

Education and Employment Among Young Arab Israelis

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Abstract

Recent years have seen a significant improvement in the level of education of Arab Israelis at all schooling levels. This chapter focuses on the changes that have taken place at the high school level (the bagrut certificate) and in higher education (the psychometric exam and academic studies) and presents a status report on the education and employment of young Arab Israelis, distinguishing between the various population groups.

Arab Israeli women in all groups have greatly improved their level of education. They are qualifying for bagrut certificates at higher rates than previously, both in relation to Jewish women and in relation to Arab Israeli men, and many of them study in science tracks. The share of Arab Israeli women pursuing higher education has also significantly increased, especially among Druze and Bedouin women, who in the past were less likely to attend college. After controlling for socioeconomic characteristics, Arab Israeli women were found to be more successful than expected given their background. At the same time, a very large number of Arab Israeli women continue to study education and pursue employment in this field, even though the labor market is saturated and it is difficult for graduates to find full-time work. In order to balance the market, there is a need to direct female students toward other fields, to increase the supply of jobs, and to create support mechanisms for women who work in fields that are not considered classic “women’s work.”

In contrast, less improvement has been seen among Arab Israeli men. The share of young men qualifying for a bagrut certificate has risen, but less than among Jews, and thus the gap has grown to the advantage of Jewish men. At older ages, the situation becomes worse, and there has been almost

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no change in the share of students qualifying for a degree. These figures are especially low among the Bedouin population. Nevertheless, there has been a substantial rise in the share of men studying computer science and engineering, fields that open the door to high-paying professions.

The employment rates of Arab Israeli college graduates are high. Their income is similar to that of Jewish college graduates in the fields of health and education, but lower than their Jewish counterparts in business and high tech. In other words, it appears that in the latter fields, Arab Israeli college graduates have still not achieved optimal integration into the labor market.

Introduction

In late 2015, the government of Israel adopted Government Resolution 922. This five-year plan for the Arab Israeli sector was intended to strengthen its economic integration into the economy. Some NIS 15 billion was allocated for implementation. The money was to be used to advance the Israeli Arab population's relatively inferior position in a range of areas due, in part, to historically low government investment. A significant portion of the plan involves improving various aspects of Arab sector education: informal education, quality of teaching, access to higher education, and a focus on improving levels of school funding.

For many years, Israel's Arab population has had lower educational achievements than the Jewish population. Enrollment rates are lower at all levels of the education system, as are rates of qualification for a bagrut certificate and average scores on the psychometric exam.¹ As a result, the share of Arab Israeli boys and girls who go on to higher education is lower. Nevertheless, the past 20 years have seen a rapid improvement in all areas of Arab education, and thus the disparities between young Arabs and Jews have narrowed. For example, in 1995, the school enrollment rate of 17-year-old Arab Israelis was 54 percent compared to 82 percent among Jews; in 2015, the gap had nearly closed, with 88 percent among Arab Israeli pupils and 93 percent among Jews (Central Bureau of Statistics (CBS), 1997, 2017). The improvement was especially significant among Arab Israeli girls. Enrollment rates among girls aged 14 to 17 rose from 59 percent in 1990 to 94 percent

1 The Israeli bagrut exam and certificate is a matriculation exam which is often compared to the NY State Regents Examination. A bagrut certificate is awarded to pupils who pass the subject-matter examinations in each exam. The bagrut certificate should not be confused with a high school diploma which signifies the completion of 12 years of study.

in 2015 (Blass, 2017). In addition, the share of higher education graduates among young Arab Israeli women has doubled over the past twenty years. There has been no similar increase among the men, though, and their share of students in higher education has hardly changed (Fuchs, 2015).

Developments in the field of education have a great impact on employment statistics of Arab men and women. Arab Israeli women's employment rate has risen significantly in all age cohorts, from 21 percent in 1995 to 35 percent in 2016 among ages 25-54 (CBS, 1995, 2015). However, it is still very low. Arab Israeli women college graduates are employed at significantly higher rates than non-graduates, 74 percent relative to 25 percent among women ages 25-54 in 2015. This means that education is especially significant for the employment of this population. Arab Israeli men are employed at relatively high rates even without higher education, but their share among workers in professions at risk of computerization (most of which have a large number of workers without a college education) is especially high (Madhala-Brik, 2015).

This chapter looks at education and employment among young Arab Israeli men and women, beginning with high school and continuing through academic studies and first steps in the labor market. It tracks the changes that have occurred in these areas in recent years, and the problems that still exist today. The chapter is built chronologically in terms of an individual's life course: the first section deals with secondary education; the second section discusses results on the psychometric exams² and differences between sectors and genders in academic study majors, as well as employment and wage data for each group. The final section summarizes the main findings and discusses possible measures for improvement in the near future.

Definitions and Data

Arab Israelis are not a homogeneous population. In order to better understand the unique characteristics of each Arab sub-group, the chapter distinguishes among Muslims, Christians, Druze, and Bedouin and compares their performance to that of non-Haredi (not ultra-Orthodox) Jews.³ Excluded

2 The psychometric exams are standardized tests in Israel, generally taken as a higher education entrance exam and similar to the SATs in the US. The psychometric exams cover three sections: quantitative, verbal reasoning and the English language.

3 Muslims: individuals whose religion is Muslim and who studied in an educational institution that is not Bedouin. Christians: individuals whose religion is Arab Christian. Bedouin: individuals whose religion is Muslim and who studied in a Bedouin educational institution. The Bedouin population in the north was combined with the population in the south in light of similar results, unless noted otherwise. All comparisons are to Jews who studied in state or state-religious Hebrew educational institutions.

from the study are Jerusalem Arabs, because a large number are not Israeli citizens and their curriculum is Palestinian, as well as Circassians, because of the small number of observations.⁴

Most Arab Israelis are Muslims. According to estimates from the Central Bureau of Statistics, in 2015, 85 percent of Arabs in Israel were Muslim (18 percent of the Israeli total population),⁵ 7 percent were Christians (1.6 percent), and 8 percent were Druze (1.6 percent) (CBS, 2017). This study relies on a database created by the CBS, which includes data on secondary education, psychometric exam scores, academic education, and the labor market for those studying in the Israeli education system⁶ from 1996 to 2010.⁷ The database is administrative and includes all pupils in the Israeli education system, except for labor and salary figures, which exist for a 25 percent sample of the population. Due to the large amount of data, it was possible to do an analysis of various sub-groups of Arab Israelis that make up only a small percentage of the total Israeli population.

The database includes men and women between the ages of 18 and 36 in 2014. The breakdown of the Arab Israeli population was 63 percent non-Bedouin Muslims (henceforth “Muslims”); 9 percent Christians; 11 percent Druze; and 17 percent Bedouin, of whom 75 percent live in the Negev and 25 percent in the Galilee. This division is a bit different from the breakdown of the total population described previously, because of both the younger age grouping and the exclusion of Jerusalem Arabs from the sample.

1. Secondary education among Arab Israelis

As noted, the education level of Arab Israelis has improved greatly in the past twenty years. Blass (2017) describes the changes in Arab students’ educational achievements since the start of the 21st century, showing that there had been an improvement in several indices, from pre-primary to secondary education. According to Blass, the reasons for the improvement include improved quality of instruction (because of the teaching staff’s

4 In 2016, the Circassians were 0.005 percent of the population (CBS, Locality dataset 2016).

5 The Muslim population also includes Bedouin, who are not distinguished as a separate group in population estimates. In the Negev, the main area where the Bedouin live, 13 percent of the population is Muslim.

6 The database includes only pupils who studied in the Israeli educational system and does not include young people who immigrated to Israel after high school. In addition, it does not include data on college graduates who studied at institutions of higher education abroad.

7 A detailed description of the database and its sources can be found in Regev (2016).

higher level of education) and a reduction in class size, especially in primary and middle schools. This chapter focuses on changes that have taken place in indices related to the bagrut certificate, which are indicative of later participation in higher education

Bagrut certificate qualification rates increased greatly from 1999 to 2013, as did the rate of those qualifying for a bagrut certificate that meets the minimum requirements for acceptance to higher education.^{8, 9} This increase took place among women and men in all groups, but at different rates (Figure 1). Among Arab Israeli women, there was a convergence with the achievements of Jewish women, but among men, the rates are still very low. For example, in 2013, the qualification rates for Bedouin and Muslim women were nearly double the rates for Bedouin and Muslim men.

The bagrut certificate qualification rate among women was higher than the rate among men in all groups as early as 1999, and by 2013, had risen a greater degree than the rate among men, increasing the gender disparity. Especially noteworthy is an increase of 28 percentage points in bagrut certificate qualification among Druze women, which brought them to a rate very close to that of non-Haredi Jewish women. Among Christians, the qualification rate increased, but the increase was small in relation to the rate among Jewish women, and therefore, the advantage Christian women had in 1999 disappeared in 2013. Among Muslim women, there was an increase of 20 percentage points, and among Bedouin women, 12 percentage points. Among all groups of women, most of the improvement was in the rate of qualification for a bagrut certificate that meets minimum requirements for higher education.

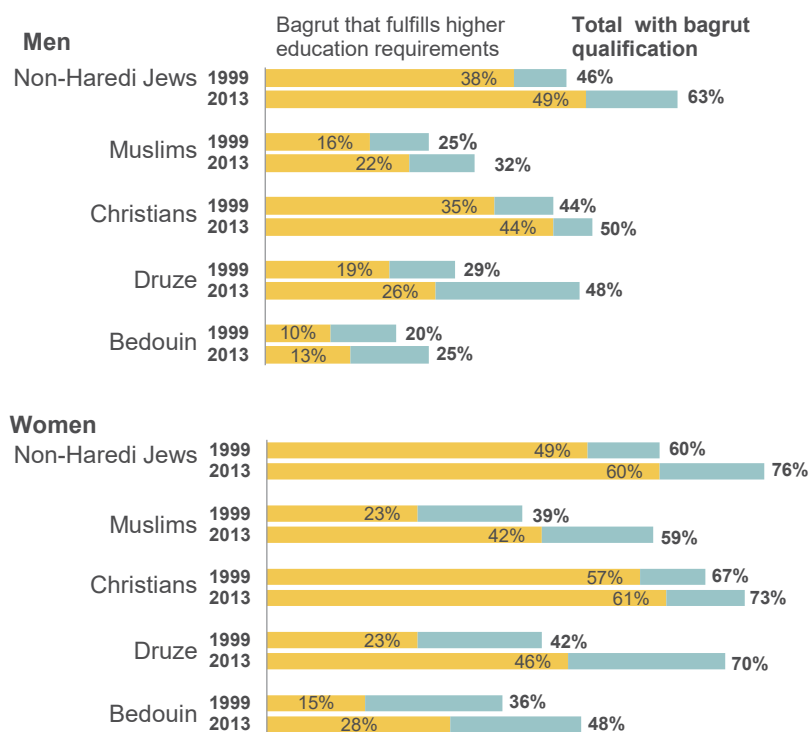
The improvement in Arab Israeli men's qualification rates was low not only in relation to Arab Israeli women but also in relation to Jewish men, even though the Arab men's starting point was lower. Among Jewish there was an improvement of 17 percentage points over the years, a greater improvement than for all groups of Arab Israelis, except for the Druze. The rate of qualification among the Bedouin was especially low at 25 percent and has risen by only 5 percentage points since 1999. The Bedouin also remain behind in the rate of qualification for a bagrut certificate meeting academic entrance requirements, which stands at only about half of the rate of overall

8 Cohorts were based on the pupils' graduation year. Thus, for example, 2013 includes pupils who were in twelfth grade in 2013, along with pupils who left school in eleventh grade in 2012, pupils who dropped out in tenth grade in 2011, and those who were in school until the ninth grade and dropped out in 2010.

9 The minimum academic requirements for higher education include a passing grade on a level of three study units in mathematics, four study units in English, and one intensive subject (in addition to English).

qualification for a bagrut certificate. Among the Druze as well, most of the increase was concentrated in qualification for a bagrut certificate that does not meet minimum requirements for higher education.

Figure 1. Share of those with a bagrut qualification, 2013
Out of the cohort



Source: Hadas Fuchs, Taub Center | Data: CBS, Administrative datasets

Upon examination, the Druze and Bedouin stand out in particular. Among Druze men and women, as noted, there has been an especially large improvement in rates of bagrut certificate qualification — a result, inter alia, of the Ministry of Education's investment in the group. For example, the Druze sector is the only one in which all of the pupils are included in the long-school-day program (Blass, 2017).

Bedouin pupils have worse results than the rest of the Arab population, although the Bedouin living in the north are slightly more successful than those living in the south. The rate of enrollment in twelfth grade among Bedouin in the north is similar to that of Muslims (72 percent for men and 92 percent for women), while among the Negev Bedouin it is much lower: 60 percent for men and 77 percent for women (among the men, the rate even decreased between 2000 and 2010). Both groups have low achievement on bagrut exams, but here, too, there is a geographic disparity. In 1999, Bedouin men in all of Israel had a similar rate of bagrut qualification (about 20 percent), but, in 2013, a gap developed, resulting in a rate of 23 percent for Bedouin in the south compared to 29 percent for Bedouin in the north.

An opposite trend has taken place among women. In 1999, Bedouin women in the north had better achievements, with 41 percent qualifying for a bagrut certificate, as opposed to 34 percent in the Negev. However, the improvement in the south was greater in subsequent years, and the qualification rate in 2013 was almost equal (48 percent in the north and 47 percent in the Negev). Among Bedouin women in the south, the qualification rate for an academic bagrut certificate more than doubled, from 13 to 28 percent. It is also worth noting that among Bedouin women in the north, there is an especially large difference (44 percentage points) between enrollment rates in twelfth grade and rates of qualification for a bagrut certificate.

Bagrut certificate figures when controlling for socioeconomic background

The lower achievements of the Arab Israeli population in qualifying for a bagrut certificate are not surprising since the pupils come from low socioeconomic backgrounds – a factor with a great impact on the likelihood of bagrut qualification. Within each socioeconomic group, the parents of Arab Israeli pupils are less educated than the parents of non-Haredi Jewish pupils. Across all groups, Christian parents tend to be the most educated, and Bedouin parents the least (Appendix Table 1). The parents' education in all groups improved greatly between 1999 and 2013, but the ranking remained the same. It is interesting to note that among Arab Israeli parents, the mothers are less educated than the fathers, especially among the Druze and the Bedouin, although, this statistic is changing for the younger generation.

Parents' income among Arab Israeli pupils is lower than that for Jewish pupils, and here, too, it is Christian families that have the highest income and the Bedouin families that have the lowest (see average income quintiles in Appendix Table 1).

In order to control for the effect of the pupils' backgrounds, the achievements on the bagrut exam for the groups were compared after controlling for socioeconomic background.¹⁰ It was found that most of the disparity in bagrut qualification can be explained by the Arab Israeli pupils' weaker socioeconomic backgrounds, among both men and women. Table 1 presents the disparity in bagrut qualification in the 1999/2000 and 2012/13 school years with and without controlling for socioeconomic background. (A negative number means that the gap is to the advantage of the Jewish population, while a positive number means that the disparity is to the advantage of the Arab sub-population indicated.)

Table 1. The disparity in bagrut qualification rates between Arab and Jewish pupils

By population group, before and after controlling for socioeconomic background variables

	1999-2000		2012-2013	
	Overall gap	Gap after controlling for background variables	Overall gap	Gap after controlling for background variables
Men				
Muslims	-22%	3%	-29%	-4%
Christians	-2%	12%	-11%	-2%
Druze	-19%	4%	-16%	3%
Bedouin	-27%	-1%	-37%	-3%
Women				
Muslims	-22%	1%	-17%	4%
Christians	7%	15%	-1%	9%
Druze	-19%	4%	-6%	14%
Bedouin	-28%	-3%	-27%	5%

Notes: The blue numbers are for results that were not significant at the 0.5% level.

Source: Hadas Fuchs, Taub Center | Data: CBS, Administrative datasets

During the first period examined, 1999/2000, bagrut qualification rates for almost all groups were higher than or equal to the rate among Jews when controlling for the effects of socioeconomic background. Among Christians,

¹⁰ After controlling for dummy variables for parents' education, education quintiles and number of siblings. The full regression results are shown in Appendix Table 2.

the disparity was especially high: 12 percent among men and 15 percent among women, or in other words, their achievements were considerably higher than those of Jews, given their backgrounds.

In 2012/13, qualification figures for Arab Israeli men deteriorated and were lower than those of Jews in all groups. In contrast, the disparity in favor of Arab Israeli women improved in all of the groups (other than the Christians), and especially among the Druze. These results match the raw data, which indicate that there was a larger improvement in women's education in the Arab Israeli sector. Similar results were obtained when examining the gap between Jews and Arab Israelis in qualifying for a bagrut certificate that meets minimum requirements for higher education. This means that the gap existing today between Jews and Arab Israelis in qualification for a bagrut can mostly be explained by the Arabs' weaker socioeconomic background.¹¹

Differences among the population groups in bagrut qualification are not equally evident when looking at bagrut exam scores.¹² In a simple comparison, the average bagrut score of Arabs and Jews is similar, other than a lower average score among the Bedouin. After controlling for socioeconomic background variables, Muslim and Christian men and Muslim, Christian, and Druze women receive higher scores than Jews, and the gap between the Druze and Bedouin and the Jews is not significant. In other words, among those who succeed in earning a bagrut certificate, achievements among Arab Israelis are higher than those among Jews when socioeconomic differences are taken into account.

Study majors

The share of Arab Israeli pupils who take a science/engineering bagrut exam is very high.¹³ In all groups of Arab Israelis, the percentage of those who took the science bagrut exam out of those who qualified for a bagrut certificate is higher than in the Jewish population. The difference among girls is particularly striking: 39 percent of Jewish girls who qualified for a

11 It is possible that work during high school can also explain the differences in bagrut scores, but the official statistics (without unreported work) do not show that Arab youth work at higher rates than Jews at this age.

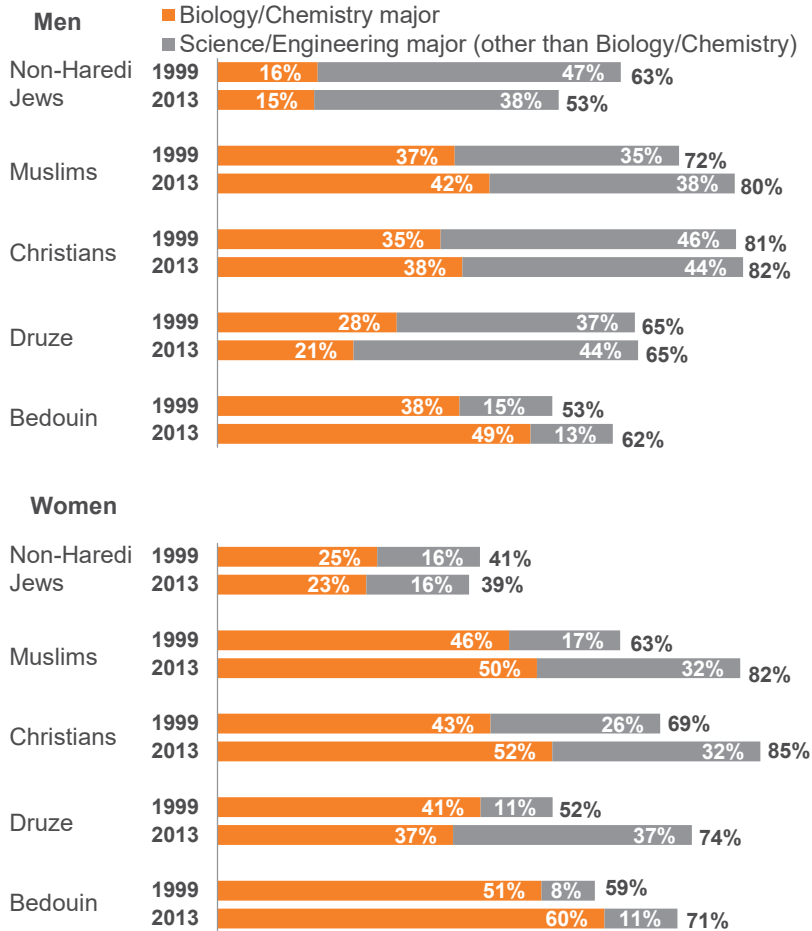
12 In calculating the bagrut average, 10 points were added to the score for subjects studied at a level of four units, 20 points for subjects at a level of five units, and 12.5 and 25 points for testing at four and five units in math and English, respectively.

13 Study majors that were combined in the science/engineering major are: electronics, biology, control systems, agriculture, chemical technology, chemistry, technological science, computer science, electronic systems, mechanics, and physics — all at the five unit level (the highest level of bagrut study).

bagrut certificate in 2013 studied in a science major track, while among Arab girls, the figure ranged from 71 percent among the Bedouin to 84 percent among Christians (Figure 2).

Figure 2. Share of those studying in the science/engineering track

Out of those with bagrut qualification



Notes: Pupils in the biology/chemistry track as well as another science/engineering track were categorized with science/engineering major.

Source: Hadas Fuchs, Taub Center | Data: CBS, Administrative datasets

In the general population, there is a male majority in the science/engineering tracks, other than biology and chemistry (Fuchs, 2016), but the Arab sector has a high percentage of girls in most of these tracks (Appendix Figure 1). Ayalon (2002) shows that in the Arab sector, the gender division in the choice of study tracks is a result of the limited number of study options, among other things. Nevertheless, this does not appear to be the only reason, since between 2000 and 2014, there was a large increase in the share of girls studying in science tracks other than biology and chemistry, or in other words, an increased number of girls in study tracks not considered “girls’ subjects.” This rate is still low among Bedouin girls, but among Druze girls, more than half with a science bagrut certificate study in science tracks other than biology or chemistry. Differences also exist in the share of girls in the technology tracks. For example, while the share of girls among pupils in the control systems major was only 16 percent among Jews between 2007 and 2013, in the Arab sector the figure was 52 percent.

2. Achievements on psychometric exams

After finishing high school, most Jews (other than Haredim) do military or national service. Among Arab Israelis, only Druze men do military service in large numbers.¹⁴ In other words, most Arab Israeli young people are able to start academic studies immediately after completing high school, but a relatively high proportion of Arab Israelis, especially men ages 18 to 22, do not work or study (Eckstein and Dahan, 2011; Fuchs, 2015). The reason is not clear but it seems that the psychometric exam, which is a basic necessity for continuing on to higher education, contributes to the delay in entering both academic studies and the labor market.

The portion of Arab Israelis who take the psychometric exam is high relative to the percent of those who continue on to higher education. Over the years, admissions requirements in some academic institutions have been lowered, and the share of students accepted without a psychometric exam score has risen. However, the vast majority of the increase has taken place among Jewish students while the share of Arab Israelis taking the psychometric exams has remained largely unchanged. Many Arabic speakers take the psychometric exam more than once: 56 percent of those taking the exam in Arabic in 2012 were repeating the exam, as opposed to 32

14 A total of 83 percent of Druze men are drafted, and most serve in the field corps or in combat support units (Ministry of Defense, Defense Social Branch). The number of Arab Israelis who volunteer to do national service has greatly increased in recent years, from 240 in 2005 to 3,784 in 2014, but this is still only about 10 percent of the age cohort. A total of 91 percent of all Arab volunteers are women (Hatib and Biton, 2011; Almasi, 2014).

percent of those taking the exam in Hebrew (National Institute for Testing and Evaluation, 2013).

Figure 3 presents the percent of young people continuing on to higher education according to psychometric exam status (did or did not take the exam). In general, Arab Israelis take the exam at lower rates than Jews, but many of those who take it do not continue on to higher education.¹⁵ Thus, while 86 to 89 percent of Jews with a psychometric exam score undertook academic studies, among Arab Israelis the percentages are lower. The share of Arab Israeli men in academic studies is between 48 and 60 percent, or in other words, about half of Arabs who have taken the psychometric exams do not continue on to academic studies in Israel.

Figure 3. Percent of young adults entering higher education and their psychometric exam status, 2014

Out of the overall group, ages 25-35



Source: Hadas Fuchs, Taub Center | Data: CBS, Administrative datasets

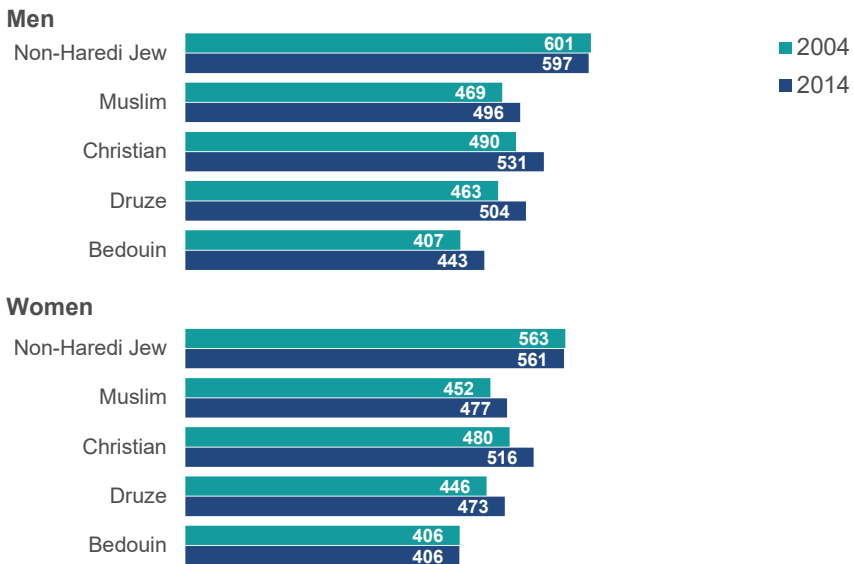
¹⁵ Within the Arab Israeli population, only among Christians are the share of those taking the psychometric exams in the 25-35-year-old age group higher than among Jews: 48 percent of men and 66 percent of women versus 41 percent and 53 percent, respectively, among Jews. In the other sub-population groups, the shares are considerably lower: 28 percent of men and 38 percent of Druze women, 27 percent of Muslim men and 40 percent of Muslim women, and 16 percent of men and 31 percent of Bedouin women.

The percentage of Arab Israeli women who take the psychometric exam and continue on to higher education is higher than men but still substantially lower than that of Jewish women. There is also a notable difference between Jews and Arab Israelis in the percentage of students who have not taken the psychometric exam. Among Jews, 21 percent of the men and 30 percent of the women without a psychometric exam score continued on to academic studies, compared with a much lower rate among Arab Israelis.

In contrast to the observed similarities in bagrut exam scores, the average psychometric exam scores of Arabs in all groups was much lower than the average score of Jews, even though a smaller percentage of Arab Israelis in that age group took the exam. The various groups' rankings for psychometric scores is similar to the ranking for the bagrut: Christians have the highest achievements and Bedouin the lowest (Figure 4).¹⁶

Figure 4. Psychometric exam scores, by gender and population group

For pupils taking the exam, ages 17-28



Source: Hadas Fuchs, Taub Center | Data: CBS, Administrative datasets

¹⁶ The achievements of Bedouin in the north are higher than those of Bedouin in the south. In the north, the average psychometric exam score was 466 among men and 428 among women, versus 427 and 394 respectively among Bedouin in the south.

The average score of Arabs rose between 2004 and 2014, while the average score of Jews hardly changed, yet there is still a large gap to the advantage of Jews. The Arabs' low average score reduces their options for higher education, and seems to indicate a lower level of proficiency in some or all of the exam sections. Some claim that the psychometric exam discriminates against Arabs and is a barrier to their entry into higher education. For example, it has been argued that the exam has a cultural bias, which reduces the chances of success for test-takers of different backgrounds (Dirasat, 2010). However, a study by the National Institute for Testing and Evaluation found that the psychometric exam is biased in favor of Arab test-takers, except in English, and that the quantitative section is the most biased in their favor (Kennet-Cohen, Turvall and Oren, 2011). It should be noted that for those who took the test more than once, the scores taken into account in calculating the average are the highest from all dates on which the test was taken.

As noted, on average, Arab Israelis take the test more times than Jews, which could indicate that a larger number of Arab test-takers do not reach the required threshold for admission to academic departments. It is also interesting to note that even though Arab Israeli women are more successful on the bagrut than Arab men, and even though they take the test for science tracks in larger numbers, Arab men have a higher average score on the psychometric exam, and the disparity is more significant in the quantitative portion than in English (in a manner similar to the patterns among Jews). This is consistent with the argument that there is a selection bias: men who take the exam are in the upper part of the distribution of abilities, while the distribution of skills is broader among the women.

An examination of the various sections of the exam shows that Arabs score highest on the quantitative portion and lowest in English as a second language (Appendix Figure 2). The lower score in English is understandable since it is a third language for the Arab Israeli population (after Arabic and Hebrew) while for the Jewish population it is the second. A possible explanation for their low score in the verbal section of the exam could be due to difficulty in reading literary Arabic.¹⁷

The Arab Israeli population's low scores on the psychometric exam, along with the high share of young people who take the test but do not continue on to higher education, could indicate that the low scores prevent young Arabs from pursuing higher education, even though their average bagrut scores are relatively high. Some attend college abroad after failing to meet

17 Thus, for example, Eviatar, Ibrahim, Karelitz, and Ben Simon (2016) showed that reading time in Arabic is longer than reading time in Hebrew.

the admissions requirements of Israeli educational institutions.¹⁸ A possible solution for addressing low psychometric exam scores could be pre-academic preparatory courses, but as shown by Regev (2016), Arabs take such courses in particularly low numbers.

3. Achievements in academic study

This section discusses issues related to higher education and institutions of higher learning. As noted previously, relevant data exist only for Israeli institutions, even though there are many Arab students who study abroad. According to estimates, in 2013, 9,260 Arab Israeli students were studying abroad and 27,130 were studying in Israel. In other words, about one-quarter of Arab Israeli students study abroad (Arar and Haj-Yehia, 2016). Most of the students who study abroad are men. For example, in the 2006/07 academic year, only 31 percent of those studying in Jordan were women (Arar and Haj-Yehia, 2011). Therefore, it is possible that some of the stagnation in the rate of Arab men pursuing an academic degree in Israel is due to an increase in the share studying abroad.

Enrollment in higher education

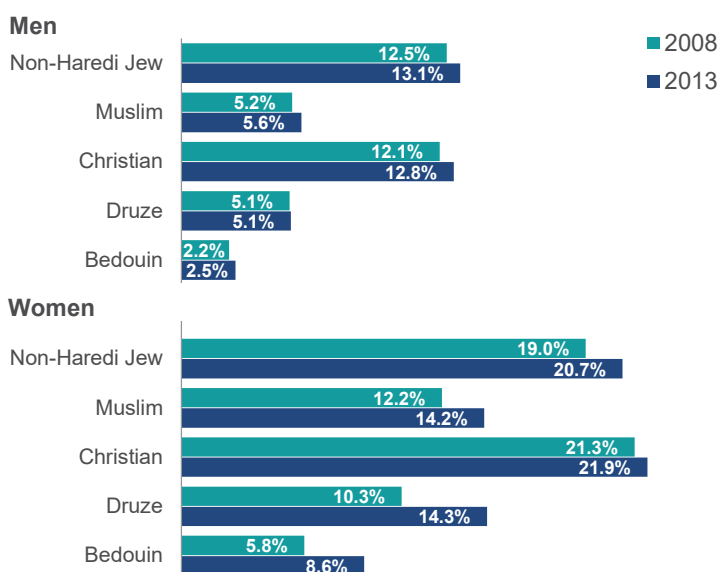
With the increase in the share of bagrut certificate holders, the rate of Arabs pursuing higher education has also risen. The increase, however, has taken place primarily among Arab women, while there has been almost no change among Arab men. Figure 5 shows the change in the percent of higher education students among all those ages 18 to 27 between 2008 and 2013. Among the Arab Israeli population groups, Christian women sought higher education at the highest rates, and this remained fairly stable in the years examined (about 21 percent).¹⁹ Among Druze and Bedouin women, there was an almost 50 percent increase in the percent of those pursuing higher education, a substantial increase given the relatively short period of time, although the rate among Bedouin women is still low. The change among Bedouin women was primarily among residents of the south, from 4.5 percent in 2008 to 8.1 percent in 2013. Among Bedouin women in the north, the share of students was greater but rose only slightly, from 9.1 percent to 10 percent. Among Muslim women the increase was the smallest, only 2 percentage points.

18 Arar and Haj-Yehia (2011) shows this for Arab Israeli students studying in Jordan.

19 The percentages in the Jewish population are a bit lower because Jews tend to start academic studies at a later age and therefore continue their studies at older ages as well.

It is surprising to see that there has been almost no change among the men, even though the share of male students in the first year examined was very low compared to the women.²⁰ It is true that men begin to study at a later age even among Arabs, but other than Druze, who serve in the Israeli military, it is not likely that many Arab men study after the age of 27. The percentage of Bedouin students is especially low, with only 2.5 percent between the ages of 18 and 27 studying in institutions of higher education in 2013 (the rate is similar for the Bedouin in the north and south).

Figure 5. Share of academic students out of 18-27-year-olds



Source: Hadas Fuchs, Taub Center | Data: CBS, Administrative datasets

Arab students, and especially Christians, attend university at higher rates than Jews (Figure 6). This statistic includes students on main university campuses and in university supervised colleges, most of which are located in outlying areas of the country and have a high share of Arab Israelis (36.6 percent, according to the Council for Higher Education, 2016), although only 5 percent of all Arab students attend such colleges (Appendix Figure 3). The

²⁰ The number of Arab students has greatly increased, but because the Arab Israeli population has grown, their share of the population has hardly changed.

share of Arab Israeli men studying in academic colleges is lower than that of Jewish men, while the share of Arab Israeli women in these institutions is considerably lower at about half that of Jewish women. However, this share is increasing. In addition, among all Arabs, there has been a significant increase in the share of those studying at the Open University. A relatively high portion of Arab women students choose to study at academic colleges of education, as is seen in their study majors presented further on.

Despite rising enrollment rates among women, the drop-out rate among Arab Israeli students is higher than among non-Haredi Jewish students: 38 percent of Arab men and 24 percent of Arab women, in contrast to 25 and 18 percent among non-Haredi Jewish men and women, respectively (Regev, 2016). Therefore, the share of Arab degree holders is lower than the share of young people pursuing higher education.

Figure 7 presents the share of academic degree holders in Israel ages 30 to 33.²¹ About half of Jewish women have an academic degree, and nearly the same percentage of Christian women. The rate among other Arab women is lower although, given the substantial growth in the share of Arab women pursuing higher education, along with the stability in the rate among Jewish women, the gap is expected to narrow.

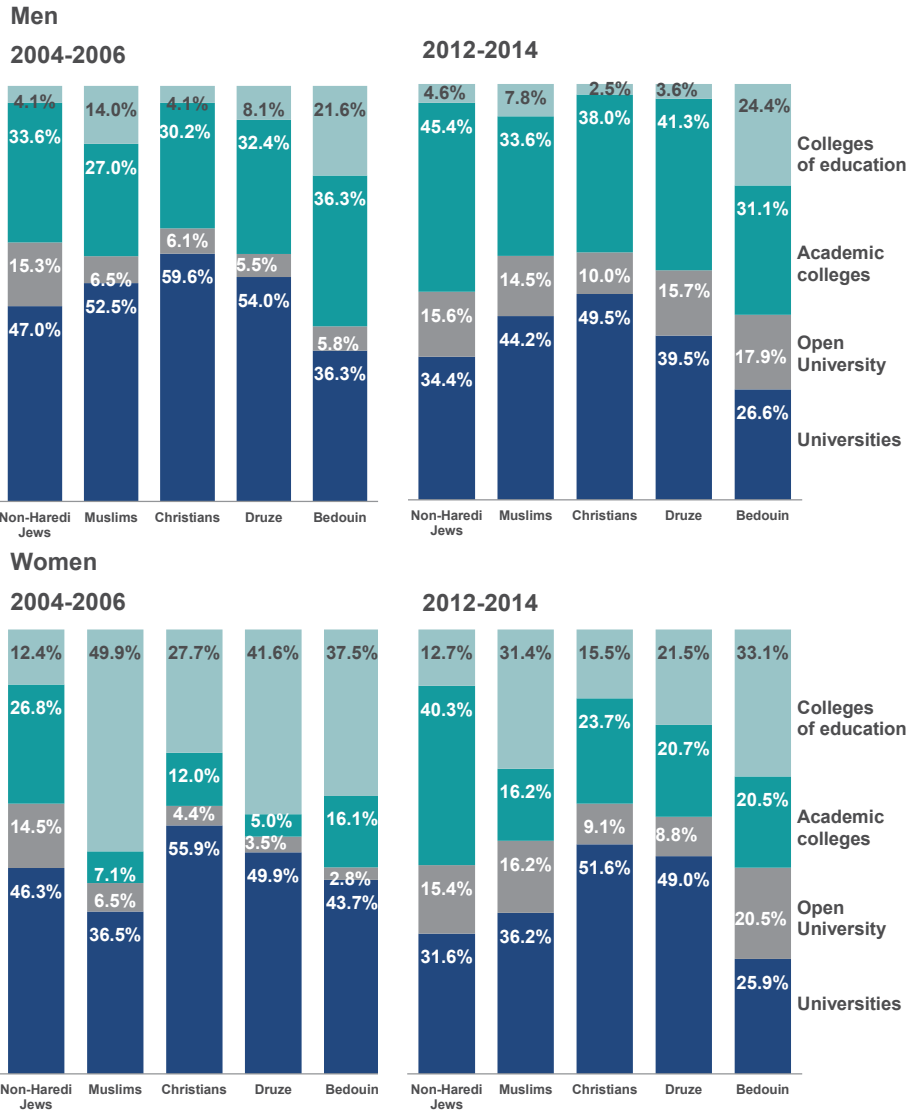
The share of men with college degrees is much lower, and in the entire Arab Israeli population, is less than half that of women. Among Muslims and Druze, the rate is less than 10 percent, and among Bedouin men, only 6.5 percent.²² As shown in the previous section, the percentage of male students has increased little, and thus, the gender gap in the share of Arab college graduates is expected to increase.²³

21 Figure 5 shows the share of students, not degree holders, and refers to other years, hence the difference in the data.

22 The percentage of college graduates for Bedouin in the north and south is similar: 17 percent among women and 6.1 among men in the north, and 16 percent among women and 6.6 percent among men in the south.

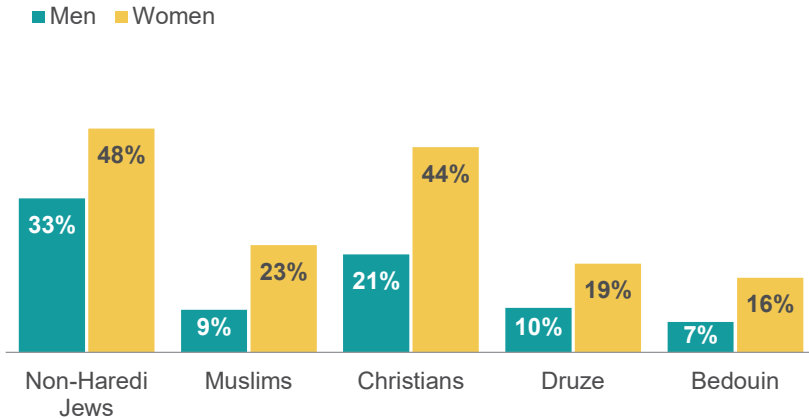
23 As noted, this statement is valid only for college graduates who have studied in Israel because the data do not include Arab men who studied for an academic degree abroad. The *Labor Force Survey* conducted by the CBS (2015), which also includes those who earned degrees abroad, shows a much higher percentage of Arab men with an academic degree — 16 percent among Muslims (including Bedouin), 27 percent among Christians, and 14 percent among Druze ages 30 to 34 in 2015. However, data from this survey have fluctuated wildly over the years, and they indicate that the percentage of college graduates among women is much higher than what is shown here, even though they study abroad at lower rates, and therefore, the data cannot be compared with the administrative data presented here.

Figure 6. Distribution of students among academic institutions



Source: Hadas Fuchs, Taub Center | Data: CBS, Administrative datasets

Figure 7. Share of those ages 30-33 with an academic degree, 2014



Source: Hadas Fuchs, Taub Center | Data: CBS, Administrative datasets

Higher education, like qualification for a bagrut certificate, is affected by socioeconomic background. Table 2 presents the overall gap in 2014 in the share of college graduates among the groups for ages 30 to 33, along with the disparity that remains after controlling for socioeconomic background variables and qualification for a bagrut.²⁴ In contrast to the bagrut qualification gap between Jews and all groups of Arabs, which, after controlling for background variables, disappears or reverses to the advantage of Arabs, the disparity between Jewish and Arab men in qualification for an academic degree remains negative. On the other hand, when controlling for the variables among women, the gap becomes positive in favor of Arab women among Christians and disappears among Bedouin and Muslim women. Only for the Druze is it negative. However, as noted, there has been a significant increase in the share of women pursuing academic education among the Druze and Bedouin and, the disparity is expected to decrease among Druze women and to become positive among Bedouin women.

The estimation results for earning an academic degree, like the estimate of the gap between Jews and Arabs in bagrut certificate qualification presented

²⁴ The explanatory variables are socioeconomic background data that are identical to those controlled for in Table 1: dummy variables for parents' education, income quintiles, and number of siblings, along with a variable that indicates qualification for the bagrut. The full regression results can be seen in Appendix Table 3.

previously, illustrate the enormous role of socioeconomic background in educational achievements, to the extent that it may cancel out or even overturn gaps of tens of percentage points among groups. A study by Khattab, Miaari, Kraus, Yanai, and Lazarus (2014) finds a similar result and shows that parents' education and employment have a larger impact on the academic achievements of Arab women than Jewish women.

Table 2 Gap in qualification for academic degree relative to Jews, ages 30-33, 2014

	Overall gap	Gap after controlling for background and bagrut qualification variables
Men		
Muslims	-24%	-5%
Christians	-12%	-6%
Druze	-23%	-6%
Bedouin	-26%	-4%
Women		
Muslims	-25%	0%
Christians	-3%	4%
Druze	-29%	-7%
Bedouin	-32%	-1%

Notes: The blue numbers are for results that were not significant at the 0.5% level.

Source: Hadas Fuchs, Taub Center | Data: CBS, Administrative datasets

4. Study majors

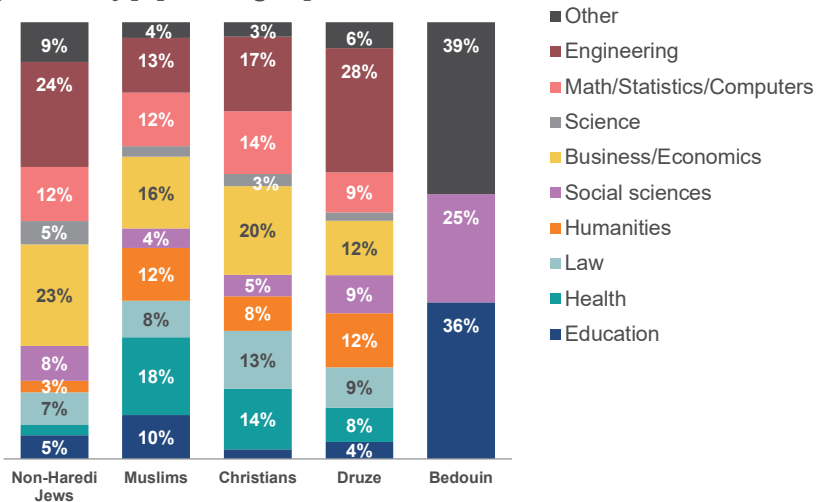
In order to analyze study majors for each group, academic subjects were divided into main categories. The category "education" includes all students in academic colleges of education. In order to cancel out the effect of dropout rates and changes in study major, which are relatively high in all sectors, this section examines the subjects studied by third-year students in an institution of higher education. For convenience, the results are divided by gender. The figures do not include students from the Open University because of their especially high dropout rates.

Subjects studied by men

Figure 8 presents the subjects studied by male students from 2012 to 2014. A total of 42 percent of Jewish students study computers and engineering, the fields with the highest average wage. These fields are less commonly chosen by Arab Israelis, and the low share of Muslim students studying for a degree in engineering is especially notable. The share of students in computers and engineering is relatively high among Druze and very low among the Bedouin. Within this category, computer science, computer engineering and structural engineering majors are most popular. However, dropout rates in these fields are very high, especially among Arabs. It appears that more and more Arab Israeli students are being directed to these fields and, in 2016, the number of students was considerably higher than in the years examined for this study (Ministry of Finance, 2017).

Among Bedouin students, 61 percent study teaching and the humanities. This means that even the few Bedouin young men who continue on to higher education do not pursue majors with high earning potential. This is especially typical of Bedouin in the south; study majors of Bedouin in the north are more similar to those of other Arabs in the north.

Figure 8. Study majors of male third-year students, 2012-2014
Ages 21-35, by population group



Notes: Not including students in the Open University. For Bedouin students, categories, with the exception of education and humanities, were combined due to the small number of observations. Computer engineering was combined with mathematics, statistics and computers.

Source: Hadas Fuchs, Taub Center | Data: CBS, Administrative datasets

A relatively high share of male Arab students, and especially Muslims and Christians, study for a degree in a health-related field, compared with a very low percentage of Jewish men. Figure 9 shows the percentage of Muslim, Christian, and Druze students in the various health-related departments (there are too few observations among the Bedouin). Most Muslim students study for a degree in nursing, while among Christians, the majority are medical students. In addition to the large number of Arab students in the health professions in Israel, a very high percentage of the Arabs who study abroad are in these fields as well (84 percent in 2012, according to the Knesset Research and Information

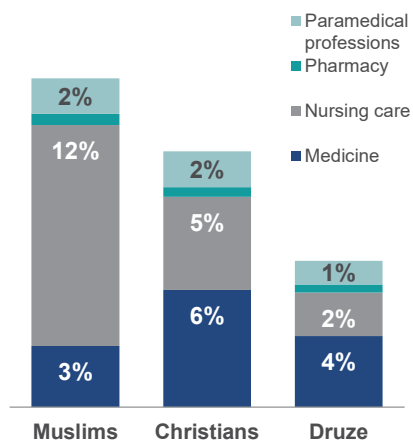
Center, 2016). Thus, the percentage of Muslims and Christians studying health-related fields is actually much higher in total, about one-third of Arab students in Israel and abroad.

A comparison between this data and data on students' study major between 2004 and 2006 shows that there has been a decline in the share of students in education (other than among the Bedouin); an increase in the percentage of students in business and economics and computers and engineering; and an increase in students who receive a general degree in the social sciences. These changes are not large, though (Appendix Figure 4).²⁵

The choice of study major depends on personal considerations, such as interest and future earning potential, but also, often, on admissions requirements. While bagrut scores for Arab Israelis are similar to those of Jews, their average psychometric exam score is low and makes it impossible

Figure 9. Share of students in healthcare related study majors, 2012-2014

Out of all students ages 21-35, by population group and study major



Source: Hadas Fuchs, Taub Center
Data: CBS, Administrative datasets

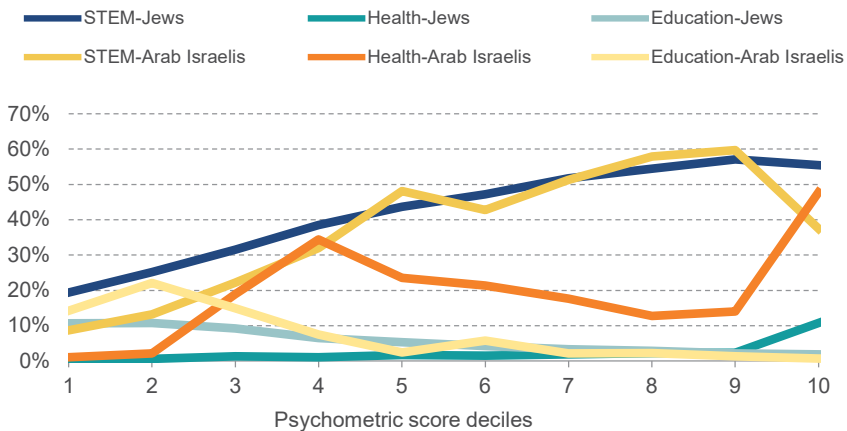
²⁵ From 2004 to 2006, the age group examined was younger than from 2012 to 2014 because of data constraints. A comparison with a matching age group in later years shows that at the younger ages, the increase in the share of those who pursue studies in computers and engineering is even larger, especially among the Druze, and the decline in the number of those studying education is also larger.

for them to be accepted to the more sought-after departments. Nevertheless, among high-achieving young people, the differences in choices between Jews and Arabs have been reduced over the years.

Figure 10 shows the percent of third-year students in sciences, engineering and mathematics (henceforth “sciences”) and in health and education, according to psychometric exam scores (the population was divided into achievement deciles). Patterns related to pursuing scientific studies are similar among Arabs and Jews and increase as psychometric exam scores increase, except in the highest decile, in which Arab men pursue medical studies at high rates, both in relation to Jews and in relation to other fields. The similarity in pursuing scientific fields is relatively new. Between 2004 and 2006, Arab men with a relatively high psychometric exam score (fifth decile and above) pursued computers and engineering less and health-related professions more. In other words, while in the past, Arab men with high abilities pursued healthcare-related studies, such as medicine and pharmacy studies, today they choose to pursue computer studies and engineering in numbers similar to Jewish men. The reasons behind these trends require further examination, but they may indicate greater willingness to go into professions that today are considered more lucrative, as opposed to professions traditionally associated with Arabs in Israel, such as pharmacy.

Figure 10. Share of male students in the main study majors by psychometric scores

As a percent of all third-year male students, psychometric scores in deciles, by sector



Notes: Not including students in the Open University. STEM studies are a curriculum based on four subject areas: science, technology, engineering, and math.

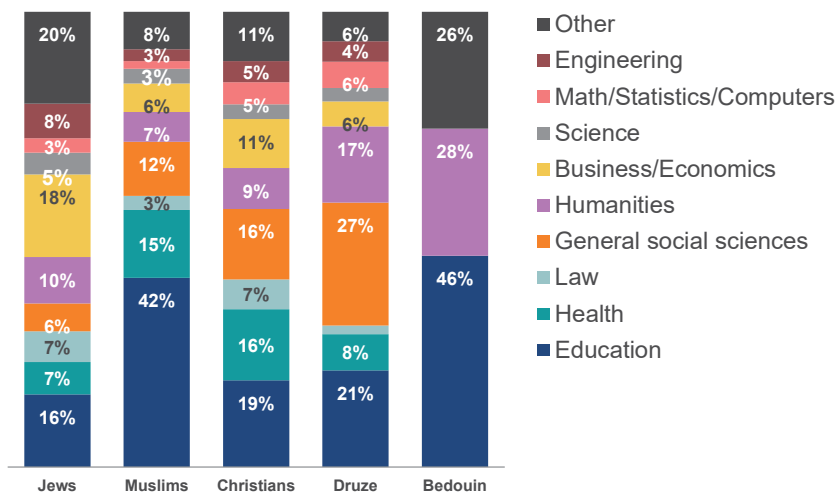
Source: Hadas Fuchs, Taub Center | Data: CBS, Administrative datasets

When controlling for background variables, Arab men pursue science studies at even higher rates than Jews. On the other hand, if the choice of study major based on a comparative advantage in math (as reflected in the psychometric exam score) is examined,²⁶ 60 percent of Jewish men in the top math score decile choose science, as opposed to only 36 percent of Arab men. Nevertheless, in this area, as well, Arabs and Jews have moved closer.

Subjects studied by women

Figure 11 shows study majors for third-year female students from 2012 to 2014. A high share of Muslim and Bedouin women study education — 42 and 46 percent, respectively — while the rate for Druze and Christian women is less than half those figures.²⁷ While these rates are still too high, they are much lower than the rates of female education students from 2004 to 2006 in all groups of Arabs, other than the Bedouin (Appendix Figure 4). Given the surplus of teachers in the Arab education sector, this decline is an important step for the employment possibilities of women college graduates.

Figure 11. Study majors of female third-year students, 2012-2014



Notes: Not including students in the Open University. For Bedouin students, categories, with the exception of education and humanities, were combined due to the small number of observations. Computer engineering was combined with mathematics, statistics and computers.

Source: Hadas Fuchs, Taub Center | Data: CBS, Administrative datasets

²⁶ The comparative advantage in mathematics was calculated according to the score on the quantitative portion of the exam divided by the score on the verbal portion.

²⁷ Bedouin women in the north study education at slightly lower rates than Bedouin women

Among Druze women, the decline in the share of education students was especially dramatic — more than 50 percent. However, there are differences in the level of the decline across residential locations. Druze are concentrated in the north, but some of them live in very remote communities and some in communities near centers of employment.²⁸ From 2004 to 2006, there were large differences between Druze women in very remote communities, who studied teaching at very high rates, and those who came from less remote communities (72 percent versus 14 percent, with a difference of 39 percentage points after controlling for socioeconomic background variables). This was apparently because of the geographic distance and limited employment possibilities in distant towns. By 2012 to 2014, the share of Druze women studying teaching was declining significantly, with the decline concentrated in the more remote towns.

As with the men, the percent of Arab women students in health-related fields is high relative to Jewish women, though lower than the percent among men. The most common degrees among women are in the paramedical professions, but a relatively high percentage attend medical school, especially Christians (4 percent). In addition, the portion of women studying for a general degree in the social sciences is very high (even higher than for the men), especially among the Druze: 27 percent. This is more than twice the percentage of female students in the department between 2004 and 2006. This study major does not lead to clear employment possibilities, and it would appear that those who pursue it do so because of the types of courses offered by colleges in the north.

The low rates of women studying computers and engineering is surprising, given the achievements of Arab Israeli girls in high school. As noted, Arab girls study in science/engineering tracks at high rates relative to Arab boys and Jewish girls. Nonetheless, fewer pursue computer science and engineering studies in college than Arab men and Jewish women. This trend contrasts with what is happening among Jewish girls who study science in high school, who subsequently pursue computers and engineering in college at relatively high rates. What is especially striking is the difference between the percent of girls who study science other than biology or chemistry in high school and then continue with related studies in college: 31 percent among Jews; 21 and 22 percent among Christians and Druze, respectively; and, only 9 percent among Muslims.

in the south, perhaps because of the greater supply of teachers in the north.

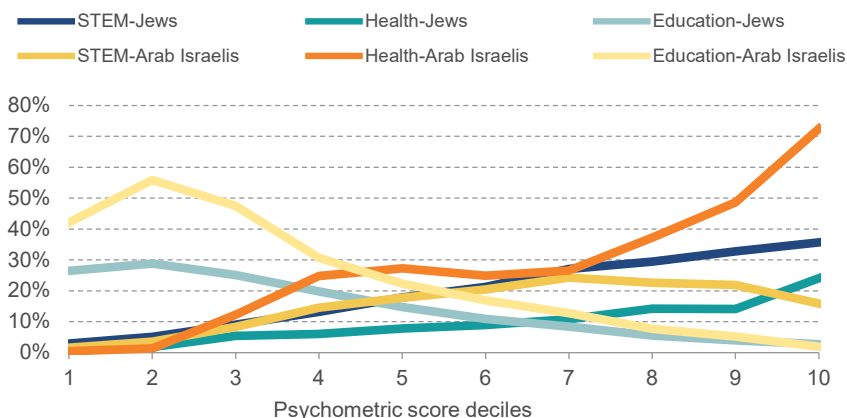
²⁸ The level of remoteness was calculated according to community of residence at age 14. Very remote communities were given a ranking of 1, and less remote were ranked 3 (out of 10 levels, according to the CBS ranking).

In examining the choice of study major based on psychometric exam score, the higher the psychometric score of Arab women, the more likely they are to choose health-related studies, reaching a level of more than 70 percent in the highest psychometric decile. In the three highest deciles, they choose the caring professions and medicine (Figure 12). A relatively low share of Arab Israeli women with high psychometric exam scores pursue STEM studies. In both sectors, the share pursuing studies in education declines as the psychometric score increases.

Among Jewish women with a comparative advantage in math, there is a decline in the share of education students, but Arab women with a similar advantage still choose to study education in large numbers and scientific professions in low numbers.

Figure 12. Share of female third-year students by study major and psychometric score deciles, 2012-2014

Women ages 21-35, by sector



Notes: Not including students in the Open University. STEM studies are a curriculum based on four subject areas: science, technology, engineering, and math.

Source: Hadas Fuchs, Taub Center | Data: CBS, Administrative datasets

5. Work and wages

Over the years, the Arab population's employment attributes have been weaker than those of the Jewish population in terms of employment rates and characteristics such as wages and profession prestige. This section examines the current situation of Arab Israelis in the labor market and changes that have taken place in the market over time.

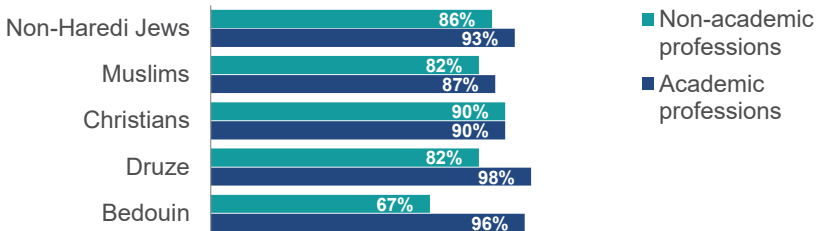
Employment rates

Figure 13 presents employment rates from 2013 to 2015 for ages 25 to 34 according to education level.²⁹ Unsurprisingly, the employment rate is higher among college graduates. Among men, the greatest difference between college graduates and young people without a college education is among the Druze (a difference of 16 percentage points in favor of college graduates) and the Bedouin (29 percentage points). College graduates from these groups are also employed at a higher rate than non-Haredi Jewish college graduates.

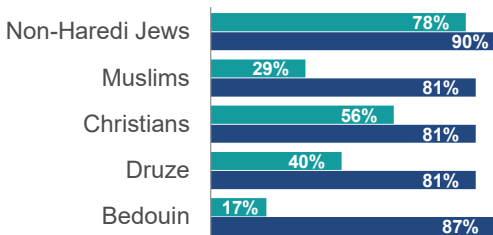
Figure 13. Employment rates, ages 25-34, 2013-2015

By population group

Men



Women



Note: Bedouin includes Muslims living in the south; Muslims is all other Muslims, including the Bedouin in the north. See footnote 29 (below) for further clarification.

Source: Hadas Fuchs, Taub Center | Data: CBS, *Labor Force Survey*

²⁹ Due to the small number of relevant observations, the figure does not include students, whose employment characteristics are different. The figures were taken from the CBS *Labor Force Survey* because the database used for most of the study lacked data on employment rates. In the CBS *Labor Force Survey*, there is no separation of non-Bedouin Muslims from Bedouin, and therefore, the Bedouin have been defined for the purposes of this figure only as Muslims living in the Negev. In other words, the separation is between Bedouin in the Negev and other Muslims (including Bedouin living in the north).

The employment rate for all Arab Israeli women is very low, but those who have chosen to go to college work at much higher rates. Yashiv and Kasir (2012) examine the characteristics of labor force participation by Arab women and showed that higher education, marital status, and modern attitudes are important in explaining this participation. Figure 13 shows the increase in employment that comes with an academic degree (though in recent years, Arab women without higher education have also been entering the labor market).

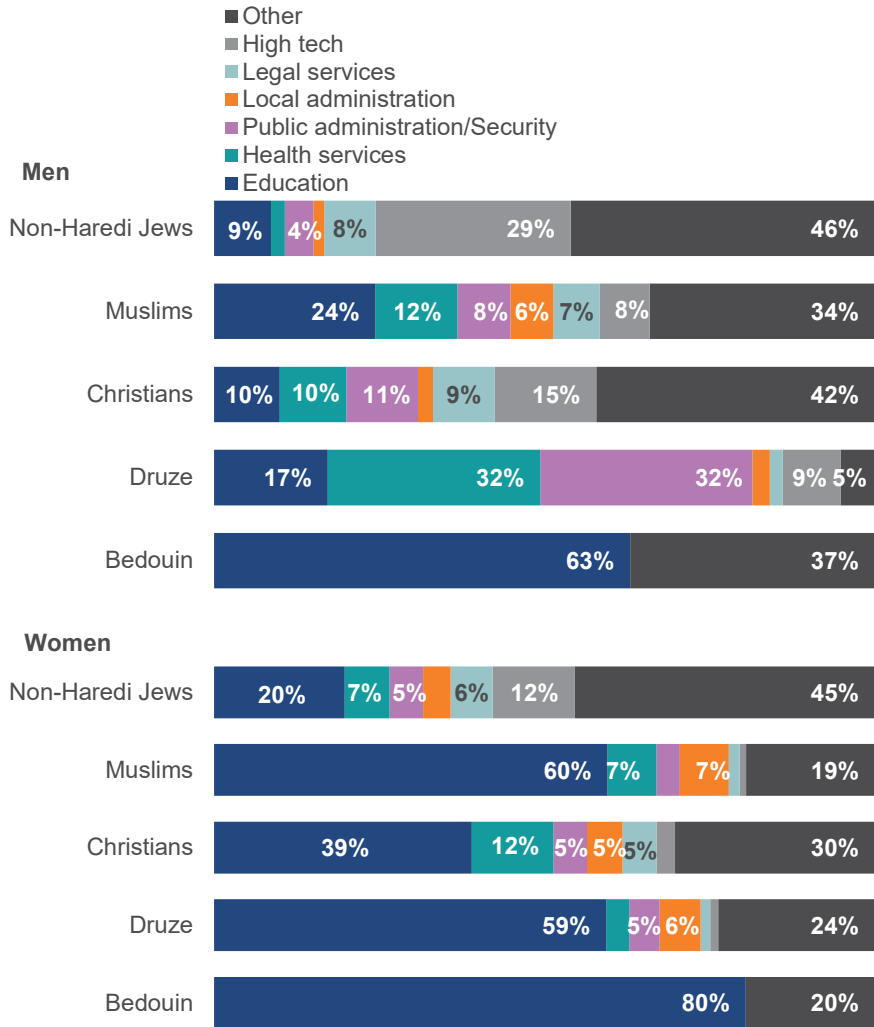
Employment branches

The differences between Arab and Jewish college graduates in areas of employment are similar to the differences in study majors between the groups (Figure 14). Jewish men are employed at high rates in high tech, while Muslim and Bedouin men are employed at relatively high rates in education. The rate is particularly high among the Negev Bedouin: 74 percent of college graduates aged 32-35 in this group are employed in education. Bedouin in the north are employed in education at a much lower rate, 39 percent, but it is still relatively high compared with the rest of the Arab Israeli population.

In addition to employment in the field of education, Muslim, Christian, and Druze men and women are employed at high rates in healthcare. Druze academic graduates are employed at very high rates in the security forces as well. Some 30 percent of those in the civilian labor force (excluding permanent army) are employed in the police, and in the general labor force (including those in the permanent army), the share of those in security increases to about half of those employed.³⁰ The Druze live in remote towns, and distance from centers of employment, along with their historic success in the security forces, may pull Druze men to these fields.

³⁰ The administrative database does not include workers employed by the army. The gap between the rate of employment in the civilian labor force (according to the administrative database) and the rate of employment in the general labor force (according to the *Labor Force Survey*), combined with the relative proportion of those employed in the civilian security forces out of all those employed, leads to an estimate of 45-55 percent of Druze men employed in the security forces.

Figure 14. Employment branches for those with a higher degree ages 25-35



Notes: Civilian employees only. For Bedouin, categories were combined with the exception of education due to the small number of observations.

Source: Hadas Fuchs, Taub Center | Data: CBS, Administrative datasets, Labor Force Survey

Wages

The average monthly wage of college graduates in the different population groups is presented in Figure 15.³¹ Across the board, wages for Jews are higher than wages for Arabs Israelis, even though Arabs have more work experience because they start college at a younger age. As will be shown, part of the gap is a result of differences in study majors. It is also evident from the data that women's wages are much lower than those of men in all groups. Most of that disparity is a result of differences in occupations and work hours between men and women (Fuchs, 2016). Unfortunately, the limitations of the data in the current database make it impossible to examine how differences in work hours affect wages.

Figure 15. Average monthly wage, 2013

Individuals ages 25-35 with higher education who are not students, NIS

Men



Women



Source: Hadas Fuchs, Taub Center | Data: CBS, Administrative datasets

31 Gross wages from work as a salaried employee; reported income and work only.

In examining wage gaps by the various study majors, there are large differences between Jews and Arabs after controlling for work experience, bagrut average, and psychometric exam score (Figures 16a and 16b).³² It is important to note again that because of the limitations of the data, differences in work hours, which can greatly affect wages, were not taken into account.

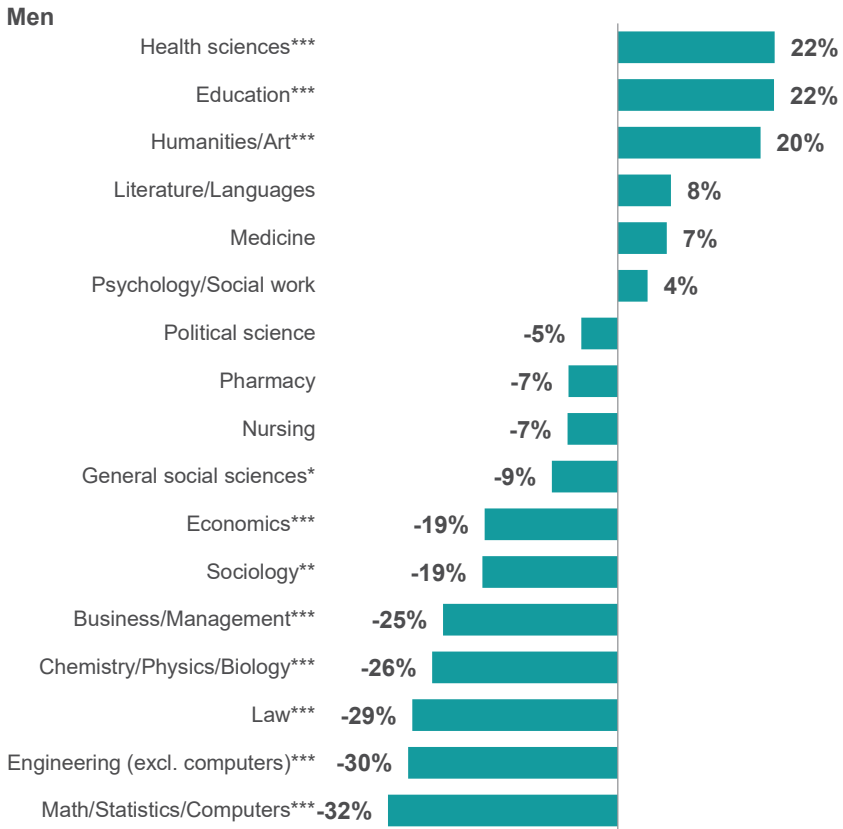
The results for women and men were similar: in health-related fields and education, the gap is positive (Arabs earn more) or relatively small. In these fields, there is a relative majority of Arab college graduates, and wages are determined according to wage agreements (as in the entire public sector). In contrast, in business and computers and engineering, the wage gap in favor of Jews is large. This result might explain some of the reluctance of Arab Israelis to choose these fields in college. Even with the gaps, though, wages in these industries are the highest of all industries and therefore, they have the greatest economic potential for Arabs as well.

In addition to differences in employment industries of college graduates, wages could be affected by differences in occupations within the industries. However, such statistics do not exist in the database. Gharrah (2005) shows that a Jewish college graduate has a 1.7 times greater chance of working in management occupations than an Arab college graduate (according to data from 1990 to 2001), and data from the Central Bureau of Statistics *Labor Force Survey 2015* show that while 23 percent of college educated Jewish men ages 25 to 34 are employed in a management occupation, among educated Arab Israelis, the rate is only 11 percent.

32 The gap presented is the coefficient for the Arab interaction variable x study major, which was obtained from the regression of the log of wages on work experience, the average bagrut score, the psychometric exam scores by exam parts, dummy variables for study major, and interaction variables of Arab x study major.

Figure 16a. The wage gap between Jewish and Arab Israeli men, by study major, 2013

Ages 25-35, controlling for experience, bagrut and psychometric scores

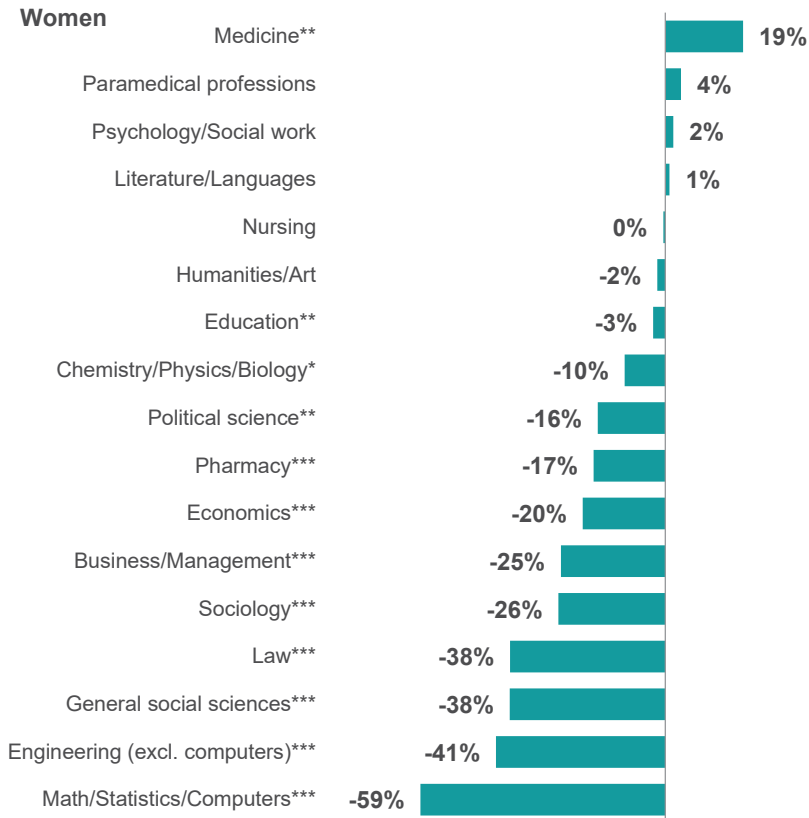


Notes: * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$. The complete list of occupations and their categorization can be found in the Appendix.

Source: Hadas Fuchs, Taub Center | Data: CBS, Labor Force Survey, Administrative datasets

Figure 16b. The wage gap between Jewish and Arab Israeli women, by study major, 2013

Ages 25-35, controlling for experience, bagrut and psychometric scores



Notes: * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$. The complete list of occupations and their categorization can be found in the Appendix.

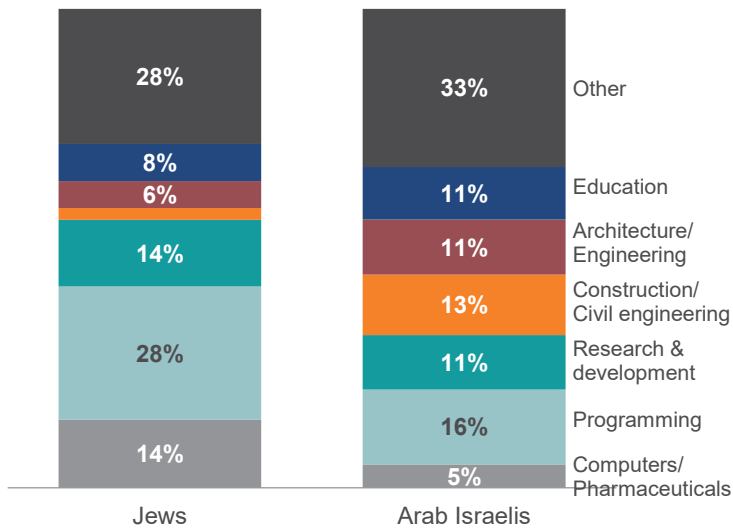
Source: Hadas Fuchs, Taub Center | Data: CBS, Labor Force Survey, Administrative datasets

Why do Arab Israeli graduates in computers and engineering earn less than Jews with the same degrees? The breakdown of employment branches among these graduates could explain some of the disparity. Among Arab Israelis with a degree in these study majors, the share of those in occupations that are less lucrative, like in construction and civil engineering or architecture and engineering, is higher than the share employed in programming and

high tech where the average salaries are higher (Figure 17). The fact that Arab Israelis do not serve in the military is also very likely to negatively impact their ability to integrate into high tech (see for example, Swed and Butler, 2013).

Figure 17. Employment branches for men with degrees in mathematics, computers and engineering, 2013

Ages 25-35

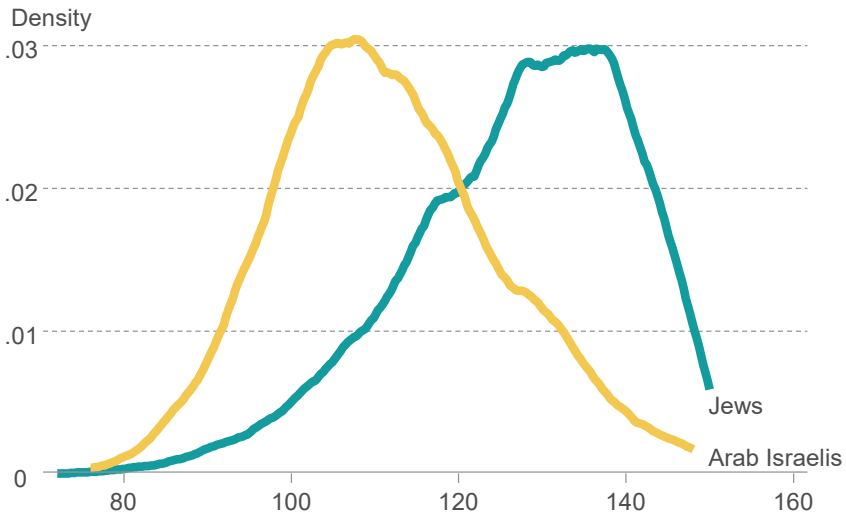


Source: Hadas Fuchs, Taub Center | Data: CBS, Administrative datasets

Among women, the wage gap between Jews and Arabs with a degree in computers is very high (about 60 percent). It would appear, however, that the reason for this is differences in graduate characteristics in each sector. Figure 18 presents the distribution of the psychometric exam scores of Jewish and Arab Israeli women who study mathematics, statistics and computer science. The findings suggest that the wage gap is less the result of discrimination and more affected by disparities in worker characteristics. The differences in psychometric exam score distribution have decreased over time and were smaller for women graduates in computers between 2012 and 2014. We can assume that the large wage gap will continue to decline in the future.

Figure 18. Distribution of scores on the psychometric math exam for women with a degree in math, statistics, computer science, and computer engineering, 2013

Ages 25-35



Source: Hadas Fuchs, Taub Center | Data: CBS, Administrative datasets

The field of education in the Arab sector

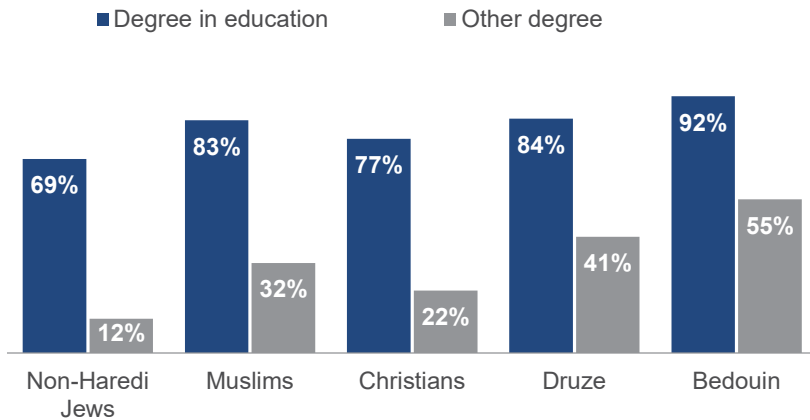
In line with the distribution of study majors, many Arab Israeli women are employed in the field of education (Figure 14).³³ It is interesting to note that even though there is supposedly a large surplus of teachers in the Arab sector, a significant share of Arab women ages 25 to 35 with a degree in education are employed in the education field. Furthermore, a large share of women college graduates who have not studied education are employed in education, especially among the Druze and the Bedouin (Figure 19).³⁴ Data from the CBS *Labor Force Survey* show that the working hours of Arab teachers

33 The share of women employed in education is especially high among the Bedouin: 66 percent in the north and 89 percent in the south.

34 This is also a phenomenon among men with higher education, although to a lesser extent than among women. The share of Arabs employed in the education field is higher than the number who study education, especially among the Bedouin.

has risen over the years more than the hours of Jewish women and that the share of women employed part-time decreased. It appears, therefore, that despite the growth in the share of women pursuing higher education and the large number of Arab women who study education, a significant portion of these women find work, and with a large number of hours.

Figure 19. Women employed in education, by degree, 2013
Ages 25-35



Source: Hadas Fuchs, Taub Center | Data: CBS, Administrative datasets

At the same time, there are also data indicating that there is actually a surplus of manpower in teaching in the Arab sector. A total of 59 percent of candidates for placement in the Arab sector's school system in 2014, or about 5,800 people, were not placed in educational institutions, and this number is increasing (Knesset Research and Information Center, 2014). In other words, even though a large portion of graduates with degrees in education are employed, there are still many more women interested in working in this field who do not find jobs. One explanation may be that there are women graduates employed in education, but not as teachers (for example as aides). As was shown previously, the share of women who pursue degrees in education has greatly decreased in recent years but, as it is still high, the teacher surplus problem is expected to continue.

Among Bedouin in the south, in contrast to most parts of the country, a teacher surplus is not particularly felt, due, in part, to the high birthrate relative to the rest of the Arab sector.³⁵ In order to balance supply and demand, the Ministry of Education is offering incentives to Arab teachers from the north to teach in Bedouin schools in the Negev, subsidizing rent and contributing to the teachers' *Keren Hishtalmut* (study savings fund). In fact, 35 to 37 percent of teachers in Arab education in the Negev live in Haifa and the northern region.³⁶ This means that young teachers who do not find work in the north go to work in Bedouin schools in the Negev due to a lack of choice, despite the distance from their homes. Another possible solution to this surplus of teachers could have been placement in Jewish schools, but the share of Arab teachers in Jewish schools is negligible and has barely increased over the years.

The data on Arab sector teaching personnel show conflicting trends. On the one hand, there appears to be a teacher surplus: teaching candidates are not placed in jobs and teachers are forced to travel from the north to the Negev. On the other hand, Arab women who study education are employed in the field at higher rates than Jewish women, and at a similar salary. A possible explanation for this contradiction could be that while Arab women are in fact employed at higher rates than Jewish women, they are interested in working more hours but are unable to do so. An indication of this is found in the data for Arab Israeli women employed part-time versus their Jewish counterparts. In general, Arab women ages 25 to 40 are employed part-time at lower rates than non-Haredi Jewish women. Nevertheless, among those employed part-time, the share of Arab women who reported that they are employed part-time because they did not find work for more hours was 50 percent, in contrast with only 15 percent among Jewish women (most Jewish women who are employed part-time do this because they are raising children, according to data from the CBS, *Labor Force Survey*, 2015). In other words, Arab women are employed part-time because of employment constraints while, for Jewish women, it is a personal choice.

In the Arab sector, in contrast with the Jewish sector, teaching was not a clearly "female" profession until recently. With increased levels of education among women and a higher portion of female teaching students, the share of women teachers has greatly increased and is approaching the share of Jewish women in the occupation (Appendix Figure 5).

35 In 2006-2007, the birthrate was 5.6 children per woman, as opposed to 3.08 among non-Bedouin Arab Israelis (excluding residents of Jerusalem) and 2.52 among the Druze (Toledano, Frisch, Zussman, and Gottlieb, 2009).

36 The data were calculated using Ministry of Education teacher files from 2000 to 2014.

Conclusion

Over the past twenty years, a great number of changes have taken place in education and employment in Arab Israeli society. A substantial number of indices show a trend toward improvement: the rate of students qualifying for a bagrut certificate has significantly increased and the share of those pursuing higher education has also continued to rise. Nevertheless, in these and other areas, the disparities between Jews and Arabs are still large and the challenges are many.

The improvement in Arab women's education has been especially impressive, and as a result of the improvement over the years, Arab women today qualify for bagrut certificates at rates approaching those of Jewish women. In addition, a large share of Arab women take the science/engineering bagrut. Accordingly, Arab women from all groups pursue higher education at increasingly high rates. However, the lack of daycare centers and public transport, the norms of a traditional society, and limitations in Hebrew language fluency have led many of these women to choose the field of education, which is seen as more "feminine" and allows them to work within their community at hours convenient for mothers. Education remains the preferred field for Arab women, especially among Muslims and Bedouin, even though they have high achievements in high school, and even though the birthrate in this population has declined significantly.

The large share of women who pursue teaching professions is already affecting the balance in employment in the field: a surplus of teaching candidates has led to a situation in which they are not placed in educational institutions, and the surplus is expected to continue to grow as long as the rate of women pursuing teaching careers does not decline significantly.

The Ministry of Education is attempting to address the surplus in various ways, including reducing budgets for students in teachers' colleges in the north and providing incentives to Arab teachers who teach in Bedouin schools in the Negev. However, it is worth considering more extensive measures, such as guiding high school pupils to consider higher education in fields that are "in-demand," encouraging other employment possibilities, and improving daycare for children, which would enable women to take jobs in a larger variety of professions.

Arab Israeli men, in contrast, have improved their educational level to a modest extent. The disparity between Arabs and Jewish men in bagrut qualification rates has narrowed, but the share of Arab men pursuing higher education has remained low and is growing only slowly. The increase may have been concentrated in the percentage rate of those studying abroad, but in some cases, institutions abroad may not provide a high-quality

education (as shown by Lewin-Epstein, Kalev, Marantz, and Slonim, 2015 for pharmacists who studied in Jordan). In addition, this education is limited in scope compared to education in Israeli academic institutions and is available only to those with means.

A relatively large portion of Arab college graduates study health professions, a field in which they succeed in finding employment and in which the wage gap between Jews and Arabs is low. In contrast, in computers and engineering, the share of Arab Israelis is much lower and the wages of those who work in the field are lower. Some of the gap stems from the fact that the industries in which Arabs are employed in high tech and engineering are different from those in which Jews are employed, and Arab Israelis are in less lucrative occupations in the field. The gap may also be a result of the remote areas of residence of many in the Arab sector, where opportunities for work in the field are few. To improve the situation of Arab men in the labor market and diversify their employment opportunities, it is advisable to strengthen their achievements while they are in high school and encourage them to pursue varied majors in college, while also providing them with support and guidance in finding employment (and perhaps also incentives to employers), with a focus on the more lucrative fields.

This chapter distinguishes among the various Arab sub-groups. It finds that each group has different characteristics and, accordingly, faces different challenges. The Christian population has the highest achievements in the Arab sector on all indices: bagrut scores, rates of college graduates, and fields of employment. There are still disparities between Christians and Jews, but they have been narrowing over the years.

In the Muslim population, the largest group in Arab society, the trends are fairly similar to those among the general Arab population. That is, there has been an overall improvement in education indices, along with a gap in favor of the women, and a striking tendency to study health-related fields and education in college.

The achievements of the Druze are mixed. On the one hand, Druze schools do well when schools are ranked according to bagrut qualification rates, and the entire sector shows a significant improvement in these indices. In addition, their employment rates are high: among men, the share of college graduates employed is higher than among Jews. Nevertheless, the fields in which the Druze are employed are relatively limited, and a high rate of college graduates are employed in security work. This appears to be at least partially due to the fact that many Druze live in remote areas that do not provide developed employment opportunities. Remote places of residence have a broader impact as well: large numbers of Druze women study for a general degree in social sciences, which does not clearly translate into employment

opportunities, apparently because there are educational institutions close to Druze towns that offer this track. In addition, 41 percent of the college educated women who did not major in education are, nonetheless, employed in the field.

Among all Arab groups, the Bedouin have the lowest achievements on all indices (despite a significant improvement among Bedouin women). This appears to be connected to their very weak socioeconomic background. The vast majority of Bedouin college graduates, both women and men, are employed in education. While the correlation between supply and demand is greater than in other sectors, and Bedouin schools in the Negev still suffer from a shortage of local teachers, there is nonetheless a need to direct the Bedouin to other sectors in order to improve their employment statistics and their general level of education.

In addition to directing Arabs to professions where there are more employment opportunities and jobs with better pay, it is very important to raise the education level within Arab schools. While bagrut scores for Arabs and Jews are similar, Arabs' psychometric exam scores are much lower. Even assuming that the psychometric exam discriminates against Arabic speakers, the low scores in each of the exam sections show that the skills of Arab students at the end of their senior year of high school are lower than those of Jews. Psychometric exam scores are correlated with salary, and without an improvement in Arab schools, from pre-primary education to high school, it will be difficult to achieve satisfactory integration of Arab Israelis into the Israeli labor market.

In the context of educational disparities, this chapter examines the extent to which gaps between Arabs and Jews are affected by socioeconomic characteristics of each group. The analyses show when these characteristics are controlled for (and in the case of an academic degree, controlling for the effect of bagrut qualification as well), the achievements of Arab Israeli women are equal to or better than those of Jewish women, and among men, the gaps are narrowing considerably.

Given stagnation in the rate of Jews who pursue higher education (Bank of Israel, 2011), improvements in the education of Arab Israelis has great potential for improving their socioeconomic status. The rise in educational levels among Arab Israeli women is also an opportunity to improve their place in a relatively traditional society. In light of the substantial changes in education and employment figures in recent decades, there is hope that this progress will continue and that Arab Israelis will be optimally integrated into the labor market.

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The database was created with the assistance of the Central Bureau of Statistics, and is taken from the following datasets:

Population Census (2008)

Population Registry (2014)

Dataset of pupils, 8th to 12th grade (1996-2010)

Dataset of bagrut examinees at the end of 12th grade (1996-2014)

Psychometric exam grades (1996-2014)

Students in pre-academic preparatory courses (mechinas) (2005-2012)

Degree recipients (2000-2014)

Dataset of multi-year students (1996-2014)

Income for the study population (2003-2013) and their parents (1999-2013)

Haredi schools divided by Haredi streams (1996-2010)

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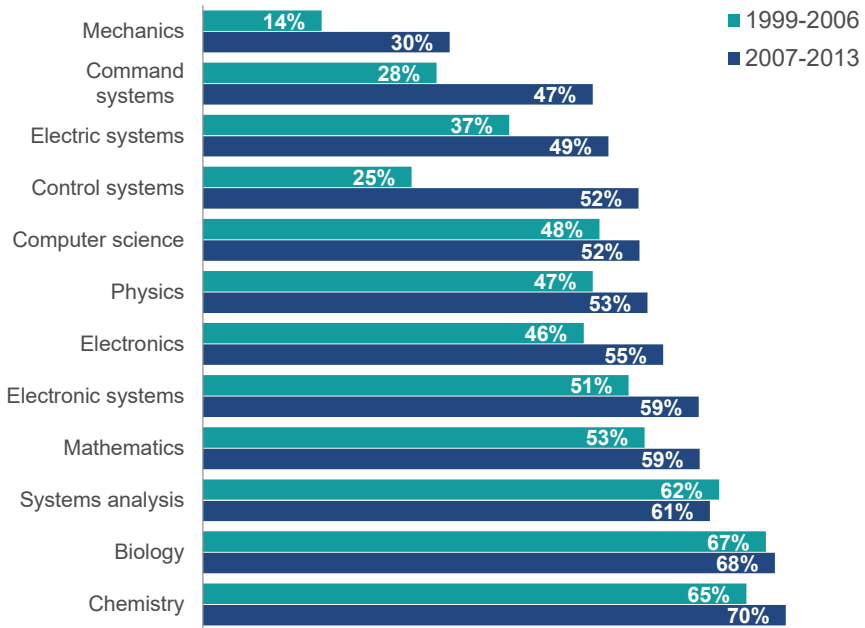
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Appendix

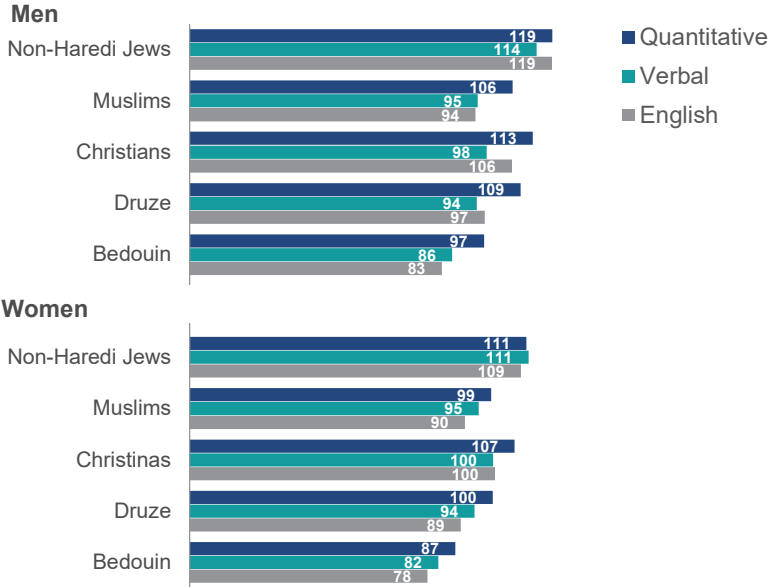
Appendix Figure 1. Share of Arab Israeli women in science and technology study majors



Source: Hadas Fuchs, Taub Center | Data: CBS, Administrative datasets

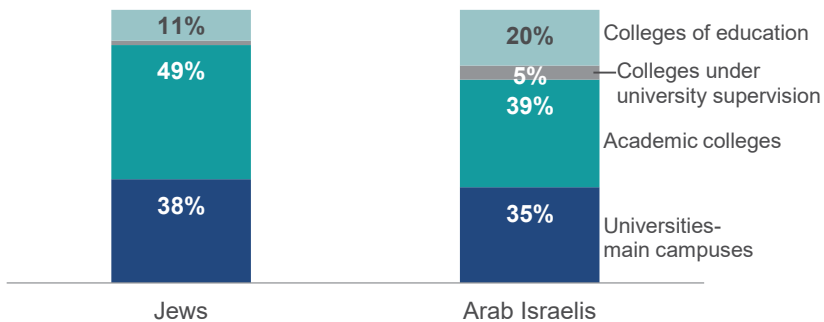
Appendix Figure 2. Average psychometric exam scores, by the three sections of the exam, 2014

For psychometric exam takers ages 17-28



Source: Hadas Fuchs, Taub Center | Data: CBS, Administrative datasets

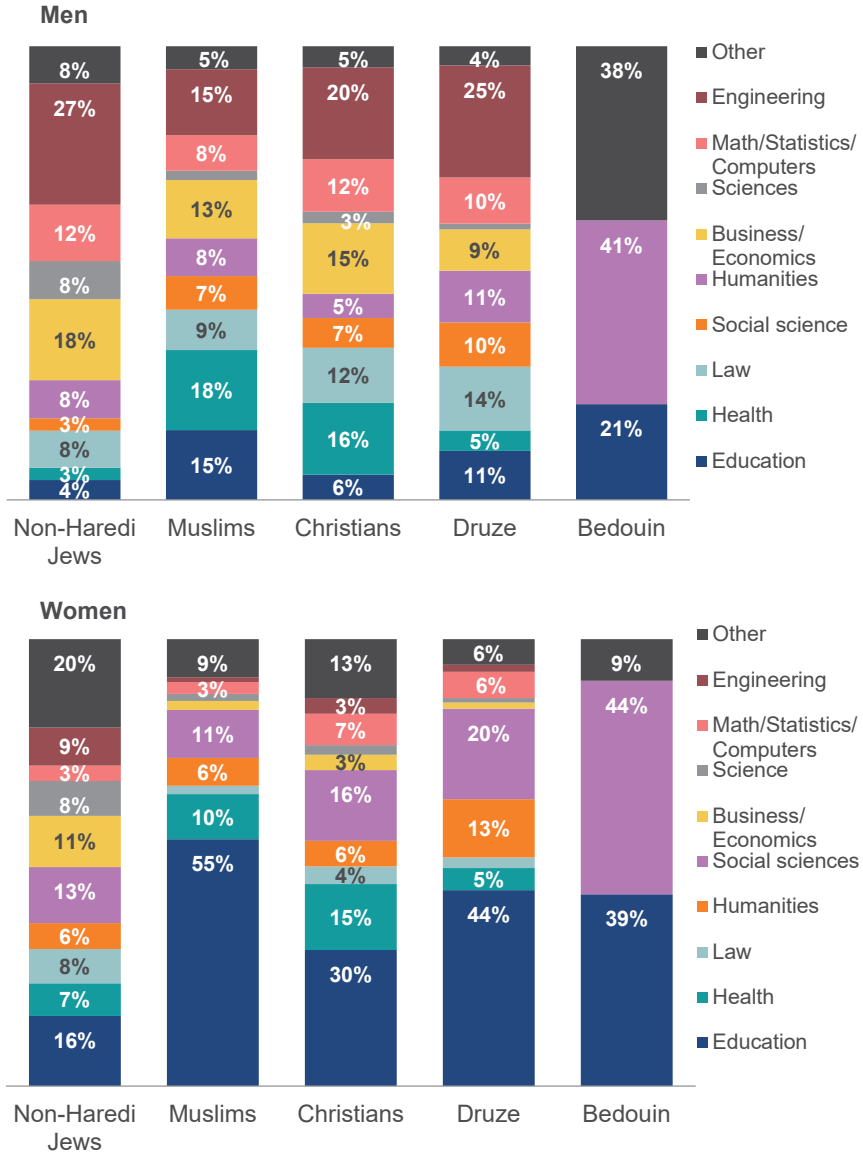
Appendix Figure 3. Distribution of undergraduate students by institution of higher education, 2016



Source: Hadas Fuchs, Taub Center | Data: Council for Higher Education

Appendix Figure 4. Study majors of third-year students, 2004-2006

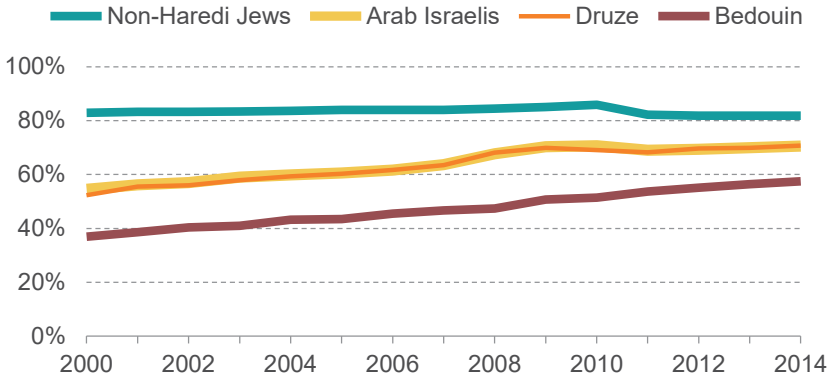
Ages 21-28, by population group



Notes: Not including students in the Open University. For Bedouin students, categories, with the exception of education and humanities, were combined due to the small number of observations. Computer engineering was combined with mathematics, statistics and computers.

Source: Hadas Fuchs, Taub Center | Data: CBS, Administrative datasets

Appendix Figure 5. Share of female teachers



Source: Hadas Fuchs, Taub Center | Data: Ministry of Education, Dataset and Institutions

Appendix Table 1. Parental education and income

	1999-2000	2012-2013
Father's years of schooling		
Non-Haredi Jews	12.3	13.3
Muslims	8.8	10.3
Christians	10.4	12.0
Druze	9.4	11.1
Bedouin	5.9	9.3
Mother's years of schooling		
Non-Haredi Jews	12.3	13.4
Muslims	7.9	10.2
Christians	10.4	12.2
Druze	7.2	9.7
Bedouin	4.3	7.8
Parental income quintile		
Non-Haredi Jews	3.3	3.5
Muslims	2.0	2.2
Christians	2.5	2.8
Druze	2.2	2.5
Bedouin	1.8	1.9

Source: Hadas Fuchs, Taub Center | Data: CBS, Administrative datasets

Appendix Table 2. Regression results: Bagrut qualification**Explained variable: Bagrut qualification**

The odd columns present the results before controlling for socioeconomic status, while the even columns show the results after controlling for socioeconomic status. Income quintiles were calculated for each year separately, according to parental income of the student at age 17. Parental education was calculated according to the following groups: less than 12 years of schooling (basic group), 12 years, 13 to 15 years, or 16 years or more of schooling (see regression tables on the following pages).

Appendix Figure 2. Regression results: Bagrut qualification

	Men				Women			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Years	1999-2000	1999-2000	2012-2013	2012-2013	1999-2000	1999-2000	2012-2013	2012-2013
	No control	With control	No control	With control	No control	With control	No control	With control
Muslims	-.221***	.028***	-.295***	-.044***	-.223***	.0109	-.174***	.044***
Christians	-.018	.121***	-.108***	-.023	.065***	.149***	-.009	.090***
Druze	-.190***	.045***	-.164***	.033**	-.192***	.038**	-.058***	.135***
Bedouin	-.271***	-.007	-.370***	-.030**	-.276***	-.031	-.271***	.047***
Income quintile (Reference category: Quintile 1 (lowest))								
Quintile 2		.003	.	.024***		.0242***		.053***
Quintile 3		.036***		.085***		.060***		.103***
Quintile 4		.104***		.167***		.120***		.155***
Quintile 5 (highest)		.122***		.245***		.194***		.208***
Mother's years of schooling (Reference category: Less than 12 years)								
12 years		.072***		.094***		.110***		.110***
13-15 years		.164***		.170***		.196***		.161***
16 + years		.224***		.197***		.219***		.176***

	Men				Women			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Years	1999-2000	1999-2000	2012-2013	2012-2013	1999-2000	1999-2000	2012-2013	2012-2013
	No controls	With controls	No controls	With controls	No controls	With controls	No controls	With controls
Father's years of schooling (Reference category: Less than 12 years)								
12 years		.065***		.079***		.065***		.091***
13-15 years		.1531***		.183***		.136***		.153***
16_ years		.195***		.206***		.170***		.166***
Number of siblings		-.015***		-.023***		-.006***		-.010***
Constant	.453***	.256***	.609***	.315***	.593***	.350***	.746***	.427***
N	93,151	32,037	101,417	35,229	89,575	32,348	96,516	33,628
R ²	.030073	.1589866	.0716256	.2006976	.0295162	.1392766	.0250146	.129574

Notes: * p < 0.10; ** p < 0.05; *** p < 0.01.

Source: Hadas Fuchs, Taub Center | Data: CBS, Administrative datasets

Appendix Figure 3. Regression results: Bagrut qualification and academic degree, ages 30-33, 2014

	Men				Women			
	Bagrut qualification		First degree		Bagrut qualification		First degree	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	No control	With control	No control	With control	No control	With control	No control	With control
Muslims	-.222***	.036***	-.235***	-.049***	-.206***	.031***	-.245***	-.000
Christians	-.013	.119***	-.117***	-.057***	.049***	.143***	-.034***	.039***
Druze	-.197***	.034***	-.231***	-.057***	-.169***	.044***	-.288***	-.067***
Bedouin	-.255***	.045***	-.261***	-.039***	-.247***	.020	-.317***	-.012
Bagrut qualification				.399***				.451***
Income quintile (Reference category: Quintile 1 (lowest))								
Quintile 2		.149**		-.012**		.045***		-.007
Quintile 3		.067***		.006		.096***		.019***
Quintile 4		.137***		.037***		.163***		.070***
Quintile 5 (highest)		.240***		.130***		.226***		.148***

	Men				Women			
	Bagrut qualification		First degree		Bagrut qualification		First degree	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	No control	With control	No control	With control	No control	With control	No control	With control
Mother's years of schooling (Reference category: Less than 12 years)								
12 years		.080***		.030***		.096***		.055***
13-15 years		.161***		.064***		.1715***		.106***
16 + years		.216***		.100***		.196***		.130***
Father's years of schooling (Reference category: Less than 12 years)								
12 years		.069***		.022***		.071***		.037***
13-15 years		.161***		.064***		.143***		.086***
16+ years		.194***		.093***		.160***		.105***
Number of siblings		-.017***		-.006***		-.005***		-.012***
Constant	.4716842***	.2386978***	.3257199***	.0457387***	.6240862***	.3465189***	.476213***	.0659874***
N	195,150	71,860	195,150	71,860	184,732	69,030	184,732	69,030
R²	.0294787	.1648187	.040842	.3259565	.0256664	.1328437	.0393709	.345648

Notes: Years of schooling is grouped; similar results were obtained when years of schooling was a continuous variable. Significance levels: * p < 0.10; ** p < 0.05; *** p < 0.01.

Source: Hadas Fuchs, Taub Center | Data: CBS, Administrative dataset