

# Stratification and the formation of expectations in highly differentiated educational systems

Claudia Buchmann<sup>a,\*</sup>, Hyunjoon Park<sup>b</sup>

<sup>a</sup> Department of Sociology, The Ohio State University, 110 Townshend Hall, 1885 Neil Avenue Mall, Columbus, OH 43210, United States

<sup>b</sup> Department of Sociology, The University of Pennsylvania, Philadelphia, PA 19104, United States

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## Abstract

Highly differentiated educational systems constitute a common organizational form of schooling in which youth are sorted into secondary schools that stress either vocational or academic training and between which movement is rare. With standardized data from five countries, we illuminate two important stratification processes in these systems: (1) social origins strongly influence students' placement into different types of schools with high SES students most likely to attend academically oriented schools that provide a direct pathway to the university. (2) The types of schools students attend largely determine their educational and occupational expectations and impart a strong dose of realism in these expectations. Thus, the institutional arrangements of highly differentiated educational systems perpetuate socioeconomic inequalities quite early in the life course, well before students complete their education and enter the labor force.

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In the past decade or so, our understanding of the differences among educational systems and their impact on stratification processes in industrialized societies has advanced substantially. Several landmark studies have shown that institutional variations in educational systems lead to different processes whereby youth are sorted into educational trajectories and subsequent occupational destinations (Erikson & Goldthorpe, 1992; Kerckhoff, 1993; Müller & Karle, 1993; Shavit & Müller, 1998). The focus of much of this comparative research has been on milestones at the end of formal schooling, such as

educational attainment, entry into the first job. Fewer studies examine how institutional variations in educational systems shape youths' experiences while they are still in school. Yet long before young adults transition from school to the labor market, the structure of educational systems may serve to channel students' choices and shape their views of their future (Kerckhoff, 2001).

This paper looks earlier in the life course than most prior research in order to understand how the institutional arrangements of what we call "highly differentiated" educational systems impact stratification processes and the formation of students' expectations about their future. In highly differentiated educational systems, students are sorted at an early age into secondary school pathways that differ greatly in curricula and between which movement is rare (Kerckhoff, 2000:456).

\* Corresponding author. Tel.: +1 614 247 8363;  
fax: +1 614 292 6687.

E-mail address: [Buchmann.4@sociology.osu.edu](mailto:Buchmann.4@sociology.osu.edu) (C. Buchmann).

Secondary schools tend to stress either vocational or academic training and students' future options for attending university or attaining more advanced vocational training are largely determined by the type of school they attend. Highly differentiated secondary school systems are far more prevalent in the world today than we might expect on the basis of the limited attention they have received in prior research. In fact, differentiation between educational pathways at the secondary level in some form is prevalent in most European countries.<sup>1</sup>

We focus on stratification processes and the formation of students' educational expectations in five countries with highly differentiated secondary school systems: Austria, the Czech Republic, Germany, Hungary, and the Netherlands. We predict that in all five countries, students' placement into different educational trajectories is strongly determined by social origins, such that students of high socioeconomic status are most likely to enroll in high-status, academically oriented secondary schools that offer the most direct pathway to a university education. We further predict that students' placement into different secondary school types impacts their expectations about the future, since the type of school students attend sends them a clear message about the kinds of educational and occupational opportunities that will be open to them. As a result, students' expectations in highly differentiated systems should be more realistic than those of students in undifferentiated educational systems, where the general nature of secondary schooling does little to constrain their options until much later in life. While prior research has provided indirect evidence for the importance of school placement on students' aspirations and expectations in highly differentiated educational systems (Buchmann & Dalton, 2002; Yuchtman & Samuel, 1975), ours is the first study to examine whether the types of secondary schools students attend directly impact their educational and occupational expectations using systematic, comparative data for several countries.

We utilize standardized, cross-national data from the 2003 Program for International Student Assessment

(PISA) to examine how students' socioeconomic status (SES) impacts their school placement net of other factors and, in turn, how their school placement impacts students' educational and occupational expectations. We find that in all five countries students from high SES backgrounds are substantially more likely to attend high-status, academically oriented schools and students from low-SES backgrounds are more likely to attend lower status, vocationally oriented schools. Their placement in different educational trajectories strongly determines students' educational and occupational expectations, net of other factors, and imparts a strong dose of realism into these expectations. These findings illuminate how the institutional arrangements in highly differentiated educational systems produce a specific pattern of stratification that serves to perpetuate socioeconomic inequalities quite early in the life course, well before students complete their education and enter the labor force.

In light of the changing economic and demographic contexts of European societies, this particular pattern of stratification in highly differentiated educational systems has important implications for national development and social inequality. Highly differentiated educational systems may have been well suited to economies that did not require large numbers of highly educated workers. But it is questionable whether educational systems that sort a large segment of the population into lower status, vocationally oriented schools are well aligned with today's information and technology based global economy. The [Commission of the European Communities \(2006\)](#) estimates that by 2010 half of the newly created jobs in Europe will require tertiary-level qualifications; only 15 percent of all new jobs will require low-skilled workers. It is clear that national economic development has become increasingly dependent on the volume and quality of human capital of a nation's population (see Coulombe, Tremblay, & Marchand, 2004).

Moreover, given the rising demand for skilled workers in the global economy individuals who are sorted into vocational schools at early ages may face grim economic prospects. As we demonstrate in this paper, socioeconomically disadvantaged groups are more likely to be sorted into educational trajectories that preclude higher education. Other evidence indicates that immigrant children, who tend to come from economically disadvantaged backgrounds, are also more likely to be sorted into vocational schools in highly differentiated educational systems (Kristen & Granato, 2007; Park & Kyei, 2008). As immigrant populations in many European countries continue to grow (Haug, Compton, & Courbage, 2002), the sorting of immigrant and other

<sup>1</sup> Of the 40 countries participating in the PISA survey used here, 18 can be classified as having highly differentiated school systems in that they contain at least 2 (but usually 3 or 4) different streams of secondary schooling: Albania, Austria, Bulgaria, Chile, the Czech Republic, FYR Macedonia, Germany, Greece, Hungary, Ireland, Israel, Japan, Korea, Latvia, Mexico, the Netherlands, Peru, Poland, Portugal, Russia, Switzerland and Thailand. In most of these countries the streaming occurs at or after the age of 15. For example, 97 percent of the student sample in Switzerland is still in general secondary school (OECD, 2005a, Annex B). Because PISA is a study of 15-year olds, we limit our study to countries where students are placed into different secondary school trajectories before 15 years of age.

socioeconomically disadvantaged children into lower status, vocationally oriented educational pathways may serve as a major barrier to class mobility for large segments of the populations in European nations.

## 1. Prior research

### 1.1. Institutional context and educational and occupational destinations

Comparative research on educational and occupational destinations shows how differently structured educational systems lead to differences in the processes whereby youth are sorted into educational trajectories and subsequent occupational destinations (Erikson & Goldthorpe, 1992; Müller & Karle, 1993; Shavit & Blossfeld, 1993; Shavit & Müller, 1998). In an early study, Müller, Luttinger, König, and Karle (1989) compared nine European countries in terms of the absolute magnitude of the relationship between social origins, educational attainment and later class destinations. They found small differences between these countries in the extent to which social origins affect educational attainment or occupational destinations, but large differences in the effect of schooling on occupational class (see also Erikson & Goldthorpe, 1992).

Müller and Karle (1993) then showed that national variations in the organization of educational systems impact variations in the educational attainment of children from different class backgrounds. Their analysis of men's attainment in nine countries found that sons of service-class parents continually increased their share among survivors at each educational transition in all countries, but that countries differed in the extent to which the most advantageous educational credentials are distributed to these classes. Although they did not demonstrate it empirically, they argued that the cross-national variation in this process was likely due to "differences in the supply of education in different national educational systems and in the channeling of the student population through the different educational institutions and transitions" (19, emphasis added).

Researchers interested in mobility processes and occupational destinations have developed complex schemes for classifying national educational systems (see e.g., Allmendinger, 1989; Maurice, Sellier, and Silvestre, 1982; Maurice, Sellier, and Silvestre, 1986). Most recently, in their comparative study of school-to-work transitions, Müller and Shavit (1998) combined these prior classifications and developed hypotheses regarding the association between educational qualifications and occupational attainment. They summarized

three institutional features of educational systems that should be most influential for this relationship: *standardization* is the degree to which the quality of education is standardized nationwide; *stratification* relates to the degree and type of tracking at the secondary level; *vocational specificity* relates to the proportion of students leaving the educational system with specific skills. Stratification and vocational specificity are closely related concepts; educational systems that incorporate specific streams for vocational training tend to be more stratified because there is a clear distinction between academic and vocational trajectories and students generally attend different schools depending on the type of education they expect to receive. The clarification of these dimensions of institutional variations of educational systems has been and will continue to be extremely useful to comparative scholars who want to understand educational systems' capacity to structure the flow of young people into schools in childhood and then out of schools and into status positions in adulthood (Kerckhoff, 2001). Because of the lack of clarity regarding the term "stratification" as a process versus an outcome, in this paper we use the term "differentiation" rather than "stratification" to describe the degree and type of tracking between schools that occurs at the secondary level.<sup>2</sup>

In highly differentiated educational systems, students are sorted at an early age into schools that prepare them for different educational and occupational trajectories. Once in a particular type of school, the opportunity to change to a different type is limited. The German educational system is perhaps the clearest and most-studied case of a highly differentiated system. After four years of school, students are sorted at about the age of 10 into three different kinds of secondary schools. The *Gymnasium* is the highest status trajectory. Successful gymnasium students who pass the *Abitur* are granted access to a university education. The *Realschule* offers a general curriculum stressing the academic, vocational, and business skills needed for a range of skilled blue-collar occupations and business apprenticeships. *Realschule* students can attempt to enter the *Gymnasium* after the completion of grade 10, but few actually do so. The *Hauptschule* provides the minimum compulsory secondary education through ninth or tenth grade. Other European countries also track students into differ-

<sup>2</sup> The term "highly stratified educational system" can be misleading in that it implies that countries that practice between-school tracking at the secondary level are more stratified than those that do not practice such between-school tracking. But whether the streaming of students into different schools actually leads to greater stratification is a question to be assessed with empirical evidence.

ent secondary schools at a relatively early age. Along with Germany, we examine the cases of Austria, the Czech Republic, Hungary, and the Netherlands, all of which have highly differentiated secondary schooling. While these countries vary in how they enact such differentiation (see [Appendix A](#) for details), we expect that our analyses will reveal more similarities than differences in the stratification processes of these five highly differentiated educational systems.

In contrast to highly differentiated systems, some countries have educational systems with little differentiation of curricula or status streams at the secondary level. The American educational system has long been noted for its open structure and lack of branching points ([Turner, 1960](#)). As [Rubinson \(1986:523\)](#) described it, “much of the curriculum is common to all tracks, and students from any track can continue to higher education. No decision is irrevocable.” In undifferentiated educational systems, secondary schools stress academic preparation and vocational training usually occurs after formal schooling ends ([Müller & Shavit, 1998:9](#)).

Müller and Shavit found that in highly differentiated and vocationally specific systems, educational attainment has large effects on both prestige of the first job and entry into the service class. Moreover, vocational education enhances the odds of obtaining a skilled versus unskilled blue-collar occupation (1998:39). In explaining these findings, they emphasized how the features of educational systems impact the demand for workers by employers: “in [stratified] systems the differences among qualifications are clear and they are *well recognized in the labor market*. . . Standardization enhances the comparability of qualifications in the national space and allows *employers* to rely on them with confidence when recruiting workers” (1998:10, emphasis added).

### 1.2. Institutional context and social–psychological orientations

Other researchers have emphasized the impact of institutional variations in educational systems for youths themselves. In one of his last articles, [Kerckhoff \(2001:7\)](#) argued that in addition to structuring youths’ entry into the labor market, the institutional arrangements of educational systems impact “opportunities for students to choose among alternative paths to educational attainment.” Along these lines, [Mortimer and Krueger \(2000\)](#) found that institutional differences in the U.S. and German systems have consequences for the social–psychological orientations of the students moving through them. Due to the selection process they experience after their first four years of school,

German students are forced to become aware early in life that school achievement is linked to adult occupational opportunities. Then they proceed on educational trajectories that lead to a relatively fixed set of job options. As a result, German students develop a realistic view of the credentials they will likely obtain. Because American students generally do not experience such a selection process, their perceived occupational options remain more expansive well into young adulthood ([Csikszentmihalyi & Schneider, 2000](#)). At the same time, as they must find their way from school to work without clear institutional markers, young adults in the United States often experience a period of floundering from job to job early in their work lives. [Mortimer and Krueger \(2000:481\)](#) also linked structural differences between the American and German educational systems to the degree of confidence or anxiety American and German youths have about their futures, and their feelings of failure when they encounter barriers in their paths.

Finally, [Buchmann and Dalton \(2002\)](#) focused on the impact of institutional variations on the formation of adolescent educational aspirations. They found that interpersonal influences are far less important in the formation of students’ educational aspirations in countries with highly differentiated secondary educational systems than in countries with undifferentiated secondary schooling. They reasoned that this was likely due to the fact that in highly differentiated systems the sorting of students into different types of schools sends such strong messages about their future options that it overwhelms the influence of significant others’ attitudes. Because [Buchmann and Dalton \(2002\)](#) did not have data on the types of schools students attended, they could not demonstrate the degree to which the type of school served to constrain students’ educational expectations.

## 2. The current study

The current study builds on the foundation laid by prior research by examining the interplay between institutional structures and individuals’ social–psychological orientations in determining the process of social mobility in several countries with similar educational systems. While [Müller and Karle \(1993:19\)](#) proposed that variations in the destinations of students from different class backgrounds are due to “the channeling of the student population through different educational institutions,” we seek to show *how* this channeling occurs in highly differentiated systems. Building on prior research on the impact of institutional arrangements for youths’ social–psychological orientations, we further show how the sorting of students into different types of schools

shapes their expectations about their future which, as much prior research has found, are closely aligned with students' actual educational and occupational destinations (Morgan, 1998; Sewell, Haller & Portes, 1969).

Because we have data on the types of secondary schools in which students are enrolled, we can examine how socioeconomic status impacts the placement of students into particular educational trajectories in highly differentiated educational systems. The availability of such information in conjunction with data on socioeconomic status and students' expectations provides us with considerable leverage over prior research. Prior research on stratification processes in highly differentiated educational systems consists of either single-country case studies (Hanley & McKeever, 1997; Mateju & Strakova, 2005) or studies contrasting highly differentiated systems and undifferentiated systems (Buchmann & Dalton, 2002; Mortimer and Krueger, 2000). Here we take a different approach and examine with standardized, comparative data, five societies that all have highly differentiated secondary schooling as a central feature of their educational systems. If we find regularities in the relationship between SES and school placement and in the relationship between school placement and students' subsequent educational and occupational expectations across all five societies, this will constitute evidence that the shared structural features of these educational systems, as opposed to the idiosyncratic features of any single country, are largely responsible for the patterns observed.

### 2.1. Hypotheses

Social origins impact educational attainment in a wide range of societies with various institutional arrangements of their school systems (Erikson & Goldthorpe, 1992; Müller & Karle, 1993; Müller et al., 1989; Shavit & Blossfeld, 1993). In U.S. secondary schools, poor and minority students are more likely to be in remedial or vocational tracks (Alexander & McDill, 1976; Alexander, Cook and McDill, 1978; Gamoran & Mare, 1989; Oakes, 1985). Even as the use of formal tracking has declined in the United States, socioeconomic status still plays a role in determining the academic rigor of a student's high school curriculum (Kerckhoff & Glennie, 1999; Lucas, 1999). Research on countries such as France (Hout & Garnier, 1979), and Israel (Shavit, 1990) also find strong effects of class background, as well as minority and immigrant status, in determining students' school placement.

In highly differentiated school systems, the link between socioeconomic status and placement into higher status academically oriented pathways should be partic-

ularly strong because of the early stage in the educational career that the sorting of students occurs. Previous research demonstrates that the effects of social origin are strongest at the beginning of the educational career and then decline thereafter (Mare, 1981; Shavit & Blossfeld, 1993). If younger students are more dependent on parents' preferences and the economic status of their families than are older students, then in systems with crucial branching points at an early age there should be a high correspondence between students' social origins and their placement in different types of secondary schools. Single-country case studies of highly differentiated systems provide some support for this argument. Hanley and McKeever (1997) found that under state socialism in Hungary, despite socialist policies to favor students from working-class backgrounds, children of elite origins were far more likely to enter high-status academic secondary schools (as opposed to technical schools) and enter tertiary education than students of working-class origins. In the post-communist Czech Republic, Mateju and Strakova (2005) find that gymnazia, the most elite secondary schools, are extremely socially selective, with students from high SES origins far more likely to be enrolled in these schools. In this paper, we examine the relationship between SES and school placement for several countries.

**Hypothesis 1.** In highly differentiated educational systems, socioeconomic status is highly predictive of the type of school a student attends. Students from higher class backgrounds are more likely to be in educational trajectories that lead to university education while students from lower class backgrounds are more likely to be in educational trajectories that do not lead to higher education.

It is well known that students' educational and occupational expectations have a substantial impact on their subsequent educational attainment (Sewell, 1968; Sewell et al., 1969; Woelfel & Haller, 1971). Moreover, as Kerckhoff noted nearly two decades ago, "it seems reasonable to argue that expectations of the future are affected by observed structural constraints, and they thus reflect more than pure motivation" (Kerckhoff, 1976:371). In highly differentiated educational systems, students' expectations should be determined in large part by the type of school they attend because their placement in different educational trajectories sends them a clear message about the qualifications they will receive and the occupational destinations that will be open to them (Buchmann & Dalton, 2002). To use John Meyer's terms, the narrow, well-defined *charters* of different types of



secondary schools makes them very influential, such that “students tend to adopt the personal and social qualities appropriate to the positions to which their schools are chartered to assign them” (1977:60).

**Hypothesis 2.** In highly differentiated systems, the type of school students attend has a strong impact on their educational and occupational expectations, net of their socioeconomic status. Students in academically oriented secondary schools are more likely to expect to complete college and to expect to have a high-status occupation than students in vocationally oriented or basic schools.

If in highly differentiated systems students’ educational and occupational expectations are shaped largely by the types of secondary school they attend, their expectations should be more realistic than those of students in undifferentiated educational systems where the general nature of the curriculum and the absence of between-school sorting convey the notion that students can access a wide range of educational and occupational trajectories well into adulthood. Because the educational system itself does little to constrain students’ options, students may persist in expecting to achieve high levels of education and high-status occupations even if these expectations are not realistic.

In a comparison of 13-year-old boys in England and the United States, Kerckhoff found that youth in England developed more realistic educational expectations earlier than their U.S. counterparts and he attributed this difference to the educational institutions of the two societies. Kerckhoff argued that in Great Britain, the explicit feedback that schools provide students on their performance relative to others early on defines their future “within rather narrow limits” (Kerckhoff, 1977:564). In the U.S., in contrast, feedback from educational authorities usually includes hope and encouragement which provide a basis for unrealistic expectations. Kerckhoff’s argument should hold for many countries such that the degree of realism of students’ educational expectations depends on the degree to which the educational system provides students with feedback about their future. While Kerckhoff focused only on the realism of educational expectations, we believe reasoning should also apply to students’ expectations about their occupational destinations.

**Hypothesis 3.** In highly differentiated educational systems, students’ educational expectations are more realistic than those of students in undifferentiated systems, such that the percentage of students expecting to complete college is closer to the actual rate of college completion.

**Hypothesis 4.** In highly differentiated educational systems, students’ occupational expectations are more realistic than those of students in undifferentiated systems, such that fewer students expect to attain white-collar high-status occupations and students’ occupational expectations are distributed more evenly throughout the occupational hierarchy.

### 3. Data and methods

We use standardized cross-national data from the 2003 Program for International Student Assessment (hereafter PISA) conducted by the Organization for Economic Co-operation and Development (OECD). PISA was initially conducted in 2000 in 43 countries with the goal of assessing the reading literacy of young people. The 2003 assessment focused on mathematical literacy in 41 countries and the 2006 assessment focused on scientific literacy in 57 countries (OECD, 2001). The PISA surveys target the population of 15-year olds enrolled in school full-time or part-time, regardless of grade or type of educational institution. A two-stage stratified sampling design first of schools and then of students within sampled schools, achieved a high quality of coverage of the national population of 15-year olds in each country.<sup>3</sup>

From the countries participating in PISA 2003, we identified five European countries with highly differentiated secondary school systems: Austria, the Czech Republic, Germany, Hungary and the Netherlands. In these countries, students are sorted into different types of schools for either vocational or academic training before they are 15 years of age (OECD, 2005a, chapter 4). We used data from these five countries to determine the role of socioeconomic status on school placement and the role of school placement on students’ educational and occupational expectations.

In order to test whether students express more realistic educational expectations in these countries relative to countries with undifferentiated schooling, we compared them to students in Australia, Canada, New Zealand, Spain and the United States. These countries have educational systems with little curricular differentiation between secondary schools; all secondary schools tend to stress academic preparation. Although some schools also may offer vocational training, students are not sorted into strict vocational or academic pathways in these countries.

<sup>3</sup> See OECD (2001) Annex A3 for detailed discussion of PISA sampling procedures as well as the target population coverage.

### 3.1. Variables

School type is both a dependent variable and independent variable in the analyses. In highly differentiated countries where students are enrolled in different types of secondary schools before age 15, the PISA database provides information of the type of school each student attends. On the basis of these data, we created a four-category classification of school type for each country which is presented in Fig. 1. School type 1 represents the most academically oriented secondary school that provides the most direct pathway to university enrollment. School type 2 represents either a comprehensive school in Germany (a school that combines all types in a single building), or a school that provides high-level vocational training. In all cases except Austria, students in school type 2 can gain access to higher education, either directly or indirectly, but the odds are lower and the pathways are less direct than in school type 1. School type 3 constitutes vocationally oriented schools in all countries and students in this track end their formal training with a vocational credential and have no opportunity to pursue higher education. School type 4 is the most basic form of schooling in all countries.

The countries also differ in the age at which selection into different types of secondary school occurs. In Austria and Germany children are selected at the age of 10 while in Hungary they are selected at age 11; in the Netherlands this branching point occurs at age 12 (OECD, 2005a). The Czech Republic has a multi-year gymnasium system; children can transition from primary school to the gymnasium as early as age 11 but they can also gain entry to the gymnasium at age 13 and at age 15 (see Mateju & Strakova, 2005 for more detail). These differences produce some noteworthy differences between countries. In Hungary and the Netherlands, type 4 schools constitute primary schools, as a small minority of 15-year olds are still enrolled in primary school. Technically, these students may be able to enroll in a type 1 school after completing their primary education, although in most cases the odds are likely very low that they will do so, since enrollment in primary school at this advanced age likely suggests that they repeated a grade or more. Likewise, given the multi-year gymnasium system in the Czech Republic, children in type 4 schools can still transition to a gymnasium at age 15. Thus while in Germany and Austria, students in type 4 schools generally do not gain access to a university education, in Hungary, the Czech Republic, and the Netherlands, a university education is still a possibility for students in type 4 schools. Appendix A provides more detailed information on the structure of each country's educational system.

Table 1 presents descriptive statistics for all variables. Note that all school types are relatively well represented in all countries, with the exception of school type 4 in Austria, Hungary and the Netherlands, where less than ten percent of the population of 15-year olds are enrolled.

On the basis of the four-level school type classification in Fig. 1, we can specify Hypothesis 1 more precisely. Country-level differences notwithstanding, we should see a clear pattern between socioeconomic status and school type in all five countries such that socioeconomic status has a significant positive effect on the likelihood of enrolling in academically oriented (type 1) schools versus all other school types. Moreover, among students attending schools for vocational training, we expect to see socioeconomic status distinctions between those in the higher level vocational training pathway (type 2) versus those placed in the terminal vocational training pathway (type 3).

Recall that Hypothesis 2 predicts that students in academically oriented secondary schools are more likely to expect to complete college and to expect to have high-status occupations than students in vocationally oriented or basic schools. To test this hypothesis, we use the two dependent variables: educational expectations and occupational expectations. In all countries, students were asked about the highest level of education they expected to complete and their responses were coded according to the International Standard Classification of Education [ISCED].<sup>4</sup> From this variable we created a dummy variable coded 1 if students expected to complete ISCED Level 5A or 6, which corresponds to university education or higher. ISCED Level 5B, vocational tertiary education, was coded zero along with the other response options. In four of the five countries, students were also asked about the occupation they expected to have by age 30. They provided their answers to this question in open-ended responses which were coded into a continuous index of the socioeconomic status of occupation measured by the International Socio-Economic Index of Occupational Status (ISEI) (Ganzeboom, De Graaf, & Treiman, 1992).<sup>5</sup> PISA 2003 also included a measure of occupational expectations as a four-category variable indicating whether a student

<sup>4</sup> The International Standard Classification of Education (ISCED) was originally developed by UNESCO and is used regularly by UNESCO and other international organizations for reporting national education statistics. For details on the classification scheme see the coding of parent's education below.

<sup>5</sup> See Annex A in the PISA 2003 Technical report (OECD, 2003) for detailed information on the measures of students' expected occupation at age 30.

Table 1  
Descriptive statistics for all variables (weighted).

	Highly differentiated systems					Undifferentiated systems				
	AUT	CZE	DEU	HUN	NLD	AUS	CAN	ESP	NZL	US
Expect college or more (%)	24	37	19	53	41	63	62	48	39	64
Expected occ. status	51.1 (17.1)	52.1 (17.1)	51.8 (17.5)	53.6 (18.6)	–	57.6 (17.3)	–	–	–	62.5 (17.7)
School type										
1	21.5	15.3	29.1	35.3	19.9					
2	45.4	28.9	13.7	38.9	18.7					
3	28.6	13.4	39.4	19.6	57.9					
4	4.4	42.4	17.7	6.1	3.5					
Female (%)	50.1	49.1	49.7	47.3	49.0	49.2	50.7	50.8	50.0	49.6
Family structure (%)										
Two-parent	75.7	74.5	69.7	71.3	75.6	68.7	68.1	80.6	64.1	53.5
Single-parent	15.9	12.8	15.6	18.9	13.2	19.8	18.1	13.9	18.7	28.5
Other	8.4	12.7	14.7	9.8	11.2	11.5	13.8	5.5	17.2	18.0
Math achievement	507(89)	524(89)	503(99)	490(90)	538(90)	524(92)	535(84)	485(85)	523(95)	483(92)
SES	0.06 (0.85)	0.17 (0.80)	0.16 (0.99)	–0.07 (0.89)	0.10 (0.86)	0.23 (0.83)	0.45 (0.83)	–0.30 (1.01)	0.21 (0.91)	0.30 (0.91)
Parent's occupation	47.2 (16.1)	50.1 (14.4)	49.4 (16.2)	48.6 (15.3)	51.3 (16.0)	52.6 (16.0)	50.7 (16.0)	44.9 (16.8)	51.6 (16.4)	54.2 (16.4)
Parent's education (%)										
Isced 1 or 2	6.5	1.9	14.1	6.9	15.5	12.9	4.1	31.9	8.8	5.6
Isced 3b/3c	34.8	24.4	18.6	19.4	–	2.2	–	2.0	13.2	–
Isced 3a	14.8	46.1	19.7	40.5	33.0	29.3	31.2	25.9	26.8	44.5
Isced 5b	29.3	1.6	14.4	7.4	–	13.9	23.6	11.4	19.3	12.5
Isced 5a/6	13.5	25.0	22.1	25.1	44.0	38.8	37.9	25.3	20.0	34.6
Missing	1.1	1.0	11.0	0.7	7.5	2.9	3.2	3.6	11.9	2.8

Note: Standard deviations are in parentheses.



	1	2	3	4	Age at Selection
<b>Germany</b>	Gymnasium*	Gesamtschule* (comprehensive school)	Realschule	Hauptschule	<b>10</b>
<b>Austria</b>	Gymnasium*	Berufsbildene Mittlere Schule Berufsbildene Höhere Schule	Berufsschule/Polytechnische Schule	Hauptschule	<b>10</b>
<b>Czech Republic</b>	Gymnazium*	Střední Odborné Vzdělání* w. maturitní zkouška (vocational secondary with Maturate)	Střední Odborné Vzdělání w. závěrečná zkouška (vocational secondary without Maturate)	Základní Škola* (basic school; can lead to Gymnazium)	<b>11</b>
<b>Hungary</b>	Gimnázium*	Szakkozse Iskola* (secondary vocational school)	Szakiskola (technical school)	Általános Iskola* (primary school; can lead to Gimnázium)	<b>11</b>
<b>Netherlands</b>	VWO* (pre-university)	HAVO* (senior general secondary)	VMBO (pre-vocational secondary)	PRO (primary)	<b>12</b>

Note: \* indicates that students in this school type can gain access to a university education.

Source: PISA 2003 and Eurydice Information Database on Education Systems in Europe 2003.  
[http://www.eurydice.org/Eurydice/frameset\\_eurydice.html](http://www.eurydice.org/Eurydice/frameset_eurydice.html)

Fig. 1. Secondary school types available to 15-year olds in five highly differentiated countries.

expects to be in a white-collar high-skilled, white-collar low-skilled, blue-collar high-skilled, or blue-collar low-skilled occupation.

Other independent variables include sex (coded 1 if female), family structure, parent's education, parent's occupation, family socioeconomic status and math achievement. Following prior research on the importance of family structure for educational outcomes (McLanahan & Sandefur, 1994) we include three measures of family structure drawn from students' reports of who usually lives with them at home. Students are classified as living in a single-parent family if they reported living with only one of the following: mother, other female guardian (e.g., stepmother or foster mother), father, or other male guardian. Students living with both their mother and father are classified as having a two-parent family. All other response combinations, including stepfamilies, are classified as other.<sup>6</sup> Parent's education is the highest level of educational attainment of either parent reported in five ISCED categories: lower secondary education or less (ISCED 1 or 2); Vocational upper secondary (ISCED 3B or 3C); academic upper secondary (ISCED 3A), which is the reference category;

vocational tertiary (ISCED 5B); and university degree or higher (ISCED 5A or 6). Parent's occupation indicates parent's current or last main job and is measured by the International Socio-Economic Index of Occupational Status (ISEI). The highest status occupation of either parent is used.

In addition to providing measures for parent's education and occupation, PISA 2003 provides a composite index to indicate the family's overall socioeconomic status (SES). The SES index was created by factor analysis using the following variables: parent's occupation, parent's education, family wealth indicating material items possessed, the number of books at home and home educational resources (a quiet place to study, a desk for study, a dictionary and calculators), and home possessions of "classical" culture (classical literature, books of poetry and works of art). The variable was standardized to have a mean of 0 and a standard deviation of 1 across students in all OECD countries participating in PISA 2003 (OECD, 2003), which allows cross-national comparisons of the overall SES level of nations. We present descriptive statistics for the SES variable as it was originally scaled, so that SES means can be compared across countries. But because we want to examine how SES impacts students' placement in secondary schools relative to the *national* population of students, for the multivariate analyses we rescaled SES to have a mean of 0 and a standard deviation of 1 within each country. For all analyses, we ran models first with the SES mea-

<sup>6</sup> Number of siblings impacts children's educational outcomes in a wide variety of contexts (Steelman, Powell, Werum and Carter, 2002), but PISA 2003 does not have data on the number of siblings in the household.

sure and then with the parent's education and occupation measures; results were very similar.

Ability is an important determinant of students' perceptions of their future (Sewell, 1968; Sewell et al., 1969). Ideally, ability should be measured prior to when students are asked about their expectations. Because PISA has no prior measure of ability, we use student's math achievement as a proxy for prior ability. It indicates a student's score on the mathematics assessment at the time of the PISA survey. Scores are reported a single composite mathematics literacy scale that has a mean of 500 and a standard deviation of 100 across all students of the OECD countries in PISA. Based on Item Response Theory, PISA provides five plausible values for each student instead of a fixed value. When math achievement is used as a dependent variable, all five plausible values should be used simultaneously to obtain the estimates of population parameters (OECD, 2005b). Since we use math achievement as a control variable, we average the five plausible values to create a single measure of math achievement.

### 3.2. Analytical strategy

In order to examine the degree to which students' social origins relate to their enrollment in different types of secondary schools, we conduct a multinomial logistic regression analysis that compares the effects of social origins on attending school types 2, 3 and 4 relative to attending school type 1, which offers the most direct path to a university education in each country. Noteworthy impacts of social origins on the likelihood of attending other school types (e.g., type 2 versus type 3) are indicated throughout the text.

Then, in order to examine whether the type of school attended impacts students' educational expectations net of other factors (Hypothesis 2) we estimate a logistic regression model predicting the likelihood of expecting to complete university education or more (ISCED 5A or 6) by school type, parental education, occupation, and controls in all five countries. For the four countries (Austria, the Czech Republic, Germany and Hungary) with data on occupational expectations, we conduct an OLS regression analysis to see the extent to which the type of school students attend explains the variation in students' expected occupational status, net of other factors.

Finally, we examine Hypotheses 3 and 4 regarding the realism of students' educational and occupational expectations by comparing the descriptive statistics for students' expectations in highly differentiated countries to those in countries with undifferentiated secondary

systems. Then we use multivariate models to assess how the effects of family SES and math achievement on students' educational expectations vary across countries using pooled data across all five differentiated systems in contrast to five undifferentiated systems. We expect to find that the effects of students' socioeconomic and academic achievement on educational expectations are consistently larger in differentiated systems than in undifferentiated systems.

## 4. Results

Table 2 presents the results of multinomial logistic regression analyses contrasting the likelihood of attending each non-academic type of school (types 2, 3 and 4) with school type 1 on the basis of SES, with controls for sex and math achievement. We present results using the SES index for parsimony; analyses that used parent's education and occupation yielded similar findings. In all countries, females are significantly less likely to be enrolled in low status, vocationally oriented schools. In most EU member countries today, higher proportions of females than males attain tertiary education (Eurostat, 2002). The fact that females are overrepresented in academically oriented schools relative to males suggests one plausible mechanism for the growing female-favorable gender gap in higher education in many European countries. Girls are more likely to enter educational trajectories that lead to the university, while boys are more likely to enter pathways that either preclude higher education or, at best, offer only indirect routes to higher education. The *reason* for this gender difference in the type of schools into which students are selected is an important topic for future research.

Math achievement has a significant negative relationship with enrollment in non-academic trajectories in all countries. Because achievement is measured after students are enrolled in secondary school, we cannot make claims about the causality of this relationship; indeed, enrollment in a particular type of school likely has a strong impact on students' math achievement. In models that excluded achievement as an independent variable, the SES and sex variables yielded effects consistent with those reported here. This fact, combined with the moderate correlation of SES and math achievement (.40 on average), led us to include math achievement in these models.

Most relevant to our current interests, the results indicate that high SES students are significantly less likely to be enrolled in non-academic educational trajectories (types 2, 3 and 4) and more likely to be enrolled in type 1

Table 2

Multinomial logit contrasting enrollment in basic and vocational school types with enrollment in academic school type.

Austria	BMH/BHS Schule v. Gymnasium	Beruf/Polytech. Schule v. Gymnasium	Hauptschule v. Gymnasium	Hungary	Szakiskola Piskola v. Gim.	Szakkoze v. Gim.	Altalanos Iskola v. Gim.
Female	−0.634** (.193)	−2.199** (.253)	−2.376** (.311)	Female	−1.201** 0.181	−2.155** 0.216	−2.418** 0.209
SES	−0.817** (.097)	−1.419** (.123)	−1.316** (.192)	SES	−0.826** 0.079	−1.692** 0.116	−1.619** 0.147
Math Achievement	−0.007** (.001)	−0.021** (.002)	−0.033** (.003)	Math Achievement	−0.011** 0.002	−0.029** 0.002	−0.033** 0.002
Intercept	5.374** (.860)	12.276** (1.042)	15.453** (1.409)	Intercept	6.661** 0.808	14.285** 0.875	14.803** 0.968
Czech Republic	SOVw/M v. Gymnazium	SOV v. Gymnazium	Zakladni Skola v. Gymnazium	Netherlands	HAVO v. VWO	VMBO v. VWO	PRO v. VWO
Female	−1.016** (.238)	−2.763** (.271)	−1.735** (.159)	Female	−0.087 (.106)	−0.840** (.134)	−1.816 (.697)
SES	−0.654** (.077)	−1.093** (.100)	−0.585** (.078)	SES	−0.427** (.090)	−0.695** (.104)	−0.520 (.206)
Math Achievement	−0.016** (.002)	−0.031** (.002)	−0.025** (.002)	Math Achievement	−0.016** (.001)	−0.043** (.002)	−0.052** (.007)
Intercept	10.707** (.981)	17.985** (1.056)	16.297** (1.052)	Intercept	10.224** (.839)	26.496** (1.346)	26.384** (3.251)
Germany	Gesamtschule v. Gymnasium	Realschule v. Gymnasium	Hauptschule v. Gymnasium				
Female	−1.301** (.160)	−0.836** (.128)	−1.700** (.152)				
SES	−0.555** (.145)	−0.894** (.076)	−1.025** (.106)				
Math Achievement	−0.024** (.002)	−0.020** (.001)	−0.032** (.002)				
Intercept	12.614** (.848)	11.790** (.598)	17.164** (.988)				

Note: Standard errors are in parentheses.

\*  $p \leq .01$ .\*\*  $p \leq .001$ .^  $p \leq .05$ .

schools which offer a direct pathway to a university education. As expected, we also find that, among students attending schools for vocational training, the likelihood of enrolling in the higher level vocational training (type 2) versus terminal and lower status vocational training (type 3) depends on SES; students of higher status origins are significantly less likely to be found in lower level vocational training.

The pattern between SES and school type placement is very clear when depicted graphically. To create graphs of this relationship, following Long and Freese (2003:216–217), we computed the predicted probabilities of attending each type of school across all measures of SES, ranging from two standard deviations below the mean SES to two standard deviations above it in each country. In the graphs presented here, the population in each country was assigned the math score at the 75th percentile of the math score distribution in that country, and all other variables were held constant at their mean.<sup>7</sup> Fig. 2a–e presents the probability of attending a specific type of school relative to the school types below it in the hierarchy at different points along the SES distribution. For example, in the figure for Germany, the area between the lowest line and the  $x$ -axis (probability=0) indicates the probability of attending *Hauptschule* (type 4) for any given level of family SES within two standard deviations of the mean SES in Germany. The shaded area between the next line and the  $x$ -axis indicates the summed probability of attending either *Realschule* (type 3) or *Hauptschule*. Therefore, the area between the line for *Realschule* and the line for *Hauptschule* presents the probability of attending *Realschule*. Similarly, the area between the line for *Realschule* and the line for *Gesamtschule* (type 2) presents the probability of attending *Gesamtschule*, while the area between the line for *Gesamtschule* and the top of the figure (probability = 1) indicates the probability of attending *Gymnasium* (type 1). From the figure, it is evident that the probability of attending the highest status school, *Gymnasium*, increases as family SES increases, whereas the probabilities of attending *Realschule* and, to a smaller extent, *Hauptschule*, decrease.

A similar relationship between social origins and school type is clearly evident in all countries and inter-

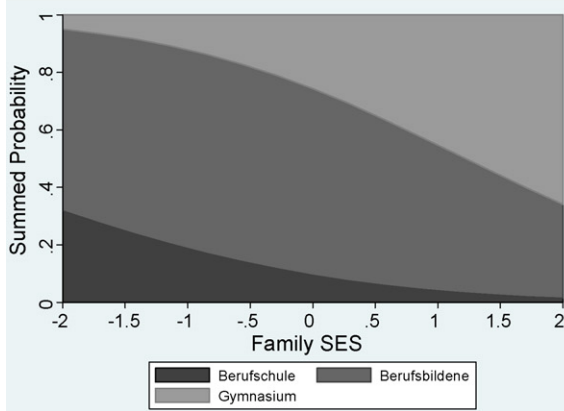
esting comparisons can be made on the basis of these figures. First, note that the figures for Austria and the Netherlands only show the probabilities for 3 of the 4 school types, because less than 5 percent of students in these countries are enrolled in school type 4. Similarly, in Hungary, the shaded area depicting the probability of attending basic school (*Alttanulos Iskola*) is so small because only 6 percent of the sample is found in these schools. The size of the shaded areas relates to the proportion of the sample found in each school type; the slopes of the lines between each shaded area represent the changing probability of attending a particular school type as SES status changes. Germany and Hungary appear to have systems where SES is most strongly predictive of school type placement. In Germany, a student with a math score at the 75th percentile and a socioeconomic status that is two standard deviations below the mean has only about a 1 in 10 chance of attending *Gymnasium*, while a student with the same math score with an SES that is two standard deviations above the mean has nearly an 8 in 10 chance of attending *Gymnasium*. Indeed, the most common destination for lower than average SES students is *Realschule*, which offers no access to a university education. In Hungary, the steepness of the main slope in the graph is similar to Germany's, indicating that students from above average social origins have much greater odds of attending the *Gimnazium*, the most direct pathway to a university education. At the same time, one could argue that Hungary's system is less stratified by socioeconomic status than Germany's, since the most common destination for students with 75th percentile math scores and below-average SES is school type 2 (*Szakkozse Piskola*) from which it is possible to transition to university.

In the Czech Republic and the Netherlands, higher SES students clearly have higher odds of attending the most academically oriented (type 1) schools but the experiences of high- and low-SES students with math scores at the 75th percentile are not as strongly differentiated as in Germany and Hungary (e.g., the slopes of the lines between different school types are not as steep). These country-level differences notwithstanding, the results provide clear support for Hypothesis 1. In all five countries students' social origins are highly predictive of the type of schools they attend, net of math achievement; high SES students are significantly more likely to attend academically oriented schools.

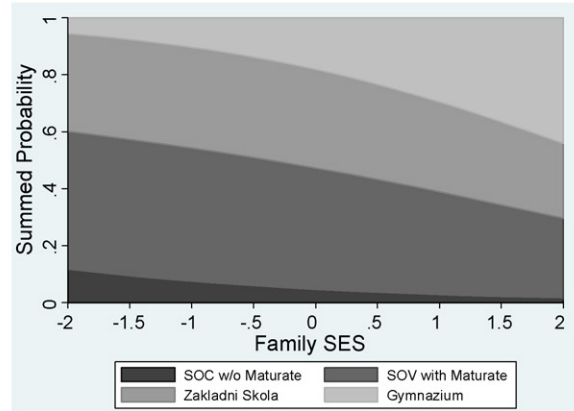
In light of the evidence indicating that socioeconomic status is a major determinant of the type of secondary school a student attends, an analysis examining the role of school type in shaping students' expectations about

<sup>7</sup> We also generated graphs that held math scores at the 25th and 50th percentiles to examine how SES relates to school type for students at achievement levels. We present graphs with math scores set at the 75th percentile, which arguably provide the most conservative example of the role of SES in school placement, since in this scenario students' academic performance is well above average.

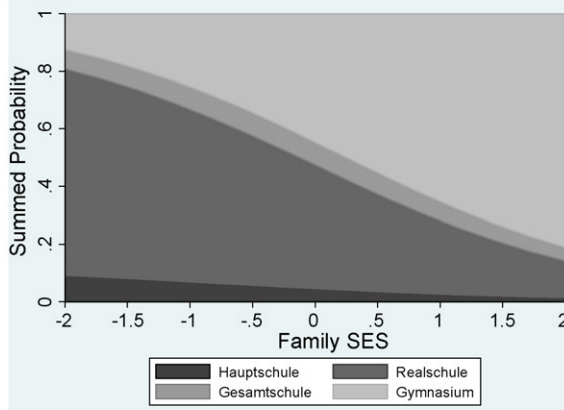
(a) Austria (math score fixed at the third quartile = 577 points)



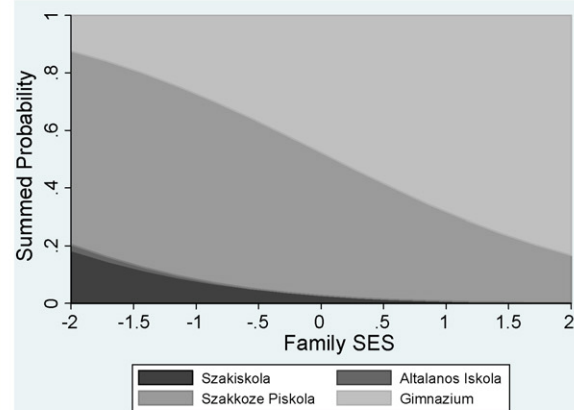
(b) Czech Republic (math score fixed at the third quartile = 588 points)



(c) Germany (math score fixed at the third quartile = 577 points)



(d) Hungary (math score fixed at the third quartile = 553 points)



(e) Netherlands (math score fixed at the third quartile = 608)

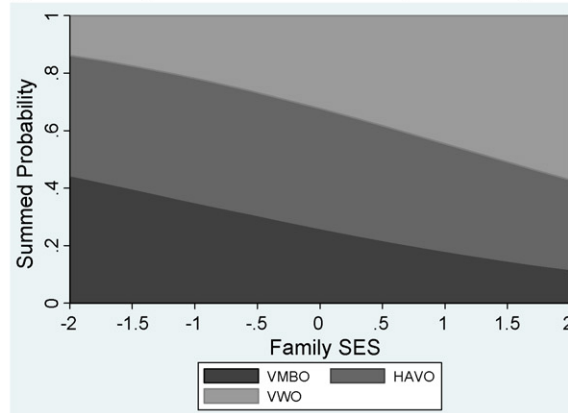


Fig. 2. Probability of attending different secondary school types by family socioeconomic status. (a) Austria (math score fixed at the third quartile = 577 points), (b) Czech Republic (math score fixed at the third quartile = 588 points). (c) Germany (math score fixed at the third quartile = 577 points). (d) Hungary (math score fixed at the third quartile = 553 points). (e) Netherlands (math score fixed at the third quartile = 608).

their futures becomes all the more important because it can reveal a major mechanism of class reproduction that may operate similarly in societies with highly differentiated secondary school systems. For this analy-

sis, we estimate a logit model predicting the likelihood of expecting completion of college or more. In addition to school type, independent variables include sex, family structure, math achievement, parent's occupation



Table 3  
Determinants of expecting college or more in highly differentiated countries.

	Austria	Czech Rep.	Germany	Hungary	Netherlands
Female	−0.114 (.084)	0.726** (.097)	0.213 (.121)	0.845** (.112)	0.194 <sup>^</sup> (.092)
Family structure					
Single-parent (vs. two-parent)	−0.218 (.138)	−0.410* (.136)	−0.088 (.126)	−0.048 (.114)	−0.126 (.164)
Other (vs. two-parent)	0.047 (.178)	−0.277 <sup>^</sup> (.130)	0.109 (.165)	−0.368 <sup>^</sup> (.157)	−0.430 <sup>^</sup> (.182)
Math Achievement	0.009** (.001)	0.013** (.001)	0.007** (.001)	0.010** (.001)	0.008** (.001)
Parent's occ.	0.006 <sup>^</sup> (.003)	0.019** (.004)	0.011* (.003)	0.016** (.003)	0.006 <sup>^</sup> (.003)
Parent's ed. (vs. isced 3A)					
Isced 1 or 2	−0.928** (.244)	−0.369 (.481)	−0.039 (.235)	−0.689** (.198)	−0.082 (.163)
Isced 3b/3c	−0.345* (.106)	−0.085 (.100)	−0.123 (.147)	−0.291* (.102)	—
Isced 5b	0.058 (.102)	−0.142 (.298)	0.108 (.145)	−0.180 (.166)	—
Isced 5a/6	0.766** (.149)	0.772** (.101)	0.790** (.138)	0.879** (.158)	0.426** (.126)
Student's school type (vs. type 1)					
Type 2	−1.534** (.109)	−1.380** (.150)	−0.826** (.199)	−1.369** (.168)	−0.261 <sup>^</sup> (.122)
Type 3	−2.946** (.196)	−3.593** (.374)	−1.541** (.136)	−3.355** (.221)	−1.948** (.176)
Type 4	−2.689** (.619)	−0.713** (.149)	−2.363** (.335)	−2.487** (.247)	−3.453** (1.006)
Intercept	−4.691 (.440)	−7.998** (.513)	−5.194** (.587)	−4.776** (.476)	−4.348** (.703)
N	4,398	5,985	4,202	4,483	3,720
−2 Log likelihood	60,828	96,986	555,505	78,855	155,062
G <sup>2</sup> (M <sub>u</sub>  M <sub>c</sub> ) <sup>a</sup> : df = 3	7019**	6718**	36,114**	10,255**	13,415**

Note: Standard errors are in parentheses.

<sup>a</sup> M<sub>u</sub> indicates the unconstrained model (with the variables for school type) in which the constrained model (without the variables for school type), M<sub>c</sub>, is nested. See text for more information.

\*  $p \leq .01$ .

\*\*  $p \leq .001$ .

<sup>^</sup>  $p \leq .05$ .

and parent's education. These results are presented in Table 3.

Several results are noteworthy. First, in the Czech Republic, Hungary, and the Netherlands, females are significantly more likely than males to expect to com-

plete college or more. These findings are in line with a growing female-favorable gender gap in college attainment in the United States and other industrialized countries (Buchmann & DiPrete, 2006; Eurostat, 2002). In Germany and Austria males and females

do not differ significantly in their expectations. These results correspond with prior research that finds that girls have come to have higher aspirations for college than boys in most countries, but not in Germany and Austria (Buchmann & Dalton, 2002). The effects of family structure are generally weak but, where significant, children residing in single-parent or other types of families are less likely to expect college than children in two-parent families. Students with higher math achievement scores are significantly more likely to expect to complete college in all countries. Also as expected, students are more likely to expect to complete college as their parent's occupational status increases and students of college-educated parents are significantly more likely to expect to complete college themselves, compared to those whose parents completed only secondary education. These results underscore the similarities across countries in the role of family background on educational expectations.

Table 3 also shows that in all five countries, students in school types 2, 3 and 4 are significantly less likely to expect to complete college than students in school type 1, which offers the most direct pathway to college. Note that the coefficients for school type 3 are larger than those for school type 2 in all cases, indicating that the “college expectation gap” between students in type 3 schools (those that offer lower vocational training) and type 1 schools is larger than the gap between students in type 2 and type 1 schools. The pattern of coefficients for type 4 schools accords with the distinctions between the educational systems discussed above. In the Czech Republic, the expectation gap is smallest between type 4 and type 1 students because in the Czech Republic's multi-year gymnasium system, some students in basic schools have a last opportunity to transition to a four-year gymnasium around the age of 15. Likewise, the opportunity, albeit small at this late age, for 15-year-old Hungarian students in type 4 schools to transition to a Gimnazium means that they are more likely than students in type 3 schools to expect to complete college.<sup>8</sup>

We also estimated a baseline model that included all independent variables except for school type (not shown) and calculated the likelihood ratio statistic ( $G^2$ )

for each model to indicate the degree to which the addition of school type explains the variation in students' educational expectations, net of other factors.<sup>9</sup> The addition of the school type variable yields a model that explains significantly more of the variance in students' educational expectations than the baseline model. After adding school type to the model, the effects of sex and achievement continue to have significant impacts; the effects of parental occupation and education are weakened slightly, but remain significant in most cases.

These results provide strong support for Hypothesis 2. Students' educational expectations are strongly predicted by the type of school they attend. The striking correspondence between students' expectations to complete college and the educational trajectories in which they are located indicates that by age 15, students in highly differentiated secondary school systems have largely brought their expectations about their future into line with the opportunities for higher education provided by the type of school they are attending.

Table 4 replicates the analyses from Table 3 using a continuous measure of occupational expectations as the dependent variable for Austria, the Czech Republic, Germany, and Hungary. In the Netherlands students were not asked about their occupational expectations. Females expect significantly higher occupational expectations in all countries. This result is consistent with the substantial rise in the occupational aspirations of U.S. women in recent decades (Shu & Marini, 1998) and suggests that this increase has occurred in a range of industrialized countries. Family structure has little impact on students' occupational expectations, but students with higher math achievement scores report significantly higher occupational expectations. Parent's occupation and education have their expected effects.

The type of school students attend has a strong impact on the occupational status they expect to achieve by age 30. Relative to their counterparts in academically oriented, type 1 schools, students in all other schools report significantly lower occupational expectations. The size and pattern of the occupational expectations gaps

<sup>8</sup> In other analyses, we rotated the reference category in order to determine whether differences in the likelihood of expecting to complete college was significantly different for each school type versus every other school type. In all cases, coefficients were significantly different at the .05 level, except for the comparison between school types 2 and 4 in Austria, which was significant at the .10 level.

<sup>9</sup> We use the likelihood ratio statistic  $G^2$  for model comparison, calculated as follows:  $G^2(M_c|M_u) = -2 \ln L(M_c) - (-2 \ln L(M_u)) = 2 \ln L(M_u) - 2 \ln L(M_c)$  where  $M_c$  indicates the constrained and  $M_u$  indicates the unconstrained model in which the constrained model is nested.  $G^2$  is asymptotically distributed as chi-square with the degrees of freedom, which equals the difference between the two models' numbers of parameters (Long, 1997:94).

Table 4

Determinants of expected occupational status (ISEI) in highly differentiated countries.

	Austria	Czech Rep.	Germany	Hungary
Female	1.821* (.872)	3.374** (.423)	1.602* (.502)	2.829** (.620)
Family structure				
Single-parent (vs. two-parent)	0.218 (.738)	−0.471 (.619)	0.891 (.712)	0.582 (.685)
Other (vs. two-parent)	−1.221 (.785)	−0.797 (.614)	−2.524^ (1.113)	−0.445 (.789)
Math Achievement	0.041** (.004)	0.067** (.003)	0.044** (.005)	0.047** (.004)
Parent's occ.	0.115^	0.110**	0.083**	0.073*
Parent's ed. (vs. isced 3A)				
Isced 1 or 2	3.093* (1.039)	−0.964 (1.610)	1.978 (1.024)	−1.660 (1.027)
Isced 3b/3c	−2.196* (.745)	−1.799* (.685)	−1.905^ (.766)	−0.198 (.609)
Isced 5b	−0.931 (.811)	2.712 (1.857)	−0.665 (1.070)	−1.569 (.893)
Isced 5a/6	1.804 (.972)	1.714^ (.809)	2.388^ (.911)	1.316 (.832)
Student's school type (vs. type 1)				
Type 2	−12.464** (.769)	−6.371** (.953)	−7.716** (1.581)	−8.367** (1.117)
Type 3	−17.911** (1.141)	−15.980** (1.068)	−11.269** (.922)	−21.417** (1.080)
Type 4	−14.700** (2.045)	−6.194** (.882)	−14.768** (1.457)	−15.351** (1.279)
Intercept	36.382** (3.005)	16.903** (2.653)	32.265** (3.225)	34.287** (2.704)
N	3171	4599	2902	3633
R <sup>2</sup>	0.358	0.370	0.331	0.430
R <sup>2a</sup>	0.274	0.324	0.274	0.340
R <sup>2</sup> difference <sup>b</sup>	0.084	0.046	0.057	0.090
F-statistic (df=3)	137.3**	111.9**	82.0**	189.2**

Note: Standard errors are in parentheses.

<sup>a</sup> R<sup>2</sup> for the model without the three variables of school type but with all other independent variables.<sup>b</sup> difference in R<sup>2</sup> between the current model (with variables for school type) and the baseline model (without the variables for school type).\*  $p \leq .01$ .\*\*  $p \leq .001$ .^  $p \leq .05$ .

between students in different school types are very similar to the patterns found for educational expectations. These results further underscore the role of the school type in sending clear signals to students about their realistic occupational opportunities when they enter the labor market. We also estimated a base-

line model that included all independent variables except for school type (not shown) and compared the models' fit statistics to examine the extent to which the types of schools students attend explain the variation in their expected occupational status, net of other factors. The inclusion of school type substantially

improves the proportion of variance explained in all four countries.<sup>10</sup>

Are the educational and occupational expectations of students in highly differentiated school systems more realistic than those of their counterparts in undifferentiated systems? To address *Hypotheses 3 and 4*, we compared the percentage of PISA 2003 students reporting that they expect to receive a university education the actual percentage of adults age 25–34 in 2001 who had attained a university education (OECD, 2004, Annex 3). This group of adults is the youngest cohort for which college completion is possible by 2001 and, therefore, offers the best approximation of a realistic level of attainment for PISA 15-year olds. Since the PISA cohort will be at risk for completing tertiary education 10–20 years after the cohort of 25–34-year olds in 2001, it is reasonable to assume that with the expansion of higher education in all countries, tertiary attainment rates for the PISA cohort may be several percentage points higher than the older cohort. We need to consider this possibility when comparing the size of gaps between the expected educational attainments of PISA students and the actual attainment levels of the young adult population in each country.

The results of this comparison, reported in *Table 5*, provide some support for *Hypothesis 3*. In Germany, the Netherlands, and Austria, the gaps between students' expectations of completing college or more and the actual percentage completing college are quite small, indicating that students' expectations are quite in line with reality. The results for the Czech Republic and Hungary deviate from this pattern, however, with far more students expecting to complete college than is realistic on the basis of the low percentage of young adults actually attaining this level of education. Perhaps the socialist history of these countries or the rapid expansion of higher education in the Czech Republic and Hungary serve to create less clarity among youth regarding their future options for higher education.

Unrealistic expectations for college attainment are clearly evident among students in Australia, Canada and

Table 5

Students' expectations for college or more compared to actual rates of educational attainment.

Country	% expecting college or more PISA 2003	% attaining college or more OECD 2002	GAP
Highly differentiated			
Germany	19	13	6
Netherlands	41	25	16
Austria	24	7	17
Czech Republic	37	12	25
Hungary	53	15	38
Undifferentiated			
Australia	63	25	38
Canada	62	26	36
United States	64	31	33
Spain	48	25	23
New Zealand	39	18	21

Source: PISA 2003 and OECD, 2004.

the United States. More than 60 percent of all students report that they plan to complete a college degree or higher; in actuality, less than a third of young adults in these countries attain this level of education. Even with the expansion of higher education in these countries, it is unlikely that even 40 percent of all 15-year olds will have attained a college degree or more within the next 10–20 years. The inflated educational expectations for students in these undifferentiated educational systems are in line with *Hypothesis 3*. Spain also has a relatively large gap between students' expectations and actual attainments but the smaller gap between expected and actual educational attainments in New Zealand does not correspond with our prediction. In sum, *Hypothesis 3* appears to hold only 6 of the 10 countries analyzed.

Another way to determine whether students have more realistic views about their educational attainment in highly differentiated systems than in undifferentiated systems is to compare the extent to which students' educational expectations are associated with their socioeconomic origins and abilities. Our reasoning, again following Kerckhoff, is that in highly differentiated systems the explicit feedback that schools provide students on their performance relative to others early on defines their future "within rather narrow limits" (Kerckhoff, 1977:564). Given that educational trajectories are strongly determined by students' socioeconomic status and math achievement, we expect the effects of socioeconomic status and academic achievement on educational expectations to be larger in highly differentiated systems than in undifferentiated ones. In undifferentiated systems, where the educational systems provides

<sup>10</sup> Comparison between the two OLS models is based on *F*-statistic:

$$F = \frac{(R_u^2 - R_c^2)/(k - g)}{(1 - R_u^2)/(n - (k + 1))}$$

where  $R_u^2$  is  $R^2$  for the unconstrained model and  $R_c^2$  is  $R^2$  for the constrained model;  $k$  indicates the number of independent variables in the unconstrained model, while  $g$  indicates it in the constrained model;  $n$  is the total number of cases. The *F*-statistic has the *F* distribution with the degrees of freedom ( $df1$ ) =  $k - g$ , and the degrees of freedom ( $df2$ ) =  $n - (k + 1)$  (Agresti and Finlay, 1997:409).

students with little feedback about their future and opportunities for college education exist for virtually anyone, an individual's socioeconomic status and academic achievement should have far less bearing on their educational expectations.

To test whether there is a consistent pattern between differentiated and undifferentiated educational systems in the magnitude of SES and math achievement effects on educational expectations, we pooled data for all five countries with highly differentiated educational systems (Austria, Czech Republic, Germany, Hungary, and the Netherlands) and five countries with undifferentiated systems (Australia, Canada, New Zealand, Spain and the United States) and compared the two groups of countries in terms of the degree to which students' educational expectations are associated with SES and math achievement.<sup>11</sup> Table 6 presents results of the logistic regression of expecting a college education or more using this pooled data. The first model includes interactions between SES and country-specific dummy variables. The coefficients for the SES  $\times$  country interactions are smaller for all countries with undifferentiated systems than the coefficients for Germany (the reference country), though in the cases of Canada and Spain, they are not significant. Countries with highly differentiated educational systems are similar to Germany in that the coefficients are either larger or not significantly different from that for Germany, with the exception of the Netherlands. These results are consistent with the idea that the extent to which SES affects students' expectations to complete college or more tends to be weaker in undifferentiated systems than in highly differentiated systems.

The second model in Table 6 shows how the effect of math achievement on educational expectations varies across countries. Like the results for SES, there is a consistent pattern in the magnitude of the effect between undifferentiated and differentiated systems. Except for Spain, the effect of math achievement on educational expectations is significantly smaller in all undifferentiated systems than in Germany (the reference country). In sum, SES and math achievement have smaller impacts on educational expectations in undifferentiated systems than differentiated systems. The finding that students' educational expectations depend less on socioeconomic and academic background in undifferentiated systems than differentiated systems aligns well with institutional explanations that the function of schools in defining stu-

Table 6

Logistic regression of expecting college or more.

	SES $\times$ country	Math score $\times$ country
Intercept	−6.235**	−8.253**
Country (ref: DEU)		
AUS (Australia)	2.468**	3.826**
CAN (Canada)	2.172**	4.100**
ESP (Spain)	2.404**	1.302 <sup>^</sup>
NZL (New Zealand)	1.334**	3.788**
USA	2.859**	5.778**
AUT (Austria)	0.538**	0.200
CZE (Czech Republic)	1.146**	−0.221
HUN (Hungary)	2.565**	1.105 <sup>^</sup>
NLD (Netherlands)	1.319**	−0.900
Female	0.448**	0.455**
Family structure		
Single-parent (vs. two-parent)	0.065	0.038
Other (vs. two-parent)	−0.159 <sup>^</sup>	−0.171*
Math achievement	0.008**	0.011**
SES	0.894*	0.693**
SES $\times$ AUS	−0.190 <sup>^</sup>	
SES $\times$ CAN	−0.114	
SES $\times$ ESP	−0.130	
SES $\times$ NZL	−0.391**	
SES $\times$ USA	−0.287**	
SES $\times$ AUT	0.157	
SES $\times$ CZE	0.166 <sup>^</sup>	
SES $\times$ HUN	0.345**	
SES $\times$ NLD	−0.217 <sup>^</sup>	
MATH $\times$ AUS		−0.003**
MATH $\times$ CAN		−0.004**
MATH $\times$ ESP		0.003 <sup>^</sup>
MATH $\times$ NZL		−0.005**
MATH $\times$ US		−0.006**
MATH $\times$ AUT		0.001
MATH $\times$ CZE		0.003*
MATH $\times$ HUN		0.003*
MATH $\times$ NLD		0.004*

Note: Undifferentiated system: AUS, CAN, ESP, NZL, USA; differentiated system: AUT, CZE, DEU, HUN, NLD.

\*  $p < .01$ .

\*\*  $p < .001$ .

<sup>^</sup>  $p < .05$ .

dents' educational careers is relatively loose and thus students tend to have relatively unfettered expectations in undifferentiated systems (Kerckhoff, 1977; Meyer, 1977).

In order to test whether student in countries with highly differentiated educational systems also have more realistic occupational expectations (Hypothesis 4) Table 7 reports the results of students' occupational expectations in the six countries with data on this variable. The columns contain the percentage of students reporting that they expect to hold one of four types of occupations: a white-collar high-skilled, a white-collar

<sup>11</sup> Because occupational expectations are available for only four of the ten countries, this analysis focuses on educational expectations.



Table 7  
Students' occupational expectations in selected countries, PISA 2003.

Country	White-collar high-skilled	White-collar low-skilled	Blue-collar high-skilled	Blue-collar low-skilled
<b>Highly differentiated</b>				
Germany	61.3	18.4	17.3	3.0
Austria	58.5	21.0	17.3	3.2
Hungary	60.8	19.6	18.2	1.4
Czech Republic	58.4	22.2	16.6	2.8
Mean	59.8	20.3	17.4	2.6
<b>Undifferentiated</b>				
United States	85.3	7.8	5.8	1.1
Australia	76.0	12.5	10.6	0.9
Mean	80.7	10.2	8.2	1.0

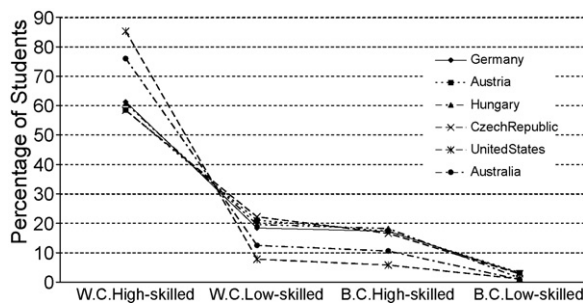


Fig. 3. Students' occupational expectations in selected countries, PISA 2003.

low-skilled, a blue-collar high-skilled, or a blue-collar low-skilled occupation by the age of 30. These results are presented graphically in Fig. 3.

A clear pattern emerges in support of Hypothesis 4. In the United States and Australia, more than three-fourths of students expect to achieve white-collar, high-status occupations. In countries with highly differentiated systems – Germany, Austria, Hungary and the Czech Republic – the figures are lower, clustering at roughly 60 percent. Note also that in highly differentiated countries far more students expect to attain white-collar, low-skilled or blue-collar, high-skilled occupations than students in countries with undifferentiated educational systems. Students' occupational expectations are distributed more evenly through the occupational hierarchy in countries with highly differentiated educational systems. Clearly, the types of schools students attend send them clear messages about the range of educational and occupational options available to them in the future; they develop relatively realistic views about how far they will go in school and what kind of job they are likely to get.

## 5. Discussion

Our analysis of five countries with highly differentiated educational systems examined the role of socioeconomic status in students' placement into different types of secondary schools and the role of school type in the formation of educational and occupational expectations. Students' social origins are highly predictive of the types of schools they attend, with high SES students more likely to attend academically oriented schools. There are some country-level variations in the degree of stratification into school type on the basis of socioeconomic status, but in all countries low-SES students are significantly less likely to be found in secondary schools that provide a pathway to higher education. These findings advance our understanding about how institutional variations serve to link students' social origins to their educational and occupational attainment in highly differentiated educational systems. While some scholars have suggested that the link was due to the channeling of students from different class backgrounds into different educational trajectories (e.g., Müller & Karle, 1993), the current study is the first to demonstrate empirically the influence of social origins on selection into distinct educational pathways for several countries using standardized data.

Moreover, our investigation of the determinants of students' educational and occupational expectations in these educational systems reveals that the type of school students attend has a strong impact on their expectations, net of other factors. Students in school types 2, 3 and 4 are less likely to expect to complete college and expect to attain a significantly lower occupational status than students in type 1 schools. The types of schools that students attend impart a strong dose of realism into students' educational and occupational expectations. Overall, stu-

dents' expectations for attaining higher education are closer to the national levels of college attainment in countries with highly differentiated systems than in countries with undifferentiated systems. Moreover, family SES and math achievement are more strongly associated with students' educational expectations in the former than in the latter. While the great majority of students in undifferentiated educational systems expect to achieve white-collar, high-status occupations, in highly differentiated educational systems, students' occupational expectations are distributed more evenly throughout the occupational hierarchy.

These findings raise several interesting questions for future research. First, the evidence regarding the impact of students' social origins on their placement in academic trajectories in countries with highly differentiated secondary school systems is striking and suggests an important avenue for more research. Future studies should examine how the process of secondary school placement occurs in these educational systems in order to understand precisely how social origins impact school placement. For example, in Germany, teachers allocate students to different types of secondary school primarily on the basis of student achievement and secondarily on the basis of parental preference. While early achievement is likely correlated with socioeconomic status, there is some evidence that well-educated parents can assert their preferences more successfully than less-educated parents at this crucial branching point (Oswald, Baker, & Stevenson, 1988). The abundant research on track placement in the United States could provide guidance for similar research on selection into educational trajectories in highly differentiated educational systems. Given that these pathways are crucial determinants of later outcomes, such studies could be very informative.

Second, because we do not have longitudinal data on students, we do not know how closely the educational and occupational expectations they express at age 15 match with their actual destinations. Our comparison of students' reported expectations with the actual educational attainment of the population is informative, but educational systems change over time. In forming their educational expectations, students may be considering national factors and policy changes not captured by aggregate statistics on current educational attainment. More in-depth research using longitudinal data for youth in a single country could be used to investigate the stability or fluidity of students' expectations over time and how well students predict their actual destinations.

Social origins play a crucial role in determining a wide range of students' educational experiences and outcomes in both highly differentiated systems like those in the

five European countries examined in this study, as well as in relatively undifferentiated educational systems. In highly differentiated systems, social origins may have their greatest impact in a relatively concentrated period of time earlier in the life course, before youth are selected into different educational trajectories. In undifferentiated educational systems, socioeconomic origins wield their impact in a myriad of ways throughout the educational life course. Thus, while stratification is apparent in all societies, the paths through which stratification mechanisms operate differ according to the institutional arrangements of educational systems.

Importantly, the effects of early sorting in highly differentiated systems may be increasingly relevant for social inequality in changing economic environments. On one hand, the strong linkage in highly differentiated educational systems between school types and students' educational and occupational expectations may be viewed as desirable and appropriate by those who believe that educational systems should provide distinctive curricula and training to students according to their different interests, abilities and chances of succeeding in higher education (see Phillips, 1995a). It can be even argued desirable for educational systems to reign in students' otherwise unfettered expectations and provide them with realistic expectations of their educational and occupational career prospects early in life.

On the other hand, educational systems that sort a substantial segment of student populations at early ages into vocationally oriented schools may not meet societies' and individuals' needs for advanced skills and technological knowledge. Evidence for this argument is found in the continuously declining preference of students for vocational secondary schools (*Hauptschule*) but increasing demand for academic secondary schools (*Gymnasium*) that offer opportunities of higher education in Germany (Ertl & Phillips, 2000; Phillips, 1995b). Moreover, job prospects for *Hauptschule* graduates in Germany have declined, likely because these secondary vocational schools provide little advanced knowledge or skills appropriate to information and technology based occupations (Phillips, 1995b). Finally, growing rates of immigration into European countries raise a particularly serious concern about the extent to which highly differentiated systems channel immigrant students into lower status, vocational schools and thus restrict social mobility of immigrants through education.

Indeed, international comparisons of student performance in reading, math, and science literacy tests from PISA data illuminate the potentially detrimental consequences of highly differentiated systems for students from economically disadvantaged and/or immi-

grant backgrounds. Disparities in student literacy skills by socioeconomic and immigrant backgrounds are considerably larger in highly differentiated systems than in undifferentiated systems (OECD, 2004, 2006). These findings have sparked debates about the potentially harmful consequences of highly differentiated educational systems for student outcomes in countries like Germany (Deutsche Welle, 2005).

It is not a simple task to change the structure of a highly differentiated educational system to an undifferentiated system, nor is it necessarily desirable. As seen in our analysis, undifferentiated systems do little to reign in students' unrealistic expectations for higher education and high-status occupations. However, our findings indicate that government officials and educational policy makers in differentiated systems should consider carefully how to respond to the evidence that such systems channel students from poorer backgrounds into lower status, vocational schools, which in turn limits their access to higher education. Given the literature that suggests that as children get older, influences of social origins on children's educational outcomes become weaker (Schneider, 2008; Shavit & Blossfeld, 1993), delaying ages at which students are sorted into different types of schools may be one potential way forward. More systematic and comparative research on institutional arrangements of educational systems will extend our understanding of how educational systems shape stratification processes in modern societies.

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## Appendix A. Descriptions of five highly differentiated educational systems

### A.1. Austria

After four years of elementary school, children attend either an academic secondary school (*Allgemein Bildende Höhere Schule*) or a general-level secondary school (*Hauptschule*) for grades 5–8 (ages 10–14). Thereafter, students enroll in one of three pathways. The Gymnasium (also called *Allgemein Bildende Höhere Schule*, upper cycle) prepares students for the matriculation exam (*Reifeprüfung*) and entrance to the university. Alternatively, technical and vocational schools through grade 12 (*Berufsbildende mittlere Schulen*) or technical

and vocational colleges (*Berufsbildende höhere Schulen*) through grade 13 prepare students for health occupations or other skilled technical occupations. A third pathway for vocational training is to enroll in a *Polytechnische Schule* for 9 grade and then in a *Berufsschule* for continued part-time vocational training for grades 10–13 while concurrently receiving on-the-job training at the workplace (known as the dual system).

### A.2. Czech Republic

The Czech Republic has a system of multi-year academic schools (*Gymnazia*); children can transition from primary school (*Základní škola*) to the *Gymnasium* as early as age 11 but they can also gain entry to the gymnasium at age 13 and at age 15. Regardless of the length of their schooling in the gymnasium (four years, six years, or eight years), students must pass the school-leaving exam (*Maturitní zkouška*) in order to gain admission to the university. For students who do not attend academic schools, secondary technical schools (*Střední odborné Vzdělání*) offer four years of vocational and technical training in order to prepare students to enter the work force. Students at these schools can also take the *Maturitní zkouška* and if they pass it, they can continue on to higher education and university study.

### A.3. Germany

After uniform compulsory elementary school, 10-year-old students attend one of three types of secondary school, all of which are connected to tightly defined opportunity structures. The rigorous academic curriculum of the *Gymnasium* through grade 13 prepares students for the school-leaving exam (*Abitur*) which provides access to the university system and, ultimately, prestigious professional, political or academic occupations. The *Realschule* offers an extended general curriculum through grade 10 that stresses the academic, vocational, and business skills needed for a range of skilled blue-collar occupations and business apprenticeships. The *Hauptschule* provides the minimum compulsory secondary education through ninth or tenth grade. While *Realschule* students can attempt to enter the *Gymnasium* after the completion of grade 10, few actually do so. The *Gesamtschule* is simply a school that offers all three pathways within the same school.

### A.4. Hungary

As of 1992, Hungary's upper secondary schools consist of three major types: *Gimnazium* are academic

schools which have little to no vocational component and prepare students for the school-leaving examination (*érettségi vizsga*) and university study. *Szakkoze Piskola* are secondary vocational schools that combine general and academic study with broadly defined vocational concentrations; students in these schools may pursue studies in *Gimnazium*. *Szakiskola* or technical schools, emphasize skills related to specific occupations. Additionally a small proportion of 15-year olds are still enrolled in *Altalanos iskola* or primary school covering grades 1–8. Students are allowed to transfer *gimnazium* at grade 4 or grade 6 (ages 11 and 13) but a small proportion of students actually transfer at these ages; 90 percent of students complete grades 1–8 in *Altalanos iskola*.

#### A.5. Netherlands

After completing eight years of primary school, at about the age of 12, children enter one of three types of secondary education: VWO provides six years of academic preparation for the university; HAVO consists of five years of general secondary education designed to prepare students for higher professional education but students who have completed HAVO can go on to complete their education in VWO and then enter the university. VMBO is the vocational track that offers basic vocational training as well as training for middle management. VMBO was introduced in 1999 to replace more specific vocational pathways known as VBO and MAVO. Additionally, a small proportion of 15-year olds are still enrolled in primary school, PRO.

Sources: for all countries, PISA ([www.pisa.oecd.org](http://www.pisa.oecd.org)) and Eurydice Information Database on Education Systems in Europe (Eurydice European Unit, 2005) ([www.eurydice.org](http://www.eurydice.org)), Shavit and Müller (1998); for Germany, Kultusminister Konferenz <http://www.kmk.org/dossier/organisation.pdf>; for the Czech Republic, Mateju and Strakova, 2005.

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