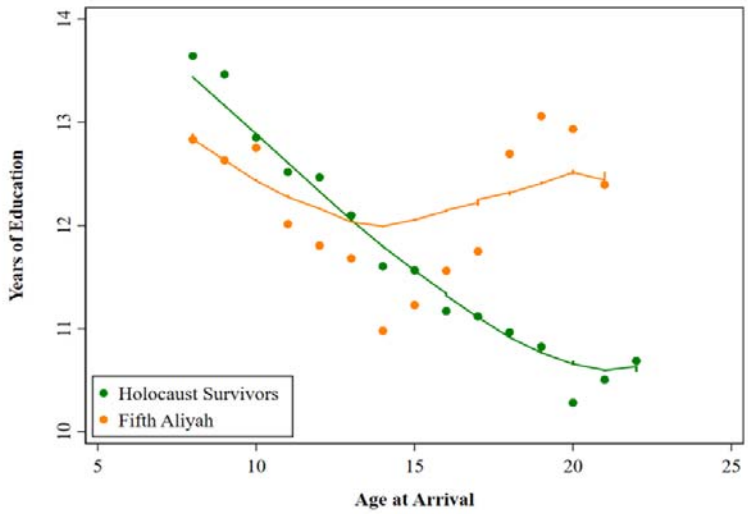
B. Second and Third Generation



Notes: These figures present nonparametric binned scatter plots of the relationship between son and father education ranks. Panel A's sample is all children born between 1967-1972 and their fathers. Panel B's sample is all children born between 1975-1980 and their fathers. To construct each series, I group parents into 20 equally sized (five percentile point) bins and plot the mean son percentile rank vs. the mean father percentile rank within each bin. I report relative mobility, which is the rank-rank slope estimate. Mobility statistics are estimated on the underlying data rather than the binned means. See notes in Table I for sample selection criteria.

Figure VI

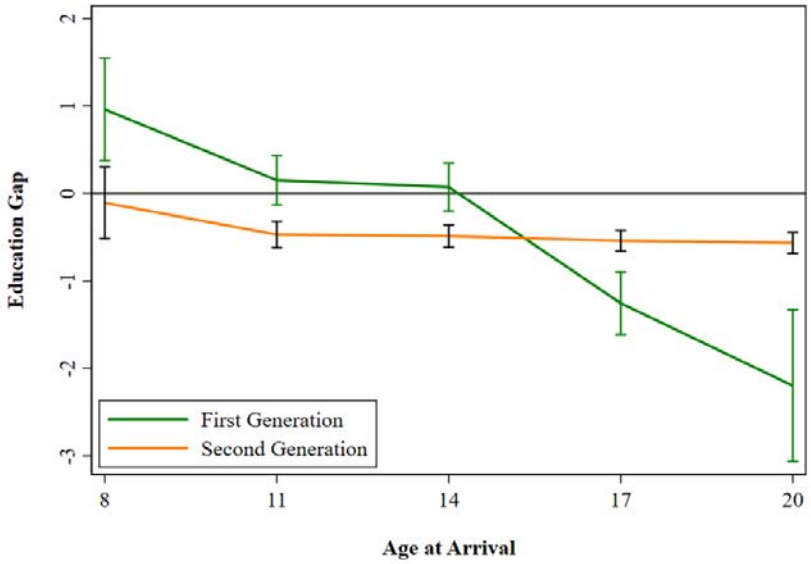
Years of Education by Age at Arrival for the Fifth Aliyah and the Holocaust Survivors



Notes: The plot reports the average years of education by age of arrival in Palestine/Israel separately for the Fifth Aliyah and the Holocaust Survivors.See Table I for sample selection criteria.

Figure VII

Education Gap by Age at Immigration

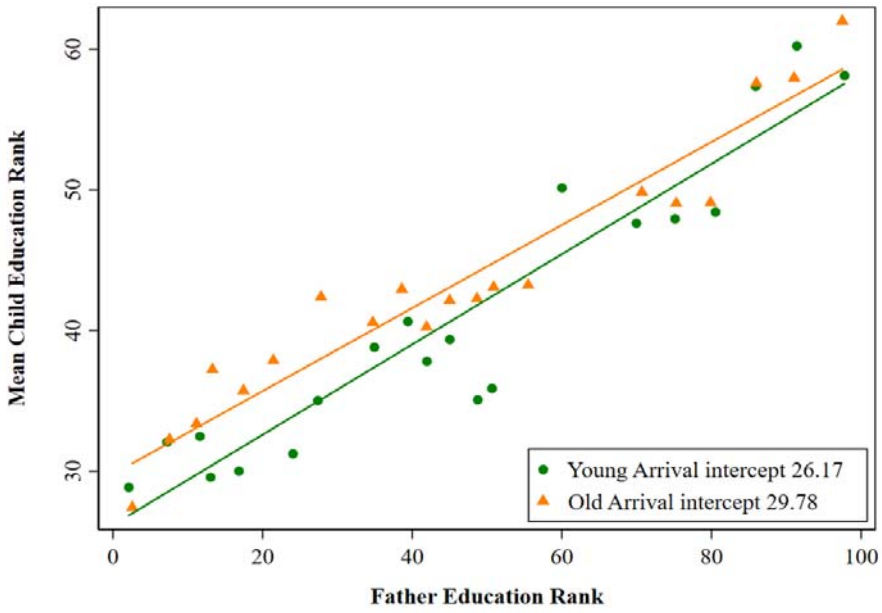


Notes: The figure presents the education gap between the Fifth Aliyah and Holocaust Survivors in two generations. See Table I for sample selection criteria.

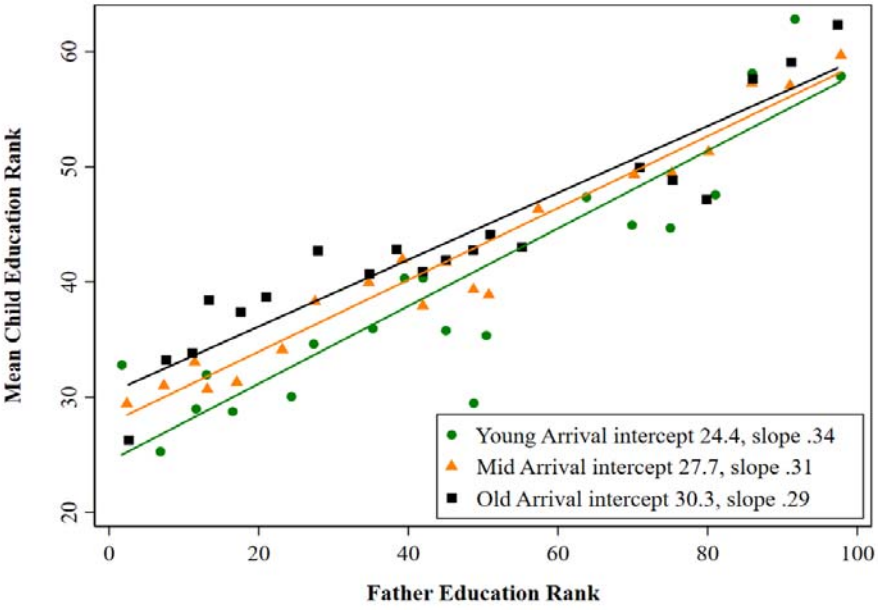
Figure VIII

Intergenerational Mobility by Father's age at Immigration

A. Two Age Groups



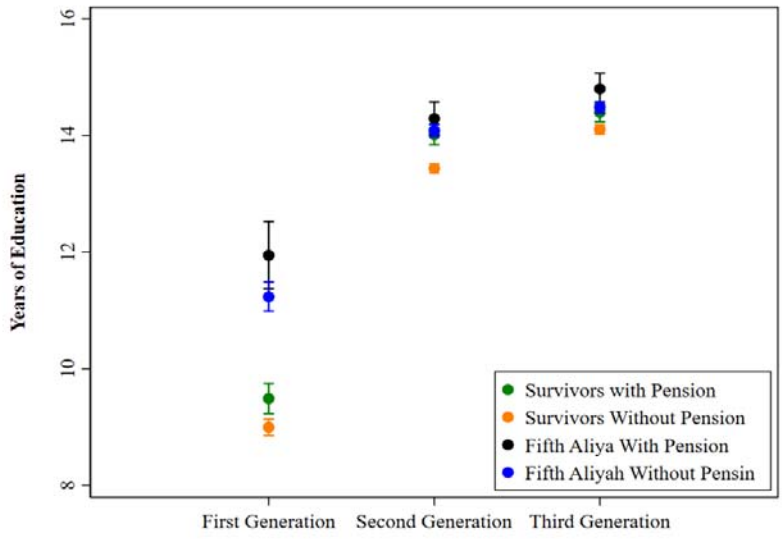
B. Three Age Groups



Notes : The plots are constructed in the same manner as in Figure V. Sample is stratified by age at arrival into two groups in Panel A, and three groups in Panel B. In Panel A, the young/old are those who arrived 8-15/16-22 and in Panel B the three groups are those who arrived at age ranges 8-12/13-18/19+.

Figure IX

Convergence in Educational Attainment
By Pension Recipient Status

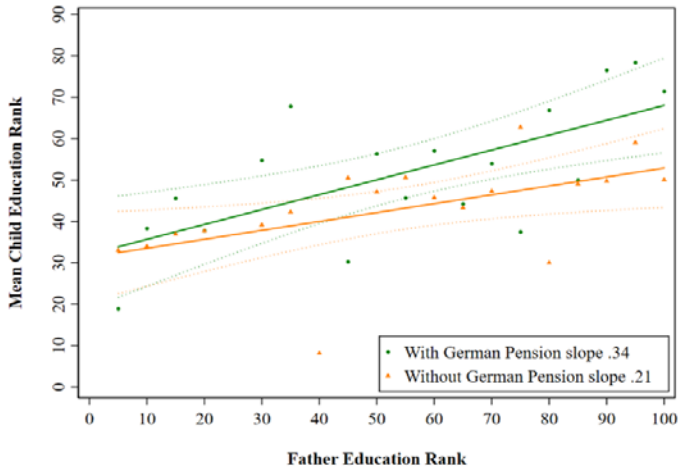


Notes : The pension recipients received monthly payments from Germany in accordance with the BEG laws, and is defined as having reported receipt of this income in either the 1983 or 1995 census samples. See Table Ifor sample selection criteria.

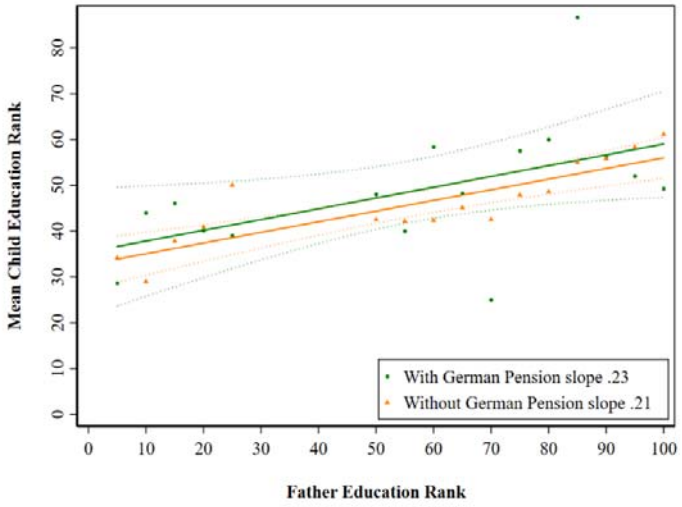
Figure X

Intergenerational Mobility of Polish Holocaust Survivors by Pension Recipiency

A. First and Second Generation



B. Second and Third Generation



Notes: The plots are constructed in the same manner as in Figure V. Dashed lines reflect the 95% confidence interval of the estimates. See Table VIII for sample selection criteria.

Appendix for

Intergenerational Mobility Following a Large Exogenous Shock: Evidence from the Holocaust

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A1. Introduction

This appendix accompanies "Intergenerational Mobility Following a Large Exogenous Shock: Evidence from the Holocaust". Section A2 provides further details on the historical background. Section A3 describes literature on intergenerational mobility (IGM). Section A4 presents additional tables and figures that were mentioned in the body of the paper but were omitted due to space considerations. Section A5 features a formal presentation of the Becker-Tomes model of human capital transmission.

A2. Historical Background

A2.1. Jewish Immigration

Jewish emigration from Europe was part of a massive wave of immigration across many groups from the Old World to the New World, occurring between the middle of 19th century and the start of World War II. About 3.3 million Jews, representing roughly 38% of the entire Jewish European population at the turn of the 19th century, left Europe before the war (Metzer, 1998). Prior to 1924, most of these immigrants made the United States their destination of choice. However, the US turned to a more restrictive policy on immigration in 1924, a highly significant policy shift for European Jewry. The new policy allowed only 24,000 immigrants from Eastern Europe and 126,000 from Western Europe to enter the US annually, which was a considerable constraint since only three years earlier in 1921, 521,000 Jewish immigrants had arrived from Eastern Europe. This policy essentially removed the US as an option for Jews to escape European anti-Semitism and a challenging economic environment.

Choosing Palestine as a destination for Jewish immigrants was both an ideological and practical choice. The earlier immigration waves, from 1880 to 1923 (First, Second and Third Aliyah), attracted more ideological immigrants who were generally young and wanted to participate in the 'Zionist project'. However, the immigrants who arrived in the late 1920s and beyond were driven more by practical considerations, including the restrictions regarding entrance into the US. The wave of immigration into Palestine during the 1930s, the Fifth Aliyah, was the largest immigration wave prior to the Declaration of Independence of the State of Israel in May 1948, and its membership was the least ideological in nature, as they were simply fleeing increasingly harsh conditions in Europe. A timeline of Jewish emigration from Europe and their destination is presented in Table A1, taken from Metzer (1998).

A2.2 Pull Factors: Palestine during the British Mandate Period (1922-1948)

In 1922, Britain received from the League of Nations a mandate to administer Palestine. Following the 1917 Balfour Declaration, the British Mandatory government was given responsibility for laying the foundations for the establishment of a Jewish national home in Palestine. The British administration's mission was to enable Jewish immigration into Palestine while ensuring the rights of the rest of the local Arab population. During the British Mandate period until the late 1930s, Palestine immigration laws were based mainly on the economic principles of the country's absorption capacity, as published by Winston Churchill (acting as the British Secretary of State for the Colonies) in a 1922 White Paper.

In 1934, the Jewish Agency for Israel noticed a departure from the absorption capacity principle, as British political considerations came into play, with policy being increasingly influenced by Arab pressure. Following the outbreak of the Arab Revolt (1937), the Mandatory government shifted policy and introduced non-economic restrictions on Jewish immigration. This culminated with the McDonald White Paper issued in May 1939, which provided immediate entry permits for only 25,000 refugees, and stipulated that only 10,000 Jewish immigrants would be permitted into the country annually. When asylum was most needed for European Jewry, Palestine was effectively closed to Jewish immigrants.

A2.2.1 Implementation of Immigration Policy into Mandatory Palestine (1920-1939)

The Mandatory government issued immigration certificates under four categories:

a. Labor: Visas issued to people who could work and support themselves in Palestine. The certifications were issued by the Mandatory Government according to absorptive capacity assessments, and allocated by the Jewish Agency according to political considerations since the Jewish Agency had to guarantee their ability to be assimilated into the local economy. This represented roughly 50% of the visas issued (Metzer 1998).

b. Capitalists: Issued to individuals with over £1,000 (£66,000 in 2020 £), self-employed with over £500, and skilled artisans with over £250.[1] The threshold varied slightly during the period, but those with the necessary capital were essentially granted an unconditional visa until the July 1937 White paper, in which the mandatory government included capitalists in the overall quota. This represented roughly 25% of the visas issued (Metzer 1998).

[1] Note that £1,000 represented more than the average annual salary for a lawyer in Germany during 1930s (Niederland 1996).

c. Dependents: People with relatives in Palestine who guaranteed to support them. As with visas granted to capitalists, these permits were essentially unlimited until the caps were put in place in 1937. This represented roughly 20% of the visas issued (Metzer 1998).

d. Students: Young people who could demonstrate that they had the financial means to support their study in Palestine. To qualify for a student visa, an individual had to complete secondary education and have working knowledge of Hebrew. This represented less than 5% of the visas issued (Metzer 1998).

A2.3 Push Factors: Poverty and Anti-Semitism Drive Jews to Leave Europe

At the beginning of the twentieth century, the Eastern Europe Jewish communities were inclined to emigrate, primarily due to harsh economic conditions but also because of anti-Semitism. However, by the beginning of the 1930s, even more prosperous Jewish communities in Western Europe, were inclined to emigrate because of anti-Semitic persecution. Among the immigrants from Europe, two Jewish communities are worth examining in greater depth: Polish and German Jewry.

A2.3.1 Poland: The Largest Diaspora Suffering from Economic Depression and Growing Anti-Semitic Harassment

The economic conditions in Poland between the two world wars were very harsh. A severe recession began in 1930, with Poland suffering an overall unemployment rate of 20%, and the conditions for Jews was even worse – both economically and from rising anti-Semitism (Cherniavsky, 2015).

Most Polish Jews lived in cities and worked in low-income occupations; for example, in Warsaw in 1931, 80% were engaged as self-employed merchants and artisans, and generally earned low wages (Cherniavsky, 2015). The recession gripping Poland had repercussions for the Jews, as many rural Poles moved into cities and intensified the competition among low-income employees. The situation for Jews worsened further as a result of the nationalization of the tobacco, oil, and railway industries, as Jews were restricted from working in any industry that was nationalized. Finally, in the years immediately preceding the war, the anti-Semitic boycott of Jewish businesses increased the economic pressure on Polish Jewry. All of these factors conspired to make Palestine an increasingly attractive option, even among those without idealistic convictions regarding Zionism.

A2.3.2 Germany: The Rise of Nazism

The Jewish community in the Weimar Republic (1918–1933) enjoyed unprecedented integration in all major aspects of German life. They occupied high-level positions in the economy at a rate more than double their proportion of the overall population, and distinguished themselves in the arts, sciences, and in politics (Barkay and Mendes-Flohr, 1999). However, economic crises in 1923 and 1929 revealed that although the Jews were ostensibly considered 'German', a latent anti-Semitism lurked beneath the surface. As conditions in Germany worsened, a strong form of German nationalism that excluded the Jews began to take form, culminating in the ideology of Nazism.

In January of 1933, Hitler was named chancellor of Germany, ushering in a period of extremely harsh anti-Semitism. During the first five years of the Nazi government, the German-Jewish community was subjected to harsh economic discrimination and encouraged to emigrate. In August of 1933, the German Zionist Federation and the Nazi regime signed the "Transfer Agreement", enabling Jewish emigrants to transfer about £1,000 in cash and equivalent goods to Palestine, despite new laws which tightly restricted transfer of foreign currency out of Germany (Segev, 2000). Not only did the "Transfer Agreement" encourage immigration, but it also created essential wealth flow into the growing Jewish economy in Palestine. Relative to Polish Jewry, who often immigrated to Palestine for better economic prospects, German Jews were essentially fleeing persecution and responding to the recognition that Hitler's Germany was not going to be a comfortable place for the Jews.

A2.4. Fifth Aliyah (1929-1938): "Certificatism" Replaces Idealism

The Fifth Aliyah was the largest wave of immigration to Palestine under the British Mandate. Between 1929 and 1938, about 240,000 Jews came to Palestine, mainly from Europe, increasing the local Jewish population from 175,000 to 412,700 (Palestine Census of 1938; Bachi, 1974). The immigrants came from the following countries: Poland (40%); the Central European countries of Germany, Austria, and Czechoslovakia (25%); Romania (6%); and Yemen (3%). Interestingly, the age distribution of the Fifth Aliyah was roughly similar to the subsequent wave of immigrants after the Holocaust. About 64% were 15-45 years old, 20% under 15, less than 4% were over 65 (Metzer, 1998).

Unlike prior immigration waves, most of the immigrants in the 1930s were not motivated by Zionist ideals. Rather, they more closely resemble other immigrant groups seeking out better conditions than those in their country of origin - in this case escaping from

increasing anti-Semitism and economic crisis in Europe (Halamish, 2006). A manifestation of the changing composition of immigrants is reflected in how Labor certificates were allocated. Until 1932, the Labor certificates were mainly reserved for ideological Zionists ("Halutzim" or pioneers) who came to Palestine to build a homeland for the Jewish people. After 1932, the certificates were largely given to middle class workers. This change in policy came after heated debate by the Jewish Agency board, which recognized that the need was to find Jews refuge from Europe, rather than simply attracting the most useful pioneering Zionists (Halamish, 2006).

A2.4.1 Fifth Aliyah from Poland

About 100,000 out of 3,000,000 Polish Jews immigrated to Palestine in 1929-1939. The immigrants were largely drawn from the middle class of Polish Jewry. The nature of the Polish immigrants is reflected in the distribution of immigration permit types. Roughly three quarters of the immigrants received Labor (40%) and Dependent (35%) visas, implying that it was simply individuals who either had family in Palestine or would be able to participate in the economy. The remaining quarter of visas were given to Capitalists (10%) and other 'positively' selected individuals, including students, tourists and returning residents (Cherniavsky, 2015).

The composition of the immigrants suggests that the members of the Fifth Aliyah from Poland were *not* positively from the overall distribution. In fact, Cherniavsky estimates that from 60,000 potential immigrants eligible for the capitalist permit, only 5,500 of them actually entered Palestine. Hence, most of the wealthy people did not take part in the Fifth Aliyah. On the other hand, while Jewish organizations participated in transfer costs of German Jews, the immigrants from Poland had to finance the cost of immigration themselves. As such, the Polish immigrants to Palestine are unlikely to have been drawn simply from the top or bottom of the distribution, and so selection issues are unlikely to bias the results.

A2.4.2 Fifth Aliyah from Germany

Relative to Poland, Germany's Jewish population was more successful and wealthier. However, the most successful Germans were reluctant to leave. For example, in 1938, the Jewish agency had 2,000 capital certificates without nominees – implying the wealthiest German Jews were unwilling to abandon their property. Therefore, most German Jews who

entered Palestine were generally middle class and only reluctantly departed Germany when the Nazi regime made it infeasible for Jews to practice their occupation (Niederland, 1996).[2] Contrary to popular perception, the German Jews who emigrated to Palestine were not all doctors and lawyers. Rather, there was a steady flow of German Jews leaving for Palestine as the regime made it increasingly impossible for Jews to support themselves. As such, most of the participants of the Fifth Aliyah were middle-class professionals drawn from a wide range of occupations. While empirical data is scarce on this issue, in Table A4, I present evidence supporting this claim by demonstrating that the occupational mix of German Jews who participated in the Fifth Aliyah was similar to those who perished in the war who had lived in Berlin (Gelber 1990, authors calculations from data from Yad Vashem).

A2.5. Holocaust Survivors

A natural question to ask is whether the Holocaust survivors were positively or negatively selected. Immediately after the war, a common perception among Israelis was that the Holocaust survivors were somehow of lower moral quality than average Israelis, since survival must have involved moral compromises of either collaborating with the Germans, betraying other Jews, or of not leaving Europe before the war. There was also a famous expression that Israelis felt that their kin in Europe cowardly went to the gas chambers "like lambs to the slaughterhouse", attributed to Abba Kovner who participated in the Warsaw Ghetto uprising. However, over time, the Israeli public had a growing respect for the survivors in that they had survived incredible hardship and persevered. The Eichman Trial of 1961 generated a national conversation about the Holocaust and a shift in their treatment and in their perception by the Israeli public.

From a perspective of selection, historians, sociologist, and others still cannot identify the features distinguishing those who survived the Holocaust and those who perished. "There is no evidence to indicate that survival was due to anything more—or less—than luck and fortuitous circumstances" wrote the historian Debora Dwork (in Ellis and Rawicki, 2014). "Survival turned out to be much more a matter of chance than anything else. Any choices Jews might make to try to survive were, in the end, not choices at all but, rather, hopeful guesses that their decisions would make a difference" (Tammeus and Cukierkorn, 2009).

[2] Neiderland (1996) discusses that the regime gradually restricted Jewish occupational freedom, because of a concern that outlawing Jews participating from all occupations at once could hurt the stability of the German economy.

As such, I base my primary analysis on comparisons between Holocaust survivors and the Fifth Aliyah, and consider issues of selection to be relatively minor. However, in my empirical work I make two corrections to account for the possibility of selection. First, I include country fixed effects, accounting for the possibility that different Jewish communities had different average levels of human or physical capital. Second, I consider comparisons within the group of survivors by age at arrival, for which selection issues should not play a role.

A3. Literature Review on Intergenerational Mobility

In the manuscript, I present the canonical Becker-Tomes model which laid the theoretical groundwork for most studies of intergenerational mobility. In this section, I provide a brief review of related scholarship in this area which was not included in the main text due to space considerations.

A3.1. Measuring IGM

Three main mobility indices are commonly used in economic mobility research: intergenerational elasticity, mobility matrices and intergenerational rank association.

A3.1.1 Intergenerational Elasticity (IGE)

Following Becker and Tomes (1979) and Solon (1999), empirical researchers commonly estimate intergenerational income mobility with the following log-linear regression:

$$\log y_{t+1} = \alpha + \beta \log y_t + \varepsilon_{t+1}$$

where y_t is parents' permanent income or earnings and y_{t+1} is children's permanent earnings. The parameter β is the intergenerational elasticity (IGE), which indicates how a 1% change in parents' income affects the child's income (in percent). β, the degree of regression towards the mean (assuming $\beta < 1$) is a measure equality of opportunity degree in a society (Becker and Tomes, 1986), higher β indicates lower equality of opportunities or lower mobility**.** An alternative interpretation of the IGE is that it represents how closely related, on average, a child's economic status is to that of her parents. Higher IGE implies *lower* mobility as it implies that parents and children are more similar.

The existing literature on economic mobility commonly uses the IGE due to its invariance to measurement units or to any linear transformation. Therefore, the IGE enables meaningful comparisons of regression to the mean across countries and periods (e.g. Jantti et

al., 2006, and others). Moreover, by relating the mean economic outcome of children to the mean economic outcome of parents, the IGE (under the assumption that intergenerational relationships follow a simple auto-regressive process) can be used to extrapolate how long it would take for log income gaps between families to recede (Mazumder, 2015). In addition, since estimating the IGE is done in a regression context, it is straightforward to add covariates and their interactions with parents' income as additional regressors.

One drawback of using the IGE, however, is that it reflects both structural and positional changes in mobility. While this feature of the IGE that it combines structural and positional changes can be useful in describing the overall economic transmission between generations, it is also an obstacle in the decomposition of intergenerational transmission: the IGE can be higher in one society than in another simply because the residual variation of log earnings in the child's generation is higher in the former society (Black and Devereux, 2010). Changes in the distribution of marginal earnings owing to changes in the return to education or any structural change will affect the IGE even if mobility does not change.

Furthermore, a significant disadvantage of using the IGE as a transmission or mobility measurement is its instability: IGE estimation is highly sensitive to sample selection and specifications. Treatment of measurement errors, life-cycle bias or zero earnings changes IGE estimation significantly; the relationship between log child earnings and log parent earnings is non-linear in their extremities (Chetty et al., 2014), excluding zero income will yield lower IGE estimations. Similarly, Dahl and DeLeire (2008) found estimates tend to be lower in samples with fathers who have years with no earning records.

A3.1.2 Transition matrix

A transition matrix presents child's earnings (or other outcome) quantile conditional on the parents' earnings quantile. Discretization of the earnings distribution allows for a separate intergenerational mobility rate at different parts of the joint distribution of parental and child earnings and distinguishes between upward and downward mobility.

Using a transition matrix can facilitate the comparison of intergenerational mobility across countries (Jantti et al., 2006) or sub-populations (Chetty et al., 2014), which cannot be done with IGE estimation, as splitting the sample by group shows the degree of regression to the mean within subgroup rather than the mean differences between groups. Compared with IGE estimations, transmission matrices are more stable. Dahl and DeLeire (2008) found estimates of transition matrices from different studies to be often remarkably similar, even when those

studies yield very different estimates of the IGE. Yet, when relying on earnings data, the same earnings measurement biases in IGE will affect the transition matrices as well. Another limitation of the transition matrix is the arbitrary discretization of earnings distributions, since the choice of the number of quantiles is somewhat arbitrary.

A3.1.3 Intergenerational rank association (IRA)

The intergenerational rank association (IRA), or rank-rank association, measures the correlation between the position of fathers in the lifetime earnings (or any other outcome) distribution and the position of their children in the outcome distribution (Chetty et al., 2014; Dahl and DeLeire,2008):

$$\text{rank } y_{t+1} = \alpha + \beta \text{ rank } y_t + \varepsilon_{t+1}$$

where β estimate stands for the correlation between children's and parents' positions in the outcome distribution (IRA). In other words, β measures relative transmission: the difference in outcomes between children with different parents' outcomes. The intercept measures the expected rank for children from families at the bottom of the outcome distribution. Unlike IGE, the rank-rank slope depends only on the joint distribution of parent and child percentile ranks and not on structural changes. Furthermore, the IRA estimates are less sensitive to measurement errors and biases than the IGE estimations and like the transmission matrix, can be used to compare intergenerational mobility among sub-populations (Chetty et al. 2014, 2018; Dahl and DeLeire, 2008).

A3.2. Inferring Causality

Along with improved measurement, an additional goal of current research has been a better understanding of the causal mechanisms underlying intergenerational mobility, and a variety of research methods have been used. Some researchers have tried to tackle the nature-nurture problem, by decomposing the family's influence on the child's earnings outcome to genetic versus environmental causes. Another approach is to look for specific parental attributes that influence children's earnings achievements (Black and Devereux, 2010).

A3.2.1. Siblings Study

Sibling correlation looks for a similarity of outcomes between people with common genetic and childhood environmental characteristics as opposed to random people who do not share these characteristics. Sibling differences, within family analysis, can reveal causality.

Research using different types of siblings can help distinguish between nature and nurture: identical twins, fraternal twins, full siblings, half siblings, and adopted siblings represent a variety of genetic and environmental transfer from parents to children (Behrman and Taubman, 1989; Bjorklund et al., 2005; Sacerdote, 2002).

However, the sibling approach faces data limitations including relatively small samples (particularly the twin samples) and selection bias (in adoption research). Moreover, there is a conceptual concern regarding unobservable variables with possibly different effects on siblings, e.g. parental expectations.

A3.2.2. Subpopulation Comparison

Subpopulation comparisons, as used in many empirical studies recently, overcome some of the above- mentioned data limitations of the sibling approach. Populations can be divided by race, geography, country of birth, or any other criteria. Variations in intergenerational mobility between groups make it possible to explore factors correlated with mobility and use them to establish causality, as in (Bhattacharya and Mazumder, 2011; Chetty et al. 2014, 2018; Corak, 2013; Mazumder, 2014, and others).

From administrative data on more than 40 million children and their parents in the US, Chetty et al. (2014) characterized variation in intergenerational mobility across commuting zones. They used intergenerational rank association to calculate the expected rank of children for any given rank of their parents in the national income distribution, using the slope and intercept of the rank-rank regression. The slope measures relative mobility within a commuting zone while the intercept measures absolute mobility, which is the expected rank of children with parents from the bottom of the income distribution in each commuting zone. They found substantial variation in both relative and absolute mobility across commuting zones.

Chetty et al. (2014) then attempts to explain spatial variation in mobility with observable characteristics of the commuting zones and identifies five factors: segregation, inequality, school quality, social capital, and family structure all have a positive correlation with the variation in upward mobility across commuting zones. Although this research does not identify causal mechanism (because all the variables are endogenously determent), it laid the ground for following studies.

A3.2.3. Natural experiments

One limitation of Chetty et al. (2014) is that the initial endowment of human and physical capital is likely endogenous. Other scholars have instead tried to examine mobility by exploiting an exogenous influence on parents' outcomes that is unrelated to parental characteristics, and then use variations in parents' outcomes after the exogenous event to identify the effect on children's outcomes. The event can be a policy change (Chevalier, 2004), war (Page, 2006), natural disaster (Nakamura et al., 2016), sudden economic change such as immigration or migration (Abramitzky et al., 2019; Chetty et al., 2015) and so on.

Bütikofer et al. (2018) examines the effects of the large and long-lasting economic shock that was caused by the Norwegian oil boom in beginning of the 1970s on intergenerational mobility. The oil boom increased bottom-up mobility while it did not affect the upper part of the income distribution. It created a geographic variation in mobility: only residents of oil production areas enjoyed the higher mobility. Interestingly, the geographic differences in intergenerational mobility did not persist to the third generation. A father's earnings rank was found to be an equally good predictor of the educational attainment of third generation children, independently of the birth region of the father.

The exploitation of natural experiments to identify causality has become more common in the economic mobility literature, yet it is fraught with limitations of natural experiments: identifying a situation where an external event changed outcomes (whether earnings, education, or socioeconomic status) while avoiding a selection bias and getting suitable data are very challenging. Moreover, multiple factors probably influence the socioeconomic outcomes; the identification strategy must identify relevant samples to avoid bias due to omitted variables.

A3.3. Transmission of Education

Scholars are interested in education transmission as an additional factor in intergenerational mobility. Using education as a variable in the IGM regression equation helps to prevent measurement bias and allows the use of data on younger children. Besides practical gains, education plays a significant role in human capital accumulation and thereby influences one's socioeconomic status. However, the interpretation of β is slightly different when the variable of interest is education rather income: in the income equation, β describes the child's return to education and parental return on investment whereas for education, it is the parental return on

investment in child's education and parent's return to their own education (Lindahl et al., 2014).

While it is well known that more educated parents have more educated children, the mechanisms (and their relative importance) are unclear. Is this a matter of budget constraints? Do highly educated parents gain higher income so they can afford more education for their children? Do children inherit ability or motivation to study more? Perhaps highly educated parents spend more productive time with their children, improving their abilities or enhancing motivation, since parental human capital complements investment in their children, as considerable evidence suggests (Becker et al., 2018). Answers to these questions might have a crucial influence on public policy: if a family's budget constraints determine children's education, then public finance could help narrow education gaps and increase equality of opportunity.

In order to understand the mechanism of education transmission from parents to children, a plausible source of exogenous variation in parental education is critical. Page (2006) exploited variations in fathers' educations induced by the 1944 G.I. Bill in the United States and found a positive correlation between fathers' and children's education that is independent of the father's innate ability. Havari and Peracchi (2019) examined variations in European fathers' educations due to World War II; they found that children of parents who suffered the war had lower educational attainments than children of parents with similar characteristics who did not suffer the war. Their findings imply that parental influence on children's educational attainments does not occur only through parents' innate abilities. Chevalier (2004) identified the effect of parental education on their children's school attainment using a discontinuity in parental educational attainment. The discontinuity stems from changes in the minimum school-leaving age legislation, which took place in the 1970s in Britain. He found positive effects of both parents' education on their children's schooling achievements when focusing on natural parents only. Step-parents had no impact or a negative impact on their children's education. Chevalier's findings, however, were restricted to parents with lower educational attainment, suggesting inherited traits as the cause of parent-child education correlation.

Holmlund et al. (2011) suggested that inconsistency in conclusions stems from differences in data and identification strategies. They applied three identification strategies over one data set and treatment: identical twins, adoptees, and instrumental variables (using educational reforms). Yet the findings were still inconclusive, which suggests that the choice of identification strategy is responsible for the disparities previously observed in the

literature. A possible explanation is heterogeneity; since each method estimates effects for different subpopulations, it reveals different mechanisms of intergenerational education transmission.

A4. Sample Selection and Empirical Results

A4.1 Sample Selection

My sample was constructed in the following manner, and is presented in Appendix Table II. I begin by restricting my sample to European-born Jews who are in the Israeli Population Registry of 2000 born between 1900 and 1938. The registry includes all individuals ever issued an Israeli identification number. Then, all women and all individuals for whom the gender variable was missing are excluded. Finally, I further restrict the sample to a more narrow age window, those born between 1909 and 1932. This process yields my First Generation sample of 41,528 members of the Fifth Aliyah and 96,245 Holocaust survivors. The First Generation is then matched to their sons, forming the Second Generation. It is worth noting that many members of the First Generation had no sons (in our sample), and so of the 41,528 members of the First Generation of the Fifth Aliyah, only 18,073 are matched to a son. The Second Generation of the Fifth Aliyah contains 25,657 sons of the First Generation, and this is the sample that is the basis of the intergenerational mobility calculations. A similar procedure is executed for the Holocaust survivors and for the Third Generation. The observation count is reported in Panel C of Appendix Table II.

In Appendix Table III, I report the year of entry for men and women into Palestine/Israel between 1929 and 1952. For each cohort of immigrants, I also report the average birth year by sex. The table reveals that the immigrants from the Fifth Aliyah (1929-1938) arrived at a relatively young age, and had a higher proportion of females. This suggests that it was families relocating to Palestine. During the war, between 1939 and 1945, the immigrants were generally young men evading the authorities, as British policy was to restrict Jewish immigration out of sensitivity to Arab concerns. These cohorts are excluded, as they are likely self-selected in a way which makes them less useful as a comparison group. The Holocaust survivors, who arrive between 1946 and 1952, arrive at significantly older ages than the immigrants from the Fifth Aliyah. For example, among immigrants arriving in 1949, the average Holocaust survivor was roughly 30 years old – whereas the immigrants in 1937 were on average 20 years old. This difference is adjusted for in the regression analysis.

In Appendix Table IV, I examine the occupational distribution of German Jewry using three different sources: Jews in Berlin in 1925, German Jews who participated in the Fifth Aliyah, and finally German Jews from Berlin who perished in the Holocaust. The occupational distribution is taken from Lashchinsky (1963), Gelber (1990), and the Yad Vashem Data Archive Project for each group respectively. Although the data are not detailed enough to draw any strong conclusions, at first glance, the distributions are relatively similar – meaning that the Jews who left Germany were not extremely different than those who remained in Germany. This is consistent with the identification assumption of the paper that the Fifth Aliyah and the Holocaust survivors are relatively comparable, except for the differences generated from their experience during the war.

In Appendix Table V, I compare the sample of all members of the First Generation with the sub-sample who are successfully matched to a son. Reassuringly, the samples are relatively similar, implying that I can perform intergenerational mobility analysis without concern that the sample is not representative. The other feature to note from the table is that the matched sample is relatively younger than the overall sample, which is logical that those who immigrated to Israel later in life may have had lower fertility (and therefore be less likely to have a matched son). In Appendix Table VI, I perform a similar check and show that the decision to focus on the Polish subset of the data rather than those from Central Europe does not materially impact my conclusions. The Central European sample, which contains Germany, Austria, and Czechoslovakia, exhibit the same patterns as the overall sample, with the first generation having large gaps but significant catch-up observed by the second and third generation. It is worth noting that the education gap for the Fifth Aliyah and the Holocaust survivors is smaller in this sample than either the overall or Polish samples. This is likely due to the fact that the Central European education systems were better than the Polish system, in spite of the fact that both systems discriminated against Jews.

In Appendix Table VII, I present the summary statistics for the Fifth Aliyah and the Holocaust survivors stratified by three groups of birth cohorts: 1908-1916, 1917-1924, and 1925-1932. As expected, the gap in the first generation between the Fifth Aliyah and Holocaust survivors both in terms of income and in terms of neighborhood SES is largest for those who were born earliest (and therefore likely arrived in Israel at older ages). For example, for the early birth cohorts, the neighborhood SES gap is 2.1 quantiles, whereas it is only 1.8 quantiles among the later birth cohorts.

A.4.2 Empirical Results

In Appendix Table VIII, I present the summary statistics *only* for Holocaust survivors, but stratified by age at arrival. As discussed earlier, survivors who arrived later in life were less able to overcome their poor initial endowment. The table reveals that even within Holocaust survivors, those who arrived later had significantly lower educational attainment. For example, among Polish Holocaust survivors, those who arrived between ages 8 and 15 received a full 1.81 years of education more than Polish survivors who arrived between ages 16 and 22. Interestingly, the gaps disappear in the second generation (Panel B).

In Appendix Table IX, I present the mobility matrix for the Fifth Aliyah and the Holocaust survivors. The matrix reveals higher upward mobility for Holocaust survivors' sons as compared to the Fifth Aliyah. For example, the percent of sons rising from the lowest to highest quantile (1 to 5) is higher for survivors: 12% of survivors' and 9.9% from Fifth Aliyah are able to make this jump. On the other side of fathers' distribution, 35.7% of survivors sun maintained their fathers' position in the highest quantile, compared with 37.6% of Fifth Aliyah's sons. This indicates a higher downward mobility for survivors, as they were less able to invest in their children's education, and again survivors' children are less similar to their parents than those of the Fifth Aliyah. Another possibility worth noting is that the highest educated of the Fifth Aliyah also had access to capital, and were able to preserve their advantage across generations.

A5. Formal Presentation of B-T Model

Assumptions:

1. Income is the sum of return on parent's capital invested in children (y), endowments (e) and "capital gain" which related to market luck during lifetime (u):

$$I_{t+1} = w_{t+1}y_t + w_{t+1}e_{t+1} + w_{t+1}u_{t+1}$$

y_t is parents investment in children (depend on family income), w_{t+1} return on capital (human and non-human) in generation t+1, e_{t+1} endowments in generation t+1, u_{t+1} stochastic market luck assumed to be uncorrelated with parents income.

2. Endowment (transmitted by a stochastic linear process):

$$e_{t+1} = a_t + he_t + v_{t+1}$$

a_t is influence of social capital of other families, h measures the fraction of endowments transmitted to children (inheritability rate), v measures unsystematic component in the transmission process ("endowment luck").

3. Homothetic utility function:

$$U_t(Z_t, I_{t+1})$$

where Z_t is the parent's consumption and I_{t+1} is the children's Income.

4. Family income (S) as expected by generation t:

$$S_t = Z_t + \frac{I_{t+1}}{1+r_t} = I_t + \frac{w_{t+1}e_{t+1}}{1+r_t} + \frac{w_{t+1}u_{t+1}}{1+r_t}$$

Parents maximize utility by choosing optimal allocation between consumption and investment in human capital of children subject to family income:

Max $U_t(Z_t, I_{t+1})$

s.t $Z_t + \frac{I_{t+1}}{1+r_t} = S_t$

Maximization of the utility function determine demand functions for parents' consumption Z_t, investment in children (y_t) and children's income (I_{t-1}):

$$I_{t+1} = \beta_t I_t + \alpha w_{t+1}e_{t+1} + \alpha w_{t+1}u_{t+1}$$

α is family's fraction of income spent on children, β=α(1+rt) (propensity to invest in children).

Return on parents' investment:

$$w_{t+1}y_t = \beta_t I_t - (1-\alpha)w_{t+1}a - (1-\alpha)hw_{t+1}e_t - (1-\alpha)w_{t+1}v_{t+1}$$

Change in parents' endowment affects children's income both directly and indirectly through a change in parent's investment in children in response to the change in their own wealth:

$$\frac{dI_{t+1}}{dw_{t+1}e_t} = \alpha h + \beta_t \frac{dI_t}{dw_{t+1}} = \alpha h + \beta_t \alpha \frac{w_t}{w_{t+1}}$$

In Becker-Tomes (1978) model terms, Holocaust survivors suffered from lower parent's investments, comparing with Fifth Aliyah, which results in lower income in First Generation:

$$I_{sur,1} = w_1 y_{sur,0} + w_1 e_1 + w_1 u_1$$

Where sur is the Holocaust effect.

The Holocaust affected Second Generation through lower endowments (e.g. connections, learning skill, maybe mental health problems) as well as and lower family income:

$$e_{sur,t+1} = a_{t+1} + h\left(e_{sur,t} - sur\right) + v_{t+1}$$

$$S_{sur,t} = I_{sur,t} + \frac{w_{t+1}\left(e_{sur,t+1}\right)}{1+r_t} + \frac{w_{t+1}u_{t+1}}{1+r_t}$$

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Appendix Table I

Immigration Waves into Palestine

Immigration Wave	Years	Number of Immigrants	Main Countries of Origin	Characteristic
First Aliyah	1882-1903	25,000	Russia, Romania	Middle Class, Religious
Second Aliyah	1904-1914	35,000	Russia, Poland	63% Young Single Men
Third Aliyah	1919-1923	35,000	Russia, Poland	Organized Young Adults
Fourth Aliyah	1924-1928	67,000	Poland, Russia	44% Middle-class Families
Fifth Aliyah	1929-1939	240,000	Poland, Germany	57% Arrived with Family
Holocaust Survivors	1946-1952	500,000-700,000	Poland, Romania	Mostly Families

Source : Bachi (1974)

Notes : The table reports the demographic and origin composition of the waves of immigration into Israel. The main analysis focuses on the Fifth Aliyah as the comparison group for the Holocaust Survivors.

Appendix Table II

Sample Selection Process

	Fifth Aliyah (1)	Holocaust Survivors (2)
Panel A: Original Sample		
From Literature[1]	240,000	500,000-700,000
CBS data (1900-1938 birth cohorts)	147,177	513,155
Panel B: Removed from Sample		
Born in non-European countries	18,735	229,453
Female	65,975	139,520
Missing Gender Variable	1,024	3,172
Born before 1909 or after 1932	19,915	44,765
Panel C: Analysis Sample		
First Generation Sample	41,528	96,245
[2]Linked with sons from Second Generation	18,073	42,162
[3]Second Generation	25,657	59,659
Linked with sons from Third Generation	19,920	43,583
[4]Third Generation	30,917	64,800

Notes : The table describes the process by which I arrive at my final sample. In the first row, I report the number of immigrants by category according to the existing literature. The first distinction is my analysis is restricted to birth cohorts between 1900 and 1938, leading to lower numbers of immigrants in both categories. The Fifth Aliyah is defined as individuals arriving between 1929 and 1938, and the Holocaust Survivors are those who arrived between 1946-1952. [1]The literature includes references from Metzer (1998). In Panel B, I report the number of deleted observations sequentiall through my criteria for sample inclusion. The dropped observations are those born outside of Europe, all females, any individual with a missing gender variable, or those born before 1909 or after 1932. In Panel C, I report our final sample count. The first generation is composed of those who meet the sample criteria, and in the row below, I report the subset of the first generation succesfully linked with a son.[2] The second generation is composed of all sons of the first generation born between 1940 and 1977.[3] The third generation is composed of all sons of the second generation born between 1955 and 1997.[4]

Appendix Table III

Immigrant Arrival into Palestine/Israel by Year

	Males		Females		
Year of Arrival	No. of Immigrants	Mean Birth Year	No. of Immigrants	Mean Birth Year	Male/Female ratio
1929	593	1913.7	513	1914.3	1.16
1930	1,036	1913.7	750	1914.4	1.38
1931	798	1915.6	965	1914.2	0.83
1932	2,491	1915.0	3,032	1914.0	0.82
1933	7,165	1916.7	7,614	1916.4	0.94
1934	7,492	1917.0	7,884	1917.0	0.95
1935	9,443	1917.7	12,996	1916.4	0.73
1936	5,542	1917.6	7,671	1916.9	0.72
1937	2,246	1917.0	2,490	1916.8	0.90
1938	4,722	1917.4	4,186	1917.6	1.13
1939	8,317	1917.5	6,472	1918.3	1.29
1940	2,435	1918.8	1,919	1919.6	1.27
1941	1,641	1919.5	1,119	1920.0	1.47
1942	944	1917.7	246	1920.0	3.84
1943	1,727	1918.6	726	1922.3	2.38
1944	3,094	1921.5	1,979	1922.4	1.56
1945	3,739	1922.3	2,838	1922.4	1.32
1946	7,157	1922.5	5,774	1923.4	1.24
1947	7,931	1922.4	7,072	1923.3	1.12
1948	32,250	1921.4	29,047	1922.0	1.11
1949	29,813	1919.3	29,387	1920.9	1.01
1950	12,453	1918.1	17,367	1919.3	0.72
1951	5,633	1919.3	8,487	1919.9	0.66
1952	1,008	1920.5	1,373	1920.7	0.73

Source : Israel Central Bureau of Statistics, 2000 Population registry

Notes : The table reports immigration into Palestine/Israel by year for 1909-1932 birth cohorts in the Population Registry. The cohorts arriving between 1929-1938 represent the Fifth Aliyah and the cohorts arriving between 1946 and 1952 are the Holocaust Survivors. The rows in gray are excluded from the sample.

Appendix Table IV

Occupational Distribution of German Jews

	Jews in Berlin (1925) (1)	Fifth Aliyah From Germany (2)	Dead Jewry in Berlin (3)
Merchants, credit & transportation	44	26.8	28.6
Industry & artisan	26.7	17.6	27.5
Professionals and Government Employees	6.6	10.9	10.9
Health & aid	4.5	9	3.6
Home services	2.4		
Agriculture	0.1	17.4 [a]	
Self-employed or without profession	15.6	5.3	2.7
Source of Estimate:	Lashchinsky J.	Gelber Y.	Yad Vashem

Notes: [a]Includes traders in agriculture commodities and people after short training who applied for labor visas. The data sources are Lashchinsky (1963), Gelber (1990), and the Yad Vashem Data Archive Project.

Appendix Table V

Summary Statistics: Holocaust Survivors and the Fifth Aliyah,
Overall Sample and Subsample Linked with Sons

	First Generation			Linked Sample		
	Holocaust Survivors	Fifth Aliyah	Difference	Holocaust Survivors	Fifth Aliyah	Difference
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: All Countries						
Year of Birth	1920	1917	3.57	1922	1918	3.47
	(6.67)	(6.47)	(0.04)	(6.51)	(6.83)	(0.06)
Years of Education (Education Registry 2008)	10.5	12.3	-1.89	10.6	12.5	-1.93
	(3.94)	(3.66)	(0.06)	(3.96)	(3.56)	(0.08)
Log Income in 1972 (2017 NIS)	11.3	11.5	-0.20	11.3	11.5	-0.20
	(0.66)	(0.66)	(0.01)	(0.59)	(0.59)	(0.01)
Neighborhood SES Quantile (1983 registry)	13.0	14.8	-1.86	13.0	14.8	-1.80
	(4.01)	(3.75)	(0.03)	(4.04)	(3.81)	(0.04)
Age at Arrival	28.2	17.8	10.39	26.7	16.3	10.39
	(7.02)	(6.57)	(0.04)	(6.85)	(7.00)	(0.06)
Observations	96,245	41,528		42,162	18,073	
Panel B: Poland						
Year of Birth	1919	1916	3.01	1920	1917	2.92
	(6.28)	(6.30)	(0.06)	(6.31)	(6.77)	(0.09)
Years of Education (Education registry 2015)	9.9	12.3	-2.44	10.0	12.5	-2.53
	(3.75)	(3.42)	(0.09)	(3.82)	(3.21)	(0.12)
Log Income in 1972 (2017 NIS)	11.3	11.4	-0.17	11.3	11.5	-0.20
	(0.64)	(0.66)	(0.02)	(0.59)	(0.60)	(0.02)
Neighborhood SES Quantile (1983 registry)	13.3	14.9	-1.57	13.4	15.0	-1.58
	(3.75)	(3.57)	(0.04)	(3.77)	(3.60)	(0.06)
Age at Arrival	29.5	18.5	11.00	28.2	17.3	10.93
	(6.61)	(6.36)	(0.06)	(6.63)	(6.89)	(0.09)
Observations	37,389	18,767		16,616	11,628	

Source : See Table I.

Notes : Columns 1-3 presents mean outcomes of the First Generation, columns 4-6 present mean outcomes for the sub-sample of the First Generation who are successfully linked to a son. Note that the linked sample is used for the intergenerational mobility analysis. The samples are roughly similar along observable dimensions, though the matched sampled (columns 4-5) are somewhat younger than the overall sample. Standard deviation in parentheses in columns 1-2 and 4-5, standard errors in parentheses, clustered by birth country of first generation in columns 3 and 6.

Appendix Table VI

Summary Statistics: Holocaust Survivors and the Fifth Aliyah from Central Europe (Germany, Austria, Czechloslovakia)

	Holocaust Survivors	Fifth Aliyah	Difference	Cohort Adjusted
	(1)	(2)	(3)	(4)
Panel A: 1st Generation				
Year of Birth	1921	1918	2.66	
	(6.22)	(6.49)	(0.09)	
Years of Education	11.4	12.8	-1.47	-1.48
(Education Registry	(3.45)	(3.54)	(0.11)	(0.11)
Log Income in 1972	11.4	11.6	-0.18	-0.22
(2017 NIS)	(0.65)	(0.63)	(0.03)	(0.03)
Neighborhood SES	13.7	15.4	-1.72	-1.86
Quantile	(3.93)	(3.61)	(0.07)	(0.07)
Age at Arrival	27.4	16.9	10.48	13.14
	(6.54)	(6.73)	(0.09)	(0.02)
Observations	9,789	12,311		
Panel B: 2nd Generation				
Year of Birth	1957	1955	1.66	
	(7.20)	(8.36)	(0.14)	
Years of Education	14.2	14.7	-0.47	-0.56
(Education registry	(2.71)	(2.90)	(0.05)	(0.05)
Log Average Wage	11.7	11.7	-0.03	-0.04
1997-2000	(1.12)	(1.20)	(0.02)	(0.02)
Neighborhood SES	13.5	14.5	-1.05	-1.01
Quantile	(3.92)	(3.66)	(0.08)	(0.09)
Observations	6,004	7,121		
Panel C: 3rd Generation				
Year of Birth	1986	1984	1.52	
	(6.93)	(7.93)	(0.12)	
Years of Education 32+	14.1	14.6	-0.46	-0.45
(Education registry	(2.53)	(2.69)	(0.08)	(0.08)
Matriculation Pct	0.76	0.79	-0.04	-0.04
	(0.43)	(0.40)	(0.01)	(0.01)
Neighborhood SES	11.1	12.3	-1.23	-1.19
Quantile	(4.70)	(4.49)	(0.09)	(0.09)
Observations	6,912	8,168		

Source : See Table I.

Notes : Standard deviation in parentheses in columns 1-2 ,robust standard errors in columns 3 and 4.

Appendix Table VII

Summary Statistics: Holocaust Survivors and the Fifth Aliyah by Birth Cohorts

	Birth Cohorts 1908-1916			Birth Cohorts 1917-1924			Birth Cohorts 1925-1932		
	Holocaust Survivors	Fifth Aliyah	Difference	Holocaust Survivors	Fifth Aliyah	Difference	Holocaust Survivors	Fifth Aliyah	Difference
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Panel A: 1st Generation									
Year of Birth	1912	1912	0.23	1921	1920	0.49	1928	1928	-0.10
	(2.24)	(2.12)	(0.02)	(2.16)	(2.16)	(0.02)	(2.32)	(2.30)	(0.03)
Years of Education (Education Registry 2008)				10.2	11.8	-1.62	10.7	12.9	-2.23
				(3.86)	(3.61)	(0.08)	(4.00)	(3.63)	(0.09)
Log Income in 1972 (2017 NIS)	11.1	11.4	-0.27	11.3	11.6	-0.24	11.3	11.6	-0.22
	(0.72)	(0.67)	(0.02)	(0.63)	(0.62)	(0.02)	(0.59)	(0.62)	(0.02)
Neighborhood SES Quantile (1983 registry)	12.5	14.6	-2.10	13.0	15.0	-2.01	13.4	15.2	-1.80
	(3.98)	(3.68)	(0.05)	(3.96)	(3.81)	(0.06)	(4.07)	(3.82)	(0.07)
Observations	30,776	24,306		36,277	10,635		29,192	6,587	
Panel B: 2nd Generation									
Year of Birth	1950	1948	2.05	1955	1955	0.24	1961	1962	-0.64
	(5.36)	(5.49)	(0.07)	(6.33)	(6.77)	(0.09)	(6.36)	(6.41)	(0.09)
Years of Education (Education registry 2015)	13.7	14.5	-0.77	13.9	14.5	-0.61	14.0	14.6	-0.55
	(2.95)	(2.92)	(0.04)	(2.79)	(2.83)	(0.04)	(2.76)	(2.84)	(0.04)
Log Average Wage 1997-2000 (2017 NIS)	11.8	11.9	-0.10	11.8	11.8	-0.07	11.6	11.6	-0.05
	(1.13)	(1.15)	(0.02)	(1.10)	(1.15)	(0.02)	(1.14)	(1.17)	(0.02)
Neighborhood SES Quantile (1995 registry)	13.6	14.8	-1.28	13.5	14.4	-0.87	13.4	14.1	-0.68
	(3.78)	(3.46)	(0.06)	(3.74)	(3.75)	(0.06)	(3.74)	(3.92)	(0.06)
Observations	12,909	11,628		21,907	7,289		24,843	6,740	

Source : See Table I.

Appendix Table VIII

Summary Statistics: Holocaust Survivors by Age at Arrival

	All Countries			Poland		
	Arrived at Age 8-15	Arrived at Age 16-22	Diff-erence	Arrived at Age 8-15	Arrived at Age 16-22	Diff-erence
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: First Generation						
Year of Birth	1935	1929	5.48***	1935	1929	5.88***
	(2.10)	(2.05)	(0.02)	(2.10)	(1.90)	(0.04)
Years of Education	11.9	10.7	1.12***	11.9	10.1	1.81***
(Education Registry 2008)	(3.74)	(3.95)	(0.06)	(3.90)	(3.95)	(0.13)
Log Income in 1972	11.3	11.3	0.01	11.4	11.3	0.04
(2017 NIS)	(0.58)	(0.62)	(0.02)	(0.52)	(0.65)	(0.04)
Neighborhood SES Quantile	13.6	13.4	0.14**	14.0	13.8	0.20*
(1983 registry)	(4.03)	(4.07)	(0.05)	(3.83)	(3.82)	(0.10)
Age at Arrival	13.9	19.1	-5.20***	13.7	19.1	-5.48***
	(1.81)	(1.44)	(0.02)	(1.87)	(1.43)	(0.04)
Observations	16,785	18,200		4,317	4,548	
Panel B: Second Generation						
Year of Birth	1967	1962	4.89***	1966.7	1961.5	5.20
	(6.18)	(6.35)	(0.07)	(6.04)	(6.12)	(0.13)
Years of Education	13.9	14.0	-0.07*	14.2	14.3	-0.10
(Education registry 2015)	(2.78)	(2.75)	(0.03)	(2.85)	(2.73)	(0.06)
Log Income in 1972	11.2	11.5	-0.31***	11.3	11.6	-0.36
(2017 NIS)	(1.24)	(1.14)	(0.01)	(1.24)	(1.12)	(0.03)
Neighborhood SES Quantile	13.2	13.3	-0.12*	13.6	13.8	-0.20
(1983 registry)	(3.73)	(3.77)	(0.05)	(3.54)	(3.56)	(0.09)
Observations	18,587	16,427		5,011	4,314	

Source : See Table I.

Notes : First generation composed of Holocaust Survivors stratified by age at arrival. In column 1 younger arrivals arrived at age 8-15, in column 2 older arrival arrived at age 16-22. In columns 3 and 7 differences in mean outcomes, columns 4 and 8 presents adjusted differences. Columns 6-8 are restricted only to those born in Poland (in the first generation). See notes to Table I for variables and sample definitions. In columns 1,2,5,6 standard deviation in parentheses, in columns 3,4,7,8 Robust standard errors are reported in parentheses, and are additionally clustered by country of birth in columns 3 and 4. *** p<0.01, ** p<0.05, * p<0.1.*** p<0.01, ** p<0.05, * p<0.1.

Appendix Table IX

Intergenerational Transmission Matrix of Years of Education

		Holocaust Survivors Quintile				
		1	2	3	4	5
Sons Quintile	1	47.8	35.4	45.3	36.9	18.2
	2	7.5	5.7	5.4	3.4	3.2
	3	25.3	31.1	26.3	29.6	27.3
	4	7.3	7.8	7.8	11.5	15.5
	5	12.0	20.0	15.2	18.6	35.7

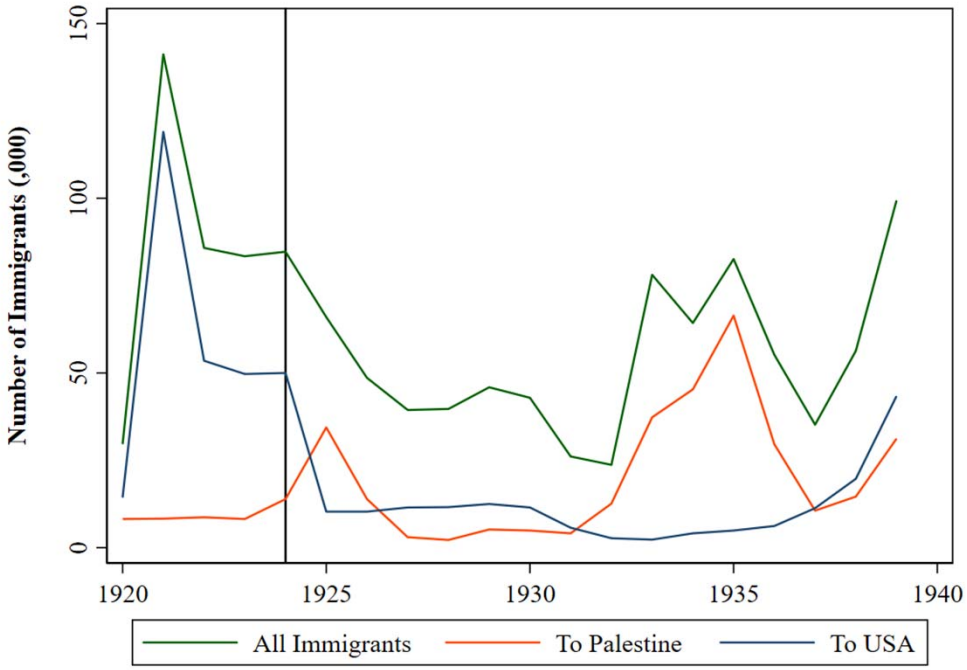
		Fifth Aliyah Members Quintile				
		1	2	3	4	5
Sons Quintile	1	53.4	35.2	45.2	30.2	19.2
	2	3.5	5.9	3.9	3.3	2.1
	3	27.5	28.4	23.9	33.3	24.6
	4	5.8	9.2	8.1	11.0	16.5
	5	9.9	21.3	18.8	22.2	37.6

Source : See Table I.

Notes : Each cell reports the percentage of children with education quintile given by the row conditional on have a father's education given by hte column. This is reported for children in the 1956-1965 birth cohorts.

Appendix Figure I

Jewish Emigration from Europe

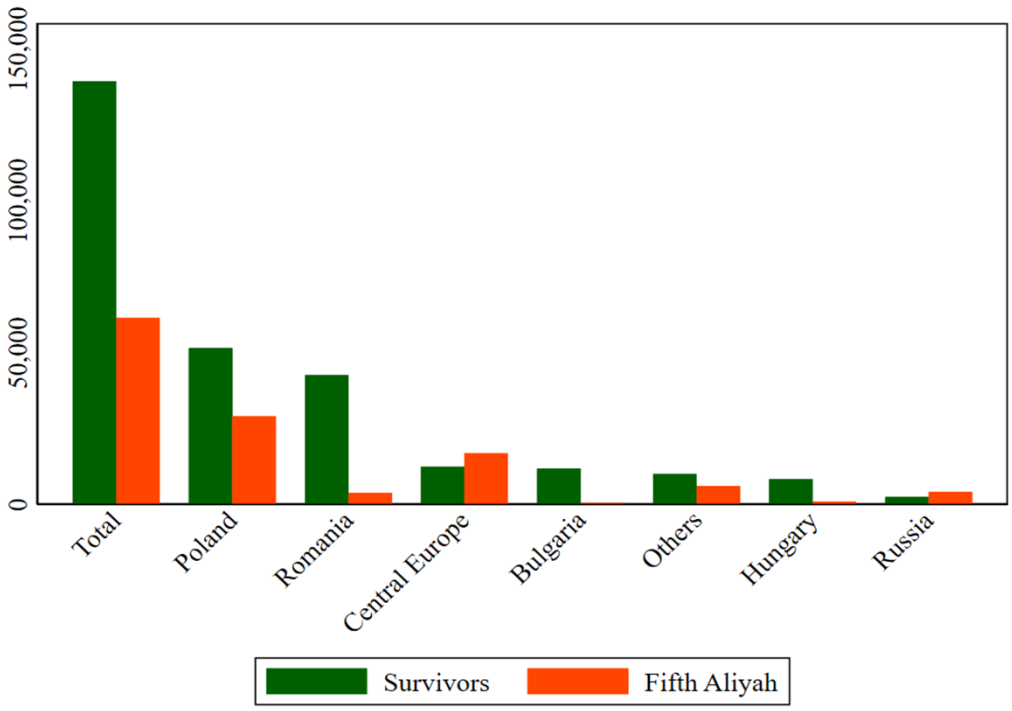


Source: Metzer (1988).

Note: The vertical line (1924) indicates new US immigration law with significant limittations, affecting mostly immigrantion from Eastern Europe.

Appendix Figure II

Jewish Immigration from Europe



Source : See Table I

Notes : The plot reports the distribution of the sample by country of birth. Central Europe include Germany, Austria and Czechoslovakia.

Appendix Figure III

Notes: In 1939, Poland wad divided between Germany and Russia along the demarcation lien shown in the figure. At the conclusion of the war, Jews from the "German" part were often eligible for greater reparation payments under the German BEG laws.