Nonhierarchical Curriculum Differentiation and Inequality in Achievement: A Different Story or More of the Same?

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Although the ideology behind curriculum differentiation presents it as a strategy for reducing educational inequalities, the research shows that, contrary to expectations, differentiation enhances inequalities. This may be a result of the stratified nature of most forms of curriculum differentiation that have been analyzed in existing research. Previous research has not looked into the implications of nonstratified curriculum differentiation on educational inequalities. This article attempts to fill this void by examining the effect of variations in subject offerings on gender and socioeconomic inequality in course taking and achievement in Israeli secondary education, where students can choose from among advanced courses that yield similar educational opportunities. Multilevel analysis was performed on 18,704 academic track students, distributed among 198 schools, who graduated in 1992. The main findings are as follows: Curricular differentiation is associated with increasing gender and socioeconomic inequality in course taking. When students can choose alternative subjects, boys and socially privileged students increase their concentration in advanced sciences courses. That concentration is accompanied by increasing inequality in achievement. The findings are interpreted, taking into account the constraints that ascriptive characteristics of the students pose on making curricular choices.

School curriculum plays a major role in the discourse on the policies that may help reduce educational inequalities among social groups. A main issue in this context is the role of curriculum differentiation in shaping the outcomes of schooling (e.g., Gamoran, 1997). The research on curriculum differentiation usually reports on its negative implications pertaining to equality in educational attainments. As Cohen (2000) wrote, ''From their studies of the negative effects of low tracks, sociologists of education have recommended doing away with curriculum differentiation'' (p. 276).

Teachers College Record Volume 108, Number 6, June 2006, pp. 1186–1213

0161-4681

These negative implications are not necessarily applicable to nonhierarchical curriculum differentiation. The usual analysis of differentiation concentrates, indeed, on "high" and "low" tracks, overlooking the possibility that other, less stratified forms of differentiation may bring about different results.

Starting in the late 1970s, Israeli secondary education has undergone a reform of between-subject curriculum differentiation (hereafter, subject differentiation): Students in secondary education can now choose from among a variety of advanced academic courses in different subjects. These courses are not stratified, and they all open meaningful educational opportunities. My purpose in this article is to examine whether subject differentiation brings about different results than stratified forms of differentiation and whether it can be recommended as a strategy for reducing educational inequalities.

TYPES OF CURRICULUM DIFFERENTIATION

A differentiated curriculum includes a variety of courses at the same educational stage. Differentiation can take various forms, which depend on the history and the culture of each society (LeTendre, Hofer, & Shimizu, 2003). I refer to three forms of differentiation: level differentiation, formal tracking, and subject differentiation. Level differentiation occurs when a school offers the same subjects at different levels, usually basic and advanced.[1] This form of differentiation is the most common and exists in many educational systems in the United States, Britain, France, Israel, and many others (e.g., Ayalon & Gamoran, 2000; Gamoran, 1997; Lees, 1994; LeTendre et al., 2003). Level differentiation is hierarchical by definition: Advanced courses are more appreciated than basic courses, they provide more educational opportunities, and they absorb students with better scholastic abilities (Gamoran, 1997; Lucas, 1999).

I use the term *formal tracking* to refer to the classical curriculum tracking, in which students study in either academic or nonacademic (often vocational) programs (Kerckhoff, 1986; Shavit, 1984; Vanfossen, Jones, & Spade, 1987). Although various ways of sorting students into different courses are often referred to as *tracking* (LeTendre et al., 2003), I use the term only for formally structured programs. In such programs, each track has its own structured curriculum, which is applied to all its students. This form is hierarchical because academic programs are more appreciated than nonacademic programs and usually absorb better students (LeTendre et al.).

Subject differentiation occurs when students, usually in academic programs, can choose from among alternative subjects offered at the same,

usually advanced, level. As noted, this is a major form of differentiation in Israel (Ayalon & Yogev, 1997). Subject differentiation is not hierarchical; the different subjects are equally appreciated and provide similar educational opportunities.

CURRICULUM DIFFERENTIATION, CURRICULUM STANDARDIZATION, AND INEQUALITY

Curriculum differentiation has opponents and proponents, and both sides support their views with powerful arguments. The most common argument in favor of differentiation is that a differentiated curriculum enables students to enroll in courses that are congruent with their interests and abilities. The rationale behind level differentiation and formal tracking underscores the diversity in students' abilities and the need to offer programs that correspond to that diversity (Bradock & Williams, 1996). Studying courses at the appropriate levels is expected to improve the achievements of underprivileged students and thus reduce inequalities in educational outcomes.

The support for subject differentiation is based on a combination of ideological and practical arguments. Unlike level differentiation and formal tracking, which underscore the diversity in students' abilities, the support for subject differentiation emphasizes diversities in the interests and inclinations of the students. Educational systems are expected to acknowledge differences among students and accept their right to a curriculum that corresponds to their tendencies. A differentiated curriculum concurs with the belief in freedom of choice and the right of every student to be educated according to her or his culture and inclinations (Brandt, 2002; Brighouse, 2001; Fantini, 1989; McDonough, 1998). The ideological aspects are accompanied by practical arguments: A curriculum that corresponds to the interests of the students is expected to improve their achievements (Olneck, 1993; Stout & Stevens, 2000). For example, Fantini recommended individualized instruction and alternative programs as a means of promoting educational equality; proponents of school choice expect choice, particularly if schools present themselves as magnet schools with specific curricula, to promote achievements (Lee, Coladarci, & Donaldson, 1996); the proposal of using African American dialect in instructing Black children in the United States is aimed at helping them learn Standard English (Olneck, 2000); a female-type curriculum in the sciences is expected to moderate the gender gap in course taking in this field of study (Volman, Van Eck, & Ten Dam, 1995); and a special curriculum is expected to assist gifted children to better realize their potential (Trefz, 1996). This approach follows the general belief of educators that students

will do best when the curriculum is adjusted to their preferences (Lee, Smerdon, Alfred-Liro, & Brown, 2000).

The support for curriculum standardization as a mechanism for improving the achievements of disadvantaged students is usually grounded in practical rather than ideological reasons. This support is based on studies showing that a differentiated curriculum enhances inequalities in achievements, whereas a standardized one, in which students are exposed to academic courses in general and advanced courses in particular, reduces them (Gamoran, 1997). Those studies refer to level differentiation and formal tracking, and most of them suggest that these types of differentiation have negative effects on disadvantaged students concerning their exposure to knowledge, and consequently, their achievements. The negative effect of a differentiated curriculum on the achievements of disadvantaged students has been reported by studies that compared Catholic schools with public schools in the United States. Bryk, Lee, and Holland (1993) and Lee (1993) reported that in the Catholic schools, which were characterized by a restricted curriculum, all students followed the same academic programs, whereas in public schools, which offered many options, course taking was related to social background. These differences produced more equitable achievements in Catholic schools compared with the public schools. Gamoran (1992) reported less between-track inequality in achievement in Catholic schools compared with public schools. He attributed that finding to the demanding curriculum in nonacademic tracks in Catholic schools. The relation between differentiation and inequality in exposure to knowledge was also demonstrated by Stevenson and Baker (1991). Their comparative study found that in centralized educational systems, in which the curriculum is controlled at the national level, the amount of mathematics taught was not related to the characteristics of the students, whereas in less centralized systems with local or provincial control, it has been found to be related to student characteristics.

Several studies that analyzed curriculum reforms also revealed the advantages of a less differentiated curriculum. Gamoran (1996) studied a reform of curriculum standardization implemented in Scotland. The reform was designed to increase the opportunities of all students to take academic courses. He reported that the reform decreased social inequality in course taking and in achievement. A reform implemented in the United States that aimed at upgrading the mathematics curricula for low achievers yielded similar results (Gamoran, 1997). Gamoran and Hannigan (2000) showed that in American schools that restricted the mathematics curriculum to college preparatory courses, all students benefited from taking algebra regardless of their prior achievements. In the Israeli context, Shavit (1990) showed that the participation rate of Arab men in postsecondary education was higher than that of Jewish men of Middle Eastern and North African

origin, the disadvantaged Jewish ethnic groups. Shavit interpreted this pattern as an outcome of the scarcity of vocational secondary education, which is usually a dead end, in the Arab educational system. Vocational education is highly developed in the Jewish system, and it mainly absorbs students from the disadvantaged Jewish ethnic groups. Graduates of most vocational programs have neither the certificates nor the motivation for postsecondary education. Shavit concluded that the scarcity of vocational education in the Arab sector, which likely stems from discrimination, actually benefits Arab students.

Ayalon (2002) showed that the restricted curriculum of Arab schools in Israel, which offer advanced courses mainly in mathematics and sciences, reduced gender inequality in the taking of these subjects. These course-taking patterns are probably related to the fact that Arab female students express more positive attitudes toward mathematics than do their Jewish counterparts (Mittelberg & Lev-Ari, 1999).

Different results were obtained in the study of Ayalon and Gamoran (2000), which was based on the assumption that the effect of differentiation on inequality is context bound. This study provided support for both standardization and differentiation. Ayalon and Gamoran showed that a differentiated curriculum, which includes basic and advanced courses in mathematics and English, enhanced inequality in achievement in the United States but reduced it in Israel. The national examination system in Israel, coupled with the fact that students who take only basic courses can still be eligible for a matriculation diploma, motivates students who take basic courses in mathematics and English to work hard and get good grades. In the United States, students who are assigned to basic courses are aware of their limited educational opportunities and do not see much point in obtaining good grades. This study shows that differentiation could reduce inequality in achievement in the proper context. The importance of context in evaluating curriculum differentiation has also been shown by Gamoran (1997), who compared the previously mentioned curriculum standardization reforms in Scotland with those in the United States. Gamoran reported that although both reforms reduced inequality in achievement, the reform in Scotland was more widely implemented than in the United States. Gamoran assigned this difference to the national examination that exists in Scotland but not in the United States. He concluded that "curriculum reforms without assessment are likely to be weakly implemented and thus to have modest effects" (p. 625).

The rationale of the arguments in favor of a differentiated curriculum as a strategy of reducing educational inequalities is straightforward: Students do better when they can study subjects and levels within subjects that match their abilities and inclinations. The idea that a standardized curriculum may serve as a mechanism of reducing inequality may seem at first to be opposed

to common sense. How can a restricted curriculum that overlooks the differences between students reduce inequalities? Still, most empirical results indicate that standardization, rather than differentiation, reduces educational inequalities.

The advantages of the less differentiated curriculum look less surprising in view of the explanations to that finding. The negative effects of the differentiated curriculum are perceived as an outcome of the channeling of disadvantaged students, by their own choice or by the school staff, to the less attractive and less prestigious programs (Lee, 1993; Lee, Smith, & Croninger, 1997). This pattern is part of the general tendency of educational systems to match the social hierarchy of students and the prestige hierarchy of courses. More valued courses are perceived as appropriate for higher status students who usually do better in school (Apple, 1990). When a system is characterized by level differentiation or formal tracking, the "choices" of some students are, by definition, better than others. Schools invest more resources in academically advanced courses and assign to them their best teachers (Gamoran & Berends, 1987; Ingersoll, 1999). Subsequently, academic courses in general, and advanced courses in particular, produce better educational outcomes (Gamoran, 1992, 1997). In addition, students in nonacademic or basic academic courses are usually aware of the inferiority of their curriculum and the limited opportunities that it offers and consequently have little motivation to work hard and earn high grades (Ayalon & Gamoran, 2000). Hence, the negative consequences of differentiation for underprivileged students may be the result of the stratification of programs. The Israeli findings in the study of Ayalon and Gamoran support that explanation. Although level differentiation in mathematics and English in Israel is hierarchical, the basic courses still provide students with educational and occupational opportunities. Consequently, students take advantage of the differentiated programs and improve their achievements.

Subject differentiation provides the context for testing the implications of curriculum differentiation on educational equality in the absence of "high" and "low" tracks. The analysis of subject differentiation provides a compelling test for the proposed link between the stratified character of most forms of curriculum differentiation and the failure of differentiation to decrease educational inequality. If the stratification of the different courses and programs is indeed the reason for the failure of differentiation to promote educational equality, we can expect different results from subject differentiation, in which subjects are offered at similar levels and open similar educational opportunities. If we find that subject differentiation reduces inequality, we may conclude that a differentiated curriculum is a valid strategy for reducing inequality, provided that it includes courses that are either not stratified or, at least, provides the students with meaningful

opportunities. If, on the other hand, we find that the implications of subject differentiation are not very different from those of the stratified forms of differentiation, we may conclude that something inherent in curriculum differentiation prevents it from operating as a strategy for reducing inequalities. Such a finding would provide additional support for the recommendation of sociologists of education "to do away with curriculum differentiation" (Cohen, 2000, p. 276).

In the following analysis, I examine the outcomes of subject differentiation on gender and socioeconomic inequality in course taking and in achievement in the academic track of Israeli secondary education, which is characterized by substantial subject differentiation. I asked two questions: What are the implications of variations in subject differentiation on inequality in course taking? How are these implications related to achievement?

CURRICULUM DIFFERENTIATION IN ISRAELI SECONDARY EDUCATION

Subject differentiation in the academic track in Israeli secondary education has substantially increased following a reform initiated in the late 1970s. Until this reform, a high school curriculum was composed of structured programs concentrating on specific fields of study: humanities, mathematics and physics, social sciences, and life sciences. All students enrolled in a program studied the same curriculum, and their matriculation exams were composed of the same subjects at the same levels. The matriculation exams are standardized national tests that are taken during the last two years of high school. The matriculation diploma is a prerequisite for higher education and consists of students' grades awarded by their schoolteachers averaged with their scores in the matriculation exams.

The reform eliminated the structured programs. Now the curriculum consists of a core of compulsory subjects (civics, Hebrew, Arabic for Arab students, basic mathematics, basic English, Bible studies, history, and literature) and advanced courses in a variety of optional subjects (e.g., literature, history, physics, chemistry, sociology, French). The basic courses are offered at the one-two-or-three-unit level, and the advanced courses at the four-or-five-unit level. One unit corresponds to 1 weekly hour for 3 years, or 3 weekly hours for 1 year. Students can choose from among the optional subjects (usually one or two, but sometimes more), construct their own programs, and sit for the matriculation exams in the subjects that they have chosen.

The Ministry of Education initiated the reform, which followed the decision of the Israeli parliament (Knesset) to issue the Tuition Free

Secondary Education Act. Prior to the act, which was implemented in 1979, students had to pay for their tuition during their last 3 years in high school. Although tuition was progressive, it had been viewed as limiting the access of underprivileged students to secondary education (Yogev & Ayalon, 1987). The major purpose of the Tuition Free Secondary Education Act was thus to decrease the socioeconomic and ethnic selectivity of secondary education.

The prospects of a significant increase in the heterogeneity of the students in secondary education aroused concerns regarding the capacity of the system to cope with a highly diversified population. The minister of education appointed a committee to find a proper response to the diversification of the population of students. The committee recommended the curricular reform described above, viewing the flexibility and richness of the new program as providing an appropriate educational environment for the diversified population of students (Yogev, 1980). In his presentation of the reform, the minister of education expressed his hope that in the new system, students would be able to find the school subjects that corresponded to their inclinations (Ayalon, 2000). Studying the appropriate subjects was expected to improve the achievements of underprivileged students and eliminate, or at least decrease, educational gaps among ethnic groups and socioeconomic strata.

Most optional subjects have similar formal status in the curriculum. The status of the various subjects is affected, to a large degree, by the policy of the Israeli universities. In calculating the average matriculation scores of applicants, the universities give bonuses to advanced courses. Most advanced subjects get similar bonuses and have a similar status in the diploma.[2] However, although the various subjects are not formally stratified, an informal stratification exists between exact and life sciences (hereafter, sciences) on one side and humanities, social sciences, and foreign languages (hereafter, humanities) on the other. Sciences are very highly regarded by students, parents, and teachers who believe that taking advanced sciences provides the students with better opportunities (Ayalon & Yogev, 1997). Although this belief is a near-myth (Ayalon & Yogev, 1997), students who take advanced sciences are considered the school elite.

Schools tend to be involved in assigning students to advanced sciences classes. Schools control, to a lesser degree, the assignment of students to advanced humanities classes, which are sometimes considered a default option for students who are not able to take advanced sciences. Consequently, students who take advanced courses in different fields of study differ in their educational and social profiles. Specializing in sciences is more common among more able students, boys, children of better educated parents, and students of European or American origin (the privileged Jewish ethnic group in Israel). Less able students, girls, children of less

educated parents, and students of Middle Eastern or North African origin (the disadvantaged Jewish ethnic groups) specialize more often in humanities (Ayalon & Yogev, 1997). In spite of this informal stratification, advanced humanities open the doors of higher education, and the students who take these courses are motivated to work hard and achieve high grades.

A major factor that determines the taking of advanced courses is subject offerings. Schools vary in their offerings of optional subjects. The number and content of subject offerings depend on school resources, size, geographic location, and the ethnic and socioeconomic composition of its students (Ayalon, 1994). Variations in offerings affect variations in course taking. If the supply of courses cannot meet the demand of students, schools obviously cannot follow students' preferences. Discrepancy between supply and demand is more common in sciences because supply of sciences courses is restricted by the availability of laboratories and computers.

This article examines the effect of subject differentiation, represented by the school's subject offerings, on socioeconomic and gender inequality in course taking and in achievement.[3] In Israel, socioeconomic and gender inequality in course taking and in achievement follow patterns similar to those of other educational systems. Research conducted in other educational systems showed that higher status students usually enroll in the more prestigious courses (e.g. Apple, 1990) and have better scholastic achievements (e.g., Breen & Goldthorpe, 1997). In Israel, this is true for elementary school and junior high school (Dar & Resh, 1988), and even for academic secondary education despite the selectivity of the academic track (Ayalon & Gamoran, 2000). Gender inequality in Israeli secondary education is more complicated. Girls score higher than boys in the matriculation examinations. That advantage of girls is attained in a system that is characterized by significant gender inequality in course taking. Similar to other educational systems (e.g. Oakes, 1990), boys take more advanced courses in mathematics and sciences than girls do. Girls are concentrated in advanced courses in the humanities and social sciences (Ayalon & Yogev, 1997).

DATA, VARIABLES, AND METHOD

DATA

The data come from the 1992 matriculation files of the Israeli Ministry of Education and Culture. I am aware that changes may have occurred in the Israeli education system since 1992. However, my purpose is to analyze the link between subject differentiation and inequality, not to describe the current state of the Israeli system. The files contain information on the

education of the student's father and mother, the student's gender, the exams taken by all the students who graduated in that year and took at least one matriculation exam, and the grades received in those exams. The analysis was performed on 18,704 academic-track Jewish students distributed among 198 schools. Because of a high proportion of missing data in parental education, one of the major variables in the study, Arab students were not included in the analysis.[4]

VARIABLES

Dependent Variables

Score. Score is the matriculation average score of the student. Two additional dependent variables represent exam taking, which is a good indicator of course taking because most students take exams in the advanced subjects that they studied. However, a minority of less able students do not take the exams either because their teachers discourage them or because they themselves have decided to postpone taking the exams. Thus, less able students may be underrepresented when exam taking serves as an indicator of course taking. Course taking is represented by two variables: (1) sciences—the number of advanced sciences subjects (physics, chemistry, biology, and computer sciences) in which the student took exams; and (2) humanities—the number of humanities subjects (the most popular are literature, history, geography, and Bible studies), social sciences, and third foreign languages (mainly French and Arabic) in which the student took exams. Most subjects that constitute that category are humanities.

The last two variables are dependent in the analyses of course taking and explanatory in the analyses of achievements.

Explanatory Variables

Student variables. *Gender:* Gender is coded 1 for boys, 0 for girls.

Pareduc: Mean parental education, the average years of schooling of a student's parents, serves as an indicator of socioeconomic background.

English: The number of units in English on which the student was examined. I use this variable as a proxy for ability because the data lack a direct measure for ability (for similar use, see Ayalon & Yogev, 1997). The decision to use it as a proxy for ability is based on the centrality of English in Israeli secondary education and on its power in predicting future achievements. Israeli schools offer English at levels of 3 to 7 units. Because the universities demand at least 4-unit English as a prerequisite, students who are considered suitable for higher education are encouraged to take advanced English upon starting high school, prior to assignment to the

advanced courses, even if they have difficulties in this subject. In addition, students' grades in English in the matriculation examinations and the psychometric test (an aptitude test required by the universities) have proved to be a reliable predictor for their achievements in postsecondary education (Beller & Ben-Shakar, 1981). [5]

Units: The total number of units on which the student was examined. Units depend on students' ability and motivation and on school policy. Usually, more able students take and are examined on more units of study. However, some schools (usually more established ones) encourage students to take many units of study, while others do not. The variable is used only in the equation of achievement, mainly as control.

School variables. The major school variables are the measures of curriculum differentiation.

Nhumanities: Number of advanced humanities, social sciences, and foreign languages that the school offers.

Nsciences: Number of advanced science subjects that the school offers.

Additional school-level variables serve mainly as controls.

Three variables represent school patterns of course taking, which are affected by school curricular policy, which in turn depends, to a large extent, on its ability composition:

Math-mean: Mean mathematics units taken at school.

Units-mean: Mean number of total units taken at school.

English-mean: Mean English units taken at school.

Because of the above-noted special status of English in the curriculum of Israeli secondary education, English-mean is less affected by school's curricular policy than math-mean and units-mean. Consequently, it represents a school's ability composition more than math-mean and units-mean do.

Additional school variables:

Educ-mean: Mean parental years of schooling; serves as a measure of school socioeconomic composition.

Size: Number of students in school who took at least one matriculation exam in 1992. The inclusion of this variable is based on previous research indicating that school size affects course taking and achievements (Lee & Smith, 1997).

Sector: Coded 1 for public general schools (hereafter, general), 0 for public religious schools (hereafter, religious). Previous research shows that the two sectors differ in their curricular policy (Ayalon & Yogev, 1996). I refer to these differences later.

%Male: Percentage of male students in school**.** Variation in school gender composition stem from two sources: (1) the fact that 62 of the 85 religious schools in the study are single-gender; and (2) the differential popularity of vocational education in the community. Because vocational programs in

Israel cater mainly to boys (Yogev & Ayalon, 1991), a strong system of vocational education reduces the percentage of boys in the academic track.

METHOD

The study of the effect of curriculum differentiation on inequality in course taking and in achievement requires two levels of analysis: (1) the student level, which examines the effects of student characteristics on course taking and on achievement, and (2) the school level, which explores the effect of curriculum differentiation on the links of students' characteristics with course taking and with achievement.

The analysis is performed by hierarchical linear modeling (HLM) using the HLM computer program (Bryk & Raudenbush, 1992; Bryk, Raudenbush, & Congton, 1994).

The general student-level model is

$$(\text{outcome})_{ij} = \beta_{0j} + \sum \beta_{kj} X_{kij} + r_{ij},$$

where

(outcome) ij represents the outcome (number of advanced sciences, advanced humanities, or achievement) for student i in school j.

βoj represents the intercept for school j.

β_{kj} represents the slope of the explanatory variable X_k (*gender* and *pareduc* in the equations of course taking; *gender, pareduc, humanities, sciences*, and *units* in the equation of achievement) for student i in school j.

r_{ij} represents the error term for student i in school j.

In hierarchical modeling, the parameters estimated at the student level may become the dependent variables at the school level. In all analyses, the intercepts and the slopes of the explanatory variables are allowed to vary between schools and are modeled as a function of school variables.

The intercepts are modeled as functions of all relevant school variables. The model for the intercept of each of the course taking variables is

$$\begin{aligned}\beta_{0j} = {} & \gamma_{00} + \gamma_{01}(\%\text{male})_j + \gamma_{02}(\text{educ} - \text{mean})_j + \gamma_{03}(\text{size})_j + \gamma_{04}(\text{sec}\,tor)_j \\ & + \gamma_{05}(\text{Nhumanits})_j + \gamma_{06}(\text{Nsciences})_j + \gamma_{07}(\text{math} - \text{mean})_j \\ & + \gamma_{08}(\text{English} - \text{mean})_j + U_{0j}\end{aligned}$$

where

γ_{00} represents the grand mean of the outcome variable.

γ_{01} represents the effect of *%male* on the intercept, γ_{02} represents the effect of *educ-mean*, etc.

U_{0j} represents the error term for school j.

For achievement, the model of the intercept includes one additional variable: *units-mean*.

The slopes of *pareduc, gender, humanities, sciences*, and *units* are modeled as a function of school's course offerings, *sector*, and *English-mean*.

The general model for the slopes is

$$\beta_{1j} = \gamma_{10} + \gamma_{11}(\text{Nhumanits})_j + \gamma_{12}(\text{Nsciences})_j + \gamma_{13}(\text{sector})_j + \gamma_{14}(\text{English} - \text{mean})_j + \text{U}_{1j}$$

where

γ_{10} – represents the average slope for variable X_1.

γ_{11} represents the effect of *Nhumanities* on the slope, etc.

U_{1j} represents the error term of the slope of variable X_1 at school j.

The inclusion of *Nhumanities* and *Nsciences* in the models of the slopes is straightforward. *Sector* is included in the equations of the slopes because we know from previous research that the status of the various school subjects varies between the religious and general sectors (Ayalon & Yogev, 1996). *English-mean* is included in the equations for a partial control for school's ability composition. This control reduces the probability that possible links between course offerings and the dependent variables are due to selection. I considered the inclusion of additional school variables to the equations of the slopes in the various models. The effect of most variables was small and insignificant, and because there was no theoretical justification for their inclusion, I omitted them to get more parsimonious models.

All student-level explanatory variables are centered around the school mean. Thus, the score of every student represents his or her relative position in his or her school. The means of the various schools are introduced into the equations as predictors of the intercept (see Bryk & Raudenbush, 1992).

The school-level continuous variables are centered around their grand means, and the dummy variables retain their original form. Following this procedure, the intercept reflects the mean level of course taking or achievement of an average female student in an average religious school. The slopes represent the link between student's characteristic and his or her advanced sciences courses, advanced humanities courses, and achievements in a religious school with average subject offerings, and average level of English units.

RESULTS

THE DISTRIBUTION OF KNOWLEDGE

The descriptive statistics and the correlations for the student and the school variables are presented in Table 1. The student variables show that *score* is positively correlated with parental education and with sciences taking; a

Table 1. Descriptive statistics and correlations

	Student Variables ($N = 18{,}704$ students)							
	Gender	Pareduc	Humanities	Sciences	English	Units	Mean	SD
Average matriculation score (*score*)	−0.06	0.33	−0.03	0.44	0.51	0.56	74.91	9.69
Gender—male		0.09	−0.18	0.17	0.03	−0.02	0.41	0.49
Parental education (*pareduc*)			−0.06	0.24	0.33	0.22	13.27	3.05
N Humanities taken (*humanities*)				−0.49	−0.16	0.34	0.90	0.85
N Sciences taken (*sciences*)					0.32	0.51	0.58	0.68
N English units taken (*English*)						0.66	4.28	1.21
N total Units taken (*units*)							3.52	1.21

Note: Because of the large *N*, all correlations are significant at the $p < 0.05$ level.

	School Variables ($N = 198$ schools)									
	Size	Sector	%Male	Nhumanities	Nsciences	English-mean	Math-mean	Units-mean	Mean	*SD*
Mean parental education (*educ-mean*)	0.28*	0.02	0.01	0.37*	0.42*	0.45*	0.44*	0.45*	12.82	1.73
Size		0.50*	0.00	0.73*	0.59*	0.43*	0.35*	0.08	94.54	90.85
Sector–general			−0.05	0.37*	0.27*	0.10	−0.06	−0.44*	0.57	0.50
% Male students				−0.12	−0.01	−0.13	−0.05	−0.11	0.42	0.30
N humanities offered (*Nhumanities*)					0.64*	0.56*	0.46*	0.28*	4.13	2.19
N sciences offered (*Nsciences*)						0.63*	0.61*	0.83*	2.31	1.19
Mean number of English units taken (*English-mean*)							0.81*	0.74*	3.92	0.87
Mean number of math units taken (*Math-mean*)								0.65*	3.13	0.81
Mean Number of total units taken (*Units-mean*)									23.41	5.04

*$p < 0.05$.

larger number of advanced science subjects, total units, and English units is related to higher achievements. Number of advanced humanities is not related to *score*. Parental education is related to both achievement and course taking: Children of better educated parents take more advanced sciences courses, more English units, and more total units, and have better achievements. The number of courses taken in humanities is not related to parental education. The distinction between taking advanced humanities and advanced sciences is manifested by the substantial negative correlation (-.49) between *sciences* and *humanities*.

The correlations between the school-level variables shed light on some interesting aspects of the distribution of knowledge in Israeli high schools. School socioeconomic composition, represented by *educ-mean* (mean parental education), is positively and substantially correlated with the offering of advanced subjects. The correlation between *Nhumanities* and *Nsciences* (.64) indicates that offering advanced sciences is related to offering advanced humanities. In other words, schools do not choose between specializing in humanities or sciences, and they offer either advanced courses in both fields of study or a restricted curriculum. Another significant finding is the difference between the two sectors. General schools offer more advanced subjects than public religious schools in both fields of study. However, the negative correlation between *units-mean* and *sector* (-.44) shows that, on average, students in religious education take more units of study. This is a result of the policy of religious schools, which demand that most students take advanced courses in Jewish studies in addition to advanced sciences and nonreligious humanities (Ayalon & Yogev, 1996).

DIFFERENTIATION AND COURSE TAKING

The effect of curriculum differentiation on gender and socioeconomic inequality in course taking is presented in Table 2. The table includes two models: one for sciences, and one for humanities.

The power of the model in explaining the between-school variance in course taking is impressive. It explains over 70% of this variance of both sciences and humanities. School characteristics that affect the intercept (*educ-mean, Nsciences, Nhumanities, math-mean, and %male for sciences, and educ-mean, Nsciences, Nhumanities, %male, size*, and *sector* for humanities) appear as major determinants of patterns of course taking.

Gender Inequality

The gender coefficient in the *sciences* model (0.016) implies that in an average religious school, no significant gender difference exists in sciences

Table 2. The effects of student and school characteristics on course taking of sciences and humanities: results of HLM analysis

A. Regression coefficients	Sciences	Humanities
Effects on the Intercept		
Average intercept	0.468**	1.609**
% male students	0.078**	−0.188*
Mean parental education	0.025**	0.041**
Size	0.000	−0.002*
Sector—general	−0.021	−0.0917**
N humanities offered	−0.031**	0.094**
		−0.101**
N sciences offered	0.119*	
Mean math units taken	0.157**	0.124
Mean English units taken	−0.030	0.086
Effects on the Gender Slope		
Average intercept	0.016	−0.184**
Sector—general	0.130	−0.106
N humanities offered	0.005	−0.002
N sciences offered	0.081**	−0.022
Mean English units taken	0.001	−0.045*
Effects on Parental Education Slope		
Average intercept	0.017**	0.006
Sector—general	0.015**	−0.021**
N humanities offered	0.002	−0.002
N sciences offered	0.005**	−0.004
Mean English units taken	0.004	0.001
Effects on *N* English Units Taken Slope		
Average intercept	0.124**	0.082**
Sector—general	0.011	−0.075**
N humanities offered	−0.008*	0.007
N sciences offered	0.044**	−0.024**
Mean English units taken	0.032**	−0.027

*$p < .0.10$.

**$p < 0.05$.

B. Summary statistics for the HLM models

Intraclass correlation coefficient (proportion of the between-school variance in the outcome)		
	Sciences	Humanities
	0.13	0.46
Proportion of Variance Explained by the Models		
	Sciences	Humanities
Intercept	0.73	0.74
Gender slope	0.58	0.15
Parental education slope	0.46	0.38
N English units taken slope	0.62	0.29
Outcome variance	0.15	0.10

taking. This finding, which may look surprising in light of the documented gender differences in sciences taking in Israeli secondary education, is a consequence of the status of sciences in religious education. Because of the centrality of Jewish studies in religious education, sciences are less valued, less selective, and less male oriented than in general education (Ayalon & Yogev, 1996). To estimate the gender gap in general education, we add the coefficient of *sector* (0.130) to the *gender* coefficient. The result, 0.146, brings us to the usual picture of boys taking more advanced sciences than girls.

The effect of *Nsciences* on the gender slope in the sciences model implies that, all other things being equal, each additional sciences offering increases the advantage of boys by 0.081. To illustrate, when sciences offerings in a general school exceed the average by one standard deviation (1.19), the advantage of boys increases to 0.242 (0.146+0.081*1.190).

The results for humanities are different. The gender slope in the humanities model, which is negative and statistically significant, implies that girls take more humanities courses than boys. Sector and course offerings do not affect that pattern.

The effect of *Nsciences* on the gender gap in course taking of sciences and the absence of any significant effect of course offerings on that gap in taking humanities suggest that inequality in sciences taking is more sensitive to school curriculum than inequality in humanities taking. Increased sciences offerings are associated with increasing concentration of boys in advanced sciences, whereas the advantage of girls over boys in humanities taking is much less dependent on offerings. Gender inequality in sciences taking is more sensitive to all school characteristics included in the analyses than inequality in humanities taking. This is revealed by the difference in the power of subject offerings, sector, and mean English units in explaining the between-school variance of the gender slope in the two models: 58% in the sciences equation and only 11% in the humanities equation.

Socioeconomic Inequality

The positive significant effect of *pareduc* in the sciences model implies that better parental education is associated with taking more advanced sciences. *Nsciences* has a positive effect on this slope, indicating that increased sciences offerings are accompanied by increasing concentration of children of better educated parents in advanced sciences courses.

There is no significant link between parental education and humanities taking in an average religious school (the slope of *pareduc* in the humanities model is small and insignificant), but in an average general school, better parental education is linked to a reduction in humanities taking (0.006–0.021 = –0.015). Thus, in general education, advanced humanities are

more likely to be studied by children of less educated parents. Similar to gender inequality in sciences taking, socioeconomic inequality in humanities taking is not related to either sciences or humanities offerings.

Ability Inequality

More English units are related to taking advanced sciences, implying that, as expected, more able students (recall that English serves as a proxy for ability) are more likely to take advanced sciences. The picture is more complicated for humanities. In an average religious school, English has a positive effect on humanities taking (the slope of English in the humanities model is 0.082). When we add the coefficient of *sector* (–0.075) to the slope of English, we get a small value (0.007), implying that in general education, the taking of advanced humanities is only marginally related to ability. The negative effect of *Nsciences* on the English slope in the humanities model suggests that increase in the number of sciences offerings is related to decrease in the scholastic ability of students who take advanced humanities. The availability of advanced sciences courses thus decreases the selectivity of humanities courses.

Some Conclusions on Inequality in Course Taking

If we sum the findings presented in Table 2, we can conclude that an increase in curriculum differentiation is related to increasing gender and socioeconomic differentiation in course taking. Increasing sciences offerings is related to an increase in gender and socioeconomic inequalities in sciences taking: Boys and children of better educated parents increase their concentration in advanced sciences courses. Interestingly, course offerings only marginally affect inequalities in humanities taking. It seems that the assigning of students to sciences courses is a dynamic process that depends on the school's curriculum, whereas humanities courses absorb their traditional clientele almost independently of course offerings.

The findings on the relation between curriculum differentiation and the concentration of boys and of socially privileged students in sciences courses may be viewed as the desired outcome of differentiation. Differentiation is expected to help the students enroll in courses that are compatible with their inclinations and preferences. The increase in curricular segregation that accompanies an increase in curriculum differentiation may be viewed as indicating that students are indeed studying the courses that correspond to their inclinations. We should recall, however, that the desired outcome of the Israeli reform (i.e., curriculum differentiation in order to get a good

matching between students and courses) was improving the achievement of disadvantaged students and narrowing achievement gaps. We look into this issue in the following section.

DIFFERENTIATION AND ACHIEVEMENT

The analyses of achievement are presented in Table 3. In the first column, which pertains to the whole sample, we can see that course offerings have no effect on the level of achievement (the intercept), but they have substantial effects on both gender and socioeconomic inequality in achievement (the slopes). The major school variables that affect *score* are sector, social composition, gender composition, and mean English and mathematics units, which partly represent ability composition. Better educated parents, a higher proportion of female students, the taking of more English and mathematics units, and affiliation with the public religious sector are related to higher average achievements in school. These characteristics explain a substantial proportion—78%—of between-school variance in *score*.

Gender Inequality

The gender slope (− 1.254) suggests that girls have better average achievements than boys, but it does not reach statistical significance. Each additional sciences offering increases the advantage of girls by about 0.60 points. To illustrate, in a school that offers the average number of sciences subjects, girls score about 1.3 points higher than boys. Other things being equal, when a school's sciences offerings are one standard deviation above the mean, the advantage of girls increases to about 2 points (− 1.254–0.600*1.190 = 1.968). Similar to their effect on gender inequality in course taking, the effect of humanities offerings on gender inequality in achievement does not reach statistical significance. School variables explain a substantial proportion, 45%, of the variance of the gender slope. Because *Nsciences* is the major variable in the equation of the gender slope, we can conclude that gender inequality in achievement is significantly associated with sciences offerings.

We can offer two explanations, not necessarily mutually exclusive, for the effect of sciences offerings on girls' advantage in achievement. The first explanation focuses on girls and their use of the opportunities provided in sciences-oriented schools. We have already seen that an increase in sciences offerings is related to an increase in the enrollment of boys, not of girls, in sciences courses. It is possible that the selective group of girls who do take advanced sciences in sciences-oriented schools have particularly high achievements.

Table 3. The effects of student and school characteristic on average grade in the matriculation exams: results of HLM analysis

A. Regression coefficients

	All Students ($N = 18,074$ students; 198 schools)	Girls ($N = 10,856$ students; 169 schools)	Boys ($N = 7,850$ students; 165 schools)
Effects on the Intercept			
Average intercept	74.100**	74.035**	73.208**
% male students	−4.498**	−4.657**	−2.622
Mean parental education	1.338**	1.109**	1.345**
Size	0.004	−0.000	0.007**
Sector—general	−3.473**	−2.046**	−3.745**
N humanities offered	−0.039	0.121	−0.026
N sciences offered	0.191	0.258	0.333
Mean math units taken	4.050**	5.117**	3.509**
Mean English units taken	2.621**	1.587**	2.626*
Mean total units taken	−0.291	−0.176	−0.270
Effects on Gender Slope			
Average intercept	−1.254		
Sector—general	0.115		
N humanities offered	0.047		
N sciences offered	−0.600**		
Mean English units taken	−0.590**		
Effects on Parental Education Slope			
Average intercept	0.283**	0.281**	0.310**
Sector—general	0.006	0.086	−0.111
N humanities offered	0.043**	0.030	0.068**
N sciences offered	0.025	0.013	0.022
Mean English units taken	0.070	0.049	0.089
Effects on *N* Humanities Taken Slope			
Average intercept	−0.100	0.075	−0.439
Sector—general	1.643**	1.101	2.328**
N humanities offered	0.231*	0.138	0.184
N sciences offered	−0.409	−0.180	−1.147**
Mean English units taken	−1.446**	−1.444	−0.747
Effects on *N* Sciences Taken Slope			
Average intercept	2.429**	2.053**	3.158**
Sector—general	2.180**	1.876**	2.009*
N humanities offered	0.222	0.214	0.209
N sciences offered	−0.278	−0.199	−0.976*
Mean English units taken	−1.685*	−2.413**	−0.188
Effects on Total *N* Units Taken Slope			
Average intercept	0.685**	0.772**	0.579**
Sector—general	−0.172	−0. 213	−0.069
N humanities offered	0.041	0.013	−0.044
N Sciences offered	0.004	−0.048	0.085
Mean English units taken	0.370**	0.292	0.301**

Table 3. ***(Continued)***

A. Regression coefficients

	All Students (N = 18,074 students; 198 schools)	Girls (N = 10,856 students; 169 schools)	Boys (N = 7,850 students; 165 schools)
Effects on N English Units Taken Slope			
Average intercept	1.771**	2.087**	1.534**
Sector—general	− 0.506	− 0.503	− 0.633
N humanities offered	0.027	0.094	− 0.145
N sciences offered	0.116	0.021	− 0.355
Mean English units taken	0.370**	2.087**	0.924**

*$p < 0.10$. **$p < 0.05$.

B. Summary statistics for the HLM models

Intraclass correlation coefficient (proportion of between-school variance in the outcome)

All Students	Girls	Boys
0.34	0.35	0.33

Proportion of variance explained by the model

	All Students	Girls	Boys
Intercept	0.78	0.81	0.73
Gender slope	0.45	–	–
Parental education slope	0.52	0.20	0.64
N humanities taken slope	0.21	0.12	0.27
N sciences taken slope	0.18	0.20	0.21
Total N units taken slope	0.67	0.00	0.28
N English units taken slope	0.00	0.00	0.00
Outcome variance	0.38	0.38	0.43

The second explanation focuses on boys and suggests that in sciences-oriented schools, some boys may be taking the wrong advanced courses. Boys whose talents and inclinations make them the appropriate candidates for advanced sciences probably take these courses even when sciences offerings are limited. A rich sciences curriculum may attract a different type of boys: less mathematically oriented students with less interest in sciences who enroll in these courses because they are expected, and perhaps encouraged, to make the "right" choice for their gender. This probably increases the negative selectivity of male students who enroll in humanities courses. This mismatch between students and courses may have a negative impact on the

average achievement of boys, thus increasing the gender gap in favor of girls.

To test the two explanations, I conducted separate analyses for the two genders (columns 2 and 3 in Table 3). Both explanations suggest that sciences offerings are linked to *score* via their effect on the returns on the taking of advanced courses (i.e., on the sciences and humanities slopes). According to the first explanation, *Nsciences* is expected to increase the returns on advanced sciences for girls—namely, to have a positive effect on the sciences slope in the equation pertaining to girls. The second explanation, which implies that *Nsciences* decreases the returns on advanced courses for boys, predicts a negative effect of *Nsciences* on the sciences and the humanities slopes in the equation of boys.

The effects of *Nsciences* on the slopes contradict the first and support the second explanation. The effect of *Nsciences* on the sciences slope is negative for both genders, thus refuting the first explanation, which predicted a positive effect of *Nsciences* on the sciences slope for girls. However, the negative effect does not reach statistical significance for girls, whereas it is greater in magnitude (-0.976 vs. -0.199) and statistically significant (at the $p<0.10$ level) for boys. The sciences slope for boys is 3.158, indicating that in a religious school with average offerings and an average number of English units, each additional sciences subject improves the achievement of a male student by about 3 points. The effect of *Nsciences* on the sciences slope (–0.976) implies that for boys, each additional sciences offering decreases the returns on advanced sciences by one point. Thus, boys have poorer achievements in sciences-oriented schools. As suggested, this may result from wrong choices: Boys may be taking advanced sciences without being really interested in this field of study, or they may be taking several sciences courses simultaneously, which is difficult to cope with. This, however, is only part of the story. *Nsciences* is linked to boys' achievements also via its effect on the slope of humanities. The humanities slope is statistically insignificant for both genders, but *Nsciences* has a negative significant effect on that slope only for boys. The negative effect of *Nsciences* on the humanities slope suggests that for boys, sciences offerings are related to a reduction in the returns on advanced humanities. It seems, thus, that in sciences-oriented schools, there is an increase in the negative selection of boys to advanced humanities classes. In other words, in schools that provide numerous sciences offerings, advanced humanities absorb boys who, because of lower scholastic ability, are not considered appropriate clients for sciences courses despite their gender. The reduction in the returns on both sciences and humanities taking in sciences-oriented schools suggests that in those schools, there may be indeed a mismatch between male students and courses.

It is interesting to note that whereas *Nsciences* has a significant effect on the returns on humanities taking for boys, the offering of humanities has no effect on the returns on the taking of that field of study. This is an additional sign of the relative marginality of the humanities as a curricular option for male students. Sciences offerings affect the returns on humanities more than humanities offerings do because advanced humanities serve, to a significant degree, as the default option for male students who cannot take advanced sciences. Subsequently, the educational profile of boys who take advanced humanities depends to a significant degree on the offering of advanced sciences.

Socioeconomic Inequality

Socioeconomic inequality in achievement is represented by the slope of *pareduc*. The equation of that slope in the model for the whole sample (column 1) shows that children of better educated parents have higher achievements. Humanities offerings are related to increasing social inequality in achievement. On average, each parental year of schooling increases achievement by 0.283 points. Each humanities offering further increases the advantage of children of better educated parents (by 0.043). The separate analyses show that this pattern is true mainly for boys (*Nhumanities* coefficient in the equation of *pareduc* in the girls' model is small and statistically insignificant).

How can we explain the link between humanities offerings and the increase in socioeconomic inequality in achievement among boys? One possible explanation is that increase in humanities offerings increases the enrollment of lower status male students in humanities courses. These students may be lacking the cultural capital that is needed for coping with the humanities and social sciences. This speculation receives some support from a separate analysis of course taking for both genders (unreported). The analysis showed that increased humanities offerings increase the enrollment of lower status boys (but not girls) in advanced humanities courses. That issue certainly deserves further research. The main point is, however, that increased curriculum differentiation is accompanied by increasing social inequality in achievement.

DISCUSSION

Can curriculum differentiation serve as a strategy for reducing educational inequalities? The negative effects of the differentiation between "high" and "low" tracks or advanced versus basic courses is well documented. These

negative effects are usually assigned to the hierarchical nature of these forms of differentiation. Based on the assumption that a nonhierarchical form of differentiation may produce different results, I examined the implications of a different form of differentiation, subject differentiation, in which students choose from a variety of advanced courses that open similar educational opportunities. This is a major form of curriculum differentiation in Israeli secondary education.

The results show that despite its unique characteristics, subject differentiation produces results similar to other forms of differentiation. Increase in curricular options is related to an increase in gender and social inequality in achievement. This finding implies that a rich curriculum with a variety of courses that open educational opportunities do not decrease inequality in achievements. What prevents it from achieving that objective?

Based on the present findings, we can suggest that the outcomes of subject differentiation are a consequence of the pattern of matching between students and programs. A larger number of subject offerings is associated with an increase in curricular segregation according to gender and socioeconomic background. This suggests that in making curricular decisions, students, teachers, and counselors may be following common perceptions on the "appropriate" choice for each social category and not necessarily the talents and inclinations of the individual students. In other words, curricular decisions may be made on a group basis and not on an individual one.

Consequently, in sciences-oriented schools, boys and socially privileged students may be choosing advanced sciences because it is considered the "right" choice for their social category. Girls and lower status students in sciences-oriented schools do not exploit the opportunity to study advanced sciences because it is not the "right" choice for their social category. The negative effect of curriculum differentiation on equality in achievements suggests that membership in a social category is not necessarily the right criterion for matching between students and school subjects. A differentiated curriculum seems to be producing a mismatch between students and courses, particularly for boys, whose achievements are significantly related to course offerings. Schools seem to be less preoccupied with the assignment of girls to the appropriate courses. Girls keep their advantage over boys in their "traditional" areas, almost unaffected by variations in course offerings. The relative independence of the course-taking patterns of girls on course offerings operates in their favor: A differentiated curriculum is related to lower achievements of boys but not of girls.

Subject differentiation thus does not seem to be the proper strategy for reducing inequality in achievement. It seems that curriculum differentiation may reduce inequalities only in an ideal world in which students can follow their personal inclinations in choosing courses. Because the choice of

courses is restricted by stereotypes on the right matching between students and courses, subject differentiation, similarly to other, more hierarchical forms of differentiation, ends in increasing rather than reducing inequality in achievement.

Part of the interpretation of the present findings is based on the informal stratification of the sciences and the humanities in Israeli secondary education. One may argue that the present findings are not applicable to programs that lack any hierarchy, formal or informal. But is a completely nonstratified differentiated curriculum really possible? I would like to speculate that a hierarchy, either formal or informal, is a necessary by-product of the differentiated curriculum. The matching between students and courses is based to a large extent on the typecasting of subjects as being masculine or feminine, or as appropriate for members of different socioeconomic strata or different ethnic groups. Concentration of higher status, ethnically privileged, or male students in specific subjects enhances their prestige. This prestige in turn attracts more members of the privileged social categories to these subjects (Apple, 1990). This vicious circle eventually creates a mismatch between students and subjects, which, according to the present findings, produces a link between curriculum differentiation and inequality in achievement.

The Israeli policy makers initiated the reform of increasing curriculum differentiation, hoping that a differentiated curriculum, by enabling students to choose school subjects according to their inclinations, will promote educational equity. The present findings suggest that subject differentiation does not seem to be the proper prescription for educational systems struggling with problems of inequality.

I wish to thank Yossi Shavit and the anonymous reviewers of Teachers College Record for their helpful comments.

Notes

1 Powell, Ferrar, and Cohen (1985) referred to this type of differentiation as *vertical curriculum*.

2 The universities give a bonus of 10 points to each subject that was taken at the 4 -unit level and 20 points for each 5-unit level subject, provided that the students passed the exam. Mathematics and English receive a bonus of 12.5 points for the 4-unit level and 25 points for the 5-unit levels.

3 As noted, ethnic origin is an additional source of inequality in the Israeli educational system. Jews of European or American origin, the advantaged Jewish ethnic group, have better educational achievements than Jews of North African or Middle Eastern origin, the disadvantaged Jewish ethnic group. Unfortunately, the data do not include information on the ethnic origin of Jewish students, and I am not able to refer directly to that source of social inequality in Israel. However, parental education and ethnic origin are significantly intercorrelated, and

mutual control marks parental education as central in shaping educational achievements (Ayalon & Shavit, 2004). Because of limitations of the data, I also could not analyze inequality between Arab and Jewish students. I refer to that issue later.

4 The omission of Arab students does not affect the relations between curriculum differentiation and inequality in the schools that are included in the analysis. The Jewish and Arab educational systems are completely segregated, and almost all Arab students study in Arab schools. The omission of the Arab students from the analysis does not bias, thus, the results regarding the Jewish system. It is important to note that control for parental education significantly reduces the effects of nationality (Arab vs. Jewish) on educational achievements (Ayalon & Shavit, 2004).

5 One possible concern regarding the use of number of English units as a proxy for ability is the possibility of gender differences in achievements in languages. Previous research and the present findings show that girls tend to take advanced courses in languages more than boys do. This advantage of girls suggests that the use of English as a proxy might overestimate the scholastic ability of girls and thus bias the results. The advantage of girls in taking advanced languages does not hold, however, for English. As noted, students who are viewed as proper candidates for postsecondary education are assigned to advanced English courses even when achievements in that language are modest. The data show that the percentage of boys who took the highest level courses in English is almost equal and even a little higher than that of girls. Gender distribution among the various English levels is as follows: 7.5% of the girls and 7.0% of the boys took Basic English; 33.3% of the girls and 30.0% of the boys took 4-unit English; and 59.2% of the girls and 63% of the boys took 5-or-more-unit English.

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