

Tracking and Attainment in Israeli Secondary Education

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Abstract

The debate in Israel over the role of educational tracking and particularly technological/vocational education is related to socioeconomic and ethnic gaps as well as to educational and employment achievement. Despite the public discourse, discussions rely on research from the past that is not necessarily relevant to today's system. This chapter intends to fill in some of those gaps and has as its base three empirical questions. (1) What are the factors that affect a pupil's assignment to the various educational tracks in secondary school? (2) To what extent do pupils change educational tracks? (3) Does the educational track affect a pupil's likelihood of finishing secondary school and qualifying for a bagrut (matriculation certificate)? The findings show that despite changes in technological/vocational education, socioeconomic factors still relate to tracking assignments, even when the effects of previous pupil achievement are controlled. Mobility between tracks is quite low and the educational track affects chances of completing secondary school and attaining bagrut qualification. Changes over time were also identified. First, bagrut qualification rates have increased substantially in all tracks. Second, the main transfers between tracks today are from technological to academic tracks, which are considered more prestigious. Third, while in the past most Arab Israeli secondary school pupils were in the academic track, today more than half of them are learning in the technological tracks – with many pupils in the engineering track where the bagrut qualification rates are the highest.

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Introduction

Every few months, there is renewed public debate surrounding vocational education in Israel. Many remember the now infamous debate between the Mizrahi¹ ministers in the Israeli government (Silvan Shalom and Amir Peretz) and the (Ashkenazi) Prime Minister (Benjamin Netanyahu). This is how *Ynet* reported the incident:

There was a stormy debate in the government session on the topic of vocational schools. An angry Minister Silvan Shalom said, "Wanna fight?" And Meir Cohen and Amir Peretz were at his side. The Prime Minister replied: "You are living in the past. Metal workers and welders earn a lot of money. Your stance is based on trauma." Shalom shouted back: "I have no trauma, I was in the academic track. You didn't grow up here, and you don't know how things work" (Azoulay, 2014).

This outburst within the government highlights the deep divide on the issue of vocational education in Israel. On the one hand, there are those who believe that vocational training in education is intended primarily for weaker pupils, the majority of whom are of Mizrahi origins, and that this track directs pupils away from bagrut² preparation (matriculation qualification) and destines them to low-pay low-status jobs. On the other hand, there are those who claim (like Netanyahu) that vocational training equips its graduates with skills that help them earn a reasonable income. This debate has refused to go away and comes up time and again because

¹ Mizrahi Jews are those who trace their roots back to Muslim majority countries. Ashkenazi Jews trace their roots back to Central and Eastern Europe.

² Bagrut or matriculation examinations assess knowledge on subjects studied in upper secondary school. They are frequently compared to the New York State Regents' Exams and ETS Advanced Placement (AP) tests. Bagrut scores represent an average of the test score and the grade received on that subject in school. Subjects are tested at study unit levels ranging from 1 to 5 units, calculated by the number of class hours devoted to the subject.

educational tracking, separating pupils to academic or vocational tracks, is a common structural characteristic of education systems in general and is particularly common in Israel.

Even though it is a hot topic socially, economically and politically, there is no current data on this subject in Israel. Most previous studies on tracking and other forms of segmentation in secondary education in Israel rely on data from the 1970s. Since then, there have been many reforms in the education system and among them many changes in the way pupils are tracked. As a result, there is definitely room for a reexamination of the subject.

This chapter explores the extent to which segmentation in secondary education affects subsequent educational attainment. It is based on the most recently available data from the Ministry of Education. The analysis in this chapter is guided by three research questions:

1. Which factors affect pupils' assignment to the different educational tracks in secondary education?
2. Is this initial assignment permanent? That is, to what extent are pupils able to transfer between tracks?
3. What are the consequences of educational track placement on drop-out rates and bagrut achievement?

1. Vocational Education: Background and Context

In the 1960s and 1970s, vocational training in Israel expanded substantially and was attended by nearly 60 percent of all secondary school pupils. It was intended for those pupils who were not considered suitable in terms of their prior achievements for academic studies. Academic high schools were fashioned after the Gymnasia of Central Europe – they were selective schools that integrated studies in the humanities and sciences at a relatively high level and prepared pupils for higher education and more prestigious professions. In fact, the schools, which were established based on this model in the early Yishuv period

(pre-State) were called by their European name – Gymnasia. Most children of immigrants who arrived from Middle Eastern countries in the 1950s and 1960s, as well as many Ashkenzi pupils, were considered unsuitable according to the decision makers in the education system to meet the high requirements of these secondary schools and were subsequently tracked to vocational schools where the academic requirements were relatively low.

Expanding the vocational tracks was justified also by its apparent consistency with the requirements of economic development in the early years of Israeli statehood. This was a time of rapid industrialization that created a demand for skilled and semi-skilled workers, which the vocational schools were said to supply. Thus, the vocational schools served several functions: they provided a skilled labor force for industry; presented educational opportunities for what was considered a weak population; and allowed the academic schools to retain their social selectivity and adhere to their values of “excellence.”

Since then, and primarily in the 1990s, the proportion of pupils attending vocational schools has declined, reaching between 30 and 40 percent in the last decade. In addition, since the 1990s, the name of these tracks has changed from “vocational” to “technological” in an attempt to add some prestige to them.

Currently, Israel's secondary education consists of the following four educational tracks: (A) academic track which is intended to prepare pupils for academic studies; (B) engineering, which is thought of as the “high” technological track, designed to prepare pupils for the bagrut and higher education in engineering, computer science or bio-technology; (C) the technological track, which is designed to prepare pupils for the bagrut qualification and further education in technological fields of study or as practical engineers or technicians, and (D) the vocational track, which is the “low” technological track, designed to provide vocational training alongside academic courses. All of these tracks prepare pupils for bagrut exams, though they have different emphases and, as will be shown further on, different success rates.

In addition to these tracks, the Ministry of Economy maintains several industrial schools that are intended for pupils requiring remedial or a second chance education. These schools, which are attended by about 5 percent of the pupil population, combine some academic education with practical and on-the-job training. Unfortunately, industrial school pupils are not included in Ministry of Education data and are, therefore, not included in this study.

Of all pupils in the technological tracks, about one-third attend the engineering track where bagrut certification rates are even higher than in the academic track. An additional third attend the technological track where bagrut rates have improved substantially in the past decades. Another third attend vocational tracks and industrial schools where the bagrut rates are low relative to the other tracks.

As mentioned, there is a basic disagreement about the role of technological education. On the one hand, there are researchers who see the tracking mechanism as maintaining inequalities in opportunities, education and employment. They claim that children in the lower classes have a higher chances of attending technological tracks which point them away from bagrut certification and therefore away from higher education (e.g., Shavit, 1984; Zussman and Tsur, 2010). These researchers attribute the negative results to a number of factors – primarily to a lack of sufficient academic preparation and to the negative stigma that is attached to the technological tracks. According to these claims, vocational graduates are perceived as having lower abilities than graduates of academic tracks.

On the other hand, there are those who claim that the vocational tracks provide, under certain circumstances, an economic safety-net for their graduates and that they are not simply a mechanism of social exclusion. First, there are a number of pupils, primarily boys, who have difficulty concentrating in academic classes and prefer more practical studies. Vocational education is there to lessen the drop-out rate for these pupils. In other cases, there are those who remain in school because of their interest in technology and in this way, they also get a bagrut qualification. According to this view, technological training lessens the drop-out rate

and even improves the chances of bagrut qualification among pupils who are not drawn to an academic education. Second, proponents argue that the skills learned in vocational tracks are in demand in the labor market and offer reasonable compensation. Thus, vocational training is perceived to be limiting the future chances of unemployment and poverty among pupils who are not considered to be academically strong.

Data and Variables

Data for this chapter come from four administrative files that were provided by the Ministry of Education and were merged, at the pupil level, using the identification number given to each pupil by the Central Bureau of Statistics. The resultant database includes information on a large nationally representative sample of pupils who were born in 1993 and 1994 and who would have completed their secondary education in 2011 to 2012. Pupils in Haredi (ultra-Orthodox Jewish) schools and those in special education were not included. The files include information on pupils' 5th grade scholastic achievement (the Meitzav exam), their socioeconomic background, track placement in grades ten through twelve and bagrut examination results. More details regarding these files and the overall data appear in the Appendix.

The files were combined in the following way. In the school year 1993-1994, about 92,000 5th graders were tested in the Meitzav exam (about half of all Israeli schools are tested each year). For each pupil in the two age cohorts examined, the Meitzav test scores from the 5th grade were combined with the pupil and school data from 10th to 12th grades. After this, bagrut exam results were added to this database.

The final database includes data on pupils who did not drop out of school prior to 10th grade (the grade where tracking begins), and for whom there was Meitzav information from 5th grade. The final file that was analyzed includes 81,500 pupils.

Background variables

There are three independent variables that relate to pupil background information:

Socio-demographic variables. This includes parental education (the higher of either parent's years of schooling); dichotomous variables for gender (girls=1, boys=0); migration status (immigrant=1; native-born=0); birth cohort (born in 1994=1, born in 1993=0).

Fifth grade Meitzav achievement in mathematics, science, English, and language skills (native language – Hebrew or Arabic). All test scores were standardized within subjects and then averaged for each pupil across all four subjects.

School attributes. The Ministry of Education uses a 10 point scale of socioeconomic status, where the highest ranking represents the lowest socioeconomic status. The scale is a weighted average of parental education and income of pupils in the school, whether the school is in the center or periphery of the country, and the ethnic composition of pupils in the school. For ease of use, the scale is reversed so that the highest ranking represents the schools with the highest socioeconomic ranking. In addition, dichotomous variables were used to represent Jewish education, Arab Israeli education and state-religious schools.³

Dependent variables

The following dependent variables were studied:

Academic track. This was measured in 10th and 12th grade and divided into the following categories: academic, engineering, technological, and vocational (VET) track.

³ Since the vast majority of pupils in Arab Israeli schools are Arab, there was no need to test both the effect of Arab Israeli ethnicity and that of attending an Arab Israeli school.

Mobility between tracks. A variable that represents remaining in the track or changing tracks between 10th and 12th grade.

Drop-out. A variable that represents if the pupil dropped out of school between 10th and 12th grade.

Bagrut qualification. A variable that represents pupil bagrut certification. Bagrut qualification is given after the pupil has been tested in seven mandatory subjects (English, mathematics, Torah or religious studies for non-Jewish pupils, literature, history, civics, and language skills), as well as at least one elective subject. One of these eight subjects has to be at an advanced level of study.⁴

2. Distribution of Pupils Among Academic Tracks

To put this analysis in a context, it should be noted that about 60 percent of 10th grade pupils in Israel are enrolled in the academic track. The technological and vocational tracks account for 40 percent of all Israeli pupils, as follows: about 10 percent are enrolled in the lowest vocational track, and the remaining 30 percent are distributed about equally between the engineering and technological tracks.

Figure 1 shows the socioeconomic profile of pupils in the four tracks. Several points are noteworthy: first, girls are generally overrepresented in the academic track (about 56 percent of all those in the track), but are

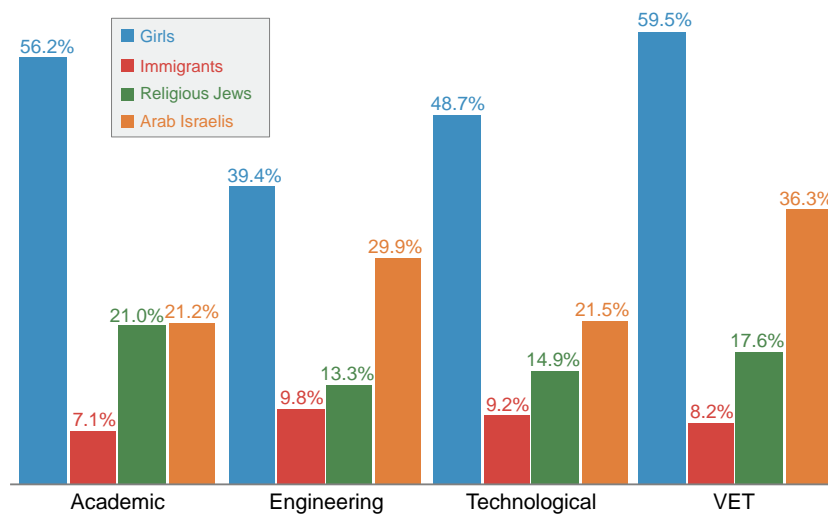
⁴ Under certain conditions, a pupil might be eligible for the certificate even if the pupils failed in one subject (except for language skills). Eligibility for the certificate, however, is defined by the accumulation of 20 units, where each subject can be studied at a number of levels. The seven mandatory subjects yield no fewer than 16 units and together with as little as one advanced elective subject, the pupil can reach the minimum 20 units. That said, advanced English (4-5 units) is a mandatory requirement for admission to a university in Israel (while most colleges do not require advanced English), thus a “university” matriculation certificate would include no fewer than 21 units.

relatively underrepresented in the engineering and technological tracks (about 39 percent and 49 percent respectively). This is not surprising given the greater preference of boys for mathematics and the sciences which are taught in these two tracks (Gabay-Egozi, Shavit and Yaish, 2015). In contrast, girls are overrepresented in VET; they are about 60 percent of the pupils in this track. This may seem surprising at first glance, because girls are better pupils on average than boys (see for example, DiPrete and Buchmann, 2013). However, it may be due to the prevalence of programs in VET for feminized occupations, such as preschool teacher's assistants and beauticians.

Figure 1

Distribution of pupils by educational track

10th grade pupils, by gender, country of origin and ethnicity,
average for 2011-2012



Source: Carmel Blank, Yossi Shavit and Meir Yaish, Taub Center
Data: Ministry of Education

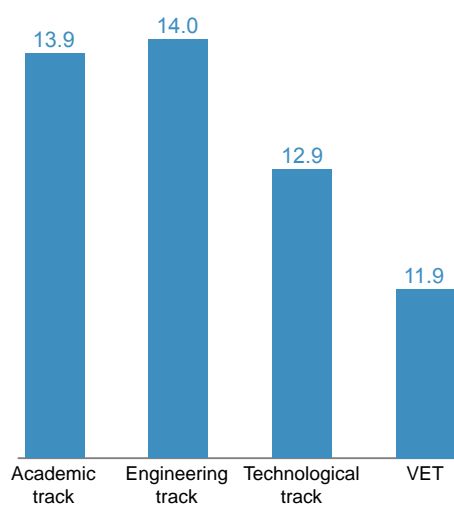
Second, immigrants – who make up 8 percent of the sample – are relatively underrepresented in the academic track and overrepresented in the vocational tracks, particularly in the engineering and technological tracks. This fits nicely with previous findings on the educational preferences of immigrants, particularly those from the former Soviet Union, who prefer a more practical education for their children (Chachashvili-Bolotin, Shavit and Ayalon, 2011).

A particularly interesting finding that has not been previously documented previously is that Arab Israelis, who make up 24 percent of the total sample, are overrepresented in the engineering and vocational tracks. Previous research in Israel has highlighted the paucity of vocational education and training programs within Arab schools that was attributed to the reluctance of the State to invest in these relatively expensive programs in the Arab sector. The cost per pupil in vocational tracks is about 50 percent higher than the average cost in the academic track (Shavit, 1989). Paradoxically, the near absence of vocational education for many years worked to the advantage of the Arab Israeli population, as many of them remained in the academic track and thus their rates of bagrut qualification increased substantially.

The new finding regarding the rate of Arab Israelis in non-academic tracks reflects an important change in the provision of vocational education since the 1990s that seems to have gone largely unnoticed. Until then, the choice of vocational education was largely preset among the Jewish population of low socioeconomic status. However, as public criticism of these programs mounted, parents preferred academic education for their children and many school principals dismantled technological/vocational education programs in schools. In contrast, in the Arab Israeli sector, demand for these programs increased because, as had been the case in the Jewish sector decades before, they are perceived as suitable programs for the many pupils, mostly males, who may drop out of secondary school prematurely. The Ministry of Education, which had become more equal in its resource allocations to Arab Israeli and Jewish education, accommodated this demand.

Figures 2 to 4 show that the academic and engineering tracks attract relatively strong pupils compared to the other tracks: more pupils in these tracks have educated parents (Figure 2), higher scores on the Meitzav exams (Figure 3) and attend schools of higher socioeconomic status (Figure 4).

Figure 2
**Parental education by pupil educational track,
average for 2011-2012**
10th grade pupils, average number of years of schooling
for parent with higher level of education



Source: Carmel Blank, Yossi Shavit and Meir Yaish, Taub Center
Data: Ministry of Education

Figure 3
Relative Meitzav scores of pupils by educational track
 10th grade pupils, pupils' 5th grade standardized Meitzav scores,*
 average for 2011-2012

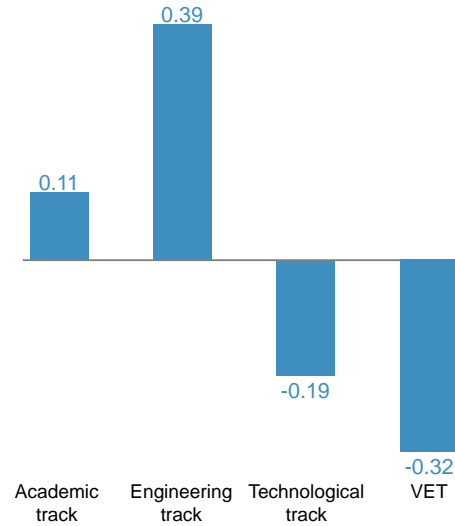
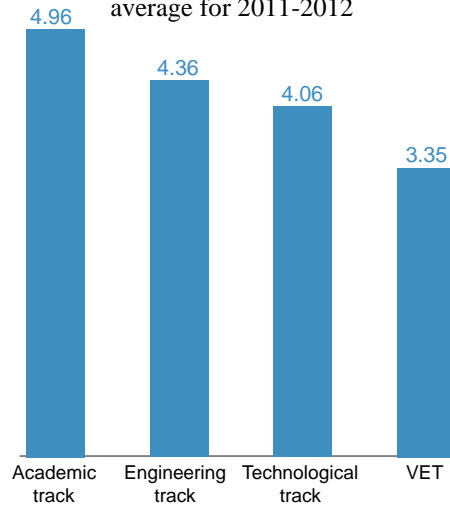


Figure 4
School socioeconomic status by educational track**
 average for 2011-2012



* Standardized to a scale score of 0-1. The value represents the ranking of the score relative to other pupils.

** The scale goes from 1 (the lowest socioeconomic ranking) to 10. This is the reverse of the Strauss Socioeconomic Index.

Source for both: Carmel Blank, Yossi Shavit and Meir Yaish, Taub Center

Data for both: Ministry of Education

3. Multivariate Analysis

The Effect of Socio-demographic Variables on Educational Track

The data presented in the previous section indicate differences among socioeconomic groups in the distribution of pupils in the various academic tracks. The question arises whether these differences are the result of socioeconomic differences or prior scholastic achievement. That is, is it that pupils from stronger socioeconomic backgrounds tend to show higher achievement already in primary school, and on the basis of their higher achievements are assigned to more prestigious educational tracks? Or, is there some selection mechanism that assigns pupils based on their socioeconomic status, regardless of their previous achievements? To check this, a multinomial regression was used that statistically controls for parental education (as a proxy for socioeconomic status), for previous achievements and for several additional variables (gender, migration status, school sector and school socioeconomic status).

In most cases, there was no difference in the results when these variables were controlled for and when they were not. The regression model (presented in Appendix Table 1) shows that the engineering track is the most selective track in terms of socioeconomic background, and that pupils in the technological and vocational tracks come from less privileged social backgrounds relative to those in the academic track.

The regression analysis raises another noteworthy point. In contrast to the data in Figure 1 which shows that Arab Israelis are overrepresented in the engineering and vocational tracks, when the other variables are controlled – and primarily controlling for the low socioeconomic status that characterizes most Arab Israelis – it seems that they prefer the engineering track over the academic track. Furthermore, they prefer the academic track over either the technological or vocational track. This would suggest that the overrepresentation of Arab Israelis in the vocational track is related to their relatively low socioeconomic status.

The Effect of Socio-demographic Variables on Mobility Between Educational Tracks

The multivariate analysis also serves to examine the mobility between education tracks in 10th to 12th grade. The data show that about 12 percent of pupils change tracks between 10th and 12th grade. The highest rates of mobility are seen in transfers out of the engineering track (about 17 percent), and the lowest mobility is in transfers out of the academic track (8.5 percent).

Table 1 presents the shifts between educational tracks for these pupils. The majority of the mobility is into the academic track from each of the other tracks, with about equal proportions (10-13 percent of all pupils in the other tracks). Mobility between the technological, vocational and engineering tracks is minimal, as is the move out of the academic track.

Table 1. **Mobility between education tracks**

share of pupils staying in the same track or changing tracks between 10th and 12th grade, as percent of all pupils in that track

Track in 10 th grade	Track in 12 th grade					
	Stayed in track	Moved to academic track	Moved to engineering track	Moved to technological track	Moved to vocational track	Dropped out
Academic	91.5%	--	1.3%	2.2%	2.1%	2.9%
Engineering	83.3%	12.5%	--	1.8%	1.0%	1.4%
Technological	80.6%	10.4%	0.9%	--	2.5%	5.5%
Vocational	80.2%	10.5%	0.5%	3.7%	--	5.2%

Source: Carmel Blank, Yossi Shavit and Meir Yaish, Taub Center

Data: Ministry of Education

The drop-out rate from the “lower” two tracks (technological and vocational) is two to three times higher than the drop-out rate in the academic or the engineering track (about 5 percent versus about 1.4 to 2.9 percent, respectively).

To test the effect of pupil socio-demographic characteristics on the move to the academic track (most mobility is into this track), logistic regression models were conducted (Appendix Table 2). The regression tested the effect of 5th grade educational achievement, gender, country of birth, migration status, age group (born in 1993 or 1994), school sector and school socioeconomic status on the likelihood of moving to the academic track from each of the other tracks.

Among those pupils in the engineering track in 10th grade, the model indicates that high achieving pupils are less likely to make such a move. Mobility was higher among girls and lower for pupils attending state-religious or Arab Israeli schools. There was also a decline in the likelihood of moving to the academic track for those in the 1994 cohort versus those born in 1993.

Among pupils transferring from the technological track to the academic track, there was a different picture. For those pupils with high achievement in the 5th grade, there was a higher tendency to move to the academic track than for those with low achievement. Girls had less of a tendency to transfer than boys, and immigrants had less of a tendency than Israel-born pupils. In addition, the likelihood of a transfer was low for pupils in Arab Israeli schools as well as for those in schools with high socioeconomic status. Among pupils who began in the vocational track, the likelihood of moving to the academic track was highest among the most capable pupils (as reflected in their 5th grade test scores), boys, and immigrants.

The only substantial track mobility was from the three technological/vocational tracks to the academic track. Capable pupils and boys are relatively less likely to move from the most selective engineering track to the academic track. However, the opposite pattern was noted for mobility to the academic track from the two lower tracks (technological and vocational tracks): capable pupils and boys are more

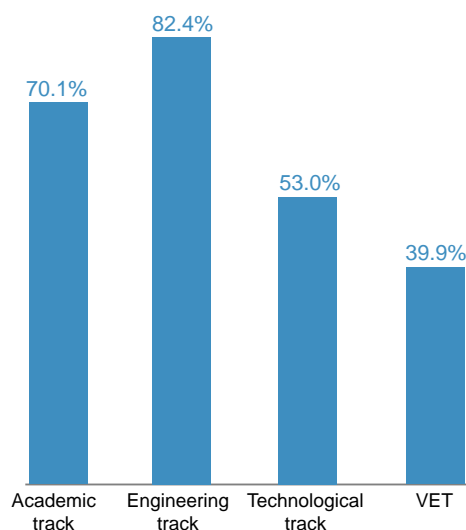
likely to make these shifts. Thus, it would seem that mobility accentuates, rather than attenuates, the initial scholastic and gender differences between tracks. Interestingly, pupil socioeconomic status (as reflected in parental education) does not directly affect track mobility when the other variables are controlled.

4. The Effect of Educational Track on Educational Attainment

In the next and final part of the analysis, the focus is on two aspects of educational attainment: dropping out and eligibility for bagrut certification.

With regard to bagrut certification, Figure 5 shows the disadvantage of pupils in the technological and vocational tracks relative to those in the academic track, as well as the advantage of pupils in the engineering track. To distinguish between the effects of the different variables on these rates, a logistic regression model was used (see Appendix Table 3). The results clearly show that the differences in the likelihood of bagrut certification in the different tracks is to a large extent the result of the control variables (like socioeconomic background), although the differences remain substantial after controlling for these factors. This means that the advantages with regard to bagrut qualification associated with the academic and the engineering tracks is not only the result of a selection process of more capable pupils or those with stronger social backgrounds for these tracks, since even after controlling for these variables, the rate of bagrut qualification remains high. Rather, the data suggest that both the academic and the engineering tracks better prepare their pupils for the matriculation exams.

Figure 5
Rate of bagrut qualification by educational track
out of all pupils in the educational track, average for 2011-2012



Source: Carmel Blank, Yossi Shavit and Meir Yaish, Taub Center
Data: Ministry of Education

The logistic regression models produce additional noteworthy findings. First, social origin has an important effect on the likelihood of bagrut qualification. Simply put, those from stronger socioeconomic backgrounds who are in schools with populations from stronger socioeconomic backgrounds, have a higher likelihood of attaining bagrut certification regardless of their track assignment.

Second, immigrants, pupils attending state-religious (Jewish) schools, and Arab Israelis are less likely to qualify for a bagrut certificate. Third, and not surprising, girls are more likely to qualify for a bagrut certificate than boys.

The results of logistic regressions models to predict the probability of dropping out between 10th and 12th grade largely confirm the findings presented in Table 1. Those pupils who were assigned to the technological and vocational tracks in 10th grade were almost twice as likely to drop out along the way compared to pupils in the academic track. The likelihood of pupils in the academic track dropping out of school was almost twice as high as those in the engineering track. These results are only slightly changed (reduced) when controls are added.

5. Summary and Conclusions

The distinction between academic and vocational or technological education relates to two main theoretical and policy concerns: equality of opportunity between social strata and the formation of human capital. On the one hand, sociologists agree that the differentiation between academic and technological tracks has a role in the creation of social inequalities in access to further education (for example, Shavit, 1984), in the chances of attaining prestigious employment (Shavit, 1990), and on earnings (Zussman and Tsur, 2010). Vocational tracks are typically attended by pupils from lower social strata, and this tends to lessen their chances of attaining a higher education. On the other hand, some sociologists and economists argue that vocational education provides pupils with skills that help them find employment, thereby reducing their chances of unemployment and poverty (for example, Arum and Shavit, 1995).

In Israel, there are at least three vocational tracks that differ in the socioeconomic profile of their pupils and in their expected educational achievements. A sizeable minority of pupils (about 15 percent), attend the engineering track which is selective, demanding, and, as this chapter shows, has pupils with the highest likelihood of bagrut qualification and the lowest likelihood of dropping out. The remaining two technological and vocational tracks are much less selective both relative to the engineering and academic track. As has been shown, pupils from social

strata that are considered weak are assigned to these tracks: girls, Arab Israelis and those from weak socioeconomic backgrounds.

In addition to the characteristics of pupils in each of the different educational tracks, pupil mobility between tracks was also examined. The results paint a picture that is not very encouraging. The number of pupils who change educational tracks is about 12 percent of those in the study, and this low rate testifies to a pre-determined nearly permanent tracking system (“sponsored mobility” according to Turner’s 1960 model).

This chapter also examined the effect of tracking on bagrut qualification and the likelihood of dropping out of school. Not surprisingly, engineering and academic track pupils have the highest likelihood of qualifying for a bagrut and the lowest likelihood – less than half that of technological or vocational track pupils – of dropping out. All of these findings remain the same when controlling for sociodemographic variables.

The study’s findings show that the relationship between a pupil’s social background, previous scholastic achievement, educational tracking, and bagrut qualification are similar to findings from the 1970s and 1980s. As in the past, socioeconomic status still affects pupil education track and the track still has a substantial effect on the likelihood of completing high school and receiving a bagrut certificate.

Alongside the similarities, comparing the current results to those of earlier studies suggests three important differences in the state of educational tracking in Israel between earlier decades and the present. First, as found, by Ayalon and Shavit (2004), matriculation rates in the technological/vocational tracks are now higher than they were in the 1970s and 1980s.

Second, mobility patterns between tracks has changed: while in the past the majority of moves were downward – from the higher to the lower tracks (Shavit-Streifler, 1983), today the majority of moves are into the academic track. This should be seen as an encouraging finding which can help in correcting inequalities that accompany assigning pupils to educational tracks in 10th grade.

Third, in earlier decades, secondary education in Arab schools was predominantly academic while nowadays it is split about equally between academic and technological/vocational tracks. Over the past decades, most educational systems in countries with advanced economies have been undergoing a process of dismantling educational tracking, and changing technological/vocational tracks to largely academic ones (the same process that is happening in Israel). In view of this, the shift of Arab Israeli education towards more vocational education is an interesting exception worthy of a more focused investigation, particularly in light of its implications for Arab Israeli society.

This study has an important shortcoming. As noted throughout, the Israeli discourse concerning technological/vocational education largely centers on equality of opportunity between Ashkenazim and Mizrahim. These two ethnic groups within the Jewish community are defined by ancestral countries of origin (Europe and the Arab world respectively). The data sets that were available contain information on ethnicity (Arab Israeli or Jewish) but not on ancestral country of origin. Datasets are available that contain information on both, but they do not include measures of scholastic achievement. In this study, the authors opted for the former at the cost of ignoring ethnicity among Jews. Finally, due to data limitations, a study of the effects of tracking on the future occupational and economic attainments of pupils could not be conducted.

Appendix

Details of the Files Used as Databases for the Study

Meitzav Files – The National Authority for Measurement and Evaluation (RAMA) has held nationally standardized tests (Meitzav in Hebrew) for 5th and 8th grade pupils since 2002. All elementary schools in Israel (excluding special education schools and Haredi schools) are grouped into four clusters, and each year pupils in two alternating clusters are tested in English, mathematics, science, and language skills (native language, Arabic or Hebrew). For this study, data was pooled for two cohorts of 5th graders (in 2004 and 2005). The participation rate in these tests was 90 to 92 percent among the relevant pupils.

Pupil Files - The Ministry of Education collects annual data on all pupils who attend schools that are supervised by the Ministry. The files contain information on pupils' background (such as country of birth of the pupil and parents, nationality, parents' years of schooling, etc.) as well as whether the pupil dropped out and, for high school pupils, educational track and field of study.

School Files –These files include information collected annually on all schools under Ministry supervision, such as school sector (Arab, Jewish non-religious or religious) and a socioeconomic score based on an aggregation of pupils' family characteristics.

Bagrut Files – This file records detailed outcomes of matriculation examinations for each pupil.

Appendix Table 1. **Effects of pupil and school characteristics on various educational tracks**

coefficients of multinomial regression for 10th grade pupils, 2011-2012

(standard deviation is in parentheses)

Independent variables	Educational track in 10 th grade**		
	Vocational	Technological	Engineering
Parents' education	-0.090* (0.005)	-0.035* (0.004)	0.030* (0.004)
Cohort	0.187* (0.026)	0.200* (0.021)	0.135* (0.021)
5 th grade Meitzav test score	-0.414* (0.017)	-0.365* (0.014)	0.806* (0.018)
Girls	0.136* (0.026)	-0.232* (0.021)	-0.785* (0.021)
Immigrants	0.168* (0.049)	0.096* (0.038)	0.3894* (0.038)
State-religious schools	-0.205* (0.037)	-0.614* (0.030)	-0.462* (0.032)
Arab Israeli schools	-0.456* (0.036)	-0.979* (0.032)	0.232* (0.031)
School socioeconomic status	-0.265* (0.008)	-0.205* (0.006)	-0.173* (0.006)
Intercept	0.261* (0.079)	0.639* (0.063)	-0.076 (0.062)

* Standard deviation is less than 0.05

** The academic track is the comparison category

Source: Carmel Blank, Yossi Shavit and Meir Yaish, Taub Center

Data: Ministry of Education

Appendix Table 2. **The effect of pupil and school characteristics on likelihood of changing from technological/vocational track to academic track between 10th and 12th grade**

coefficients of multinomial logistic regressions of mobility for 12th graders, 2011-2012
(standard deviation is in parentheses)

Independent variables	10 th grade track		
	Vocational	Technological	Engineering
Parents' education	0.019 (0.014)	0.004 (0.011)	-0.006 (0.010)
Cohort	0.011 (0.077)	-0.502* (0.059)	-0.129* (0.055)
5 th grade Meitzav test score	0.149* (0.050)	0.138* (0.041)	-0.294* (0.046)
Girls	-0.377* (0.076)	-0.226* (0.061)	0.320* (0.057)
Immigrants	0.263* (0.134)	-0.250* (0.106)	-0.177 (0.095)
State-religious schools	0.039 (0.113)	-0.118 (0.087)	-0.250* (0.086)
Arab Israeli schools	0.010 (0.109)	-1.280* (0.110)	-0.838* (0.081)
School socioeconomic status	0.038 (0.024)	-0.079* (0.016)	0.015 (0.015)
Intercept	-1.787* (0.235)	-0.946* (0.166)	-1.899* (0.164)

* Standard deviation is less than 0.05

Source: Carmel Blank, Yossi Shavit and Meir Yaish, Taub Center

Data: Ministry of Education

Appendix Table 3. **The effect of pupil and school characteristics on the likelihood of bagrut qualification and dropping-out of school**

coefficient of logistic regression, for 12th grade pupils, 2011-2012

(standard deviation is in parentheses)

Independent variables	Likelihood of bagrut qualification	Likelihood of dropping-out
Engineering track**	0.625* (0.028)	-0.738* (0.086)
Technological track**	-0.411* (0.024)	0.262* (0.054)
Vocational track**	-0.769* (0.028)	0.268* (0.063)
Cohort	-0.073* (0.018)	1.521* (0.056)
Parents' education	0.090* (0.003)	-0.094* (0.008)
5 th grade Meitzav test score	0.869* (0.003)	-0.441* (0.026)
Girls	0.529* (0.018)	-0.972* (0.046)
Immigrants	-0.263* (0.033)	0.452* (0.071)
State-religious schools	-0.399* (0.024)	0.543* (0.055)
Arab Israeli schools	-0.069* (0.026)	-0.401* (0.064)
School socioeconomic status	0.129* (0.005)	-0.152* (0.013)
Intercept	-1.628* (0.056)	-1.451* (0.136)

* Standard deviation is less than 0.05

** The academic track is the comparison category

Source: Carmel Blank, Yossi Shavit and Meir Yaish, Taub Center

Data: Ministry of Education

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