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HAVE THE GAPS IN EDUCATION NARROWED? ON FACTORS DETERMINING ELIGIBILITY FOR THE ISRAELI MATRICULATION CERTIFICATE

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This paper explores whether there are significant differences in educational opportunities between social groups in Israel, defined by religion, ethnic origin, gender, or family background, and if so, to what extent. We found that 60 percent of Jewish students were eligible for the matriculation certificate, 21 percentage points higher than the proportion of non-Jewish students. Within the Jewish population, differences in the rates of eligibility for the matriculation certificate were found between ethnic groups, with a higher rate of eligibility for the matriculation certificate among those of Western origin (Ashkenazim) than among those of Eastern origin (Sephardim). Interestingly, this ethnic gap in educational success is wider between second generation Israelis than between first generation Israelis, and wider than the ethnic gap between those born abroad. These results are even more pronounced among female students. However, the gaps between those of Western origin and those of Eastern origin in all generations almost disappears if the differences in parents' educational levels are taken into account. Multidimensional Scaling by Faceted SSA (Smallest Space Analysis) revealed four fundamental variables each making a unique contribution to success in attaining the matriculation certificate: general well-being, economic standard of living, parents' educational background, and investment in the child.

1. INTRODUCTION

This paper examines whether there are significant differences in the rates of eligibility for a matriculation certificate between different groups in the population, and how the attainment of this eligibility is affected by the student's family background.[1]

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[1] It should be noted that the matriculation certificate in Israel is fashioned after the European model: it is granted by the Ministry of Education to those students who have passed a battery of state-administered examinations. Typically, it is the state-supervised high-school that prepares students for these examinations. Being eligible for the matriculation certificate is a necessary condition for admission to the universities, and is a prerequisite for certain positions and professional training courses. It is a definite milestone, often an obstacle, to many youngsters in their careers.

This state of affairs, combined with the fact that statistics on the eligibility for the matriculation certificate are continually and reliably collected by the government, render this eligibility a useful indicator for describing the state of educational achievements over time and across social groups. Indeed, the performance of Ministry of Education itself is often measured by the percentage of high-school students who obtain the matriculation certificate each year. This is especially true in recent years, which have witnessed mounting popular demand for greater access to higher education.

The assumption in this paper is that members of different social groups in the population have on average similar innate abilities. Jews do not have abilities superior to those of Arabs or vice versa, and Jews of Sephardi[2] origin do not have superior abilities to those of Ashkenazim. The assumption that a person's national or ethnic origins do not determine his or her innate abilities means that significant group differences in an important educational achievement such as eligibility for the matriculation certificate point to the existence of circumstantial obstacles along the path that must be looked into. Such obstacles are likely to be interpreted by individuals in the groups with low educational achievements as indicating the existence of a guiding hand responsible for such a situation. This, in turn, provides an ideal breeding ground for social tensions that threaten society as a whole and also have adverse effects on economic activity.

Differences in educational achievements could occur, however, if academic achievement is valued differently by different groups. For example, the ultra-orthodox Haredi community does not view obtaining the matriculation certificate as a worthwhile achievement. The educational aims of the Haredi community are focused on religious studies. This is however an exception. Most sectors of Israeli society, Jews and Arabs, Sephardi and Ashkenazi Jews, do view eligibility for the matriculation certificate as an important educational achievement. The most practical expression of its importance is that it serves as an entry pass into higher education, the objective of most sectors of the population.

Many studies, only some of which will be referred to herein, have documented the differences in educational achievements between Jews and non-Jews, e.g., Levin-Epstein and Semyonov (1993), and between Sephardim and Ashkenazim, e.g., Nahon (1993) and Shavit (1990). What singles the current study out from the others is its definition of the origin of ethnic groups in the Jewish population. The definition of Oriental and Western ethnic origins must take into consideration the fact that the population of Israel's youngsters today includes those born abroad, those who are the children or grandchildren of immigrants, and those of mixed origin. In other words, a definition based only on the father's country of birth is no longer sufficient. After defining who is Sephardi and who is Ashkenazi, the question remains, is the distinction still of any importance? This paper answers that question.

The second purpose of this paper is to examine the importance of different aspects of family background in determining the chances of becoming eligible for a matriculation certificate. Differences between the rates of eligibility for the certificate in different sections of the population may be due to 'historical accidents,' i.e., economic and educational gaps that may have been created in the parents' or grandparents' generation which gave students different starting points.

Various economic models show that educational achievements differ due to family background even if there are no differences in students' capabilities.[3] Many empirical studies of the effect of parents' socioeconomic background on their children's educational achievements have been conducted in Israel and abroad. We will refer only to two recent ones: Friedlander et al. (2000), who examined the effects of various background variables on educational achievements at different stages of students' educational careers; and Lavy (1999), who used an original approach to analyze the effect of background variables (and especially origin) on educational achievements.

[2] Sephardim, or Oriental Jews, originally referred to Jews from the Iberian peninsula. The term currently has a wider meaning, and includes Jews from mainly Moslem countries. Ashkenazim, or Western Jews, originally referred to German Jews, but in current usage includes Jews from Eastern Europe and Russia.

In this paper the assessment of the effects of background socioeconomic factors on students' achievements pays special attention to their ethnic origins, based on precise definitions of these origins. This leads to greater understanding of how far Israeli society is from equality of educational opportunity.

The education system may be judged by the extent to which it contributes to narrowing these initial gaps, i.e., the extent to which the gaps are correlated or uncorrelated with the economic and educational family background of the students. The assessment of the relative importance of the family and group background will help in understanding the role of Israel's education system in narrowing educational gaps.

The analysis is based on data from the 1995 population census, which relates specifically to the question of whether the respondent has a matriculation certificate. The census also provides reliable information on origin, religion, gender, and economic standing. This combination enables the question to be studied of whether there are significant differences in the rates of eligibility of different groups.

2. THE SAMPLE

This study is based on data from the population census carried out by the CBS in November 1995, which is the richest source of economic, social and demographic data. The census covered all residents of Israel at that time, with one household in five asked to complete a more detailed questionnaire that included questions on the standard of living, education, demographic factors, etc.

This study focuses on the group of youngsters aged from 18 to 21 years in 1995, the appropriate age to sit for the matriculation examinations in or prior to that year. This sector of the population numbered 81,476 in the census. Although it might appear sufficient to focus on the 18-year-olds only, the inclusion of those aged from 19 to 21 significantly increased the sample size, and offered greater maneuverability in the questions relevant to the research. The proportion of those aged from 19 to 21 with matriculation certificates is higher than that of 18-year-olds because of the possibility of re-sitting the exams, but the difference is small (Table 1).

The rate of eligibility for a matriculation certificate is defined herein as the ratio of the number of those eligible for the certificate in the 18 to 21 year age group to the total number in that age group in the population. It is important to be aware of the fact that in publications of the Ministry of Education and of the CBS the eligibility ratio is defined differently, and refers to the ratio of those eligible to receive the certificate to the number of those who took the examinations.

The population census provides information on the family background of those aged 18–21 years who still live in their parents' home or who are doing their compulsory army service. A total of 21,335 individuals in that age group who live away from their parents' home were excluded from the sample as there were no details on certain data relevant to this study, e.g., their grandparents' origins, or their parents' economic background (Table 2).

[3] For example Galor and Zeira (1993), Dahan and Tsiddon (1996) and Benabou (1996).

Table 1
Rate of Eligibility for Matriculation Certificate in the 18– to 21–Year Age Group, by Age (original sample)

Number

	Total in age group	Age			
		18	19	20	21
Eligible	43,791	10,885	11,482	11,057	10,367
Not eligible	37,405	9,621	9,510	9,318	8,956
Total	81,196	20,506	20,992	20,375	19,323
Eligibility rate (%)	53.9	53.1	54.7	54.3	53.7

SOURCE: Based on the 1995 population census.

About 9,000 observations relating to those excluded from the sample related to individuals who were married or living with a partner.[4] This population includes a high proportion of Haredim and Moslems who marry relatively young, and have a low rate of eligibility for the matriculation certificate.

As mentioned above, the Haredi community does not consider the matriculation certificate a goal in its educational curriculum; hence 702 youngsters who had studied or were studying in religious Talmudical colleges belonging to the Haredi community were excluded from the sample.[5] Twenty-three youngsters living on kibbutzim (collective settlement) were also excluded from the sample in this study since their families' economic background is hardly relevant, due to the cooperative nature of the kibbutz society. Another group of 251 individuals was excluded from the sample as there was no information on their religion, as were further 280 individuals for whom no information was available on their eligibility for a matriculation certificate.

Table 2
Sample Population*

	No. of observations
Original sample aged 18 to 21 years	81,196
Excluded from sample:	
Not living in parents' home	21,335
Haredim	702
No information on religion	251
Living in Kibbutzim	23
Sample of this study	58,885

* The original sample included 280 observations for which no information on eligibility for a matriculation certificate was available.

[4] Individuals aged 18 to 21 who live in independent households include students, soldiers, and others.

[5] The number of young Haredim is smaller than their share in the population due to only partial cooperation of the Haredi community with the Central Bureau of Statistics interviewers.

Couples who marry young generally come from families at low income and education levels. The relatively low rate of eligibility for a matriculation certificate among these youngsters is correlated with the family's educational and economic background. The exclusion of this group from the sample may affect the results of the study: the findings are likely to understate the importance of the family background variables. On the other hand, those excluded from the sample include students who live in independent households, who have especially high rates of eligibility for the matriculation certificate. This group consists mainly of those not serving in Israel's Defense Forces who are therefore able to study in post-school educational institutions.

3. THE FINDINGS

Section 1 of this part of the study describes the rates of eligibility for a matriculation certificate among different groups in the population, based on data taken from the 1995 population census. The presentation of the data is intended to answer the question regarding the extent to which gaps in educational achievements exist between groups which *a priori* have similar capabilities on average. Section 2 examines the special effect of factors such as parents' level of education and their economic background on their children's chances of becoming eligible for a matriculation certificate. Section 3 analyzes the range of interactions between all the observed variables in an attempt to identify the basic social parameters that help in becoming eligible for a matriculation certificate. The statistical calculations use multidimensional scaling.

1. The data

Two sources of information on eligibility for a matriculation certificate are available: administrative data from the Ministry of Education, and data from the population census derived from the sample survey. The data from the two sources can be integrated into one database, but it was decided not to follow that approach in the current paper for the following reasons: a) This study examines inter-generation gaps. Such information, which is consistent with regard to the definitions of the data, is available only from the population census. b) Using data collected by only one method has certain advantages. Moreover, merging different data bases is prone to error. c) New immigrants who arrived aged 19 to 21 in possession of a matriculation certificate are not included in the Ministry of Education figures. Constructing a combined sample consisting of data from the Ministry of Education and from the population census is also prone to error. d) The Ministry data regarding the rate of those eligible for a matriculation certificate from among each year's students suffer from a bias as Haredim are included in the total number of students, but generally do not try to obtain and are not eligible for a certificate.

The rate of eligibility for a matriculation certificate in the 18–21 age group in the sample including those not living in their parents' home was 53.9 percent (Table 1). This is significantly

Table 3
Rate of Eligibility for Matriculation Certificate in Sample, by Religion and Sex

	No. of observations	Total	Girls	Boys
Total sample	58,885	56%	64%	49%
A. Jews	47,204	60%	68%	54%
B. Non-Jews	11,681	39%	47%	33%
1. Moslems	9,364	34%	42%	29%
2. Cristians	1,372	63%	73%	55%
3. Druze	945	50%	52%	49%

SOURCE: Based on the 1995 population census.

higher than the rate of 37.9 percent quoted in the official publications of the Ministry of Education and the CBS in 1995 for the 17-year age group (Table 12). The rate of eligibility for the matriculation certificate among the group of 18–21-year-olds living with their parents, based on the 1995 population census, was 56.2 percent (Table 3).

Whereas the data of the Ministry of Education are actual figures of youngsters eligible to a matriculation certificate in a given year, the CBS data on eligibility are based on a sample survey of one in five of the population in Israel. The rates of eligibility in this study are higher than those of Ministry of Education. There are several reasons for the difference. One is that the question in the census sample relates to the highest certificate received by the interviewee, and apparently many respondents answer that they have a matriculation certificate, even if they have only a partial one, for example because they are missing one of the subjects required to gain eligibility for a full certificate.

Another reason for the higher rates of eligibility for a certificate found in the study than those of the Ministry of Education is that the study uses data relating to four school years, not one. Some of the youngsters not entitled to a full certificate re-sit exams or take those that are missing, and thus become eligible; this does not constitute a major effect on the rates of eligibility in the sample.

a. Differences based on religion

Equal opportunity to obtain a matriculation certificate is one of the aspects of the feeling of equality of Israel's non-Jewish citizens. Excessive gaps in favor of the Jewish population exacerbate a feeling of inequality. Like the Jewish population, the non-Jewish population is also heterogeneous. The non-Jewish population comprises followers of different religions, although the majority of non-Jews in Israel are Arabs. The main religious groups other than the Jews are Moslems, Christians and Druze. Differences may exist within a religious group, such as those between urban Moslems and Bedouin Moslems.

Fifty-six percent of the Jewish population have a matriculation certificate, compared with only 39 percent of the non-Jewish population. The most interesting fact is that difference

within the non-Jewish population are at least as big as the difference between Jews and non-Jews. One noteworthy feature is that the share of Christian youngsters with a matriculation certificate is even higher than the share of the Jewish population, and is almost double the share of Moslems.

One feature common to all groups regardless of origin or religion is female students' higher rate of eligibility for a matriculation certificate than that of male students. The gap is highest among Christians. Two hypotheses (that require further clarification) may explain the difference in the eligibility rates of male students and female students. One is that the range of occupations in the labor market is more suitable for males than females. This is apparently reinforced by social norms according to which work by males that helps to increase the family income is more proper than work by females.

The second possibility (that also warrants detailed examination) that explains the gap in favor of female students derives from the structure of the education system. The choices of subjects in technological education is better suited to male students than to female students. The chances of obtaining a technology-based or vocational-track matriculation certificate are significantly lower than those of their obtaining an academic-track certificate. Female students are thus faced with a difficult choice, to stay in the academic track or to drop out of the education system, whereas male students may allow themselves 'partial dropping out' by transferring to the technology track. In these circumstances female students remain in the academic track somewhat involuntarily, thereby improving their chances of obtaining a matriculation certificate.

Table 5 shows the rate of eligibility for a matriculation certificate by religion, gender, and generation. The findings show as expected that male and female students' rates of eligibility exceed those of their parents. The rise was striking among non-Jews, and particularly marked among Moslem females (a rise from 12 percent of the mothers to 43 percent of the daughters), and among Christian females (from 21 percent of mothers to 74 percent of their daughters). This indicates a significant narrowing of the inter-religion gaps between the rates of eligibility for a matriculation certificate.

The gap that had existed between rates of eligibility of Christian and Jewish fathers had disappeared by the next generation. The gap between Druze and Jewish fathers almost disappeared too. Although the gap between the rates of eligibility of Moslem fathers and Jewish fathers narrowed in the next generation, they still remain too wide.

b. Differences based on origin

Fifty-three years after the establishment of the State, the subject of ethnic origin has still not disappeared from public debate in Israel. Interest in this subject has actually risen in the last few years; the practical expression of this has been the electoral success of the Orthodox Sephardi Shas party at the expense of the large parties. The proportion of those born in Israel in the total population rises naturally, although in the last few years this process halted as a result of the large immigration from the former Soviet Union. This trend would be expected to reduce the importance of origin as a factor in identifying a group in the population, in addition to which marriages between Israelis of different origins also blur the distinction between ethnic groups.

Table 4
Rate of Eligibility for Matriculation Certificate in Sample, by Ethnicity* and Sex

Ethnicity	No. of observations	Rate of eligibility for matriculation certificate		
		Total	Girls	Boys
Total sample	**58,885**	**56%**	**64%**	**49%**
Jewish population	**47,204**	**60%**	**68%**	**54%**
All oriental	22,207	51%	60%	43%
All Western	16,103	73%	77%	68%
Mixed origin	8,586	64%	70%	58%
Israeli according to grandparents' continent of birth	308	54%	61%	46%
Oriental by student's continent of birth	1,369	46%	59%	37%
Western by student's continent of birth	4,763	65%	70%	60%
Ethnic gap among students born abroad		**19%**	**11%**	**23%**
Oriental by both parents' continent of birth	12,222	49%	58%	40%
Western by both parents' continent of birth	3,518	70%	75%	65%
Ethnic gap among first-generation Israelis		**21%**	**17%**	**25%**
Oriental by one parents' continent of birth	5,445	53%	62%	46%
Western by one parents' continent of birth	3,636	77%	81%	73%
Ethnic gap among one-and-a-half-generation Israelis		**23%**	**19%**	**28%**
Oriental by grandparents' continent of birth	3,171	56%	64%	48%
Western by grandparents' continent of birth	4,186	80%	85%	76%
Ethnic gap among second-generation Israelis		**25%**	**21%**	**28%**
Mixed origin by parents' continent of birth	1,835	61%	68%	55%
Mixed origin by one parents' continent of birth	2,143	62%	70%	56%
Mixed origin by grandparents' continent of birth	4,608	65%	71%	60%

*See Appendix for definitions of ethnic origins.
SOURCE: Based on the 1995 population census.

Table 5
Gap Between Rates of Eligibility for Matriculation Certificate, by Religion, Parents and Children

	Daughters	Mothers	Sons	Fathers
Jews	69%	51%	55%	51%
Christians	74%	21%	55%	26%
Druze	52%	21%	50%	3%
Moslems	43%	12%	30%	7%

SOURCE: Based on the 1995 population census.

It is rather surprising that there is no generally accepted definition for 'Mizrahi' (literally Eastern or Oriental) and 'Ashkenazi' (see footnote 1 above) There are innumerable ways of defining who fits into each of the two groups; in this study only definitions based on country of birth will be considered. Many alternatives still exist even if a geographically based definition is used.

The official CBS publications such as the annual Statistical Abstract use three groups for the division of the population by origin: European-American, African-Asian, and Israeli-born. The definition is usually based on the father's country of birth so that there is no group of mixed origin.[6]

These definitions become less relevant as time passes as youngsters marry across ethnic groupings, and the number of those born in Israel rises. There is no justification for grouping together into one ethnic group individuals born in Asia or Africa, those born Israel but with one parent born in Asia or Africa, those born in Israel to parents both of whom were born in Asia or Africa, and those born in Israel to Israeli-born parents but whose grandparents were born in Asia or Africa. Clearly these different individuals have different degrees of group identity and a different sense of belonging to the ethnic group.

The population census provides detailed information on the country of origin of three generations: children, parents and grandparents. This information enables a more reasonable division of the Jewish population into groups by origin. In this paper twelve groups are defined by origin to give expression to the possible distinctions between those of Oriental origin and those of Ashkenazi origin defined by the current generation, in contrast with those defined according to their parents' generation (one parent or both) and in contrast with those defined according to the grandparents' generation. This definition also gives expression to groups of mixed origin. The detailed definition of each group appears in Appendix 1.

The population census provides information at a particular point in time about individuals of the same age from different ethnic backgrounds: those born in Asia or Africa vis-à-vis those born in Europe or America (i.e., the generation of those born abroad); those with parents who were both born in Asia or Africa vis-à-vis those whose parents were born in Europe or America (first generation in Israel); those with parents one of whom was born in Asia or Africa and the other born in Israel vis-à-vis those with parents one of whom was born in Europe or America and the other born in Israel (one-and-a-half generations in Israel); and those whose grandparents were born in Asia or Africa vis-à-vis those with grandparents born in Europe or America (second generation in Israel).

[6] This division by continent is to a great extent the same as the definition in footnote 1 that relates to Moslem countries, but there are some exceptions. Jews from South Africa, for example, are not considered of Oriental origin, but are included with that group according to the CBS definitions. In this study, South African Jews are included in the group of European-American origin.

This breakdown provides a synthetic time dimension by enabling a comparison of youngsters of the same age at the same time with those whose families have been in Israel for different periods of time (number of generations). These groups can be analyzed according to a scale of ethnicity: those born abroad of Oriental (or Western/Ashkenazi) origin are Oriental (or Western/Ashkenazi) of the highest degree, and this degree decreases the longer the family has been in Israel. Comparing the rate of eligibility for the matriculation certificate of these groups does not answer the question of what has happened to the ethnic gap over the years. In other words, this is not the same as comparing the educational achievements of children vis-à-vis those of their parents and grandparents. The value of the findings lies in the uniformly reliable information they yield regarding the time the family has been in Israel.

Table 4 gives the rate of eligibility for a matriculation certificate by ethnic group. Several points are of interest. First, the eligibility rate among Orientals in all the generation groups was 51 percent, some 22 percentage points lower than the rate among Westerners/Ashkenazim of all generation groups. The gap between male students in the different ethnic groups (25 percentage points) is larger than that between the female students in these groups (17 percentage points).[7] The success rate among those from families of mixed origins were between those of the Oriental and the Western groups.

Second, the ethnic groups fall into line in strict order according to the rate of eligibility for a matriculation certificate. As expected, the rate of eligibility rises the longer the family has been in Israel within each ethnic group, with the rate among Western youngsters higher than that among those of Oriental origin. Heading the line-up is the group of second generation Israelis (those born in Israel to parents also born in Israel), who are referred to as Western only because of where their grandparents were born. The rate of eligibility for a matriculation certificate in this group was 80 percent. The rate at the other end of the scale, among youngsters born in Oriental countries, was 46 percent. Groups of mixed origin came somewhere in between.

In general, in each ethnic group eligibility rates rose with the time the family had been in Israel, which serves as a synthetic time dimension. Nevertheless, the eligibility rates increase at different speeds: among those of Western origin the rates improve faster than among those of Oriental origin, so that not only is the ethnic gap not contracting, it is actually widening, as will be shown below.

The rate of eligibility for a matriculation certificate among Oriental youngsters born abroad, 46 percent, is lower than the 49 percent rate among Oriental youngsters born in Israel to parents who were born in African or Asian countries, which itself is lower than the 56 percent eligibility rate of Oriental youngsters who are second generation Israelis, i.e., whose parents were born in Israel but whose grandparents were born in Asia or Africa. This shows that Oriental youngsters born abroad should not be grouped together with Oriental youngsters who are second generation Israelis. There is a 10-percentage-point gap between second-generation Israelis of Oriental origin and those of the same origin born abroad, in favor of the former.

[7] This finding helps to refute the racist claim that differences between ethnic groups reflect innate ethnic differences in abilities. If innate ethnic differences in abilities were the main cause of differences in the achievements of different ethnic groups, the ethnic gap in achievements should be the same for both genders.

Third, the ethnic gap between rates of eligibility for a matriculation certificate is higher between second-generation Israelis than between first-generation Israelis or those born abroad.[8] The ethnic gap in the rates of eligibility for a matriculation certificate among second-generation Israelis is 25 percentage points, compared with 21 percentage points among first-generation Israelis, and 19 percentage points among those born abroad (this gap is smaller still if Ethiopian immigrant youngsters are excluded). The widening of the ethnic gap in the eligibility rates by generation of immigration is even more pronounced among female students than among male students. Note that if Ethiopian females are excluded from the group of first-generation Israelis there is no ethnic gap: the success rates among Oriental and Western females are almost the same, 71 percent.[9] This finding gives rise to special concern, if indeed it shows what happens to the ethnic gap from the aspect of educational achievements over time.

Comparing youngsters in the same age cohort from different ethnic backgrounds gives a relative clear picture due to the uniformity of the method of data collection, and because the interviewees' memory regarding their matriculation certificates is still quite fresh. Such a comparison does not provide direct information relating to what happened to the gaps over time. That question requires a comparison of the rate of eligibility for a matriculation certificate in the current generation with those of the parents' generation, when the parents were at the relevant age.

The population census gives information on the eligibility for a matriculation certificate of all individuals in all age groups. Thus, within groups of the same origin and religion, parents' rates of eligibility can be compared with their children's. However, parents' information on their own eligibility for a matriculation certificate is determined by what they remember of their attainments at the relevant age (or their attainments until the current time). Most of the current generation consists of those who are the product of the education system in Israel, so that the question asked by the CBS interviewers is understood almost uniformly. This does not apply in the parents' case, and certainly not in the case of the grandparents, some of whom completed their secondary schooling outside of Israel. Moreover, the fact that the information relies on recall from the more distant past and that such recollection may be vague creates bias. This is different from the situation in which the parents are asked, at the appropriate age, about their matriculation achievements, and the information is stored. Such real-time information does not exist. These considerations led to the decision not to perform an inter-generation comparison (mothers vis-à-vis daughters and sons vis-à-vis fathers).

The differences between the educational attainments of groups of different ethnic origins may indicate why ethnicity is still a much debated issue in Israel. Furthermore, these gaps, which are not small—and with regard to certain groups are expanding too rapidly—may well help explain the conditions that led to the success of the Shas party. It is important to bear in mind that the educational institutions run by Shas are similar to those run by Ashkenazi Haredim,

[8] The ethnic gap in the eligibility rates of those born abroad (males and females) is slightly higher if youngsters who immigrated to Israel in or after 1990 are excluded (29 percent for males and 13 percent for females). The gap between males remains almost unchanged at 24 percent if those who immigrated in or after 1983 are excluded (in other words, the ethnic gap among those who were in the education system in Israel from the age of six). Among females, however, the gap almost disappears (i.e., 2 percent) if those who immigrated in or after 1983 are excluded.

[9] These findings complement those of Lavie (1999), who proved that the inter-generation gap widens with the move to higher levels of education.

and are therefore likely to lead to a further decline in the share of those with a matriculation certificate among youngsters of Oriental origin who enroll in these institutions. In other words, the success of Shas is likely to lead to a further widening of the ethnic gap in the rates of eligibility for a matriculation certificate.

Gaps in educational achievements between ethnic groups reflect a terrible waste of human potential, because, in the authors' view, the innate aptitudes of those of Western origin do not surpass the aptitudes of those of Oriental origin. The innate abilities of the Oriental students could lead them to the same educational attainments as those of the Ashkenazi students, but various obstacles prevent them from obtaining the appropriate education.

Differences in educational achievements are probably the result of gaps in economic and educational resources in the parents' and grandparents' generations. Economic resources enable parents to invest as necessary in their children to compensate for the child's and the school's weaknesses. Parents in the strong socioeconomic groups buy private education services when they identify such a weakness. Parents' own educational resources give an added boost to their child's chances of educational success. These are the mechanisms that preserve the gaps in educational achievement from generation to generation.

The following section examines the effect and importance of the economic and educational resources available to parent on educational attainment, measured in this paper by passing the matriculation exams and thus becoming eligible for a matriculation certificate.

2. The determinants of the chances of obtaining eligibility of a matriculation certificate: regression models

This study highlights wide gaps between the educational achievements of different groups in Israel. The significance of these gaps is that many youngsters are not realizing their potential, and this prevents them and their families from attaining a higher standard of living in the future, and prevents them from making a full economic and social contribution to the country. Realization of their aptitudes would help raise Israel's per capita GDP and its standard of living.

There are many possible reasons for the non-realization of the potential of certain groups. First, the education system may be discriminatory in the allocation of means to certain groups. However, under-realization of abilities does not necessarily indicate current discrimination in the education system; such discrimination may have existed in the parents' generation. Discrimination in the previous generation means that the current generation starts from a lower rung on the ladder, as the parents have low material and educational means.

The above does not provide the only possible explanation of the gaps. Israel absorbed Jews from many countries in different periods of time, and placed them together with Jews and Arabs born in the country. The principle of "first come, first served" naturally gave a clear advantage to the pioneers who built the country, most of whom originated from Europe, over those who immigrated from Asian or African countries. This advantage, combined with material means, was translated into wealth in the parents' and grandparents' generations, thus giving an advantageous starting point to the following generations.

Israel became a Western democracy under market-economy conditions even though in the early days of the state there were clear manifestations of socialist elements, such as extensive government involvement. Those who adapted more quickly to the competitive environment

gained a clear advantage over the others. In other words, the generation of parents who arrived from Europe and America may have adjusted more quickly to the acquisitive society and thus surged forward in their economic and educational achievements. This advantage, reflected in the parents' education and their economic background, led to gaps in their children's achievements as reflected in their rates of eligibility for a matriculation certificate.

This section examines the effect of parents' economic and educational situation on their children's rate of eligibility for a matriculation certificate. This will help towards an understanding of the importance of family background in determining youngsters' educational future. Statistical tools are used to try to explain the differences in educational attainments of different groups according to several variables.

The statistical model used in the analyses is a logit regression. The advantage of a regression over the factual description in the previous section is that it can isolate the quantitative effect of a particular variable, such as the parents' level of education, while the other factors, e.g., economic background, are unchanged. A regression also enables the calculation of whether the effect of any variable is statistically significant. Table 10 gives a series of regressions describing the statistical relation between the chances of becoming eligible for a matriculation certificate and a number of variables that could influence these chances. The regressions can be viewed as examining the relative importance of different groups of variables.

i. Parents' education

Parents' education is a resource that can serve as a complement to or substitute for inputs provided by the school. It contributes to children's pre-school progress and of course to their progress in school. The importance of parents' education is directly related to the strength of the school: the weaker the school in fulfilling its essential roles, i.e., imparting knowledge and developing the ability to think, the more vital is parental involvement.

The information on parents' education in the population census is based on the parents' answers to the relevant questions. This is not always a reliable source of information, as it is subject to errors, either deliberate or otherwise. Respondents are likely to report a higher level of education than they actually received to present a better image to the CBS interviewer or due to faulty recollection.

The variables used in this paper to represent parents' educational resources are based on the number of years of schooling received by both parents. This does not necessarily represent the quality of their education. Hence the education variable was chosen as a group of years of schooling that very roughly corresponds to important stages in education, such as completion of compulsory education, obtaining a matriculation certificate, and higher education. Tables 10 and 11 show in different ways the effect of parents' education on their children's chances of becoming eligible for a matriculation certificate. Whichever aspect is chosen, it can be seen clearly that parents' education has a positive effect on their children's chances. Quantitatively the higher the parents' level of education, the more it increased their children's chances. In other words, a child growing up in a home where both parents have thirteen or more years of schooling has far higher chances of becoming eligible for a matriculation certificate than a child whose parents have between zero and eight years of schooling.

It can also be seen that the effect of parents' educational level taken together with their economic background is also positive, but is smaller than the effect of their educational level alone. This reflects the known (partial) correlation between education and income.

ii. Parents' economic background

Parents' economic background would be expected to affect the child's achievements because their economic means may help fill the gap created by weakness on the part of the child or the school. Most children spend twelve years in the school system, in which time they might be exposed to various crises that could affect their performance in school. The economic means available to their parents can provide a safety net, in the form of private tuition when necessary. Parents with such means can help with private lessons in normal times too, thereby increasing their child's chances of passing the matriculation exams.

A variable or variables must be found that will fairly represent the parents' economic standing. The obvious candidate is of course family income; the family income in any particular month, however, does not necessarily indicate the parents' economic level throughout the child's school career. In practice, current income does not reflect the extent of the property owned by the family, nor does is indicate expected income in the future. Further, the data on current income are derived from a survey and are thus liable to error arising from partial credibility of the responses. This limitation becomes less significant if the error is not systematic across the income scale.

In this paper economic status is represented by several variables, not just one.[10] The variables chosen include the family's ownership of selected consumer durables such as a computer, a dishwasher, and the number of cars owned by the family, the number of children in the family, the number of rooms in the home, and the size of the town the family lives in. Current per capita monetary income is also included. These were chosen because it was thought that they give a more accurate picture of the family's material means.

Note that the variables were measured at the same point in time as the rate of eligibility for a matriculation certificate was measured. Clearly this method is somewhat flawed, since the educational attainments are affected by the economic variables throughout the child's school years, from kindergarten to twelfth grade. This drawback is especially relevant with regard to current labor income, which is likely to reflect random fluctuations. At the same time, the choice of a list of variables that include stock-type variables, such as ownership of consumer durables, reflects a cumulative effect.

Regressions 2 to 4 in Table 10 examine the effect of parents' economic status on their child's chances of becoming eligible for matriculation certificate. Regression 2 deals with the effect of economic status without regard to the parents' educational level, while Regression 3 takes the latter into account as well. The results of the regressions show that the parents' economic status, represented by several variables, has a positive effect on their child's chances of gaining a matriculation certificate. Economic status has a positive effect even when gender, religion, origin and parents' educational level are taken into consideration. In other words the chances of obtaining a matriculation certificate are positively affected by the family's economic background.

One noteworthy result is the relatively small (specific) effect of monetary income on the chances of becoming eligible for a matriculation certificate. This is important for policy purposes, as the Ministry of Education gives equal weighting to monetary income and parents' education in allocating its 'special care basket.'

[10] The authors chose not to employ a combined socioeconomic index, but rather to examine the relative importance of each of the variables via the regression method. The findings regarding the importance of computer ownership reinforce the justification of this choice.

The presence of a computer in the home makes a relatively large contribution to any student's chances of becoming eligible for a matriculation certificate, and almost doubles the chances for a Moslem student to do so. A computer in the house increases the chances of becoming eligible for several reasons. First, it gives in indication of the parents' economic soundness. Second, a computer points to the status of children's education in their parents' order of priorities. Third, a computer is an indication of parents' openness to innovation in adapting to a changing economic environment. Finally, a computer is likely to have a direct effect on a child's ability. Unfortunately, no information is available as to whether the computer was in the home for a large part of the child's schooling, or whether it arrived shortly before the interview took place.

The number of siblings in the house is one the important elements affecting the chances of becoming eligible for a matriculation certificate. It does so in two ways: the greater the number of children in the family, the more thinly spread are the economic means, reducing the resources available for each child, and thus reducing each one's chances of educational achievement. This can also apply to the time the parents can devote to a child who encounters difficulties. On the other hand, older siblings, if their educational attainments are reasonable, can step in and assist their parents by helping their younger brothers and sisters directly and thus raise their chances of passing the matriculation exams. The results show that the addition of each sibling reduces the chances of obtaining the matriculation certificate.

The location of the home was examined to see if it had an effect on children's chances of becoming eligible for a matriculation certificate, and if so to what extent. Living in a large town is likely to boost their chances if the town attracts a thriving socioeconomic population, as happens in Israel. Living within a more highly educated community raises a child's chances of educational achievement. Such a community is usually also more sound economically, so that the municipality can invest more in education. Living in a large town (i.e., with a population of more than 100,000 residents) raises the chances of a Jewish youngster becoming eligible for a matriculation certificate. This factor is almost irrelevant for Moslem students.

Single-parent families have become more common in the last few years. A higher share of such families are below the poverty line than of two-parent families. This factor thus gives another indication of the family's economic strength. There may be other natural differences between single- and two-parent families. The statistical analysis shows that a child from a single-parent family has a lower chance of becoming eligible for a matriculation certificate. This finding is based on the data in the population census, i.e., correct to November 1995. No information is available on the length of time the child was in a single-parent environment.

iii. Religion

This section examines whether there are significant differences between the rates of eligibility for a matriculation certificate among Jewish, Moslem, Christian and Druze youngsters, whose parents all have the same educational level and economic status. One of the most surprising results is that a Christian youngster has a higher chance of achieving eligibility than has his Jewish counterpart (Table 10). The Druze student also has a higher chance of becoming eligible than the Jewish student, but the difference is less pronounced. There is no significant difference between a Jewish student's chances of obtaining a matriculation certificate and those of a Moslem student from a similar educational and economic family background.

Table 6
Economic Status, by Ethnicity and Nationality in Sample

Variable	No. of rooms	No. of siblings	Ownership of Computer	Ownership of Dishwasher	Ownership of Air-cond.	No. of cars	Money income
Total sample	3.9	2.5	40%	40%	44%	1.0	2,029
Religion							
Jewish	4.0	2.0	47%	48%	52%	1.1	2,060
Moslem	3.2	4.6	11%	4%	8%	0.6	762
Christian	3.3	2.8	25%	18%	15%	0.9	1,290
Druze	3.6	4.2	21%	11%	8%	0.8	981
Ethnicity							
Oriental (all generations)	3.9	2.4	36%	37%	39%	0.9	1,478
Western (all generations)	4.2	1.6	58%	58%	65%	1.3	2.606
Mixed (all generations)	4.1	1.9	52%	59%	58%	1.2	2.019
Oriental by student's continent of birth	3.4	2.2	16%	9%	19%	0.4	1,170
Western by student's continent of birth	3.6	1.5	36%	20%	40%	0.8	1,771
Oriental by both parents' continent of birth	3.9	2.3	31%	34%	38%	0.8	1,430
Western by both parents' continent of birth	4.2	1.5	56%	61%	69%	1.2	2,842
Mixed by parents' continent of birth	4.1	1.8	47%	53%	57%	1.1	2,329
Oriental by one parent's continent of birth	4.0	2.5	44%	45%	44%	1.0	1,546
Western by one parent's continent of birth	4.5	1.7	71%	76%	77%	1.5	2,982
Mixed by one parent's continent of birth	4.1	2.0	54%	59%	58%	1.2	2,046
Oriental by grandparents' continent of birth	4.0	2.5	47%	51%	47%	1.1	1,635
Western by grandparents' continent of birth	4.6	1.8	75%	81%	80%	1.7	3,112
Mixed by grandparents' continent of birth	4.1	1.8	54%	60%	57%	1.2	1,901
Israeli by grandparents' continent of birth	3.9	2.9	42%	48%	50%	1.2	1,124

*See Appendix for definitions of ethnic origins.

SOURCE: Based on the 1995 population census.

Table 7
Parents' Educational Level, by Ethnicity and Religion

	Years of schooling		Eligibility for matric. cert.		Percent with degrees	
Variable	Father	Mother	Father	Mother	Father	Mother
Total sample	10.8	10.4	43.4%	41.6%	15.9%	12.9%
Religion						
Jewish	11.7	11.6	51.0%	49.9%	18.8%	15.8%
Moslem	6.9	4.8	11.8%	6.4%	3.8%	0.6%
Christian	9.0	9.1	21.1%	25.5%	6.6%	3.2%
Druze	8.6	5.1	20.8%	3.2%	5.3%	0.1%
Ethnicity						
Oriental (all generations)	10.0	9.8	38.0%	37.8%	5.3%	4.2%
Western (all generations)	13.9	13.7	67.2%	64.3%	38.7%	33.5%
Mixed (all generations)	12.1	12.2	55.1%	54.3%	16.4%	12.6%
Oriental by student's continent of birth	9.4	9.1	41.6%	40.4%	19.1%	18.9%
Western by student's continent of birth	14.0	13.7	68.8%	65.1%	46.0%	43.0%
Oriental by both parents' continent of birth	9.6	9.3	35.5%	32.5%	4.4%	2.9%
Western by both parents' continent of birth	13.1	13.0	59.5%	59.4%	30.1%	24.4%
Mixed by parents' continent of birth	12.0	11.8	51.9%	48.9%	17.3%	12.7%
Oriental by one parent's continent of birth	10.4	10.7	39.4%	42.9%	5.0%	3.8%
Western by one parent's continent of birth	14.0	13.9	67.9%	65.2%	38.5%	31.6%
Mixed by one parent's continent of birth	12.0	11.9	51.8%	48.1%	14.9%	10.0%
Oriental by grandparents' continent of birth	10.6	10.9	43.4%	47.9%	4.2%	3.8%
Western by grandparents' continent of birth	14.2	14.2	70.9%	66.7%	38.6%	32.0%
Mixed by grandparents' continent of birth	12.2	12.4	58.6%	59.5%	16.8%	13.8%
Israeli by grandparents' continent of birth	10.8	11.3	47.4%	49.0%	12.0%	11.0%

*See Appendix for definitions of ethnic origins.

SOURCE: Based on the 1995 population census.

Table 8
Holders of Certificate of Matriculation in Sample, by Nationality and Parents' Educational Level

Parents' level of edu. (years of schooling)	No. of observations	Total	Jews	Non-Jews
			Percent	
Total sample	58,885	56	60	39
0–8, 0–8	13,598	32	34	31
9–11, 0–8	5,471	43	44	41
12, 0–8	3,024	48	47	52
13+, 0–8	1,409	58	56	60
9–11, 9–11	6,170	50	50	49
9–11, 12	4,473	59	59	59
13+, 9–11	3,201	69	69	65
12, 12	5,475	62	62	61
13+, 12	4,883	76	76	79
13+, 13+	11,181	81	81	78

SOURCE: Based on the 1995 population census.

This surprising result deserves separate research. Clearly the achievements of the non-Jewish sector are made despite the allocation of resources that gives priority to the Jewish sector. In other words the explanation of the success of the non-Jewish sector must lie elsewhere. There are many who believe that it derives from the Christian Arabs' private education system (part of which is run by the Church). This suggestion however merely describes the situation and does not explain it. The authors are of the opinion that the most plausible explanation is that this finding reflects the effort to succeed made by a minority group making up for its quantitative deficiency by qualitative excellence, as is done by Jewish minorities abroad.

The importance of parents' economic status relative to the importance of their educational level as factors in determining their children's educational achievements differ between the Jewish and the non-Jewish sectors of the population. The educational background has a more significant effect on students' chances of becoming eligible for a matriculation certificate in the non-Jewish sector.

Table 6 shows the gaps between students' from different economic backgrounds within groups of the same origin or religion. Students from Oriental backgrounds and non-Jewish students are disadvantaged regarding their parents' economic status. Table 8 shows the gaps between their parents' educational levels. A similar result was obtained here too, with significant gaps between Jews and non-Jews with regard to parents' educational background.

iv. Origin

The chances of any individual obtaining a matriculation certificate are affected by three main elements: family background, personal aptitude, and the input of the school. One of the main points of interest is whether the education system narrows, widens, or leaves unchanged the gaps between the rates of eligibility for a matriculation certificate among students from different countries of origin. One way of answering this question is to examine whether are significant differences between the rates of eligibility of these ethnic groups, after taking into account differences in family background.

The Ministry of Education makes use of various tools to reduce the educational gaps. The main programs, measured by size of the budget allocated, are those of educational welfare, the special care basket, wage inducements for teachers in development areas, and the long school day (a relatively new program). Theoretically the budget is allocated (usually to the schools) on the basis of such variables as parents' educational level and their income. In practice it is difficult to estimate the extent to which these criteria affect the allocation. Other criteria are taken into consideration too, such as locality (i.e., whether the school is in a distressed area), all with the express purpose of reducing the gaps in education. The original aim of the educational welfare program was more specific: to reduce the educational gaps between ethnic groups.

Table 9
Holders of Certificate of Matriculation in Sample, by Ethnicity and Parents' Educational Level

Parents' level of educ. (years of schooling)	Oriental by continent of birth		Western by continent of birth		Mixed by both parents' continent of birth	Third generation Israeli
	Student	Both parents	Student	Both parents		
Total sample	46%	49%	65%	70%	61%	54%
0–8, 0–8	25%	34%	28%	42%	32%	31%
9–11, 0–8	37%	42%	26%	52%	44%	44%
12, 0–8	58%	45%	38%	51%	46%	42%
13+, 0–8	46%	54%	48%	56%	69%	32%
9–11, 9–11	36%	49%	46%	49%	53%	77%
9–11, 12	57%	57%	49%	63%	51%	50%
13+, 9–11	59%	70%	60%	69%	66%	33%
12, 12	54%	54%	56%	62%	61%	62%
13+, 12	77%	73%	64%	77%	76%	74%
13+, 13+	67%	72%	77%	84%	80%	71%

*See Appendix for definitions of ethnic origins.

SOURCE: Based on the 1995 population census.

Table 10
The Statistical Model: the Variables that Determine the Chances of Becoming Eligible for a Matriculation Certificate (Eligibility for a Matriculation Certificate is the Dependent Variable)[a]

	Effect of education	Effect of economic status	Effect of education and economic status	Effect of education and economic status (including income)
Regression	(1)	(2)	(3)	(4)
Sex	1.88	1.94	1.96	1.94
Religion				
Moslem	0.99*	1.03*	1.40*	1.17*
Christian	2.53	2.34	2.86	2.55
Druze	1.87	1.66	2.31	2.04*
Ethnicity				
Oriental by student's Continent of birth	0.89*	1.19*	1.03*	0.86*
Western by student's Continent of birth	1.02*	1.80	1.01*	0.90*
Oriental by both parents' Continent of birth	1.20*	0.87*	1.05*	0.97*
Western by both parents' Continent of birth	1.51	1.39*	1.07*	0.92*
Mixed by parents' Continent of birth	1.30*	1.05*	0.95*	0.77*
Oriental by one parents' Continent of birth	1.25*	0.90*	1.03*	0.99*
Western by one parents Continent of birth	1.82	1.57	1.13*	1.01*
Mixed by one parents' Continent of birth	1.46	1.11*	1.04*	0.91*
Oriental by grandparents' Continent of birth	1.29*	0.90*	1.01*	1.02*
Western by grandparents' Continent of birth	2.07	1.79	1.27*	1.13*
Mixed by grandparents' Continent of birth	1.61	1.26*	1.12*	1.03*
Israeli by grandparents' Continent of birth	Omitted	Omitted	Omitted	Omitted

Table 10 (continued)

	Effect of education	Effect of economic status	Effect of education and economic status	Effect of education and economic status (including income)
Parents' level of education (years of schooling)				
0–8, 0–8	Omitted		Omitted	Omitted
9–11, 0–8	1.42		1.33	1.29
12, 0–8	1.68		1.55	1.46
13+, 0–8	2.57		2.21	2.36
9–11, 9–11	2.00		1.74	1.63
9–11, 12	2.49		2.05	1.80
13+, 9–11	3.82		2.85	2.66
12, 12	2.99		2.39	2.14
13+, 12	5.06		3.73	3.37
13+, 13+	7.87		5.36	4.69
Economic status				
No. of rooms		1.19	1.12	1.10
No. of cars		1.86	1.20	1.17
Ownership of computer		1.29	1.58	1.54
Ownership of air-conditioner		1.18	1.15	1.16
No. of siblings		0.87	0.90	0.91
Ownership of dishwasher		1.25	1.16	1.14
Inhabitant of large town		1.30	1.25	1.33
Income per capita				1.00
Family status				
Single-parent family	0.73	0.88	0.86	0.96*
No. of observations	58,885	48,854	48,854	21,119

[a] The numbers in the table are the ratio of the chances of becoming eligible for a matriculation certificate to the chances of not becoming eligible for a matriculation certificate (the odds ratios).

*Not significant at the 99.9% level.

SOURCE: Based on the 1995 population census.

Statistically, the cumulative effectiveness of these programs should be expressed in two ways: the coefficients of parents' educational level and income should be smaller than they would be in the absence of the programs. Students whose parents have a lower educational level or income level entitle their school to more resources. The partial effect of these programs

of positive discrimination (also called affirmative action) that also allocate funds according to family background is in creating a negative correlation between parents' educational or income level and their children's chances of passing the matriculation exams. This only applies if the resources reach the students and are used properly to raise the level of their schooling and their chances of becoming eligible for a matriculation certificate.

Clearly the effect of positive discrimination is only partial, with the influence of the parents' educational level and income on the child's chances of matriculating both acting in the opposite direction. The data available for this study did not enable the authors to examine the effectiveness of positive discrimination programs as they could not compare the effects of educational and income levels on the chances of educational success before and after the operation of such programs. If they are effective, the true effects of parents' educational level and economic background are actually higher than those suggested by the findings in this paper.

Another result of positive discrimination should be expressed in a positive regression coefficient of the dummy variables representing Oriental origin,[11] because those programs, particularly in their early years, were intended to reduce the ethnic gap. Giving budgetary priority to education in distressed areas and development neighborhoods should have increased the chances of students in those localities succeeding in their education, provided that the funds reached their intended objectives and were used to raise the level of those students' achievements.

Table 10 shows that the chances of success for two students whose parents have the same level of education and income are not affected by the student's origin. Stated differently, the gaps seen between achievements of children from different origins disappear when the differences between their parents' educational levels and incomes are taken into account. The findings give no indication of positive discrimination, however. As stated above, over the years the Ministry of Education has invested additional resources via the educational welfare program and other programs aimed at reducing ethnic gaps within the Jewish population, but these were not translated into greater success or higher achievements of students from Oriental origins.

4. LOCATION OF MATRICULATION IN THE SOCIOECONOMIC WELFARE SPACE: THE FSSA MODEL

In the regression method used in the previous section, the effect of each variable on the rate of eligibility for a matriculation certificate was estimated separately, *ceteris paribus*. The "ceteris" include innumerable variables and circumstances represented in the regression by variables observed and selected in a given regression analysis. This representation has no theoretical basis, however, so that no overall picture of the fundamental variables is obtained. Neither is there any overall reference to the range of interactions between the different variables.

[11] A negative coefficient of origin or religion is generally interpreted as indicating discrimination against that population group. For example, The coefficient of the wage variable in the wage equation in Israel is negative and statistically significant (Dahan, 2001). In other words, the wage of an Arab worker is lower than that of a Jewish worker with the same level of human capital.

Table 11
The Statistical Model: the Variables that Determine the Chances of Becoming Eligible for a Matriculation Certificate (Eligibility for a Matriculation Certificate is the Dependent Variable)[a]

	Male students	Female students	Jews	Non-Jews
Regression	(5)	(6)	(7)	(8)
Sex			1.97	1.91
Religion				
Moslem	1.64*	1.18*		
Christian	3.03	2.71		2.06
Druze	3.34	1.43*		1.59
Ethnicity				
Oriental by student's continent of birth	0.98*	1.13*	1.01*	
Western by student's continent of birth	1.22*	0.80*	0.99*	
Oriental by both parents' continent of birth	1.17*	0.92*	1.05*	
Western by both parents' continent of birth	1.29*	0.85*	1.06*	
Mixed by parents' continent of birth	1.10*	0.80*	0.95*	
Oriental by one parent's continent of birth	1.14*	0.91*	1.03*	
Western by one parent's continent of birth	1.39*	0.88*	1.13*	
Mixed by one parent's continent of birth	1.10*	0.99*	1.04*	
Oriental by grandparents' continent of birth	1.13*	0.89*	1.02*	
Western by grandparents' continent of birth	1.47*	1.07*	1.28*	
Mixed by grandparents' continent of birth	1.31*	0.92*	1.11*	
Israeli by grandparents' continent of birth	Omitted	Omitted	Omitted	

Table 11 (continued)

	Male students	Female students	Jews	Non-Jews
Parents' level of education (years of schooling)				
0–8, 0–8	Omitted		Omitted	Omitted
9–11, 0–8	1.28	1.41	1.34	1.24
12, 0–8	1.67	1.44	1.44	1.82
13+, 0–8	2.24	2.24	2.00	2.41
9–11, 9–11	1.79	1.72	1.69	1.97
9–11, 12	2.13	2.01	1.99	2.50
13+, 9–11	3.06	2.66	2.79	3.03
12, 12	2.57	2.24	2.31	3.02
13+, 12	4.14	3.29	3.60	5.90
13+, 13+	5.56	5.17	5.26	4.90
Economic status				
No. of rooms	1.13	1.11	1.10	1.21
No. of cars	1.16	1.24	1.21	1.12
Ownership of computer	1.78	1.35	1.52	2.35
Ownership of air-conditioner	1.13	1.17	1.16	1.01*
No. of siblings	0.90	0.89	0.88	0.92
Ownership of dishwasher	1.11	1.22	1.18	1.03*
Inhabitant of large town	1.23	1.29	1.32	1.08*
Income per capita				
Family status				
Single-parent family	0.88	0.83	0.86	0.79
No. of observations	26,483	22,371	39,603	9,251

[a] The numbers in the table are the ratio of the chances of becoming eligible for a matriculation certificate to the chances of not becoming eligible for a matriculation certificate (the odds ratios).

*Not significant at the 99.9% level.

SOURCE: Based on the 1995 population census.

Table 12
Rate of Eligibility for Matriculation Certificate According to Ministry of Education and CBS Data*

	Those who take the exams (1)	All twelfth-grade students (2)	17-year-olds (3)
1965		48.2	16.2
1973		39.8	16.3
1980		39.3	21.3
1984		41.1	26.7
1985		40.7	27.7
1986		39.9	27.2
1987		42.9	29.7
1988		43.3	31.9
1989		40.7	27.7
1990		43.6	30.7
1991	64.0	45.2	32.0
1992		44.0	31.4
1993		45.1	32.5
1994	58.9	45.1	34.0
1995	65.9	49.7	37.9
1996	64.7	48.7	38.1
1997	62.9	47.3	37.4
1998	63.2	49.7	38.5

*The data for 1965, 1973 and 1980 do not include those eligible for a matriculation certificate in the technological track, but do include external students. The data for 1985 and thereafter do not include external students eligible for the matriculation certificate, of whom there were 2,155 in 1988.

SOURCE: Column (1)—Statistical Abstract of Israel 1999, No. 50, CBS; columns (2) and (3)—The Education System as Reflected by the Figures, 1993 and 2000, Ministry of Education.

In this paper the interactions between the various family-background variables were analyzed with the help of a complementary approach—that known as faceted smallest space analysis (FSSA). (This approach derived historically from the methods of factor analysis and the older MDS.) The FSSA approach relates to all the variables simultaneously, and to all the interactions as one whole. Thus the system of interactions between the variables, which is naturally a complex one, attains an overall simplified expression by geometrical mapping of the variables. Unlike the regression approach, this method focuses on drawing qualitative conclusions, and the current application will clarify what socioeconomic qualities are required to obtain a matriculation certificate. The advantage of this method is that (via cognitive mappings and the abstraction of meanings) it enables conclusions concerning the structure of the entire

"content universe" to be drawn from observed variables, which are regarded as but a sample from all possible relevant variables. FSSA models have been found helpful in analyzing complex systems in general, and behavioral systems in particular (Shye, 1985).

Thirty variables were selected as representing socioeconomic welfare, in addition to the matriculation-eligibility variable. The FSSA statistical analysis variables included also variables that were not included in the regression. The basic data required in this statistical analysis are the correlation coefficients between pairs of variables, so that the FSSA method gives a greater degree of maneuverability. The variables are mapped in a geometric space according to the principle of one point representing one variable. The higher the statistical correlation between a pair of variables, the smaller the distance between them, and this applies simultaneously to every pair of variables.[12] To help understand the subject of the inquiry—socioeconomic welfare—and the effects of the sub-issues therein, the map is divided into sub-regions such that each sub-region matches a specific sub-issue according to the variables it covers. To generalize, it can thus be stated that the division of the map into regions enables qualitative conclusions to be drawn regarding the whole of the welfare concept, the fundamental variables represented, and the location of the eligibility for the matriculation certificate on this welfare complex.[13]

The empirical findings and their interpretation

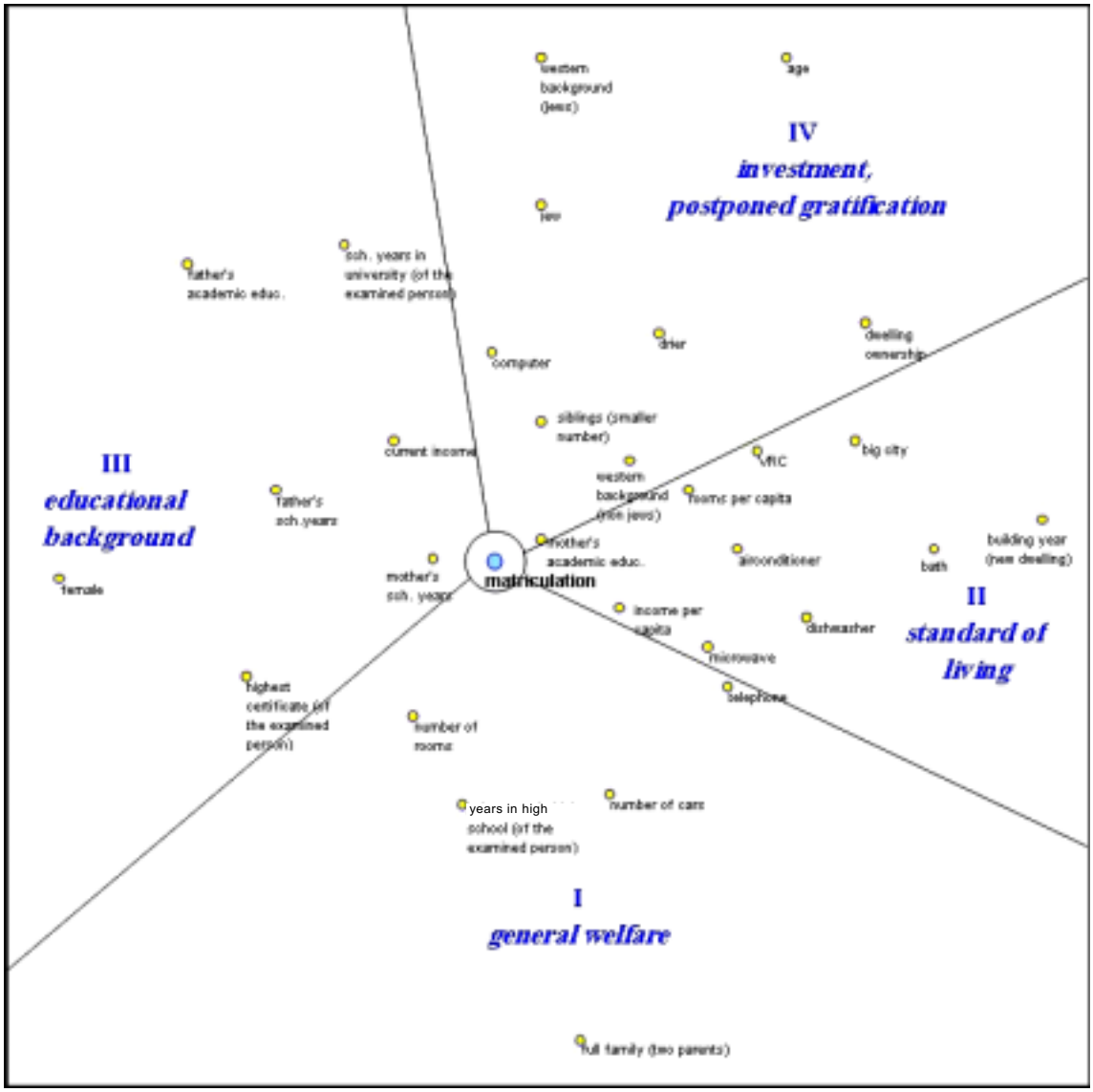
Figure 1 below shows the resulting FSSA map representing the space of "socioeconomic welfare," with the optimal location on it of each of the observed variables. However, similar to the geographical mapping, the locations of the variables are relative, and the axes of the space have no *a priori* significance. Viewing the welfare map as a continuum of meanings enables the essential social and economic qualities that facilitate eligibility for the matriculation certificate to be inferred. The first notable finding in the socioeconomic welfare map is the central location of 'eligibility for the matriculation certificate' on the map. This indicates that such eligibility is a central variable in socioeconomic welfare. This means that if only one variable had to be chosen as best and most broadly reflecting socioeconomic welfare, eligibility for a matriculation certificate would be the most appropriate candidate.

Placing eligibility for a matriculation certificate in the center of the map provides a convenient reference point for the division of the map into regions with socioeconomic significance. Four regions, in the shape of adjacent sectors of a circle, can be identified, with each sector representing a well-defined component of the whole complex of socioeconomic welfare, and indicating a specific quality that adds to the chances of becoming eligible for the matriculation certificate. The interpretation of regions based on the current sample of the variables enables qualitative identification of four elements that contribute to the chances of becoming eligible for the matriculation certificate:

[12] Here, for example, 30 variables are processed simultaneously, and hence there are 435 pairs, with 435 correlation coefficients and 435 distances on the map. The current process will try to ensure that the distances between the pairs of variables match the rankings of the 435 correlation coefficients calculated. The statistical procedure used is Faceted Smallest Space Analysis (FSSA; Shye, 1991).

[13] For a detailed description of the FSSA method see S. Shye, 1999, Facet Theory. In Encyclopedia of Statistical Sciences, Update Vol. 3. New York, Wiley; S. Shye and Elizur, D. 1994. Introduction to Facet Theory: Content and Design and Intrinsic Data Analysis in Behavioral Research. Thousand Oaks CA, Sage.

Figure 1
The FSSA (Faceted Smallest Space Analysis) Map of Socioeconomic Welfare



1. General welfare (Area I). Based on the variables that appear in this region, it has been interpreted as representing the general welfare of the family of the parents of the student examined, the family represented here by a range of socially significant variables, whether material or otherwise. The large distances between the variables in this area suggest a relatively wide and unstable common denominator. Nonetheless it may be assumed that unobserved variables reflecting social status and general standard of living would also fall into this area. One possible explanation is that one of the factors affecting the chances of matriculating is a general feeling of wellbeing, including the possibility of privacy (the number of rooms in the

home), mobility (car ownership), and possibly emotional wellbeing (a two-parent family). Specifically, emotional calm and the possibility of concentrating are primary and essential requirements for a student studying for the matriculation exams.

2. Standard of living (Area II). This area clearly represents a comfortable standard of living. Physical comfort, generally made possible by economic means, constitutes the second element that determines the chances of becoming eligible for a matriculation certificate. Specifically, family income is an important factor in determining the students' physical environment, and may also enable help in the form of supplementary private lessons if necessary.

3. Educational background (Area III): This area was taken as reflecting educational background (intellectual and academic advantages) of the student's family. It may be assumed that elements such as achievement and the level of parents' expectations, if they were observable, would also be located in this area. The youngsters' self-image and their expectations of themselves would also be located in this area to the extent that they are affected by their parents' educational level. Parents' educational level, that creates a primary and immediate norm for the students' self-image and thereby determines the degree of their educational motivation, thus constitutes a third aspect affecting their chances. Specifically, the mother's level of education (years of schooling) is largely responsible for determining students' motivation in this regard and their expectations of themselves.

4. Investment (Area IV). This area is seen as reflecting investment in the child and the cultural background that encourages such investment. The life of the child, i.e., his/her age, can be interpreted as a variable expressing a basic, gross input—the time-span in which any achievements can possibly be made. Ownership of a computer (unlike ownership of other equipment that fell into the region of standard of living) is also in the region representing investment in the child. The variable 'number of siblings' (with a small number marking its positive end) is interpreted as representing the opportunity of increased investment in the child. The fact that variables such as the degree of westernization and religion are located into this area suggests a cultural effect—in the sense of postponing satisfaction and investment in the child's future—reflected by these demographic variables. It may be assumed that every investment variable, especially direct investment in students designed to help them become eligible for the matriculation certificate, would be in this area. Thus a tendency to emphasize current investment for future goals constitutes a fourth element affecting students' chances. Specifically, the variable 'mother's higher education' in this sector points not only to a human environment that values and encourages education, but also to investment in pupils themselves, possibly through help in doing homework, showing interest in the pupil's progress etc.

A thought-provoking result of the socioeconomic-welfare map is the location of the degree of westernization and of religion (Jew or Arab) in the region representing cultural background. This may be interpreted as reflecting Western values of achievement and postponed gratification that are essential to extensive studies, especially those whose utility is diffused and lies in the future. Nevertheless, it is of interest to note that westernization among Jews (i.e., being of Ashkenazi origin) is relatively close to the region of educational background, whereas westernization among Arabs (i.e., Christian Arabs) is located close to the standard-of-living region. Whence it may be inferred that in general, whereas in the Arab sector a low standard

of living is an obstacle to a student's achievements (more so than his parents' educational level), in the Jewish population parents' educational level and the student's expectations of himself represent a more immediate obstacle (than the standard of living).

Results of the FSSA and their meaning

Using FSSA has enabled the identification of four fundamental variables likely to affect a student's chances of success in becoming eligible for a matriculation certificate, with each one making a unique contribution towards the attainment of this goal: general welfare, standard of living, educational background, and an inclination to invest. These fundamental variables are abstract, and incorporate many observable variables that were unobserved in practice. This may lead to operative conclusions. For example, in cases where a considerable investment in the student has not yielded the expected results, one should attempt to examine and improve the situation in other identified components. For example, does the student have problems regarding his general well-being? Does she experience social or mental distress? And in cases where parents' educational background is low, can one compensate for this condition through external help and boosting motivation? More generally, can an educational-welfare profile be constructed for each student or group of students defined by demographic or geographic parameters that would consist of their scores in the four fundamental variables? Based on this diagnosis, can a plan to improve students' educational achievements be devised according to essential deficiencies recorded in the four fundamental variables identified as determining the chances of achieving eligibility for a matriculation certificate?

5. SUMMARY

Based on data of the Israel Central Bureau of Statistics, the rate of Jewish students in Israel who are eligible for a matriculation certificate is 60 percent, 21 percentage points higher than the rate of non-Jewish students. Within the non-Jewish sector there are large differences in the rates of eligibility: 63 percent of Christian students become eligible, 29 percentage points more than the rate among Moslems.

The gaps between eligibility rates among Jews and non-Jews in the previous generation narrowed considerably in the current generation: in the parents' generation the rates were 51 percent among Jewish fathers, 26 percent among Christian fathers, and 7 percent among Moslem fathers. In the current generation the gap between Jews and Christians had disappeared completely, and the gap between them and Moslems had narrowed considerably. The gaps between female students in the different groups had also contracted compared with the gaps between their mothers.

Within the Jewish population differences in the rates of eligibility for a matriculation certificate largely overlap with ethnic origin. The following are the eligibility rates of the different groups: second generation of Western origin, 80 percent; of Western origin one-and-a-half generations in Israel, 77 percent; first generation, of Western origin, 70 percent; born of Western origin born abroad, 65 percent; second generation of mixed descent, 65 percent; mixed descent one-and-a-half generations in Israel, 62 percent; first generation, of mixed descent, 61 percent; second generation, of Oriental origin, 56 percent; Oriental one-and-a-

half generations in Israel, 53 percent; first generation of Oriental origin, 49 percent; and of Oriental origin born abroad, 46 percent.

The ethnic gap between educational success is wider between youngsters who are second generation Israelis than between first generation Israelis, and wider too than the ethnic gap between those born abroad. These results are even more pronounced among female students.

Parents' educational level is the most important factor in predicting students' rates of eligibility for a matriculation certificate: the higher the parents' level of education, the higher the students' chances of leaving school with a matriculation certificate. The rate of eligibility of youngsters both of whose parents have more than thirteen years of schooling was 81 percent, compared with 31 percent among those whose parents had between zero and eight years of schooling.

The gaps between Jews and non-Jews disappear if the differences in parents' educational levels are taken into consideration. There was practically no gap between the achievements of Jewish students and non-Jewish ones among those whose parents had the same educational level. Likewise, the gaps between those of Western origin and those of Oriental origin almost disappeared if the differences in parents' educational levels are taken into account. Equality of parents' educational level almost entirely removes the ethnic gap in achievement in all generations.

Multidimensional Scaling by Faceted SSA revealed four fundamental variables each making a unique contribution to success in attaining the matriculation certificate: general well-being, economic standard of living, parents' educational background, and investment in the child.

APPENDIX

Definitions of variables

1. Origin[14]

- Oriental by child's continent of birth: Oriental born in Asia or Africa.
- Western by child's continent of birth: Westerner born in Europe or America.
- Oriental by both parents' continent of birth: Both parents born in Asia or Africa, child born in Israel.
- Mixed descent by parents continent of birth: One parent oriental and the other Western, child born in Israel.
- Oriental by continent of birth of one parent: One parent born in Asia or Africa, the other born in Israel, and grandparents born in Asia or Africa or in Israel.
- Western by continent of birth of one parent: One parent born in Europe or America, the other born in Israel, and grandparents born in Europe or America or in Israel.
- Mixed descent by parents' continent of birth—one of the following:

1. One parent born in Asia or Africa and the other born in Israel, with at least one of the grandparents on the side of the Israeli–born parent of Western origin.
2. One parent born in Europe or America and the other born in Israel, with at least one of the grandparents on the side of the Israeli–born parent of Oriental origin.

- Oriental by grandparents' continent of birth: Both parents born in Israel, and all grandparents born in Asia or Africa or in Israel.
- Western by grandparents' continent of birth: Both parents born in Israel, and all grandparents born in Europe or America or in Israel.
- Mixed descent by grandparents' continent of birth: Both parents born in Israel, with at least one grandparent of western origin and at least one of Oriental origin.
- Israeli by grandparents' continent of birth: Parents and all grandparents born in Israel.

2. Education[15]

- Both parents (or the single parent in a one-parent family) with 0–8 years of schooling.
- One parent with 0–8 years of schooling and the other with 9–11 years.[16]
- One parent with 0–8 years of schooling and the other with 12 years.
- One parent with 0–8 years of schooling and the other with 13 or more years.
- Both parents (or the single parent in a one-parent family) with 9–11 years of schooling.

[14] The population census includes a report on the origin of the second parent in the case of one-parent families.

[15] The assumption is made that the educational level of the absent parent in a one-parent family is the same as that of the single parent.

[16] This group can be divided into two subgroups: one in which the mother had 0–8 years of schooling and the father 9–11 years, and the other group with the father's and mother's years of schooling reversed. The same applies to other groups, but using these more refined definitions did not contribute anything more to the findings than the above definitions.

- One parent with 9–11 years of schooling and the other with 12 years.
- One parent with 9–11 years of schooling and the other with 13 or more years.
- Both parents (or the single parent in a one-parent family) with 12 years of schooling.
- One parent with 12 years of schooling and the other with 13 or more years.
- Both parents (or the single parent in a one-parent family) with 13 or more years of schooling.

3. Size of city

A dummy variable with a value of 1 for a city with more than 100,000 inhabitants, and zero otherwise.

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