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Another Look at Persistent Inequality in Israeli Education

by

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Another Look at Persistent Inequality in Israeli Education*

by

Yossi Shavit**

DRAFT – PLEASE DO NOT CITE – COMMENTS INVITED

Abstract

This is a study of change in inequality of educational opportunity in Israel. Recent studies in Israel and elsewhere have found declining inequality of opportunity at the primary and secondary levels of education coupled with more persistent inequality at higher levels. However, these studies ignore the fact that the relative value of qualifications change as education expands over time. Many scholars agree that that the value of qualifications lies in their relative position in the distribution of education. And yet, in empirical research education is typically represented in absolute rather than relative terms. I analyze all available Israeli mobility data for the cohorts born between1951-1981 and estimate models of both absolute and relative education, as well as of education recoded into its earning value. When education is defined in absolute terms, I find the familiar decline in the effects of parents' education. When it is measured in terms of its earning value or in relative terms, the results show significant increases in the effect of parents' education on education. I also study change in the effects of ethnicity and of gender.

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1. Introduction

This is a study of change in inequality of educational opportunity in Israel. Most studies of educational stratification estimate the effects of persons' social origins on the odds of attaining nominal levels of education, such as secondary education, a college or university degree, and so forth. However, the economic returns to educational qualifications, as well as their effects on occupational attainment, vary over time. The term 'high school' was coined at a time when few adolescents attended secondary education. Nowadays, high school represents a low or medium rung on most educational hierarchies. This study takes cognizance of these changes and employs measures of qualifications that adjust to change in their economic value, and to their relative position in the educational hierarchy. Education is a double-edged sword in the stratification process. On the one hand, for working class students education can provide an important mobility avenue into the middle class and is often their only hope for economic and social success. On the other hand, education is a mechanism of social reproduction which mediates inequality between social classes across generations. The sons and daughters of the working class are less likely on average to do well in school and are therefore, less likely to succeed either occupationally or economically. Whether education is more of a mobility avenue or a mechanism of reproduction depends on the extent to which educational attainment is related to students' socio-economic origins. Therefore, scholars working in the field of social stratification and mobility are concerned with the extent to which the association between social origins and education varies over time and place. There is a debate among sociologists concerning change in educational stratification over time. Some scholars argue that inequality between social strata in educational opportunity has declined over time in most western countries while others argue that it tends to persist. Both sides in the debate cite valid theoretical reasoning. The proposition that inequality of educational opportunity is declining is consistent with industrialization and post-industrialization theories, which posit that in response to the functional requirements of the economy, educational systems expand and play a key role in the allocation of individuals among jobs and occupations (Lenski 1966, Treiman 1970). Concomitantly, the rationalization of the economy requires that processes of educational selection would be based on meritocratic rather than ascriptive principles. Hence, according to this perspective, equality of educational opportunity is expected to increase. The proposition is also consistent with the observation that that economic barriers to education have declined in economically advanced societies. Both economic development and the redistributive policies of the welfare state have improved the economic condition of the working class. These developments in turn, reduced inequality between strata in nutrition and health, which affect children's scholastic performance (Erikson and Jonsson 1996). They also enabled more working class families to bear the direct and indirect costs of education. Finally, inequality of educational opportunity is said to have declined in response to the implementation of educational reforms (e.g., Ayalon and Shavit 2004). Some reforms have eliminated institutional barriers that tended to privilege the sons and daughters of the affluent classes in the educational attainment process. Examples of such reforms are the extension of free compulsory education, the elimination of tracking at the secondary level, and the expansion of higher education at all levels.

Proponents of the opposite view do not necessarily dispute the claim that inequality of educational opportunity declined over time. Rather, they argue that it declines vis-à-vis qualifications that are losing in labor market value. Following Thurow (1975) and Hirsch (1977), many scholars working on educational stratification view education as a positional good. Namely, they argue that the value of education in not in absolute quantities but rather that in relative terms. This view is consistent with Signaling Theory (Spence 1973) which argues that employers rely on job applicants' educational credentials to indicate their trainability and diligence: employers believe that workers who have managed to obtain selective credentials are assumed to be smart and hard working. Therefore, what matters to employers is not the absolute level of worker's education but rather, the scarcity and selectivity of that level. According to this logic, as education expands in the population

over time, lower credentials lose their relative value and educational stratification shifts to higher education levels.

The association between educational expansion and its selectivity can be understood from an institutional perspective. The expansion of educational systems may require that admissions criteria be lowered in order to accommodate social strata which have heretofore been excluded from that level by scholastic requirements or other exclusionary criteria. Raftery and Hout (1993) highlight the conditions under which logic would apply. Their hypothesis of Maximally Maintained Inequality (MMI) states that inequality between social strata in the odds of obtaining an educational qualification tends to be stable over time unless that qualification had become universally available to the sons and daughters of the affluent classes. Once the affluent classes had been saturated with college education, any further expansion of colleges would require that admissions criteria (which are related to class-of-origin) be lowered. As a consequence, social selection in education shifts to higher levels which are yet to saturate the affluent classes.

Consistent with a positional perspective on education, studies have shown that the equalization of educational opportunity tends to take place vis-à-vis qualifications that are losing in relative earnings value and that inequality of educational opportunity is quite persistent with respect to higher qualifications which exhibit stable or rising earning value. Economists have shown that in most OECD countries wage differentials have increased between higher and secondary education (Katz and Autor 1999). This so called growing 'skill premium' is often attributed to the depressing impact of globalization on the wages of unskilled workers who are increasingly exposed to international competition, and to technological change which is biased in favor of skilled workers (Atkinson 2007: 42). Sociologists have shown that inequality of educational opportunity declines at the bottom of the educational hierarchy, but is more stable, or even increases, at the top (e.g. Shavit and Kraus 1990, Shavit and Westerbeek 1998, Smith and Cheung 1986, Shavit and Bossfeld 1993, Torche 2005, Breen et al. 2009, 2010). Although many sociologists discuss education in positional terms, few researchers operationalize it as such. Most studies employ absolute rather than relative measures of education. Several notable exceptions (Ultee 1980, Sørensen 1979, Olneck and Kim 1989) employed relative measures of education in models of occupational or income attainment and showed that there is some merit to the positional perspective. However, I am unaware of research which has employed relative measures of education when it is the dependent variable in the analysis. Goldthorpe's (2009) has suggested that the association between social origins and education is more stable over time when the latter is measured in relative rather than in absolute terms. He writes:

> "Insofar as it is relative level of education that matters in the labour market, then individuals will be under pressure to raise their educational attainment not just to acquire more human capital but further as a 'defensive' measure in order to maintain their place within the labour queue." (p. 18).

Presumably, the privileged social strata are better resourced to stay ahead in the perpetual race to keep ahead in the queue and inequality in this regard could persist. "Moreover," Goldthorpe continues "the question can also be raised of how far the finding of a weakening [effect of social origins] based on... absolute categories of educational qualification does indeed indicate a reduction in class inequalities in education, at all events as judged by returns..." (p.19). Namely, he recommends that research on change in educational stratification can cognizance of the changing economic returns to qualifications over time.

This study rallies around Goldthorpe's call. I study change in educational stratification in Israel over time while adjusting both change in the labor market value of qualifications and for the positional aspect of education.

When adjusting for change in the earning value of education I follow Treiman and Terrell (1975) and employ an effect proportional scaling of education. The analysis of change over time in educational attainment is similar to the comparative analysis of difference in this process between countries. In both cases, the social significance of education varies in the comparison. Treiman and Terrell (1975) compared the process of status attainment in the United States and Great Britain.

Their main methodological challenge was to develop a measure of education that would be equally valid for both countries. Whereas in the United States years of schooling seemed to be a valid measure, in Great Britain there was substantial qualitative differentiation in education (e.g., between grammar and secondary modern schools). Since the education systems of the two countries were very different, a direct comparison of nominal qualifications on labor market outcomes was not possible. Therefore, Treiman and Terrell sought a procedure for scaling education that would permit a fully comparable analysis of the association between education and occupational attainment. Following Lyons (1971) they developed effect-proportional scales of education based on the average occupational attainment of individuals in each qualification. The procedure involves a computation of the mean of the criterion variable (occupational status in their case) for each category of the variable to be scaled (education) and then to assign the mean scores as scale values. I employ a similar procedure and scale educational categories to their expected mean earnings at the time when my respondents were in their teens. When adjusting for the positional aspect of qualifications I follow Sørensen (1979) who argued that "…people compete with members of their own cohort for access to jobs. Since the distribution of education by years of schooling varies with cohort, the desired transformation of educational attainments should be carried out by cohort." (371). Thus, he represented education by the cumulative percentile distribution of education in each cohort. Olneck and Kim (1989) followed a similar procedure and rescaled educational attainment into a metric that represents how close to the top of the educational distribution an individual stands. I simply transform education into quartiles. The specifics of these transformations are discussed in the section on data below.

2. Reforms in Israeli Education

This is a study of change in educational stratification across the Israeli birth cohorts of 1955-1981. I chose to study these cohorts because they attended secondary and tertiary education since the 1970s, before and since several far-reaching educational reforms. This section describes the Israeli educational system, the reforms and their consequences for educational stratification.

At age 12, after a year in compulsory preschool and six years in primary school, most Israeli children proceed to three years in middle school and three years of secondary education. Most secondary school students attend either an academic or a vocational track. Nominally, both tracks prepare students for the matriculation examinations which are required for admission by most institutions of higher education, but success rates in the exams are much higher in the academic track. Matriculation examinations are administered nationally and graded anonymously. To obtain the Matriculation diploma students must sit for seven compulsory subjects two of which are English and Math (other subjects are Hebrew or Arabic, Civic Education, Literature, History and Bible) and pass all but one subject. Although, formally, diploma gains one access to higher education, the major universities only admit diploma holders who meet several additional conditions (For details see Ayalon and Shavit 2004). In recent cohorts, over 70 percent of men and women sat for one or more matriculation examinations. However, only about half the cohort was eligible for the diploma. Eligibility for the diploma is strongly correlated with ethnicity and social class. These gaps are very visible and therefore are also very prominent on the political agenda. During the 1990s the Ministry of Education implemented two reforms aimed at increasing eligibility rates. These included some easing of the requirements for the examinations themselves, and a gradual reorientation of the curriculum in the vocational tracks towards the matriculation examinations. The former was implemented by reducing the number of examinations that are required for eligibility for the matriculation diploma and by reducing the total amount of material that is covered by the examinations. The latter was implemented by a partial academization of the curriculum whereby some of its vocational components were replaced by academic subjects (Tzuk 1994).

Ayalon and Shavit (2004) studied the consequences of these reforms for change across cohorts in the degree of educational inequality and concluded that the reforms reduced the effect of parental

education on the odds of eligibility for the matriculation diploma. At the same time however, inequality between social strata in the odds of obtaining the more demanding diploma, which gain one access to research universities, remained stable and may have even increased.

During the late 1980s and the 1990s, Israeli higher education has also undergone several important reforms. Until the late 1980s, the system of higher education had consisted primarily of six universities regulated by the state but in the mid-1990s it was transformed from a centralized, compact, and organizationally homogenous system into a diverse one in which numerous forms of institutions compete for students. Although the transformation began in the late 1970s with the academization of several small teacher training institutions, it gained its momentum in the mid-1990s with legislation to accredit and expand undergraduate colleges. The initiative was taken in anticipation of a growing demand for higher education owing to massive immigration from the former Soviet Union, a significant increase in the number of high-school graduates, and rising demand for university graduates in the labor market (Guri-Rosenblit 1993). Like the veteran universities, the public and private colleges require applicants to hold a matriculation certificate, and some also demand psychometric tests, but their admission criteria are lower than those of the universities. Shavit and his associates (2007) studied the consequences of the transformation of Israeli higher education for the stratification of admissions to different institutions of higher education and of the odds of obtaining an academic degree. They found that during the 1980s, just before the transformation, inequality between categories of parental education in access to higher education had been on the rise. This resulted from the growing imbalance between increasing demand for higher education and the restricted capacity of the universities. The expansion of higher education through the creation and accreditation of colleges had reversed this trend. These less selective institutions had provided students from less privileged social origins with an alternative to the university, as a result of which inequalities between strata in access to higher education has declined but socioeconomic inequalities in the odds of obtaining a BA has remained quite stable.

I replicate the earlier studies by Ayalon and Shavit (2004) and by Shavit and his associates (2007) in an attempt to assess change in inequality of educational opportunity. The added value of the present study is the attempt to compare the results of traditional models, which use nominal measures of education, to those of models that adjust for change in the expected earning value of qualifications and for their position in the changing hierarchy of education.

3. Data

The research population of the study consists of Israeli residents who were born between 1955 and 1981. These cohorts attended secondary education during the 1970s, 1980s and 1990s and attended higher education in the 1970s, 1980s, 1990s and the first decade of the 2000s, that is, before and since the reforms of the 1990s. I stacked all available datasets which include information on nationally representative samples of Israeli respondents belonging to these birth cohorts, and which contain information on the educational attainment of respondents, their parents, as well as on gender, ethnicity (Arab vs. Jew), year of birth, country of birth and year of immigration. I excluded all foreign born respondents because I did not want to confuse educational experiences that occurred in Israel with those that the subjects may have experienced abroad. In an attempt to reduce right-hand censoring of education, I also excluded all respondents who were 26 years old or less at the time of the survey. The data were collected in 1995, 2001, 2002 and 2008. The first data set was obtained from the 20% sample of the Israeli Census of 1995 who were administered the detailed ('long') questionnaire (Israel, CBS 1995). Using the National Registration system the Central Bureau of Statistics merged the records of the 20% sample in 1995 with parents' records in the 1983 Census. The 2001 data were collected by Matras, Reijman and Stier (http://geobase.huji.ac.il:8080/catalog/) for their study of social mobility. They interviewed a nationally representative sample of 2,050 respondents, of which 469 met my selection criteria. The 2002 and 2008 data were obtained from the Israeli files of the respective European Social Surveys

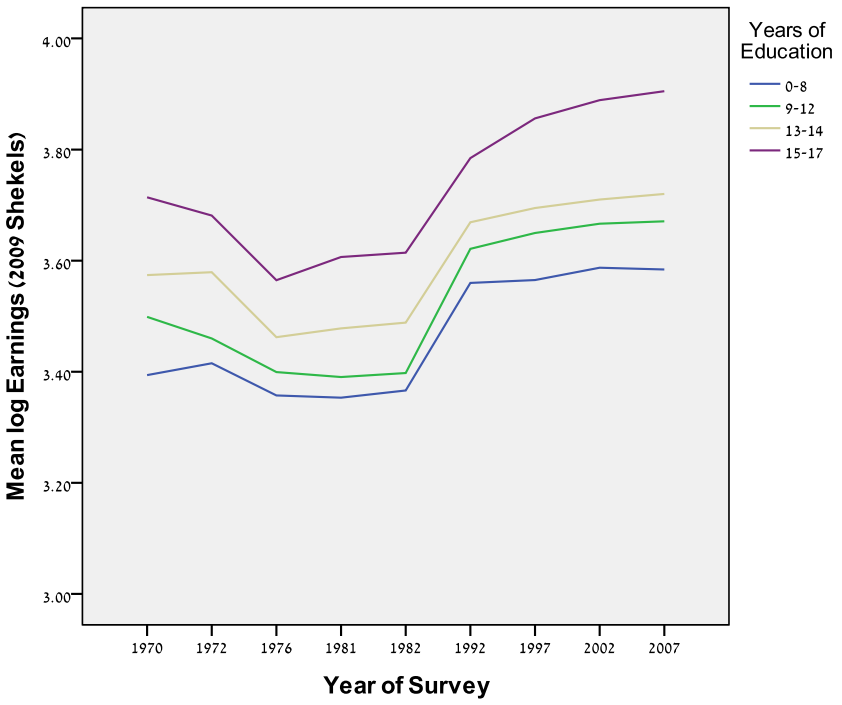
(http://www.europeansocialsurvey.org/). My selection criteria were met by 802 and 922 ESS respondents respectively. In total, I analyzed data for 19,873 cases. However, since the 1995 sample is considerably larger than the other three, I was concerned that it may over-shadow the other data sets and weighed it down by a factor of 0.04 thereby reducing its weighted size to about the mean of the other files (770). My total weighted sample size is 2,995. My dependent variable is educational attainment measured in several ways. The first measure is the conventional absolute measure. It is an ordinal variable with five categories: 1. primary education or less; 2. secondary education; 3. matriculation diploma; 4. any post-secondary education, and 5. Higher education. The percent distribution of this variable is shown in Table 1.

Table 1. Descriptive Statistics of Variables

Variables	**%**	Mean
Educational Attainment		
Primary, Middle school or less	17.9	
Secondary	25.1	
Matriculation	20.1	
Post-Secondary	11.9	
Higher	25.0	
Mean log Earning Value of Education		
Primary, middle school or less		3.47
Any secondary		3.57
Post-Secondary		3.64
Higher		3.79
Top Quartile of Education in Cohort (4 files)	24.9	
Median of Education in Cohort (4 files)	50.0	
Mean (S.D.) Years of Education (3 files)		12.9 (3.3)
Top Quartile of Years of Education in Cohort (3 files)	28.4	
Top Third of Years of Education in Cohort (3 files)	33.5	
Top Median of Years of Education in Cohort (3 files)	40.8	
Gender (Reference: female)	49.7	
Arab Ethnicity (Reference: Jews)	25.0	
Birth Cohort		
1955-1959	18.6	
1960-1964	23.5	
1965-1969	28.5	
1970-1974	18.3	
1975-1981	11.2	
Parents' Education		
Primary	50.4	
Secondary	25.6	
Post - Secondary	9.7	
Higher	13.2	
Median of parents' education	46.5	
Weighted N (4 files)	2,995	
Weighted N (3 files)	2,081	

As seen, 25% of the sample held academic degrees (higher education), an additional 11.9% had some post-secondary education and an additional 20.1% had a matriculation diploma.
The second measure of education is an effect proportional scale which recodes the five categories of education into the mean log earnings of similarly educated full time workers who were 35-54 years old when respondent was in his/her teens. As noted, wage differentials between educational categories have expanded in most developed countries (Katz and Autor 1999). In Israel too, the earnings gap increased considerably during the 1990s between workers with higher education and those with twelve years of schooling or less (Mualem and Frisch 1999). Thus, the second measure of educational attainment adjusts the educational categories for their changing economic value. I perform the adjustment through a two stage process: in the first, I compute the mean earnings of full time workers by their education category. To this end I compiled all available Family Income Surveys (http://geobase.huji.ac.il:8080/catalog/) for the years 1972-2002 in which education was coded in sufficient detail. Still however, the most detailed classification that could be obtained from all files was rather crude consisting of four categories of years of education: 0-8 (equivalent to 'primary, middle school or less'), 9-12 (equivalent to 'secondary'), 13-14 (equivalent to post-secondary) and 15 or more (equivalent to higher education). Using the compiled file, I selected all full time workers in prime working ages (35-54) and computed their mean earnings by educational categories. Figure 1 displays for these workers the mean log earnings in 2009 Shekels by categories of education. Real earnings declined in the first half of the seventies, were rather stable through 1982 and then increased, faster during the 80s and more slowly thereafter. Consistent with Mualem and Frisch's (1999) study, during the 1990s, the earnings gap increased between higher education on the one hand, and secondary or primary education on the other hand. As seen, in Figure 1, it continued to increase well into the first decade of the 21st Century.

Figure 1: Mean Log Earnings of Full Time Workers, Ages 35-54 by Education and Year.



In the second stage I return to the original data set (the stacked mobility files) and create an effect proportional scale of education with log earnings as the criterion variable. Technically, I recoded the educational attainment of each respondent in the file to the log fixed earnings (in 2009 Shekels) of similarly educated workers in the Family Income Survey corresponding most closely to the year

in which respondent was in his/her teens. The effect proportional scale represents the earning value of education when respondent was at an age when he/she would have made key educational decisions such as whether to continue to a matriculation diploma, to higher education, and so forth. The mean log earnings associated with the five categories of education are shown in the rightmost column of the Table 1. They correspond to shekel figures ranging from 2,951 to 6,166.

The third measure of education is consistent with the view that education is a positional good. Namely, that the value of a qualification is determined by its relative position in the percent distribution of qualifications in a cohort. I use two positional measures of education. The first are two dummy variables which correspond to the top median and to the top quartile of the education distribution within in each cohort. This measure is not ideal because the delineation of percentiles in a lumpy distribution (i.e., a distribution that consists of a few categories) can be very imprecise.[1] Ideally, quartile analysis of this sort requires a more sensitive measure of education than the five-category variable that is available in the mobility files. Fortunately, however, three of the four files (the 1995 Census and the two ESS files) include measures of years of education. Quartile analysis of this variable yielded small deviations from the formal cut-off points of the top quartile, top third and the median in each cohort. Therefore, I conduct the positional analysis twice: once using the quartile and median of the lumpy measure of education that is available in all four files and one using the three quintiles of years of education that is available in three of the four files. The mean of years of education and the cohort proportions in the various percentiles are shown in Table 1.

Having described the dependent variables, I now discuss the independent ones. Gender and Ethnicity are dummy variables coded 1 for men versus women, and for Arabs versus Jews respectively. Parents' education is a four category ordinal measure of the highest of the two parents' educational attainment. It distinguishes between primary, secondary, post-secondary and higher education. Birth cohort was coded in two different ways: a detailed classification that distinguishes between respondents born in: 1955-59, 1960-64, 1965-69, 1970-74 and 1975-81, and a binary classification that distinguishes between the birth cohorts of 1955-1969 and 1970-81. In exploratory analysis I employed the two measures interchangeably and the results were very similar. Ultimately, I decided to use the detailed measure in the descriptive analyses and the binary measure in the regressions. Finally, following Breen and his associates (Breen et al. 2009, 2010) I include in all models dummy variables representing survey. There are two reasons to control for survey: first, methodological differences between surveys in sampling or in measurement could bias the estimates, and second, birth cohorts gain in age between surveys and continue to accumulate education (even though I only include in the analysis respondents who were 27 years and older). In unreported analyses, I also tested for interactions between the survey dummies and gender, ethnicity and parents' education. Of the 60 interactions, two were significant but their inclusion in the model did not alter the remaining results significantly.

4. Analysis and Results

Figure 2 shows the expansion of educational attainment across the five cohorts under study. As seen, attainment rates increased at all educational levels. The increase was quite linear at the secondary and matriculation levels but post-secondary and higher education rates accelerated in the last two cohorts, which attended post secondary and higher education after the reforms of the nineties.

[1] As seen in Figure 5, in the oldest cohort the top quartile consists of higher education and about a third of the cases with post-secondary education. However, since there is no meaningful way to distinguish among respondents in the post-secondary category, they are all assigned the mean value of this category which falls below the formal cut-off point of the top quartile. Thus, the quartile consists of only 21% of cases (those with higher education). By contrast, in the youngest cohort about 50% are assigned to the top quartile (cases with either post-secondary or higher education). Clearly, these deviations from 25% violate the objective of this analysis – to adjust education for its positional quality. With respect to the median, the deviations from 50% are proportionately smaller (ranging between 39 and 55).

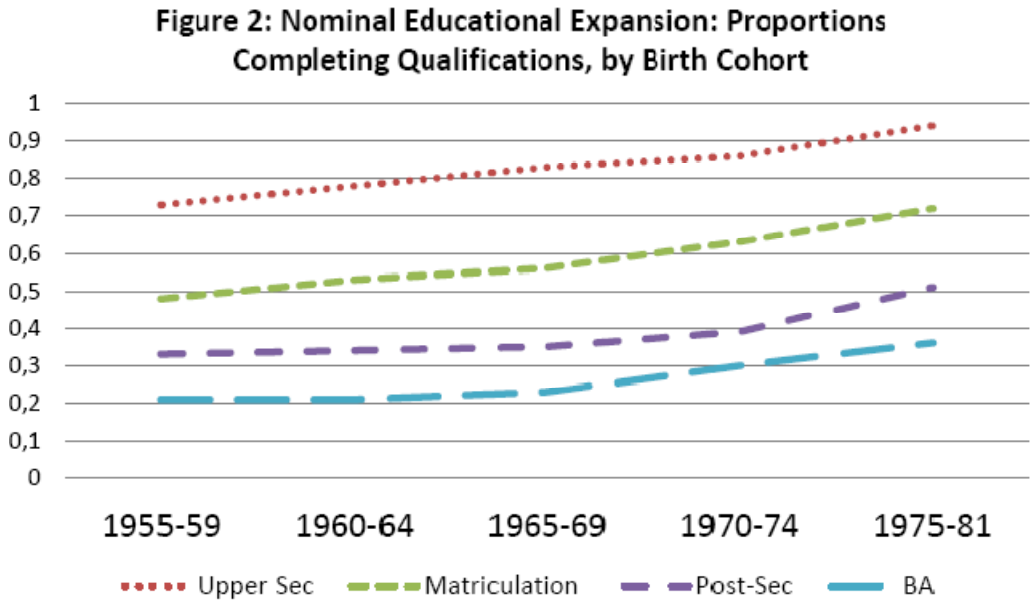
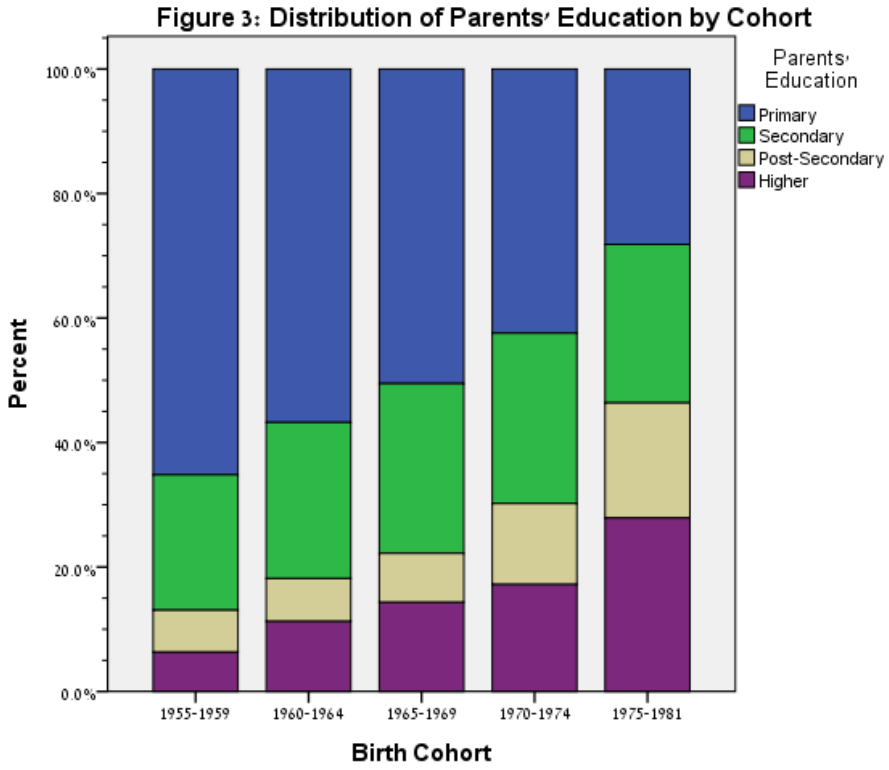


Figure 3 shows the distribution of parents' education by birth cohort. As seen, education expanded dramatically among parents as well. Whereas in the oldest cohort about 65% of respondents were raised by parents with just primary education, by the youngest cohort nearly 50% were raised by parents with post-secondary or higher education.

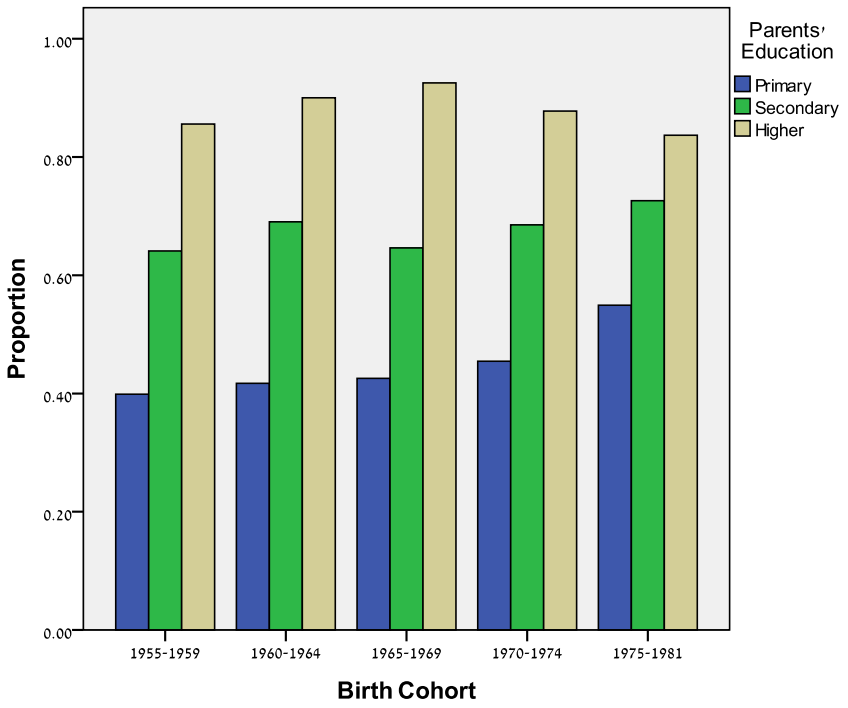


4.1 A Model of Nominal Educational Attainment

In this section I present estimates of binary logit models of nominal educational attainment. The dependent variables are the log odds of attaining at least each of the following: secondary education, a matriculation diploma, post-secondary education and higher education. The regressions are shown in Table 2. The first regression for each dependent variable includes main effects for gender, ethnicity, parents' education, birth cohort (the binary version of this variable) and survey. The second regression adds interactions that test for change across cohorts in the effects of gender, parents' education and ethnicity.

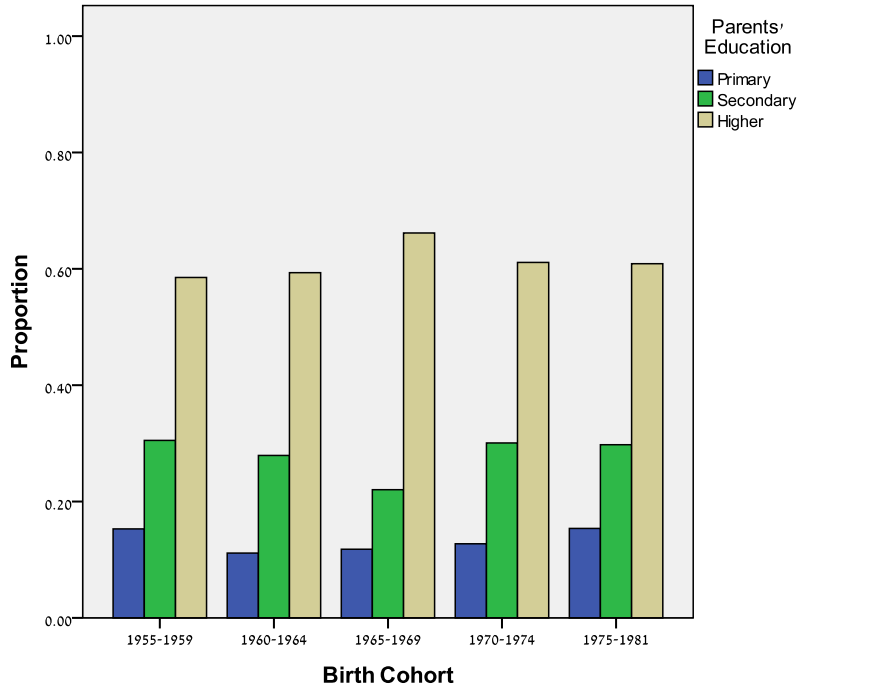
Men were less likely than women, and Arabs are less likely than Jews, to attain secondary education, a matriculation diploma and post-secondary education. At the level of higher education these differences are in a consistent direction but are not significant. Expectedly, parental education exerts highly significant and strong effects in all models. The effects of cohort are positive with respect to secondary education and the matriculation diploma. This reflects the expansion of attendance and matriculation rates that we have seen in Figure 1. However, the effects of cohort on post-secondary and higher education are insignificant indicating that when adjusted for the social composition of the cohorts, post-secondary and higher education did not expand. This last point is illustrated in Figures 4a and 4b. Figure 4a shows the matriculation rates by cohort and three levels of parents' education. As seen, among children to parents with primary and secondary education the rates increased while among children to parents with higher education they first increased and then declined to their original level. Overall, the differences between the three bars show that the gap between the three social strata in matriculation rates declined substantially across cohorts.

Figure 4a: Cohort Proportions of Matriculation Diploma Holders by Parents' Education



Turning Figure 4b we see that the rates of higher education in each of the three strata changed very little. Evidently, the growth in the attendance rates at higher education is attributable to growth in proportion of successive cohorts whose parents are highly educated rather than to rising attendance within the different strata of parents' education.

Figure 4b: Cohort Proportions of Higher Education by Parents' Education



Turning back to Table 2, I now turn to the second models for secondary education and inspect the interaction effects of gender, ethnicity and parents' education with cohort. As seen, the interaction with ethnicity is negative and significant indicating that the Arab-Jewish gap in the log odds of secondary education increased over time. Model 2 for the matriculation diploma shows similar results, but in addition, the interaction between cohort and parents' higher education is negative and significant indicating that the effect of parents' education declined: whereas in the older cohorts, respondents whose parents had higher education were 13 times (e2.570) more likely to obtain the matriculation than those whose parents had but primary education, in the recent cohorts this factor declined to 5.3. At the post secondary level women gained significantly over men and at the level of higher education, women gained over men and Jews gained over Arabs.

In sum, when applied to Israeli data, the model which treats educational qualifications as nominal categories, yields the following results: during the period under study, the ethnic gap increased (significantly in three of the four educational levels), the gender gap increased (significantly, at the post secondary and higher levels), but inequality of educational opportunity between strata defined by parents' education declined at the matriculation level. This latter gap also declined at the post-secondary and higher levels albeit insignificantly. This result is consistent with studies elsewhere which show declining educational inequality between strata, especially at the bottom of the educational hierarchy. It is also consistent with the earlier findings of Ayalon and Shavit (2004) and Shavit and his associates (2007) which were summarized earlier.

Table 2. Logit Regressions of Educational Levels

Independent Variables	Secondary Plus				Matriculation Plus				Post-Secondary Plus				Higher			
	1		2		1		2		1		2		1		2	
Gender (Female omitted)	-.227	*	-.204		-.458	**	-.401	**	-.176	*	.013		-.150		-.020	
Ethnicity (Jews)																
Arab	-1.253	**	-1.142	**	-.328	**	-.218	~	-.233	*	-.215		-.197		-.021	
Parents' Education (Primary Omitted)																
Secondary	1.274	**	1.363	**	.966	**	1.023	**	.878	**	.921	**	.931	**	.974	**
Post-Secondary	1.746	**	1.530		1.419	**	1.389	*	1.671	**	1.456	**	1.543	**	1.444	**
Higher Education	2.170	**	2.158	**	2.183	**	2.570	**	2.223	**	2.357	**	2.334	**	2.493	**
Birth Cohort	.475	**	.887	**	.209	*	.570	**	-.100		.217		-.015		.317	
Survey (1995 Census Omitted)																
Matras et al. 2001	-.524	**	-.506	**	-.752	**	-.731	**	-.666	**	-.626	**	-.093		-.055	
ESS 2002	.046		.042		.381	**	.384	**	.350	**	.386	**	.581	**	.603	**
ESS 2008	.642	**	.637	**	.183		.190		.371	**	.395	**	.484	**	.498	**
Cohort Interactions With:																
Gender			-.127				-.198				-.610	**			-.365	~
Ethnicity			-.536	~			-.373	~			-.071				-.488	~
Parents' Education-Secondary			-.340				-.222				-.133				-.101	
Parents' Education-Post Secondary			.757				-.006				.479				.194	
Parents' Education-Higher			-.052				-.901	*			-.242				-.344	
Constant	1.452	**	1.386	*	-.035		-.129	**	-1.176	**	-1.300	**	-2.099	**	-2.235	**
-2LL	1,977.0		1,971.7		3,181.9		3,172.2		3,133.3		3,117.5		2,705.1		2,695.4	

** Significant at p<0.01, * Significant at p<0.05, ~ Significant at p<0.10

4.2 Adjusting Educational Qualifications for their Expected Earnings Value

Table 3: OLS Regressions of Education Recoded into Expected Log Earnings (in 2009 Shekels)

Independent Variables	1		2	
Gender (Female omitted)	-.006		-.005	**
Ethnicity (Jews)				
Arab	-.017	**	-.051	**
Parents' Education (Primary Omitted)				
Secondary	.043	**	.037	**
Post-Secondary	.086	**	.068	**
Higher Education	.125	**	.110	**
Birth Cohort	.226	**	.200	**
Survey (1995 Census Omitted)				
Matras et al. 2001	-.029	**	-.027	**
ESS 2002	.011	*	.013	*
ESS 2008	.027	**	.027	**
Cohort Interactions With:				
Gender			-.001	
Arab			.012	**
Parents' Education-Secondary			.022	*
Parents' Education-Post Secondary			.049	**
Parents' Education-Higher			.044	**
Constant	3.513	**	3.519	**
R^2	0.61		0.61	

** Significant at p<0.01, * Significant at p<0.05,
~ Significant at p<0.10

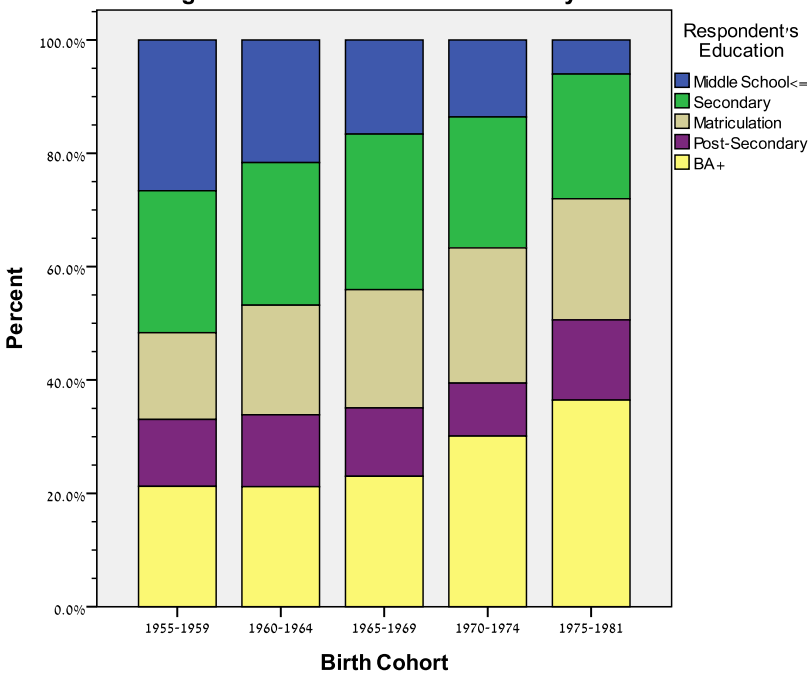
In Table 3 I present OLS regression estimates for education transformed into earning value. The following discussion focuses on the estimates of Model 2. First, consistent with the upward trend in log earnings that was seen in Figure 3, the main effect of cohort is positive and significant. Second, the main effect of gender and its interactions with cohort are insignificant indicating that on average men and women attain educational levels that are equally lucrative from an economic point of view. This is not to dispute the existence of gender differences in earnings, but rather to state that there are no gender differences in the attainment of qualifications that are economically rewarding. Third, inequality between strata defined by parents' education in the earnings value of education increased significantly over cohorts, and finally, the net educational disadvantage of Arabs was attenuated over time. In sum, by contrast to the conventional model, inequality has increased between social strata in the attainment of qualifications scaled to their earnings value. This result is consistent with the argument that the decline in inequality which was seen in models of nominal educational

categories is more apparent than real because it pertains to qualifications that had lost their relative earnings value.

4.3 Models of Education Defined as a Positional Good

In this last part of the analysis I represent education as a positional good. The dependent variables in this analysis are dummy variables corresponding to various percentile positions in distribution of education within each cohort. As noted earlier, I conduct the positional analysis twice: once (Figure 5 and Table 4) using the less precise measures available in all four mobility files, and once using quintiles of years of education, which is available in three of the files (Table 5). As seen in Figure 5, in the oldest cohort the quartile and median ran through post-secondary and secondary education respectively, whereas in the youngest cohort the top median consisted of post secondary and higher education and the top quartile consisted of higher education.

Figure 5: Distribution of Education by Birth Cohort



In Table 4 I present binary logit regression for the log odds of attaining educational levels that were positioned in the top quartile and top median in each cohort. The independent variables are similar to those used earlier except that parental education is also measured in positional terms: I define it as a dummy that identifies respondents whose parents' education was in the top third of the educational distribution in each cohort. The main results of this analysis are these: the Arab-Jewish and the Female-Male gaps in the odds of gaining access to the top quartile of education have increased but the effect of parental education, which is the strongest effect in the model, did not change significantly between cohorts. In addition, the effects of cohort are significant in both columns. These effects capture cohort the deviations from exact quartile and median values that I discussed earlier in the section on data.

Table 4: Logit Regressions of Cohort Specific Quartile and Median Education

Independent Variables	Top Quartile in Cohort		Top Median in Cohort	
Gender (Female omitted)	-.029		-.403	**
Ethnicity (Jews)	-.049		-.222	~
Parents' Education in top Median by Cohort	1.479	**	1.371	**
Birth Cohort	.792	**	-.428	**
Survey (1995 Census Omitted)				
Matras et al. 2001	-.042		-.719	**
ESS 2002	.652	**	.386	**
ESS 2008	.527	**	.296	*
Cohort Interactions With:				
Gender	-.340	~	-.193	
Ethnicity	-.704	**	-.297	
Parents' Education in top third by Cohort	-.023		.262	
Constant	-2.254	**	-.165	
-2LL	2,797.6		3,298.2	

** Significant at p<0.01, * Significant at p<0.05,
~ Significant at p<0.10

Table 5 presents similar logit regressions for the top quartile, top third and top median of years of education using the three files that provide measures of this variable. The results are similar to those shown in Table 4.

The most striking results is the significant increase in the gap between the children of educated and less educated parents in the odds of attaining education in the top median. This result is similar to the result shown in Table 3 where we saw an increase in inequality of educational opportunity when defined in terms of earnings value. The female advantage has increased although neither its main effect nor the corresponding interactions are significant. Finally, the gap between Arabs and Jews (net of parents' education) is significant with respect to the median and it seems to have increased with respect to the quartile and top third but not significantly so.

Table 5: Logit Regressions of Cohort Specific top Quartile, Median and Third of Years of Education, 1995 Census, 2002 ESS and 2008 ESS

Independent Variables	Top Quartile in Cohort		Top Third in Cohort		Top Median in Cohort	
Gender (Female omitted)	-.087		-.086		-.005	
Ethnicity (Jews)	-.085		-.187		-.291	~
Parents' Education in top Median by Cohort	1.406	**	1.428	**	1.322	
Birth Cohort	.194		-.171		.474	*
Survey (1995 Census Omitted)						
ESS 2002	.694	**	.593	**	.474	**
ESS 2008	.354	*	.337	*	.210	
Cohort Interactions With:						
Gender	-.251		-.246		-.462	~
Ethnicity	-.270		-.158		.002	
Parents' Education in top third by Cohort	.177		.150		.631	*
Constant	-1.783	**	-1.378	**	-1.093	**
-2LL	1,880.5		1,981.1		2,060.1	

** Significant at p<0.01, * Significant at p<0.05, ~ Significant at p<0.10

5. Summary and Implications

To summarize, recent studies find declining effects of social origins on educational attainment when it is measured in absolute terms. Some view these results with optimism. This paper suggests that optimism is premature. I studied change in the effects of ethnicity, parents' education and gender, on educational attainment in Israel during a period that has witness dramatic reforms in both secondary and higher education. The reforms were intended to expand attendance rates at the higher level and to reduce inequality of educational opportunity.

Educational expansion is a very common policy worldwide, and some scholars and policy makers believe that it can enhance equality of educational opportunity. For expansion to effectively do so it must be massive enough to outpace the expansion of the middle classes (Halsey et al. 1980). However, a dramatic expansion of education runs the risk of outpacing demand for skilled workers in the labor market and can result in credential inflation or over-education. Thus, a proper evaluation of educational policy and its effects on equality of opportunity should take cognizance of possible change in the value of education over time.

Sociologists and some economists view education as a positional good. From this perspective, the value of qualifications in the labor market lies not in its absolute value but rather in its relative position in the distribution of education and in its relative scarcity. Although this idea is quite popular in the theoretical rhetoric and in interpretations that accompany empirical studies of educational stratification, the vast majority of studies employ absolute rather than relative measures of education. As I noted earlier, the few studies (Ultee 1980, Sørensen 1979, Olneck and Kim 1989) that did employ relative measures of education in the analysis of occupational attainment or income

showed that there is some merit to the positional perspective. However, I am unaware of research on educational attainment which employed relative measures.

I began the analysis by treating education nominally, namely, by studying the association between social origins on the one hand, and common educational categories, such as primary education, secondary education, and so forth. The results show increases in the gender gap in higher education (favoring women), and widening gaps between Jews and Arabs (favoring the former). However, I also found a decline in the effects of parents' education, especially on the odds of attaining a matriculation diploma. These results are consistent with previous studies, which have found declining inequality of opportunity at the lower to medium levels of education (e.g. Shavit and Kraus 1990, Shavit and Westerbeek 1998, Breen et al. 2009, 2010). However, research also shows that by comparison to higher education, the relative economic value of secondary educational has declined in Israel as in many other OECD countries (Katz and Autor 1999). Therefore, I also estimated a model of educational attainment in which education was recoded into the changing earnings value of qualifications over time. The results showed a significant increase in the effect of parents' education on the earning value of education. Finally, I estimated models in which education was measured in relative terms, namely, as quintiles of education within broad birth cohorts. The results differ between quintiles but could be summarized as follows: the educational advantages of women over men, of Jews over Arabs and the effects of parents' education have increased across cohorts. Thus, I tentatively conclude that during the period under study inequality of educational opportunity in Israel declined in absolute terms but increased somewhat in both the earnings value of education and in relative terms. I hope that the paper will provide an impetus for scholars working in this field to employ both nominal and positional measures of education where warranted. The policy implications of this study are tentative and depend on the extent to which education in Israel is positional. I found that the expansion of higher education during the 1990s, which has heretofore been considered quite dramatic, did not but catch up with the educational expansion in the parents' generations. In other words, it sufficed to allow all social strata to maintain, but not to increase, their attendance rates thus preserving inequality between them in attendance rates. Coupled with the familiar finding that the earnings of workers with higher education increased by comparison to those with secondary education or less, one would think that there is room for further expansion of higher education. Presumably, additional capacity of higher education could be taken up by the middle strata, increase supply of educated workers, lower their mean earnings, and would thus reduce inequality between strata in access to higher education as well as in mean earnings.

However, to the extent that education is purely a positional good whose effects on subsequent earnings are due to the relative scarcity of credentials rather than to the skills that they represent, educational expansion is not likely to alter inequality of access to the most rewarding credentials. Rather, it could reduce inequality of access to credentials but would also lead to credential inflation as the educational hierarchy would extend ever higher. Alternatively, expansion could result in qualitative differentiation between programs and institutions but these too tend to assume hierarchical significance vis-à-vis the labor market (Lucas 2001, Shwed and Shavit 2006).

Future research should try to determine the extent to which education is a positional good in the Israeli labor market and, more broadly, the conditions and sectors in which it is. For example, Goldthorpe (2009) argues that education tends to be positional vis-à-vis managerial occupations but that its value is absolute in the professions.

Before concluding, important data limitations of this study must be acknowledged. I employed a data set that combines all available surveys that included information on both respondents' education and detailed measures of social origins. These surveys however, are small (except for the 1995 Census) and as I showed, they are not perfectly harmonized. Furthermore, they do not provide detailed information on parents' class or occupation, both important indicators of social origins. More importantly, the data files do not include information on qualitative educational differences

such as secondary school tracks and type of higher education. Future research should apply the models that I have employed in this paper to larger, more complete datasets in Israel and elsewhere.

References

Atkinson, Anthony B. (2007). "The Distribution of Eearnings in OECD Countries." ***International Labour Review*** 146 (1–2): 41-60.

Ayalon, Hanna, and Y. Shavit (2004). "Educational Reforms and Inequalities in Israel: the MMI Hypothesis Revisited." ***Sociology of Education*** 77 (2): 103-120.

Gary S. Becker (1964). ***Human Capital: A Theoretical and Empirical Analysis, with Special Reference to Education***. Chicago, University of Chicago Press.

Breen, Richard, Ruud Luijkx, Walter Müller and Reinhard Pollak (2009). "Non-Persistent Inequality in Educational Attainment: Evidence from Eight European Countries." **American Journal of Sociology**, 114 (5), pp. 1475-1521.

Breen, Richard, Ruud Luijkx, Walter Müller and Reinhard Pollak (2010). "Long Term Trends in Educational Inequality in Europe: Class Inequalities and Gender Differences " **European Sociological Review**, Vol. 26, No. 1, pp. 31-48.

Collins, Randall (1979). ***The Credential Society: An Historical Sociology of Education and Stratification***, New York: Academic Press.

Erikson, Robert and Jan O. Jonsson (1996). "Explaining Class Inequality in Education: the Swedish Test Case/", pp. 95-112 in R. Erikson and J. O. Jonsson (eds.), ***Can Education Be Equalized? The Swedish Case in Comparative Perspective,*** Boulder: Westview Press.

European Social Survey. http://www.europeansocialsurvey.org/ (accessed 22 April 2011).

Goldthorpe, John H. (2009) "Understanding the Role of Education in Intergenerational Class Mobility: Some Pointers for Sociologists from Labour Economics."

Guri-Rosenblit, Sarah (1993). "Trends of Diversification and Expansion in Israeli Higher-Education." ***Higher Education*** 25: 457-72.

Halsey, Anthony H., Anthony F. Heath, and J. M. Ridge (1980). ***Origins and Destinations: Family, Class, and Education in Modern Britain***. Oxford: Clarendon Press.

Israel, Council for Higher Education (1993). ***Annual Report Number 19***. Jerusalem: Council for Higher Education.

Israel, Central Bureau of Statistics (1995). ***Questionnaire of 1995 Census***. http://www.cbs.gov.il/mifkad/q_census1995.pdf. (Accessed 23 April 2011).

Katz, Lawrence F. and David H. Autor (1999). "Changes in the Wage Structure and Earnings Inequality". ***Handbook of Labor Economics*** 3: 1463-1555.

Lenski, Gerhard E. (1966). ***Power and Privilege: A Theory of Social Stratification***. Chapel Hill: University of North Carolina Press.

Lucas, Samuel, R. (2001). "Effectively Maintained Inequality: Education Transitions, Track Mobility, and Social Background Effects." ***American Journal of Sociology*** 106: 1642-1690.

Lyons, Morgan (1971). "Techniques for Using Ordinal Measures in Regression and Path Analysis." Pp. 147-74 in Herbert L. Costner (ed.) ***Sociological Methodology***, San Francisco: Jossey-Bass

Olneck R. Michael, and Ki-Seok Kim (1989). "High School Completion and Men's Incomes: An Apparent Anomaly." ***Sociology of Education***, 62 (3): 193-207

Raftery, Adrian E. And Michael Hout (1993). "Maximally Maintained Inequality: Expansion, Reform, and Opportunity in Irish Education 1921-75." Sociology of Education, Vol. 66, No. 1: 41-62.

Rubinstein, Amnon (1993). The Colleges' Development Policy. Minutes of the Public Stage. Jerusalem: Center of Social Policy Research in Israel.

Shavit, Yossi, and Hans-Peter Blossfeld (eds.) (1993). ***Persistent Inequalities: a Comparative Study of Educational Attainment in Thirteen Countries***. Boulder Colorado: Westview Press.

Shavit, Y., and Vered Kraus. 1990. "Educational transitions in Israel: a test of the industrialization and credentialization hypotheses." ***Sociology of Education***, 63 (1): pp. 133-141.

Shavit, Yossi, and Karin Westerbeek (1998). "Educational stratification in Italy: reforms, expansion and equality of opportunity." ***European Sociological Review,*** 14 (1): 33-47.

Shavit, Yossi, Svetlana Bolotin-Chachashvili, Hanna Ayalon and Gila Menahem (2007). "Diversification, Expansion and Inequality in Israeli Higher Education." in Y. Shavit, R. Arum, A. Gamoran (with G. Menahem), (eds.), ***Stratification in Higher Education: A Comparative Study***. Stanford: Stanford University Press.

Shwed, Uri, and Y. Shavit (2006). "The Occupational and Economic Attainments of College and University Graduates in Israel." ***European Sociological Review*** 22 (4): 431-442.

Smith, Herbert L., and Paul L. Cheung (1986). "Trends in the effects of family background on educational attainment in the Philippines." ***American Journal of Sociology***, 91: 1387-1408.

Sørensen, Aage B. (1979). "A Model and a Metric for the Analysis of the Intragenerational Status Attainment Process." ***American Journal of Sociology,*** 85 (2): 361-384.

Thurow, Lester C. (1975). ***Generating Inequality: Mechanisms of Distribution in the US Economy***. London: Macmillan Press.

Michael Spence (1973). "Job Market Signaling". Quarterly Journal of Economics (The Quarterly Journal of Economics, Vol. 87, No. 3) 87 (3): 355–374

Torche, Florencia (2005). ”Privatization Reform and Inequality of Educational Opportunity: the Case of Chile.” ***Sociology of Education***, 78 (4): 316–343.
Treiman, Donald J. (1970). “Industrialization and Social Stratification.” ***Sociological Inquiry***, Special Issue: Stratification Theory and Research 40: 207-234.
Treiman, Donald J., and Kermit Terrell (1975). “The Process of Status Attainment in the United States and Great Britain.” ***American Journal of Sociology,*** 81 (3): 563-583.
Tzuk, Uri (1994). ***The Reform in Technological Education: A Follow Up Report***. Jerusalem: The Ministry of Education and Sports.
Van de Werfhorst, Herman G., and Robert Andersen (2005). “Social Background, Credential Inflation and Educational Strategies.” Acta Sociologica, 48(4): 321-340.
Van de Werfhorst, Herman G. (2009). “Credential Inflation and Educational Strategies: A Comparison of the United States and the Netherlands.” ***Research in Social Stratification and Mobility***, 27: 269-284.
Volansky, Ami. (1996). "Opening the Gates: Democratization of Higher Education." Pp. 70-82 in O. Brandeis (ed.) ***The Third Leap: Change and Reform in the Educational System During the 1990s.*** Jerusalem: Ministry of Education and Culture.