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Cross-National Variation in Educational Preparation for Adulthood: From Early Adolescence to Young Adulthood

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Contact: Laura Lippman
Early Childhood, International and Crosscutting Studies
Division
Tel: 202.502.7383

U. S. Department of Education
Office of Educational Research and Improvement

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Foreword

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Marilyn M. McMillen
Chief Mathematical Statistician
Statistical Standards Program

Ralph Lee
Mathematical Statistician
Statistical Standards Program

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**Cross-National Variation in Educational
Preparation for Adulthood:
From Early Adolescence
to Young Adulthood**

Prepared by:

Laura Lippman

Prepared for:

U.S. Department of Education
Office of Educational Research and Improvement
National Center for Education Statistics

February 2001

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This paper presents key indicators of educational and employment status for students making the transition from adolescence to early adulthood in selected OECD countries. The data that are presented include international comparisons of student achievement, educational attainment, literacy and unemployment among young adults. Data on expenditures for education are presented as a measure of national investment in education. This is by no means an exhaustive presentation of available data; rather, it is selective, presenting data on important educational markers from international surveys and collections, offered as representative of key aspects of transitioning from education to the workforce in each country.

To ensure comparability of data across countries, the data are derived from international surveys, or data collection efforts in which data have been harmonized. The time frame to which the data refer is the middle of the 1990s, between 1994–96. Time trends are not presented, since the surveys are only available for one point in time. Although some trends in administrative data are available, it was deemed more important to present data for a time period corresponding to that of the assessment and survey data, in order to observe patterns across the milestones presented.

The countries chosen for comparison are OECD members that are representative of the regions of Europe (Northern, Central, Southern, and Eastern), English-speaking countries, and Asia. The coverage of countries will vary by source, as the same countries did not participate in each of the surveys and data collections. However, every effort was made to include seven countries that are of particular interest, and they are the focus of the discussion in the text and appear in the figures when data are available: the United States, the United Kingdom, France, Germany, the Netherlands, Sweden, and Italy.

Student Achievement in Mathematics

Assessments of student achievement measure individual academic performance, as well as the performance of education systems. Mathematics is the subject most often chosen in international comparative studies of achievement for several reasons. Mathematics could be considered the most likely subject to be similar across countries, since the content of school mathematics curricula is more similar than other subjects, and much of it needs to be taught in sequence. Mathematics achievement is a high priority for nations. A workforce that is highly skilled in mathematics is valued and often cited as a policy goal by nations, as the global economy increasingly demands technical skills that require mathematics proficiency at their base. Since mathematics is the gateway to careers in science and technology, assessments of achievement in mathematics indicate student preparedness for these careers. Finally, advanced coursework in mathematics in middle school is often considered a gateway to entrance to higher education in general.

The Third International Mathematics and Science Study (TIMSS) is the source of the data. It is the largest, most ambitious, and technically advanced international assessment of students in mathematics and science achievement conducted to date. It was conducted by the International Association for the Evaluation of Educational Achievement (IEA) in 1995 in 45 countries in middle school, and 24 countries in the final

year of secondary school. Results have been reported for 41 and 21 countries, respectively (See IEA, 1998 and IEA, 1996 for more detail). There is also a primary school sample, but these results were considered outside the scope of this paper.

Middle School

TIMSS sampled middle school students in the two grades with the largest proportion of 13-year-olds—seventh and eighth grade in most countries. Results for eighth grade mathematics are presented in this paper. Proficiency in six content areas were included in the mathematics assessment, including fractions and number sense; measurement; proportionality; data representation, analysis, and probability; geometry; and algebra. An international committee that considered the varied curricula across the participating countries developed assessment items. A discussion of performance in each content area is beyond the scope of this paper; only summary measures of national differences in performance in overall mathematics achievement are presented.

Table 1 presents means and percentile distributions of the mathematics assessment for eighth graders in 19 representative countries. To give meaning to the scores, the average score of all countries participating in TIMSS was 513, and on average, students advance 33 points from 7th to 8th grade. The range in mean scores of the selected countries is from the 480s in the Southern European countries of Spain and Greece to 605 in Japan. This range in mean scores across countries is greater than 3 times the average gain in achievement from 7th to 8th grade. Among the countries of interest, presented in Figure 1, the means range from 541 in the Netherlands to 500 in the U.S. (Italy did not report scores in time to be included in the TIMSS reports).

The distribution of scores within countries is larger than that across countries. Standard deviations among the countries in Table 1 range from 73 in Spain to 102 in Japan, or more than 2 to 3 times the average gain in achievement from 7th to 8th grade. All countries tested demonstrated a similarly large dispersion, and among the countries of interest, it ranges from 76 in France to 93 in England (Figure 1 and Table 1). The interquartile range—the range from the 75th percentile score and the 25th percentile score—is another useful measure of dispersion in the performance of the middle half of all students. It ranges among the countries of interest from 107 in France to 128 in the U.S. (as may be seen in Figure 2 and Table 1), or 3 to 4 times the average gain from 7th to 8th grade.

The Netherlands and France have the highest mean scores among the countries of interest (and they are not significantly different from each other at 541 and 538), but their distributions of performance are different, with a larger dispersion of scores in the Netherlands, where the interquartile range is 127 compared to 107 in France (Figure 2). Low scorers in the Netherlands at the 5th percentile score 397 compared to 415 at the 5th percentile in France, and high scorers in the Netherlands at the 95th percentile score 688 compared to 666 in France. France demonstrates that a wide range in performance is not a prerequisite for high overall levels of achievement. Interestingly, students at only the 25th percentile in France have a score that is about the same as the mean for the U.S.

Sweden's mean score is 519, which is not significantly different than that of the Netherlands (because of the large standard error in the Netherlands), but it is below that of France. Germany's mean score is not significantly different than Sweden at 509, and also not significantly different than England and the U.S. at 506 and 500, respectively. Germany, England and the U.S. also have large dispersions of scores, with their interquartile ranges among the highest at 124, 127 and 128, respectively. Differences in the mean scores between one country and the next lowest scoring country are, in general, small or insignificant among the countries of interest.

Gender differences in 8th grade mathematics achievement across countries are presented in Table 2. They are small or virtually nonexistent. Among the countries presented in Table 2, only Denmark, the Southern European countries and Japan have gender differences that are statistically significant, and in all cases, boys score higher than do girls. In the six countries of interest for which data are available, gender differences range from 2 points in Sweden to 8 points in France, but these differences are not statistically significant.

Differences in performance in TIMSS among countries at the eighth grade have been attributed to differences in curriculum and instructional practices which influence students' opportunity to learn content areas in mathematics (NCES, forthcoming; Schmidt et al., 1997). Some of these differences as well as other school system characteristics of each country participating in TIMSS are detailed in *National Contexts for Mathematics and Science Education: An Encyclopedia of the Education System Participating in TIMSS* (Robitaille, 1997). In all participating countries, student level factors that were strongly related to higher achievement included: higher parent education, more educational resources and books in the home, and less time watching television (IEA, 1996).

End of Secondary School

Twenty-four countries participated (and twenty-one reported data) in the TIMSS assessment of mathematics and science achievement in the final year of secondary school—intended as an assessment of the yield of education systems. The end of upper secondary education is defined differently across countries, and students vary by average age, enrollment rates in any educational program, as well as by the type and length of programs or tracks in which they are enrolled (academic, technical, or apprenticeship). The Appendix describes the structure of the upper secondary systems in the six countries of interest that participated in this assessment.

Since the end of upper secondary education varies across countries, it is important to be conscious of differences in the coverage of students who are being assessed, so that comparisons between selected highly academic students in one country and the general population in another can be avoided. An index was created to represent the percentage of the school-leaving population of a country covered by the TIMSS sample, the TIMSS Coverage Index or TCI. Countries with high TCIs have high proportions of the age cohort still in school, and they are represented in the TIMSS sample. Low TCIs indicate

smaller proportions of the cohort still in school, and/or may have excluded students in certain programs from their sample. Among the six countries of interest, the TCI was: 84 percent in France, 78 percent in the Netherlands, 75 percent in Germany, 71 percent in Sweden, 63 percent in the U.S., and 52 percent in Italy. (The U.K. did not participate at this school level.) Countries with higher TCIs tended to have higher performance on the assessment (IEA, 1998).

Results for the mathematics literacy test are presented here. This test measures general mathematics knowledge of all final-year students who are at the point of leaving school and entering the workforce or postsecondary education. It can indicate how well the overall population of school leavers is prepared to apply general mathematics knowledge to their future tasks in the workplace or in further education. The mathematics curriculum varies across countries, and the sample includes students who have specialized in mathematics, as well as those who may have not had mathematics courses in several years. TIMSS also assessed general science literacy, as well as advanced mathematics and physics at this level, but these were considered outside the scope of this paper.

Table 3 presents mean and percentile scores for selected countries representing the regions, and Figure 3 displays the means and standard deviations for the countries of interest. The average score of all countries that participated was 500. The mean scores range from 461 in the U.S. to 560 in the Netherlands, which is a wider range in scores than among eighth graders. But, standard deviations are again large, ranging from 79 in France to 99 in Sweden, indicating again that within country differences are larger than between country differences in mean scores. The interquartile range between the 75th and the 25th percentiles of performance ranged among the countries of interest from 110 in France to 126 in the U.S. Once again, the lowest 25th percentile in France scores similarly to the mean score for the U.S. (Figure 4).

The Netherlands is again the highest scorer among the countries of interest in mathematics at the end of secondary school with a score of 560, although Sweden's score was not significantly lower at 552. France was next highest at 523, and then Germany and Italy, at 495 and 476, respectively, but not significantly different from each other. The U.S. scored 461, which was significantly lower than all of the other countries of interest except Italy. The Netherlands, Sweden, and France all scored significantly higher than the international mean.

Gender differences are larger at the end of secondary education than at eighth grade. For all of the countries of interest except the U.S., young men score significantly higher than young women in mathematics literacy (Table 4). Gender differences are largest in the Netherlands, at 53 points, a bit less in Sweden and France, at 42 and 38 points respectively, and are more moderate in Germany and Italy, at 29 and 26 points, respectively.

Overall, countries that ranked high in eighth grade mathematics achievement did not necessarily do so at the end of secondary school. Yet among the countries of interest,

both the Netherlands and France scored above the international average at both levels. Higher scores were generally found among students who were still taking math classes in their final year of secondary school, and among students who were enrolled in academic versus vocational programs. As in eighth grade, high levels of parent education were strongly related to better student performance across the countries tested (IEA, 1998). However, these relationships do not necessarily translate into explanations for differences in country performance. For example, although end-of-secondary students in both France and the Netherlands were high performers, 85 percent of student in France were still taking mathematics in their final year of school, but less than a third were in the Netherlands.

Educational Attainment

Completion of secondary education is a minimum qualification for a job or further education in most OECD countries. Increasingly, a postsecondary degree is necessary for a job with a decent wage, and increased access to employment (OECD, 1998a). Although there are major differences in the structure of secondary and tertiary education across countries (see the Appendix), tremendous strides have been made in compiling and presenting comparable data on educational attainment through the development of the International Standard Classification of Education (ISCED) and the OECD Indicators of Education Systems (INES) project.

Upper Secondary

There has been a marked increase in the proportion of the population who have completed upper secondary education over the last generation. While an average of 42 percent of 55–64 year-olds in OECD countries had completed an upper secondary degree as of 1996, 72 percent of those aged 25–34 had done so (OECD, 1998a). Upper secondary programs have become more diverse, including general, vocational, and technical programs, with more flexible entrance pathways. Students who are older than the typical age of graduation are enrolling in greater numbers. In many European countries, the majority of students are enrolled in vocational or apprenticeship programs, and it is possible to complete more than one upper secondary program. In order to make valid international comparisons, then, the data presented here are restricted to graduates of the first upper secondary education programs in which students enrolled. The number of first time upper secondary graduates is divided by the population at the typical age of graduation, as defined by each country.

Table 7 presents upper secondary graduation ratios per population at the typical age of graduation for selected countries by region, and Figure 6 for the six countries of interest for which data were available. In all of the selected countries, and all OECD countries, for that matter, graduation rates are at least 72 percent (U.S.), ranging up to 100 percent in Belgium and Norway. Among the countries of interest, the range is much smaller. Germany and France have the highest rates (86 and 85 percent, respectively), followed by the Netherlands and Sweden at 81 percent, then by Italy (79 percent) and the U.S. (72 percent). For all of the countries of interest except the U.S., the majority of

graduates have completed vocational or apprenticeship programs rather than general programs (OECD, 1998a).

Gender gaps in upper secondary graduates, where they exist, tend to favor women, (reversing historical trends in some countries) and tend to be larger in countries with lower graduation rates overall. While there is no gender gap in Germany and France, a higher proportion of women than men graduate from an upper secondary program in Sweden, Italy, and the U.S. These gaps are due to the higher rates of women graduating from general rather than vocational programs in those countries, as men continue to dominate in vocational programs.

Tertiary Education

The OECD has estimated that adults with a tertiary degree spend half as much time in unemployment, and add a decade to their time employed compared to those without an upper secondary degree (OECD, 1998a). Participation in tertiary education has increased in both university and non-university programs across all OECD countries, and since 1990, enrollment has grown by more than 20 percent in many countries. This growth was largely due to higher enrollment rates rather than a larger cohort of students. On average, one out of three youth today in OECD countries will enter a university program during the course of their lives, and one out of five will enter a non-university program.

Tertiary programs vary greatly across and sometimes within countries. The types of programs in a country influence the age at entry, the length of time that students stay in tertiary education, and their likelihood of completing the program. International comparisons of graduation rates from tertiary education need to be considered with caution because of major differences in program types and length, and in the typical age of students. However, it is a worthwhile exercise to compare countries according to their ability to provide this level of education to their students, which is so valuable in their transition to the adult workforce.

The OECD identifies five categories of tertiary programs: 1) non-university programs; 2) short first university programs that are usually four years or less, such as a U.S. bachelor's degree program; 3) long first university programs that last longer than four years, such as the German Diplom or the Italian Laurea; 4) second university programs such as a U.S. master's program; and 5) an advanced research degree such as a Ph.D. Some programs may not precisely fit into these categories, and countries may differ in their assignments of programs to a category.

Table 8 presents rates of graduation from the five types of tertiary programs per population at the typical age of graduation, for selected countries by region for 1996. Most countries have either a short or long first university program, and some have both, so it is possible to compare graduation rates from first university programs, whether they are short or long, and when both exist in the same country, by combining the graduation rates from the two. Figure 7 displays this comparison of graduation rates from first

university programs, which can be seen as a basic university level credential, among the countries of interest. Countries with *short* first university degree programs, such as the U.S. and the U.K., have higher rates of graduation (35 and 34 percent, respectively) than countries with *long* first degree programs, such as the Netherlands (20 percent), Germany (16 percent), France (14 percent), and Italy (12 percent). Sweden has both types of programs, and when they are combined, graduates students from first university programs at a rate of 19 percent. It stands to reason that shorter programs would have higher graduation rates, since they require less investment of time and money. Students attending long university programs tend to be older upon graduation, and the credential is more similar to a second university degree such as a master's, with its greater specialization and selectivity.

Women are more likely than men to graduate from first university programs, whether they are long or short (see Table 8 and Figure 7). Germany is an exception to this among the countries of interest, where 18 percent of men versus 14 percent of women have completed the German Diplom. Graduation rates from second university programs are similar among men and women in all countries, but men are more likely than women to obtain a Ph.D. or equivalent.

Literacy

While comparisons of achievement and educational attainment reveal country differences in the academic knowledge and credentials obtained by youth as they make their transition to adulthood, assessments of literacy more directly measure the actual skills and competencies possessed by youth at the time of entry into adulthood. Literacy is a measure of everyday functioning, rather than academic achievement. It is defined (in the International Adult Literacy Survey - IALS) as the ability to understand and employ printed information in daily activities at home, at work, and in the community, and its usage in order to achieve one's goals and to develop one's knowledge and potential (OECD and Statistics Canada, 1995). Cross-national comparisons of literacy among young adults can speak to the yield of education systems in producing educated and literate populations, as well as to the preparedness of young adults for work.

Prior to the 1990s, literacy was often defined as a single skill—the basic ability to read—that was either possessed or not. It was usually measured by proxy measures, such as the percent of the population who have completed four to six of years of school, (during which it was assumed that basic reading skills would be mastered), or by attaining a certain grade level score on school-based reading tests. By these measures, all highly developed countries had populations with literacy rates that approached 100 percent. During the 1990s, pioneering studies in the U.S. and Canada developed scales for assessing literacy using tasks with varying levels of difficulty, in order to differentiate skill levels within populations. The IALS, first conducted in 1994, adopted this approach, and defined three domains of literacy:

- *Prose literacy - the knowledge and skills needed to understand and use information from texts including editorials, news stories, poems, and fiction;*

- *Document literacy - the knowledge and skills required to locate and use information contained in various formats, including job applications, payroll forms, transportation schedules, maps, tables and graphics; and*
- *Quantitative literacy - the knowledge and skills required to apply arithmetic operations, either alone or sequentially, to numbers embedded in printed materials, such as balancing a check book, figuring out a tip, completing an order form, or determining the amount of interest on a loan from an advertisement.*

This paper will present data on document literacy, which can be considered the most basic domain needed in order to function in society. Levels of performance are similar across the three domains within each of the participating countries, so document literacy can be seen as exemplary of literacy skills overall (OECD and Statistics Canada, 1995). Four types of tasks were included in the document literacy test: locating, cycling, integrating, and generating information. The scale of items is divided into five levels of difficulty that correspond to the following ranges on a 500 point scale:

- Level 1: 0–225
- Level 2: 226–275
- Level 3: 276–325
- Level 4: 326–375
- Level 5: 376–500

Level 3 is the level considered the necessary minimum to cope with the demands of everyday life and work in modern society. It denotes the ability to match and integrate several sources of information, and to use several parts of a document to provide multiple answers (OECD and Statistics Canada, 1995). It is used here as a cut-point with which to compare countries.

The first point to be made is that while literacy skill levels are positively related to educational attainment in all countries (see Table 11), the same level of educational attainment does not produce the same level of literacy across countries. Young adults who have recently graduated from an upper secondary program across countries, for example, are not equally likely to demonstrate similar levels of literacy. Table 9 presents the proportion of 16–29 year-olds with an upper secondary and tertiary degrees who perform at Levels 1 and 2 on the document scale, or below the Level 3 minimum for selected participating countries: Canada, U.S., Sweden, Germany, Netherlands, Switzerland (French), Switzerland (German), and Poland. Figure 8 displays the data for the upper secondary graduates only for the countries of interest that participated in the study: the U.S., Germany, Sweden, and the Netherlands.

In the U.S., 48 percent of young adults with a high school degree perform below Level 3 on the document scale. Canada and Switzerland have over 30 percent of young adults at these levels. The percentage of upper secondary graduates with low levels of literacy is 22 percent Germany, 19 percent in Sweden and 13 percent in the Netherlands. These latter three countries have been able to foster high degrees of literacy even among

less educated adults who have received no formal qualification beyond lower secondary (OECD, 1996b).

Sweden, the Netherlands, and Germany have higher levels of literacy overall, not just among those who have completed upper secondary and tertiary programs. Table 10 presents the proportion of two selected age cohorts (16–25 and 46–55) who are at document literacy Level 3 or higher, and Figure 9 present the data for the countries of interest. In Sweden and the Netherlands, over three-quarters of young adults ages 16–25 are at Level 3 or above, and in Germany, two-thirds are at that level or above. In the U.K. and the U.S., 56 and 45 percent, respectively, perform at Level 3 or above.

The level of literacy attained by the young adult (ages 16–25) cohort is higher than that attained by the older cohort (ages 46–55) in all countries except the U.S., largely reflecting higher levels of educational attainment among the younger cohort in all countries. The most dramatic increase was in the Netherlands, where one-half of the older cohort performed at level 3 or higher, but three-quarters of the younger cohort perform at those levels. Sweden has the highest level of literacy among both cohorts, indicating long-standing factors that encourage high levels of literacy.

The literacy skills of young adults, then, reflect factors that go beyond levels of educational attainment. Canada and the U.S. have higher levels of attainment of tertiary education, but relatively lower levels of literacy than the other countries in the study, such as Sweden, the Netherlands, and Germany, which have high levels of literacy even among those with low levels of educational attainment. The content of curriculum at lower levels of education and/or institutional or cultural factors may be related to these different literacy profiles across countries (OECD and Statistics Canada, 1995; OECD, 1996b).

Unemployment Among Young Adults

The transition from school to work is an area of concern for many countries. Despite a perception that the unemployment rate among youth and young adults is problematic, the amount of time spent in unemployment among youth actually declined between 1985 and 1996 (OECD, 1998a). Part of the reason for this is an increase in the number of years that youth remain in education, and corresponding decline in the amount of time in any employment status. Between 1985 and 1996, there was an average increase of two to three years among OECD countries in the time spent in education of 15–29 years olds (OECD, 1998a). A corresponding trend is an increase in the length of the transition from school to work in some countries (OECD, 1996b). In addition, a growing number of students are combining school and work, so the distinction between those worlds is becoming more blurred.

Cross-national comparisons of unemployment rates among young adults in their twenties is one measure of how well youth succeed in making the transition from school to work. Among OECD countries, in general, and the countries of interest, in particular, high proportions of young adults ages 20–24 are still in school. In 1996, the proportion of

20–24-year-olds still in school ranged among the countries of interest from 28 percent in the U.K.; about 32 percent in Germany, Italy, and the U.S.; 40 percent in Sweden; and 51 percent in France (OECD, 1998a). The unemployment rates of young adults in their late 20s, then, more accurately reflects the completion of the transition. Therefore, the rates presented here are for 25–29-year-olds, contrasted with the rates for 15–24-year-olds.

In order to present a more comparable picture of youth unemployment, given country differences in the size of the labor force as a function of different rates of participation in education, the rates presented here are for youth *not in school*. They are taken from one source for the European Union (the European Union Labor Force Survey) which should minimize data comparability problems. The Canadian data come from the Canadian Labor Survey, and for the U.S., the Current Population Survey (OECD, 1998a).

Unemployment rates for youth ages 15–24 and 25–29 who were not in school for 1996 are presented in Table 12 and in Figure 10 for the countries of interest. Among 15–24-year-olds, the rate ranges among the countries of interest from about 10 percent in the Netherlands to 33 in Italy. The mean of the selected countries in the Table 12 is 20.4. Rates of unemployment for 25–29-year-olds parallel those for 15–24-year-olds, but at a much lower level, ranging from around 6 percent in the Netherlands and the U.S., to 17.7 in Italy, with a mean among the selected countries at 11.4. Countries with larger labor force participation rates, such as Germany, the Netherlands, and the U.S. generally have lower unemployment rates. Countries with overall high levels of unemployment have high unemployment rates among 25–29-year-olds as well, as rates in this age group tend to reflect the state of the labor market overall (OECD, 1998a).

Countries with higher proportions of students in apprenticeship programs tend to have lower unemployment rates. This may be because students in these programs are better trained and linked to jobs upon leaving school. But a measurement issue may also affect these rates: apprenticeships are generally counted as employment in labor force surveys, which would have the effect of increasing the percentage employed over countries without these programs (OECD, 1996b). Germany and Denmark have more than 50 percent of upper secondary students enrolled in apprenticeship programs, and have among the lowest unemployment rates among the countries of interest.

Such explanations do not explain the low unemployment in the U.S., which may result from a larger labor force relative to other countries, higher levels of work experience while in school, and in the year for which data are presented, a stronger economy. One year of unemployment data is not sufficient for conducting cross-national comparisons, since these rates fluctuate with economic conditions. However, it may be expected that the relative levels of unemployment among the countries and the relationships between the rates of the younger age group to the older age groups in each country would be relatively consistent over time. Another explanation for the lower U.S. rates may be that lower unemployment rates among youth have been found among countries where employment protection legislation is relatively weaker, which is the case in the U.S., the Netherlands, and the U.K. (OECD, 1998a).

The reasons given by survey respondents for their unemployment indicate that finding that first job is difficult, particularly among 15–24-year-olds in Italy, (81 percent) the Netherlands (58 percent), and to a lesser extent in France (35 percent), Germany (24 percent), the U.S. and the U.K (27 percent each). However, other reasons are important also. Dismissal or redundancy is the second most frequent reason given among both those ages 15–24 and 25–29 in Germany, the Netherlands, the U.K, and the U.S. In France, about half of both age groups are unemployed because their jobs were temporary (OECD, 1998a).

Public Expenditure on Education

The level of public expenditure on education varies greatly across the countries studied, and does not appear to be related to student achievement as measured by TIMSS (IEA, 1998). It can, however, be viewed as an indicator of a nation’s institutional support for education. Education funding varies greatly across countries by level of education—primary, secondary, or tertiary—and particularly at the tertiary level. Some of the factors related to this variability at the tertiary level include national differences in the length of study in tertiary education, differences in the propensity of students to attend full-time versus part-time, and differences in the proportion of funds spent on research versus teaching. Because of this lack of comparability at the tertiary level, the focus here will be on expenditures on secondary education. Expenditures for public and private institutions at all levels of education are presented in Tables 5 and 6, however.

Figure 5 displays expenditures per student on public and private secondary institutions in 1995, based upon full-time equivalents and converted to US dollars using purchasing power parities (PPPs), for the countries of interest. Country differences in the cost of educational resources are not accounted for in this conversion. The OECD mean for secondary institutions is \$4,606 per student. Among the countries of interest, the U.S., Germany, France, Sweden, and Italy spend above the OECD mean, while the Netherlands and the UK spend below the mean. Clearly, the lower level of expenditures is not related to the higher level of performance in the Netherlands. The range in expenditures among the countries of interest is from \$6,812 per student in the U.S. to \$4,246 in the U.K at the secondary level. Extended to all of the selected countries in Table 5, the range extends from \$7,601 in Switzerland to \$1,591 in Hungary. Staffing costs are the largest component of educational expenditures, so variability across countries can be attributed to differences in teacher salaries, student/teacher ratios, and staffing patterns (OECD, 1998a).

Another way of looking at expenditures is in relation to per capita GDP, which indicates spending in relationship to a country’s relative wealth. Table 6 presents data on expenditures relative to GDP per capita on public and private institutions by level of education in 1995. In general, richer countries spend relatively more on secondary education than poorer countries. Among the countries of interest, the general patterns observed above persist. Germany, France, Italy and Sweden spend above the OECD mean, and the U.K. and the Netherlands spend below the mean. Interestingly, in this measure, the U.S. does not maintain its high position, spending right *below* the mean.

Summary

Some patterns can be observed among the seven countries of interest in their performance across the areas in which data were presented.

- Several countries perform consistently well across the areas of achievement, literacy, and graduation from secondary school. The countries with the highest levels of achievement on TIMSS (the Netherlands and Sweden) also exhibit high levels of literacy in their populations, as well as higher than average graduation rates from secondary school. France is among the top scorers on TIMSS and has among the highest graduation rates from secondary school (France did not participate in the literacy survey). Germany exhibits high rates of graduation from secondary school and high literacy, and scored near the middle of the countries of interest in eighth grade and at the end of secondary school.
- High levels of tertiary educational attainment in a population, however, do not necessarily translate into high achievement or high levels of literacy. The U.S. and the U.K. have the highest graduation rates from tertiary education, but have relatively lower proportions of the population performing above a minimum level of literacy, among the countries of interest that participated in the literacy survey.
- Youth unemployment rates track performance in the other areas for only a couple of the countries of interest. Youth unemployment is relatively low in the Netherlands and Germany, where performance in mathematics achievement, literacy, and secondary school graduation was high. In the other countries of interest, youth unemployment rates relative to the other countries do not appear to track relative levels of mathematics achievement, literacy, or educational attainment. The overall youth unemployment rate is too crude a measure to capture country differences in the successful employment of youth with credentials in specified fields, and may be more reflective of the state of a country's economy and in particular, the extent of the service sector, which attracts employment of young adults. Countries with strong service sectors, such as the U.S. and the Netherlands, tend to have lower unemployment rates among young adults. A strong economy with low unemployment rates, can actually be such a strong attraction to students that they choose to enter the job market rather than complete their education. Thus, a country's performance on educational indicators is not strongly related to this indicator of success in the labor market.
- Expenditures on secondary education in the countries of interest appear unrelated to the outcome measures presented. All of the countries spent above the OECD mean on this level of education, except for the Netherlands and the U.K, which spent below the mean.

While the data presented in this chapter provide snapshots of country performance at important points in the transition to adulthood, they fall short of illuminating important differences across countries in the patterns of the transition. The levels of country

performance are suggestive of supports for, or obstacles to, a successful transition, but they are not explicit in the data. Panel surveys would probably be more useful for identifying these patterns, and related supports or obstacles, although they are not typically able to provide the assessments of skills in populations that the TIMSS and the IALS can, and are not comparable across countries.

The cross-sectional data presented here do however, enable us to place each country on a spectrum of performance on each measure, and permit us to identify strengths and weaknesses of each country relative to others at important milestones in the transition to adulthood. The data also give a sense of the distribution of performance on each measure among the youth within each country, suggesting the distribution of achievement and opportunity. It is important to note that the seven countries of interest are much more similar to each other on many of these measures than they are to many of the other countries presented in the tables. Although the latter were not the focus of this paper, they are more representative of the full range of performance.

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Appendix

Description of School Systems in Seven Countries

This section summarizes information found in *National Contexts for Mathematics and Science Education: An Encyclopedia of the Education Systems Participating in TIMSS*, edited by David F. Robitaille.

England (The entire U.K. did not participate in TIMSS)

England has a centralized education system in which the Secretary of State for Education and Employment is responsible for providing education services, and national policy and planning. Policies are implemented by local education authorities and schools' governing bodies. Most school administration and management functions are now carried out by the local school.

Compulsory education is between ages 5 and 16. Preprimary education is voluntary. Primary education is attended by children ages 5 to 11. Secondary education is for students ages 11 to 18. Postcompulsory education is provided in institutions of further education. The first five years of secondary education are compulsory; thereafter, school is voluntary. Further and higher education is provided by colleges or vocational schools.

State schools are attended by 93 percent of the school-age population, and are funded by the central government. There are private schools maintained by public funds at all levels of education, often known as independent schools.

France

France has a centralized school system run by the Ministry of Education. There are 28 regions, known as *Academies*. France has a strong preprimary tradition, and most preprimary schools are public, and are attended by 85 percent of 2–5-year-olds (1995). Compulsory education begins at age 6 and last until age 16. Private schools comprise 86 percent of primary schools, and 20 percent of secondary school students.

There are three types of secondary schools:

- 1) Colleges or lower secondary school for grades 6–9;
- 2) Lycees or upper secondary school for grades 10–12;
- 3) Lycees professionnels or vocational upper secondary schools, which may end at grades 11 or 13.

Although vocational education is available after grade 7, most students in grade 8 and 9 attend general studies. In grade 10, a clear distinction is made between general or technical education and vocational education. Sixty-eight percent of grade 10 students were enrolled in general or technical education in 1994–95. In grade 11, students choose between three tracks leading to the *baccalaureat general* or four tracks leading to the *baccalaureat technologique*. Both lead to university.

The grade 10 vocational students attend a program leading to the *Brevet d'études professionnelles* at the end of grade 11, or to the *Certificat d'aptitude professionnelle*. Most students do the former, and can continue their education in a technological track or in vocational upper secondary for two years to achieve the *baccalaureat professionnel*, which leads to university. Youth ages 16–25 in vocational track can be apprentices. Less than one-third enter the apprenticeship program from the 9th grade.

Germany

Germany has a regional educational governance system, with each of the sixteen *Laender* having jurisdiction over educational policy in their area. Compulsory schooling extends from age 6 through age 18. Nine or ten of those years must be spent in full-time schooling, and the rest in full-time schooling or part-time vocational schools in conjunction with a trade or apprenticeship program. Only about 6 percent of students attend private schools.

Kindergarten is voluntary, and primary schools comprise grades 1 to 4 for students ages 6 to 10. Secondary level 1 is for student ages 10 to 16, and students are differentiated into one of the following systems (about a third of students in each):

- 1) *Hauptschule*, which provides a basis for vocational training;
- 2) *Realschule*, which provides the basis for careers between the purely theoretical and purely practical;
- 3) *Gymnasium*, which prepares students for higher education.

Secondary level II is for students ages 16 to 19, and prepares them for university. Full-time and part-time vocational education are available at this level, in a dual system involving cooperative apprenticeships at two learning sites, the school and the workplace. In 1993, about 31 percent of students were in gymnasium and comprehensive schools, grades 11 to 13, 16 percent were in full-time vocational education, and 53 percent were in part-time vocational education.

Italy

Italy has a centralized school system, in which official intended curricula are defined by the Ministry of Education. There are four levels of the education system: preprimary, primary, secondary, and university. Secondary schools are divided into two levels: level 1 includes middle or junior high schools, and level 2 includes senior high schools. Compulsory education begins at age 6 and continues through age 14, at the end of junior secondary school. In 1993–94, about 8 percent of primary, 4 percent of junior secondary, and 9 percent of senior secondary students attended non-state schools.

Junior secondary school lasts three years, and is attended normally during the ages of 11 to 14. There is a junior secondary school leaving examination, after which students may attend senior secondary school for an addition three, four, or five years.

Senior secondary school is not free; students pay fees to the state and the school. There are four types of schools at this level:

- 1) classical schools, which prepare students in different specialty areas for university or teaching careers, including: Liceo Classico for the humanities; Liceo Scientifico for mathematics and science; Liceo Linguistico for the languages; Istituto magistrale for primary teacher education, Scuola magistrale for preprimary teacher education.
- 2) Art schools, which train students in the visual arts for university or fine arts academies.
- 3) Technical schools, which prepare students for professional, technical, or administrative jobs in agriculture, industry, business, and can lead to university.
- 4) Vocational schools, training students to becoming technicians, and may lead to university.

The Netherlands

There is a wide variety of schools in the Netherlands resulting from the constitutional principle of freedom of education. Public schools constituted only 27 percent of schools in 1993, and private schools constituted 73 percent. The Dutch system combines a decentralized administration and school management with centralized education policy. The school system is divided into primary, secondary (lower and upper), and tertiary. Primary education starts at age 4 and covers eight grades. Compulsory education is from ages 5 to 16 but 95 percent of children begin school at age 4.

Secondary students are tracked in to one of these four tracks based on ability (percentages refer to 1993):

- 1) Pre-university education (VWO), a six-year program leading to university or colleges of higher professional education (26 percent);
- 2) Senior general education (HAVO), a five-year program preparing students for higher professional education (22 percent);
- 3) Junior general secondary education (MAVO), a four-year program after which students may go on to the final year of HAVO, take a short or long senior secondary voc-ed course, join an apprenticeship course, or enter the labor market (28 percent);
- 4) Junior secondary vocational education (VBO), a four-year course of prevocational education specializing in technical, home economics, commercial, trade, and agricultural studies, which can lead to senior secondary voc-ed courses, an apprenticeship course, or the labor market (24 percent).

Sweden

Sweden's education system has national goals and curricula, but schools are free to implement these based upon local concerns. Compulsory education is from ages 7 to 16, and since 1995, the concept of levels has disappeared. Preschool includes all day care activities for children ages 1 to 6, and are organized by schools. There are goals and objectives for the end of grades 5 and 9.

In the early 1990s, upper secondary school is divided into 16 national programs, all lasting three years. Students may follow a specially designed or individual program. Students may attend university from all programs, however two, Natural Science and Social Science, are geared for students planning to attend university.

U.S.

The U.S. has a decentralized system of education where education is primarily the responsibility of states, and local school districts are responsible for the daily operation of schools. The federal government is involved in setting federal education policy governing the receipt of federal funds, which account for under 9 percent of all educational expenditures. In fall of 1995, 86 percent of students at all levels were enrolled in public schools.

Public school generally begins with kindergarten at age 5. The final year of compulsory schooling is generally considered to be grade 12 which finishes at age 18, but states vary in the final age of mandatory attendance, from age 16 to 18. Grades 1 to 12 are generally divided into three levels, but they have varying grade ranges. Commonly, though, elementary schools contain kindergarten through grade 5 or 6; junior secondary or middle schools are grades 7 to 9 or 6 to 8, and senior secondary schools are grades 9 to 12 or 10 to 12.

Grouping by ability occurs in many schools. Students may choose from a variety of courses in secondary school based upon their interests or ability. Students who choose a larger proportion of courses that prepare them for university are said to be in a college preparatory or academic track. Those who choose a higher proportion of vocational classes are said to be in a vocational track. Those who do not concentrate in either vocational or academic courses are in a "general" school program.

Figure 1: TIMSS 8th Grade Average Mathematics Achievement Scores, 1995

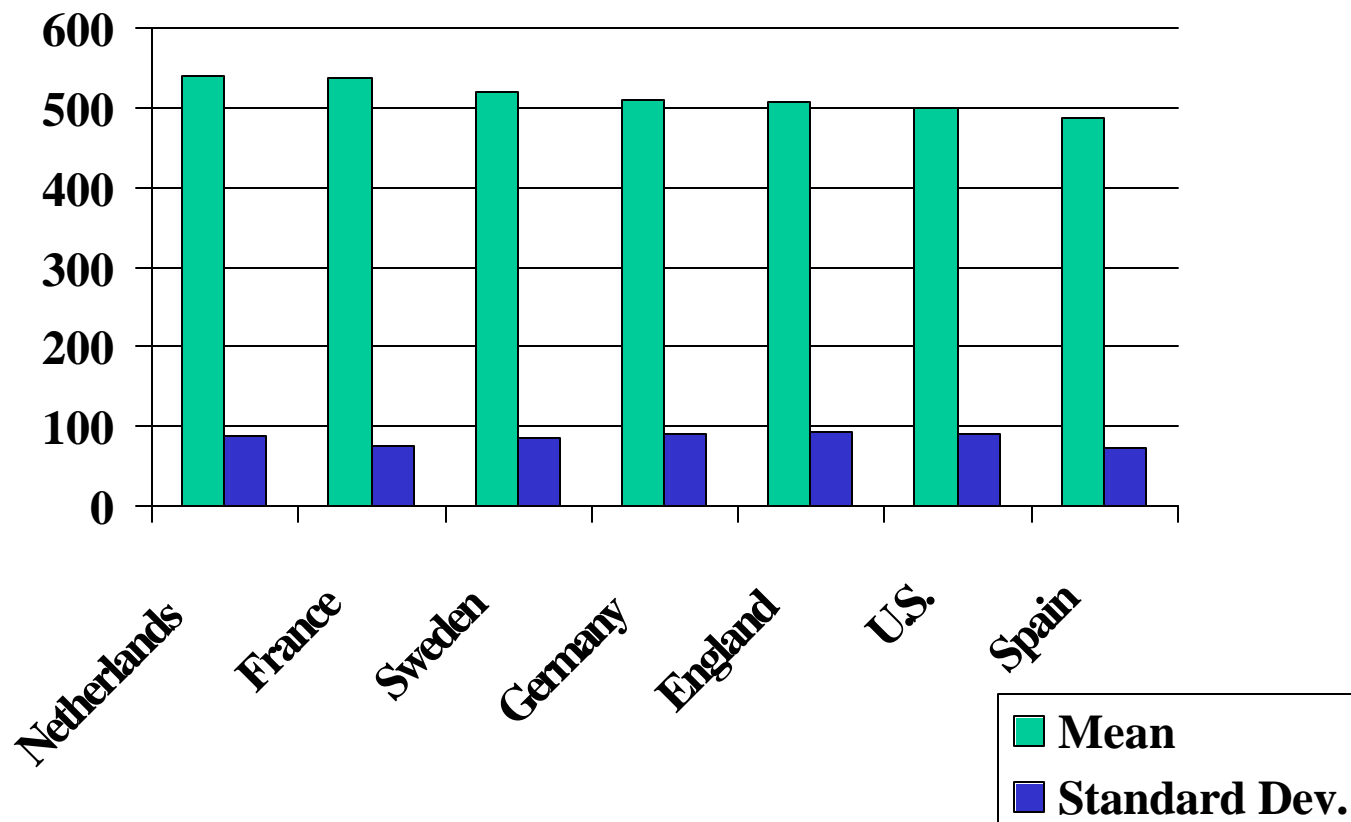


Figure 2: Percentile Distribution of 8th Grade Mathematics Achievement Scores, 1995

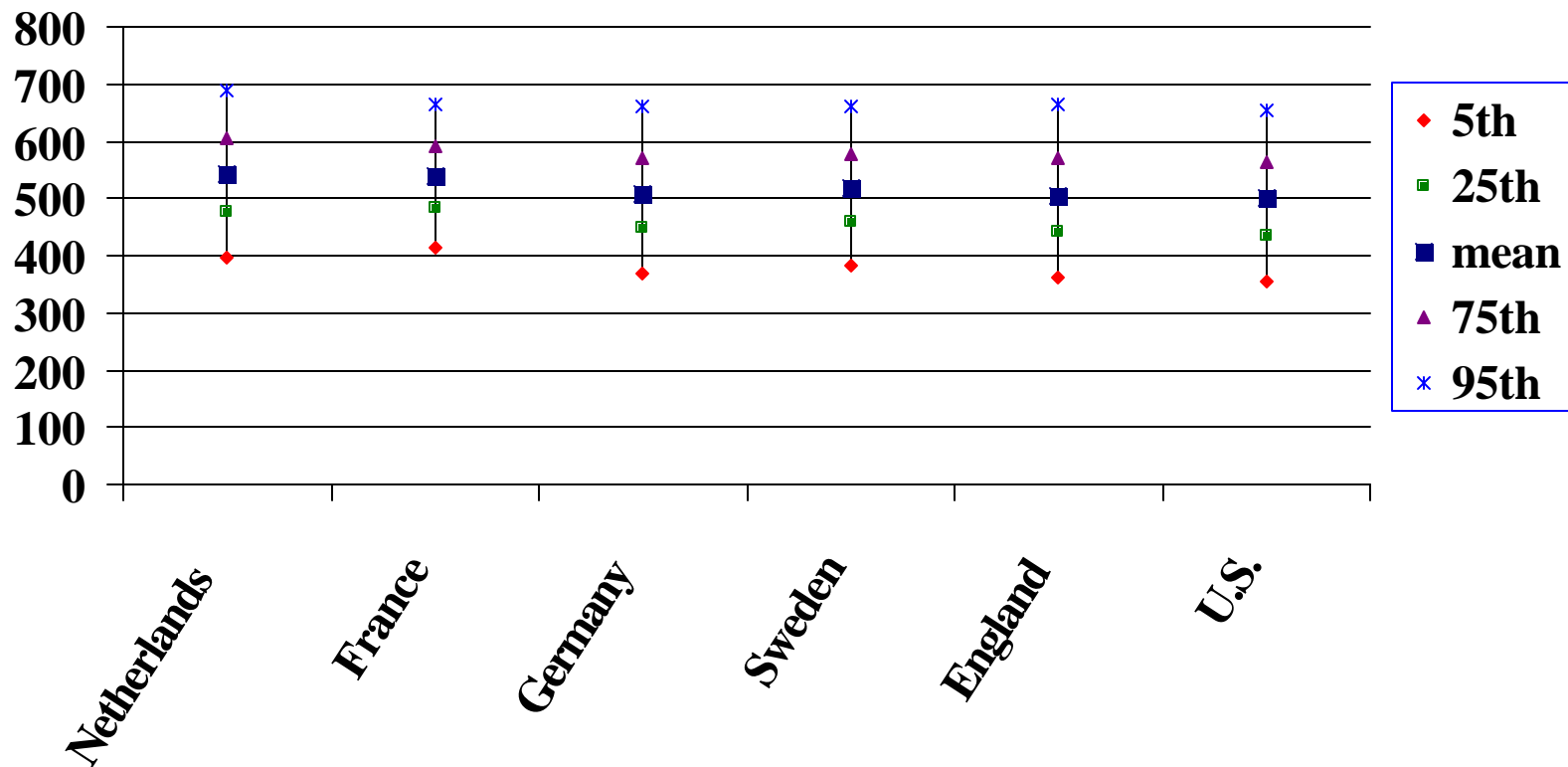


Figure 3: TIMSS General Mathematics Achievement Scores, End of Secondary School, 1995

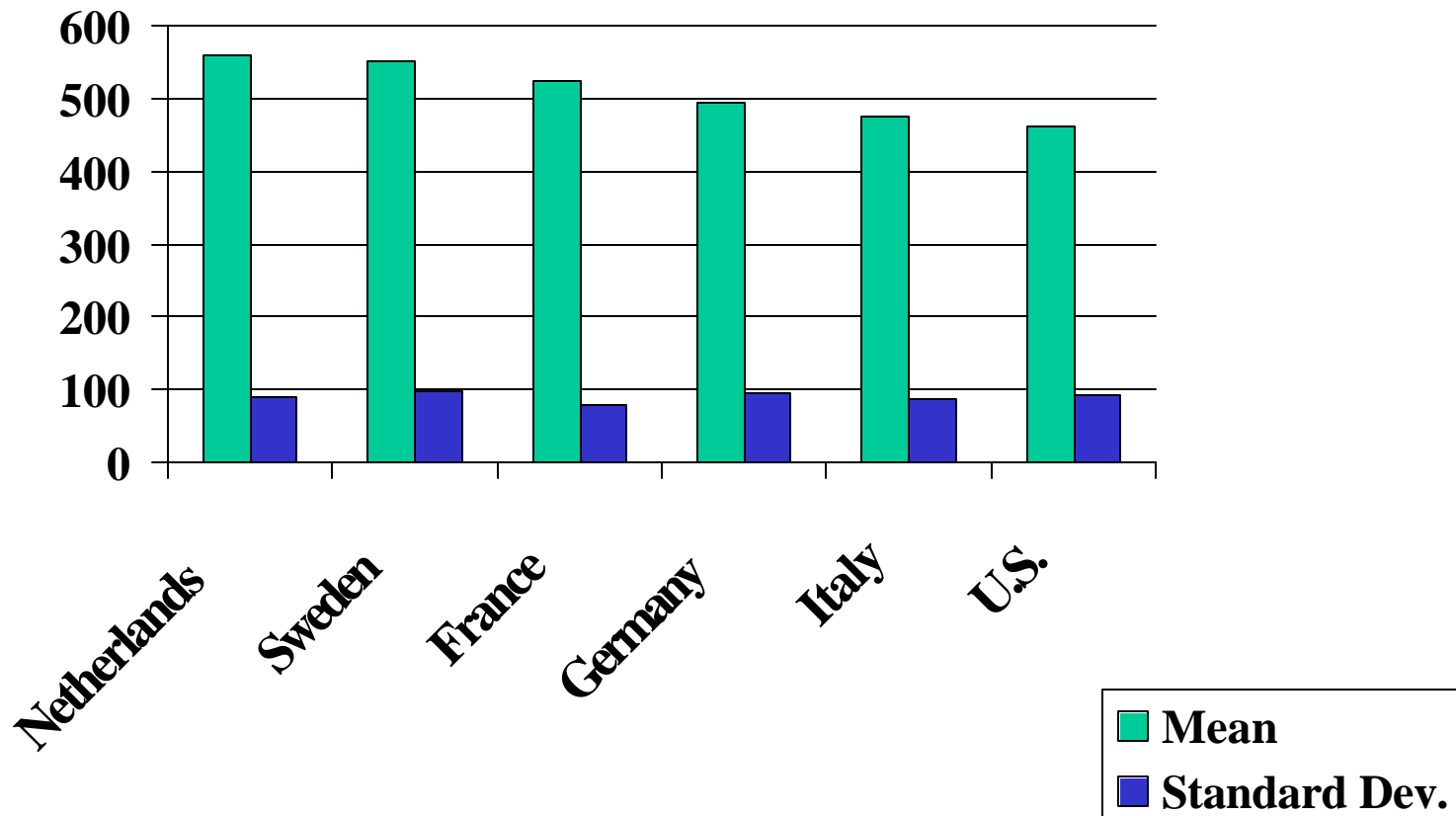


Figure 4: Percentile Distribution of End of Secondary School General Math Achievement Scores, 1995

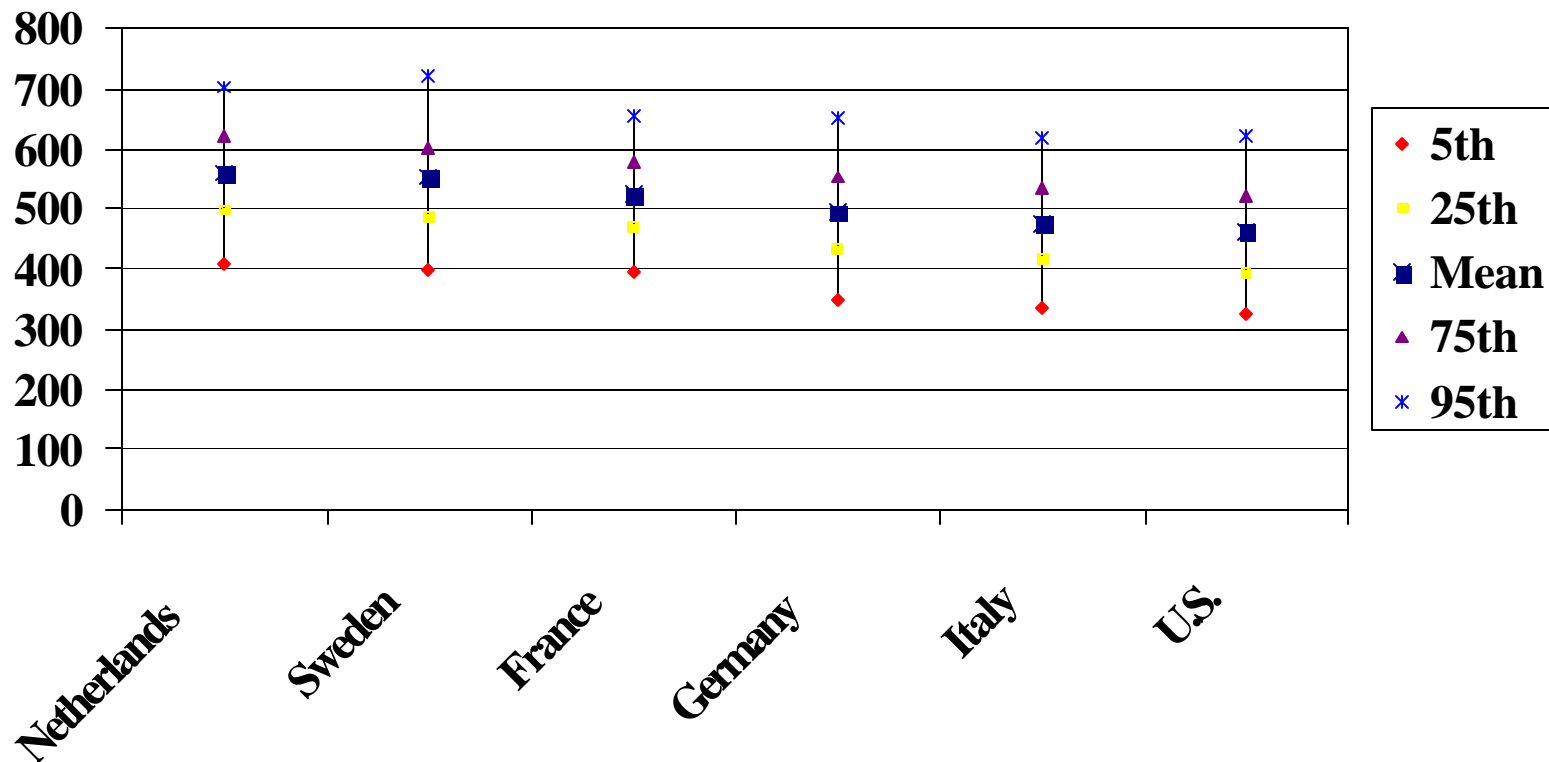


Figure 5: Expenditure Per Student on Public and Private Secondary Institutions, 1995

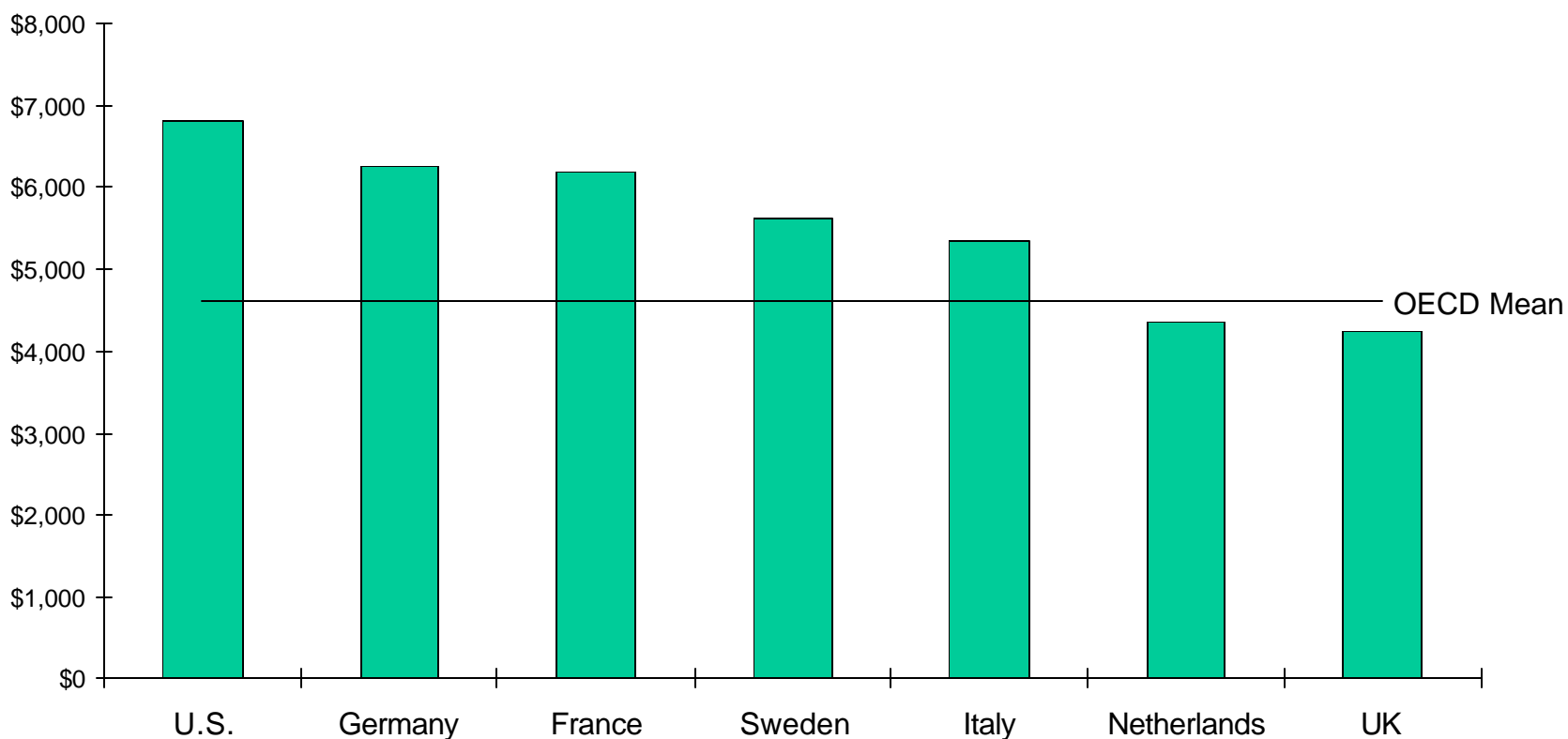


Figure 6: Ratio of Upper Secondary Graduates to Population at Typical Age of Graduation, 1996

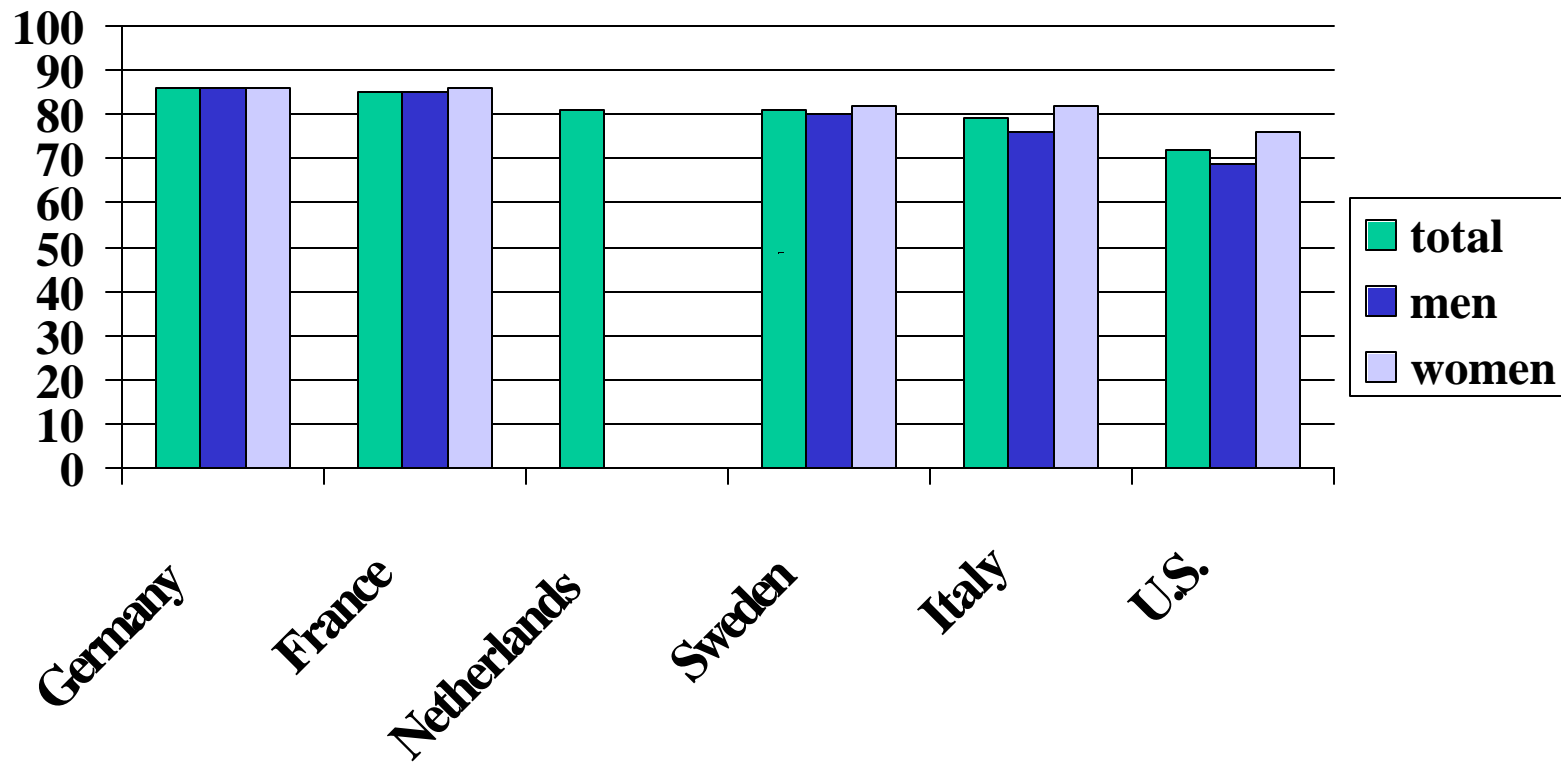


Figure 7: Ratio of Short and Long First University Program Graduates to Population at the Typical Age of Graduation, 1996

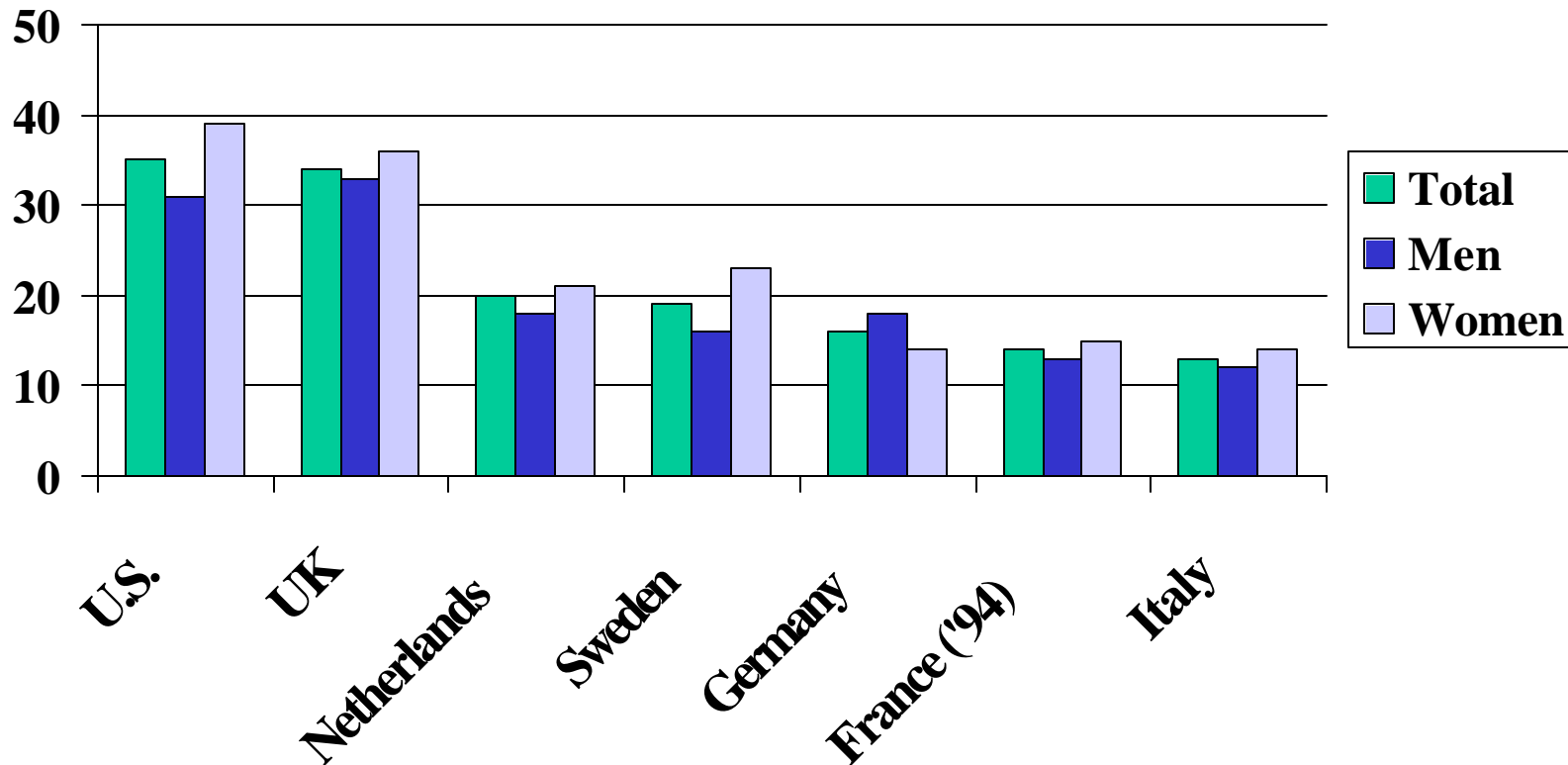


Figure 8: Percent of Upper Secondary School Completers with Low Levels of Literacy
Ages 16-29, Document Scale, 1994

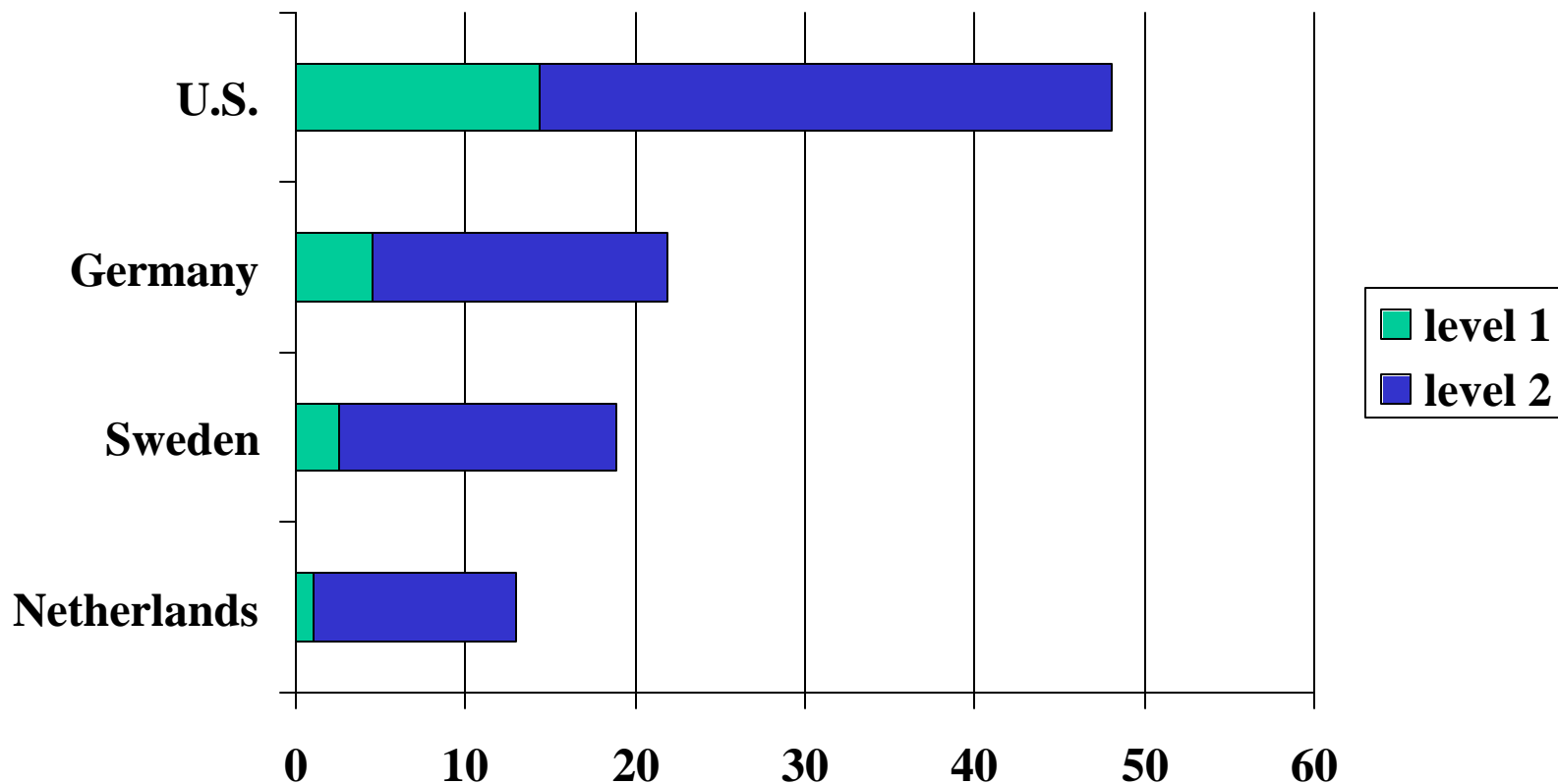


Figure 9: Percentage of population scoring at literacy level 3 or higher, Document scale by selected age group, 1994-95

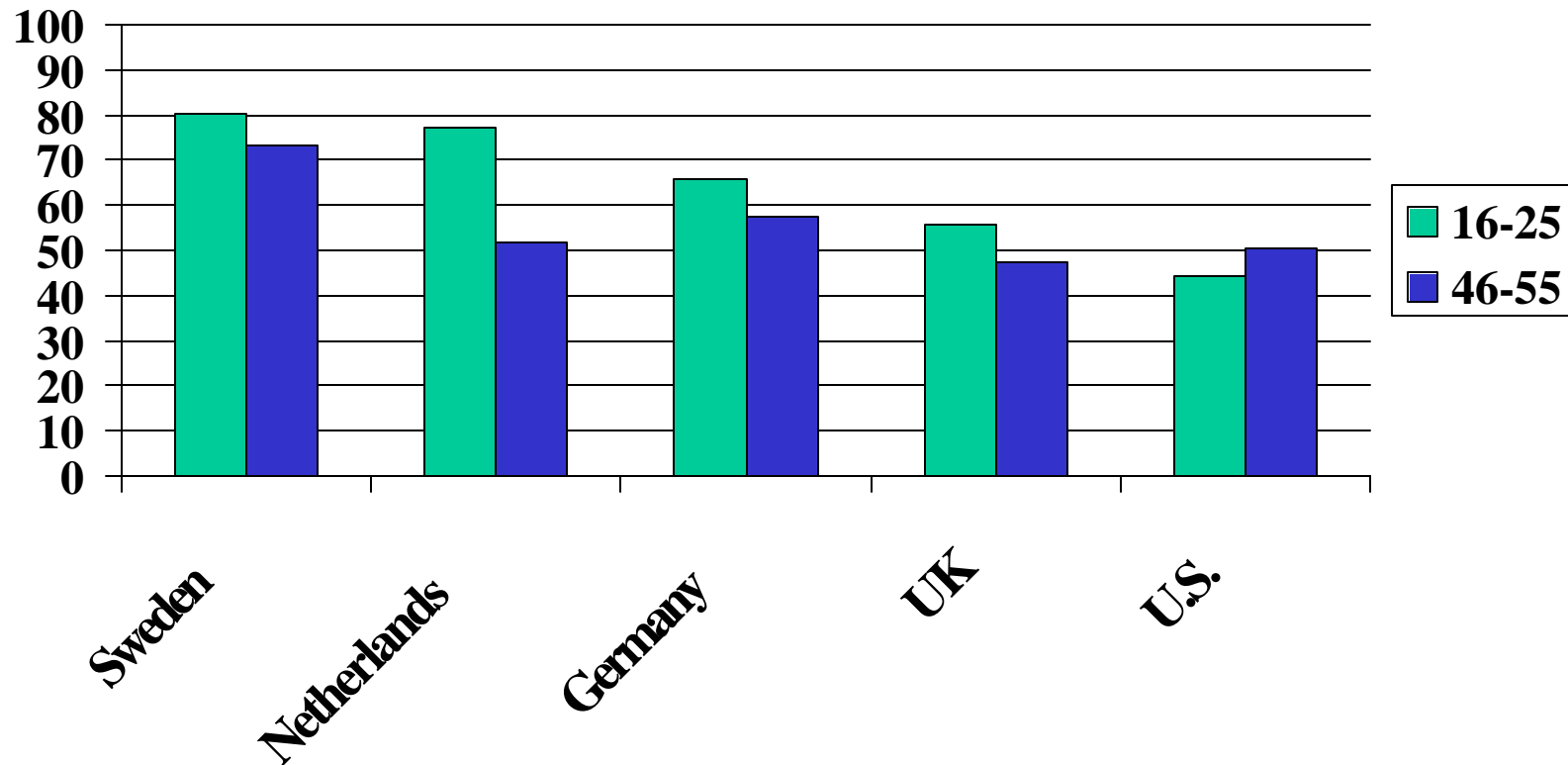


Figure 10: Unemployment of youth not in school, by age group, 1996

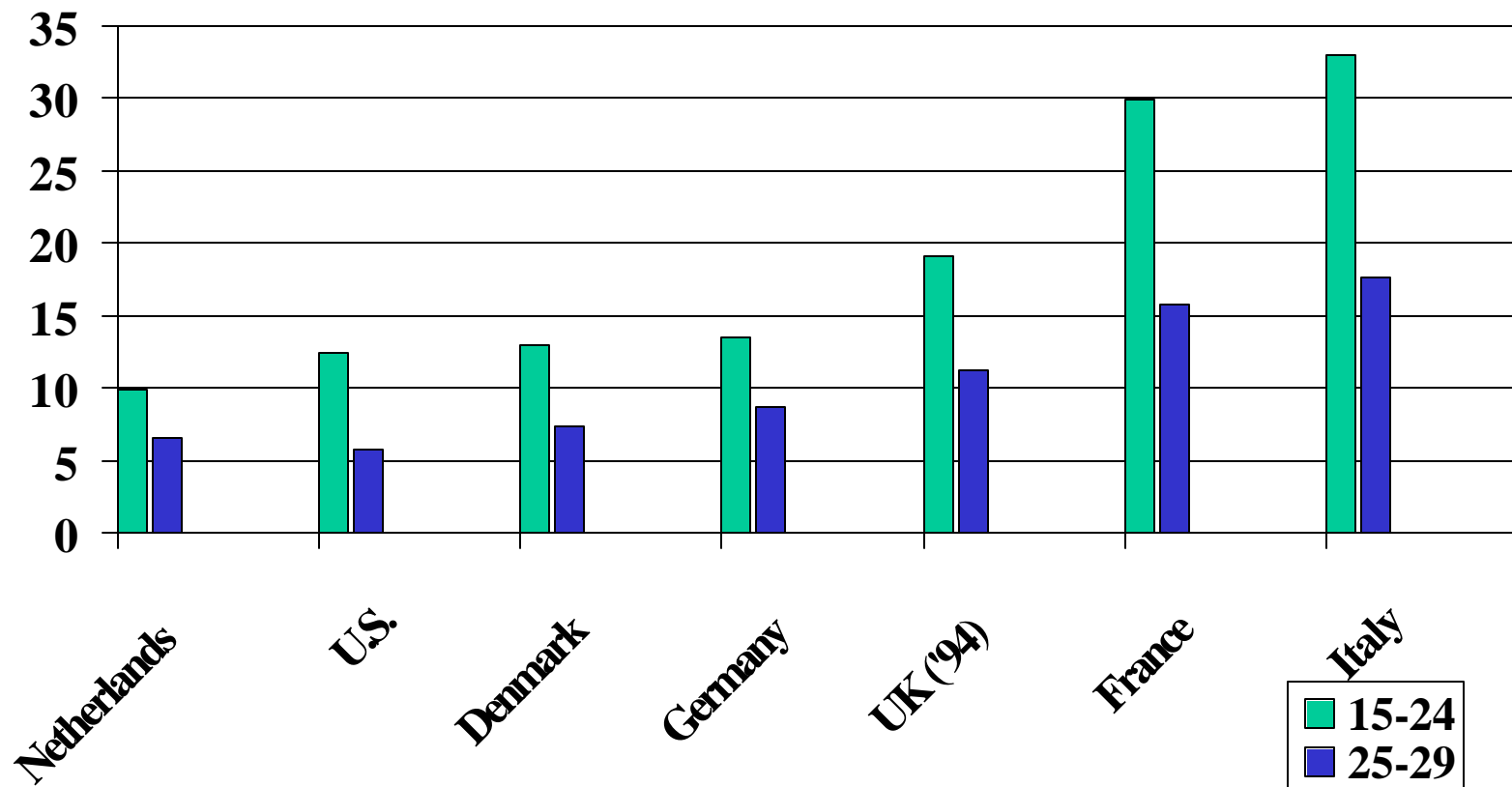


Table 1: Distribution of Mathematics Achievement Scores, Eighth Grade, 1995

Country	Mean	5th Percentile	25th Percentile	75th Percentile	95th Percentile	Standard Deviation
Anglo						
Australia*	530 (4.0)	372 (4.1)	460 (1.5)	600 (7.2)	690 (5.4)	98
Canada	527 (2.4)	389 (3.3)	468 (2.0)	587 (2.4)	670 (3.7)	86
Ireland	527 (5.1)	381 (6.5)	462 (4.9)	594 (9.6)	681 (3.3)	93
United Kingdom (England)**	506 (2.6)	361 (8.8)	443 (4.8)	570 (2.7)	665 (4.1)	93
United Kingdom (Scotland)*	498 (5.5)	364 (2.1)	436 (3.2)	559 (7.1)	649 (15.3)	87
United States**	500 (4.6)	356 (3.3)	435 (3.4)	563 (8.2)	653 (3.7)	91
Northern Europe						
Denmark*	502 (2.8)	369 (9.8)	443 (2.9)	561 (2.2)	641 (5.9)	84
Sweden	519 (3.0)	384 (2.9)	460 (6.0)	579 (3.4)	661 (4.7)	85
Western Europe						
Belgium (Flemish)**	565 (5.7)	416 (7.7)	502 (8.7)	631 (5.7)	710 (3.5)	92
Belgium (French)*	526 (3.4)	385 (13.8)	467 (1.1)	587 (3.7)	658 (6.2)	86
France	538 (2.9)	415 (5.2)	484 (1.4)	591 (2.5)	666 (3.4)	76
Germany*	509 (4.5)	368 (8.2)	448 (9.4)	572 (7.5)	661 (10.9)	90
Netherlands**	541 (6.7)	397 (10.6)	477 (9.1)	604 (7.4)	688 (6.9)	89
Switzerland**	545 (2.8)	401 (6.3)	485 (2.1)	607 (2.9)	685 (2.8)	88
Southern Europe						
Greece*	484 (3.1)	347 (2.8)	422 (1.9)	546 (3.6)	633 (6.6)	88
Spain	487 (2.0)	376 (2.0)	436 (2.5)	536 (3.5)	616 (3.9)	73
Eastern Europe						
Hungary	537 (3.2)	391 (2.3)	471 (2.1)	602 (2.7)	693 (9.2)	93
Russia	535 (5.3)	388 (4.5)	471 (5.6)	600 (8.2)	687 (2.9)	92
Asia						
Japan	605 (1.9)	435 (2.1)	536 (6.8)	676 (1.4)	771 (4.8)	102

* Countries did not meet TIMSS sampling requirements.

** Countries met TIMSS sampling requirements only partially.

SOURCE: International Association for the Evaluation of Educational Achievement (IEA)/Third International Math and Science Study.

() Standard Errors appear in parentheses. Because results are rounded to the nearest whole number, some totals may appear inconsistent.

Table 2: Gender Differences in Mathematics Achievement - Eighth Grade*

Country	Mean	Boys' Mean	Girls' Mean	Difference
Anglo				
Australia ¹	530 (4.0)	527 (5.1)	532 (4.6)	5 (6.9)
Canada	527 (2.4)	526 (3.2)	530 (2.7)	4 (4.2)
Ireland	527 (5.1)	535 (7.2)	520 (6.0)	14 (9.3)
United Kingdom (England)	506 (2.6)	508 (5.1)	504 (3.5)	4 (6.2)
United States	500 (4.6)	502 (5.2)	497 (4.5)	5 (6.9)
Northern Europe				
Denmark	502 (2.8)	511 (3.2)	494 (3.4)	17 (4.7)
Norway	503 (2.2)	505 (2.8)	501 (2.7)	4 (3.9)
Sweden	519 (3.0)	520 (3.6)	518 (3.1)	2 (4.7)
Western Europe				
Belgium (Flemish)	565 (5.7)	563 (8.8)	567 (7.4)	4 (11.5)
Belgium (French) ¹	526 (3.4)	530 (4.7)	524 (3.7)	6 (6.0)
France	538 (2.9)	542 (3.1)	536 (3.8)	6 (4.9)
Germany ²	509 (4.5)	512 (5.1)	509 (5.0)	3 (7.1)
Netherlands ¹	541 (6.7)	545 (7.8)	536 (6.4)	8 (10.1)
Switzerland	545 (2.8)	548 (3.5)	543 (3.1)	5 (4.7)
Southern Europe				
Greece ³	484 (3.1)	490 (3.7)	478 (3.1)	12 (4.8)
Portugal	454 (2.5)	460 (2.8)	449 (2.7)	11 (3.9)
Spain	487 (2.0)	492 (2.5)	483 (2.6)	10 (3.6)
Eastern Europe				
Hungary	537 (3.2)	537 (3.6)	537 (3.6)	0 (5.1)
Russia	535 (5.3)	535 (6.3)	536 (5.0)	1 (8.0)
Asia				
Japan	605 (1.9)	609 (2.6)	600 (2.1)	9 (3.3)

* Eighth grade in most countries.

1 Countries not satisfying guidelines for sample participation rates.

2 Countries not meeting age/grade specifications (high percentage of older students).

3 Countries with unapproved sampling procedures at classroom level.

() Standard Errors appear in parentheses. Because results are rounded to the nearest whole number, some totals may appear inconsistent.

SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1994-1995.

Table 3: Distribution on Mathematics Achievement Scores, Final Year of Secondary School

Country	Mean (s.e.)	5th Percentile (s.e.)	25th Percentile (s.e.)	75th Percentile (s.e.)	95th Percentile (s.e.)	Standard Deviation
Anglo						
Australia	522 (9.3)	357 (17.5)	459 (9.4)	585 (9.5)	684 (10.4)	97 (4.9)
Canada	519 (2.8)	375 (5.8)	461 (7.9)	579 (3.8)	674 (5.3)	90 (1.7)
United States	461 (3.2)	325 (4.4)	395 (3.8)	521 (6.7)	621 (7.4)	91 (1.9)
Northern Europe						
Denmark	547 (3.3)	406 (8.2)	487 (5.6)	609 (4.7)	689 (9.2)	87 (2.8)
Norway	528 (4.1)	384 (7.7)	461 (6.1)	592 (4.5)	691 (6.8)	94 (1.9)
Sweden	552 (4.3)	396 (6.4)	483 (5.1)	601 (5.5)	722 (6.8)	99 (2.3)
Western Europe						
France	523 (5.1)	392 (8.6)	468 (6.3)	578 (6.9)	655 (9.9)	79 (2.8)
Germany	495 (5.9)	347 (10.5)	432 (11.3)	554 (8.9)	652 (8.0)	94 (3.2)
Netherlands	560 (4.7)	407 (5.7)	498 (7.1)	622 (5.2)	704 (16.0)	90 (3.5)
Switzerland	540 (5.8)	395 (7.4)	478 (7.9)	601 (5.5)	684 (5.3)	88 (2.5)
Southern Europe						
Italy	476 (5.5)	336 (15.3)	417 (7.5)	534 (4.6)	619 (11.7)	87 (3.9)
Eastern Europe						
Hungary	483 (3.2)	343 (3.8)	417 (3.1)	545 (3.5)	644 (6.6)	92 (2.2)
Russia	471 (6.2)	342 (6.4)	410 (4.8)	528 (7.8)	622 (16.6)	85 (3.2)

() Standard Errors appear in parentheses.

SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1995-1996.

Table 4: Gender Differences in Mathematics Achievement, Final Year Secondary School

Country	Mean (s.e.)	Boys' Mean (s.e.)	Girls' Mean (s.e.)	Difference
Anglo				
Australia	522 (9.3)	540 (10.3)	510 (9.3)	30 (13.9)
Canada	519 (2.8)	537 (3.8)	504 (3.5)	34 (5.2)
United States	461 (3.2)	466 (4.1)	456 (3.6)	11 (5.5)
Northern Europe				
Denmark	547 (3.3)	575 (4.0)	523 (4.0)	52 (5.7)
Norway	528 (4.1)	555 (5.3)	501 (4.8)	54 (7.1)
Sweden	552 (4.3)	572 (5.9)	531 (3.9)	42 (7.0)
Western Europe				
France	525 (5.1)	544 (4.6)	506 (5.5)	38 (7.7)
Germany	495 (5.9)	509 (8.7)	480 (8.8)	29 (12.4)
Netherlands	560 (4.7)	585 (5.6)	533 (5.9)	53 (8.2)
Switzerland	540 (5.8)	555 (6.4)	522 (7.4)	33 (9.8)
Southern Europe				
Italy	476 (5.5)	490 (7.4)	464 (6.0)	26 (9.5)
Eastern Europe				
Hungary	483 (3.2)	485 (4.9)	481 (4.8)	5 (6.9)
Russia	471 (6.2)	488 (6.5)	460 (6.6)	27 (9.2)

() Standard Errors appear in parentheses.

SOURCE: IEA Third International Mathematics and Science Study (TIMSS), 1995-1996.

**Table 5: Expenditure per Student (US dollars converted using PPPs) on Public and Private Institutions
By Level of Education (based on full-time equivalents) (1995)**

				Tertiary			
	Early Childhood	Primary	Secondary	All	Non-University	University Level	All Levels of Education Combined
Anglo							
Australia	n/a	3121	4899	10590	7699	11572	n/a
Canada	5378	x	x	11471	10434	12217	6717
Ireland	2108	2144	3395	7249	x	x	3272
United Kingdom**	5049	3328	4246	7225	x	x	4222
United States	n/a	5371	6812	16262	7973	19965	7905
Northern Europe							
Denmark	4964	5713	6247	8157	x	x	5968
Finland	5901	4253	4946	7315	6933	7412	5323
Norway*	n/a	n/a	n/a	9647	x	x	6360
Sweden	3287	5189	5643	13168	x	x	5993
Western Europe							
Belgium (Flemish)**	2391	3270	5770	6043	x	x	4694
France	3242	3379	6182	6569	x	x	5001
Germany*	4381	3361	6254	8897	6817	9001	5972
Netherlands	3021	3191	4351	9026	a	9026	4397
Switzerland	2436	5893	7601	15685	8226	18365	7241
Southern Europe							
Greece**	x	x	1950	2716	1750	3169	1991
Italy*	3316	4673	5348	5013	6705	4932	5157
Portugal*	n/a	n/a	n/a	6073	x	x	n/a
Spain	2516	2628	3455	4944	3973	4966	3374
Eastern Europe							
Hungary*	1365	1532	1591	4792	a	4792	1782
Asia							
Japan	2476	4065	4465	8768	6409	9337	4991
OECD Mean	3180	3546	4606	8134	6016	8781	4713

* Public institutions.

** Public and government dependent private institutions.

n/a - Data not available.

x - Data included in another category/column.

a - Data not applicable because the category does not apply.

SOURCE: OECD Education Database.

**Table 6: Expenditure Per Student Relative to GDP Per Capita on Public and Private Institutions
by Level of Education (1995)**

				Tertiary			All levels of Education Combined
	Early Childhood	Primary	Secondary	All	Non- University	University- Level	
Anglo							
Australia	n/a	16	25	54	39	59	n/a
Canada	26	x	52	55	50	58	32
Ireland	12	12	20	42	x	x	19
United Kingdom**	28	19	24	40	x	x	24
United States	n/a	20	26	61	30	75	30
Northern Europe							
Denmark	23	27	29	38	x	x	28
Finland	33	24	28	41	39	41	30
Norway*	n/a	n/a	n/a	42	x	x	28
Sweden	18	28	30	70	x	x	32
Western Europe							
Belgium (Flemish)**	11	16	27	29	x	x	23
France	16	17	31	33	x	x	25
Germany*	21	16	31***	43	33	44	29
Netherlands	15	16	22	45	a	45	22
Switzerland*	10	24	30	63	33	74	29
Southern Europe							
Greece**	x	17	16	22	14	26	16
Italy*	17	24	27	26	34	25	26
Portugal*	n/a	n/a	n/a	49	x	x	n/a
Spain	18	18	24	35	28	35	24
Eastern Europe							
Hungary*	20	22	23	70	a	70	26
Asia							
Japan	11	19	20	40	29	43	23
OECD Mean	18	19	27	46	32	50	26

* Public institutions

** Public and government dependent private institutions.

*** Author's estimate from OECD figure (1998a)

n/a - Data not available.

x - Data included in another category/column.

a - Data not applicable because the category does not apply.

SOURCE: OECD Education Database.

**Table 7: Ratio of Upper Secondary Graduates to Population at Typical Age of Graduation (times 100),
By Type of Program, First Education Programs, 1996**

Country	Total			General			Vocational and Apprenticeship		
	M + W	Men	Women	M + W	Men	Women	M + W	Men	Women
Anglo									
Canada	73	70	77	x	x	x	x	x	x
Ireland	79	75	83	77	72	82	2	2	2
United States	72	69	76	x	x	x	x	x	x
Northern Europe									
Denmark	81	76	87	46	38	55	35	38	32
Finland	98	93	104	48	40	57	50	53	47
Norway	117	133	101	49	43	56	68	90	45
Sweden	81	80	82	27	21	34	54	59	48
Western Europe									
Belgium (Flemish)	117	104	130	34	30	39	82	74	90
France	85	85	86	34	29	40	51	56	46
Germany	86	86	86	25	22	29	61	64	58
Netherlands	81	n/a	n/a	33	n/a	n/a	48	n/a	n/a
Switzerland	81	86	76	20	18	23	61	68	53
Southern Europe									
Greece	80	75	86	54	46	63	26	29	23
Italy	79	76	82	19	16	22	59	59	59
Portugal	91	115	66	79	99	58	17	22	12
Spain	73	65	81	44	n/a	n/a	27	25	29
Eastern Europe									
Hungary	86	n/a	n/a	25	18	33	59	n/a	n/a
Poland	94	n/a	n/a	25	n/a	n/a	69	n/a	n/a
Russia	88	82	94	49	47	52	38	35	40
Asia									
Japan	99	96	102	73	69	76	26	27	26

x - Data included in another category/column of the table.

n/a - Data not available.

Source: OECD Education Database

Table 8: Ratio of Tertiary Graduates to the Population at the Typical Age of Graduation (times 100), by the Type of Program and Gender, 1996.

	Non-University Tertiary Programs			Short First University Degree Programs (e.g. U.S. Bachelor's)			Long First University Degree Programs (e.g. German Diplom)			Second University Degree Programs (e.g. U.S. Masters)			Ph.D. or equivalent		
	(A)			(B)			(C)			(D)			(E)		
	M+W	Men	Women	M+W	Men	Women	M+W	Men	Women	M+W	Men	Women	M+W	Men	Women
Anglo															
Australia	n/a	n/a	n/a	36	29	43	x	x	x	12.2	11.2	13.1	0.8	1.0	0.6
Canada	57	58	56	32	26	37	x	x	x	5.1	5.0	5.2	0.8	1.1	0.5
Ireland	16	17	15	14	12	16	11	12	10	4.5	4.6	4.4	0.6	0.8	0.5
United Kingdom	12	10	13	34	33	36	x	x	x	12.3	12.0	12.7	1.1	1.4	0.7
United States	22	18	27	35	31	39	x	x	x	12.5	11.7	13.4	1.2	1.4	0.9
Northern Europe															
Denmark	8	10	6	20	15	26	8	8	7	4.4	4.4	4.3	0.6	0.9	0.4
Finland	19	13	26	11	11	10	13	12	15	x	x	x	1.9	2.0	1.8
Norway	50	42	58	22	15	29	6	5	6	9.3	10.1	8.4	0.9	1.1	0.6
Sweden	4	4	4	11	7	16	8	9	7	3.0	2.5	3.6	1.9	2.6	1.2
Western Europe															
Belgium (Flemish)	28	24	30	a	a	a	16	17	15	4.9	4.5	5.3	0.7	0.9	0.4
France (94)	25	22	23	x	x	x	14	13	15	a	a	a	5.3	5.6	5.1
Germany	11	9	13	a	a	a	16	18	14	a	a	a	1.6	2.2	1.0
Netherlands	a	a	a	x	x	x	20	18	21	10.0	10.4	9.5	1.9	2.3	1.5
Switzerland	26	36	17	a	a	a	9	12	7	a	a	a	2.9	3.9	1.9
Southern Europe															
Greece	5	5	6	x	x	x	13	11	15	0.3	0.3	0.3	0.4	0.5	0.2
Italy	3	2	4	1	1	1	12	11	13	1.2	1.3	1.1	0.1	0.2	0.1
Portugal	6	4	9	2	1	2	14	10	18	1.5	1.4	1.6	n	n	n
Spain	2	3	2	11	9	14	15	13	17	x	x	x	0.9	1.1	0.8
Eastern Europe															
Hungary	a	a	a	x	x	x	22	18	26	2.5	2.8	2.2	0.1	0.2	0.1
Poland	10	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Asia															
Japan	30	18	43	23	31	15	x	x	x	1.9	3.1	0.7	0.4	0.7	0.1

n/a - Data not available.

a - Not applicable because category does not apply.

x- Data included in another category/column of the table.

SOURCE: OECD Education Database.

Table 9: Literacy level by Educational Attainment for 16-29-Year-Olds, Document Scale, 1994

Country	ISCED	Level 1		Level 2	
		Percent	s.e.	Percent	s.e.
Anglo					
Canada	3	9.3	(2.3)	23.6	(2.4)
	5/6/07	1.7	(1.7)	10.8	(2.6)
United States	3	14.4	n/a	33.7	n/a
	5/6/07	3.7	n/a	16.7	n/a
Northern Europe					
Sweden	3	2.5	(0.6)	16.4	(1.5)
	5/6/07	0.0	(0.0)	5.8	(2.3)
Western Europe					
Germany	3	4.5	(2.3)	17.4	(4.6)
	5/6/07	0.0	(0.0)	11.9	(6.8)*
Netherlands	3	1.0	(1.0)	12.0	(1.5)
	5/6/07	0.8	(0.9)	8.8	(2.7)
Switzerland (French)	3	4.7	(1.5)	25.8	(3.3)
	5/6/07	1.7	(1.3)	8.1	(2.7)
Switzerland (German)	3	6.1	(1.8)	25.4	(4.0)
	5/6/07	3.7	(2.5)*	18.4	(5.6)*
Eastern Europe					
Poland	3	15.2	(2.9)	39.4	(3.2)
	5/6/07	8.5	(2.7)	25.0	(3.0)

ISCED 3 refers to completed upper secondary education.

ISCED 5/6/7 refers to completed tertiary university or non-university education.

*Sample size is insufficient to permit reliable estimate.

n/a - Data not available.

s.e.- Standard error of estimate

Source: OECD and Statistics Canada, 1995.

Table 10: Proportion of Persons Aged 16-25 and 46-55 Who Are at Each Document Literacy Level, 1994 - 1995

Country	Age	Level 1	Level 2	Level 3	Level 4/5
Anglo					
Australia	16-25	9.7 (0.7)	28.4 (1.5)	42.6 (1.8)	19.2 (1.4)
	46-55	23.6 (1.2)	27.5 (1.4)	34.3 (1.9)	14.5 (1.1)
Canada	16-25	10.4 (1.3)	22.3 (3.6)	36.4 (2.1)	31.0 (4.7)
	46-55	23.0 (4.7)	31.0 (3.4)	23.6 (6.8)	22.4 (10.7)
Ireland	16-25	17.0 (1.6)	32.9 (2.1)	36.9 (2.3)	13.2 (1.8)
	46-55	36.1 (3.6)	29.8 (2.2)	24.8 (1.5)	9.2 (2.2)
United Kingdom	16-25	17.8 (1.7)	26.6 (1.8)	34.1 (2.3)	21.5 (2.0)
	46-55	24.5 (2.3)	28.2 (1.7)	31.1 (2.9)	16.2 (1.5)
United States ¹	16-25	24.7 (2.2)	30.9 (2.8)	28.4 (3.0)	16.1 (x)
	46-55	21.4 (2.1)	28.2 (2.8)	33.2 (2.1)	17.3 (x)
Northern Europe					
Sweden	16-25	3.1 (0.8)*	16.6 (1.9)	39.6 (1.5)	40.7 (1.6)
	46-55	6.8 (1.0)	19.7 (1.8)	43.1 (2.5)	30.3 (2.1)
Western Europe					
Belgium (Flanders)	16-25	5.8 (5.2)	17.8 (12.5)	51.4 (18.2)	25.0 (2.5)
	46-55	20.5 (3.1)	27.8 (2.5)	41.5 (2.9)	10.3 (1.6)
Germany	16-25	5.2 (1.4)*	29.0 (3.5)	43.0 (4.9)	22.8 (3.7)
	46-55	7.4 (1.3)*	35.0 (4.3)	43.1 (3.4)	14.5 (2.5)
Netherlands	16-25	6.1 (1.8)*	16.8 (1.9)	51.1 (3.0)	26.0 (2.5)
	46-55	12.6 (1.7)	35.7 (2.0)	38.0 (2.4)	13.7 (1.8)
Switzerland (French)	16-25	8.7 (2.0)*	24.9 (2.4)	40.4 (3.9)	26.0 (3.8)
	46-55	18.0 (3.3)	29.8 (3.8)	42.4 (3.9)	9.7 (2.0)
Switzerland (German)	16-25	7.1 (1.9)*	25.7 (4.2)	41.0 (3.7)	26.3 (3.2)
	46-55	21.0 (3.0)	33.8 (3.3)	35.0 (2.4)	10.2 (1.6)*
Eastern Europe					
Poland	16-25	32.2 (2.1)	33.1 (1.8)	26.2 (1.8)	8.5 (.9)
	46-55	55.6 (2.4)	27.0 (2.5)	13.3 (2.0)	4.1 (.8)*

* Unreliable estimate.

¹ Because of a sampling anomaly, NALS data have been substituted for the group aged 16-25.

SOURCE: International Adult Literacy Survey, 1994-1995.

Table 11: Proportion of Population at Each Level of Educational Attainment Who Are at Each Literacy Level, Document Scale, 1994-1995

Country		Level 1	Level 2	Level 3	Level 4/5
Anglo					
Canada	Less than ISCED 02	73.6	15.4	9.7	1.3
	ISCED 02	23.2	40.2	26.3	10.3
	ISCED 03	10.5	28.4	36.9	24.1
	ISCED 05	4.2	17.6	39.1	39.1
	ISCED 06/07	3.3	10.1	38.5	48.1
United States	Less than ISCED 02	74.0	18.8	6.3	1.0
	ISCED 02	45.2	27.9	21.1	5.9
	ISCED 03	21.2	33.7	32.5	12.6
	ISCED 05	11.7	25.0	39.4	24.0
	ISCED 06/07	6.7	13.3	38.9	41.1
Northern Europe					
Sweden	Less than ISCED 02	22.5	38.1	33.2	6.2
	ISCED 02	6.8	16.9	45.5	30.8
	ISCED 03	3.9	19.1	42.1	34.9
	ISCED 05	1.1	11.1	37.8	50.1
	ISCED 06/07	0.7	8.1	29.8	61.4
Western Europe					
Germany	Less than ISCED 02	55.5	30.2	14.3	0.0
	ISCED 02	10.5	38.3	39.2	12.0
	ISCED 03	4.7	26.7	43.5	25.1
	ISCED 05	4.7	20.2	48.3	26.8
	ISCED 06/07	1.1	17.9	34.8	46.2
Netherlands	Less than ISCED 02	36.0	38.7	19.2	6.2
	ISCED 02	11.2	36.9	43.1	8.8
	ISCED 03	2.9	18.2	52.4	26.5
	ISCED 05	N/A	N/A	N/A	N/A
	ISCED 06/07	1.3	13.8	50.0	34.9
Switzerland (French)	Less than ISCED 02	41.9	39.7	16.4	2.0
	ISCED 02	31.1	46.9	19.9	2.1
	ISCED 03	9.0	31.1	45.1	14.8
	ISCED 05	2.0	19.5	47.9	30.6
	ISCED 06/07	4.9	7.1	47.9	40.1
Switzerland (German)	Less than ISCED 02	72.6	16.7	10.6	0.0
	ISCED 02	31.6	40.2	17.9	10.3
	ISCED 03	9.7	30.9	42.9	16.5
	ISCED 05	5.1	24.9	49.1	20.9
	ISCED 06/07	6.8	15.7	39.1	38.4

Table 11: Proportion of Population at Each Level of Educational Attainment Who Are at Each Literacy Level, Document Scale, 1994-1995

Country		Level 1	Level 2	Level 3	Level 4/5
Eastern Europe					
Poland	Less than ISCED 02	74.6	18.8	5.2	1.4
	ISCED 02	46.9	33.9	15.2	4.0
	ISCED 03	27.8	38.3	27.2	6.8
	ISCED 05	16.4	35.5	36.1	12.1
	ISCED 06/07	15.6	29.6	32.8	22.0

ISCED 10/00/01 Primary or less.

ISCED 02 Some secondary education, but not completed.

ISCED 03 Secondary education completed

ISCED 05 Tertiary, non-university education.

ISCED 06/07 Tertiary, university education.

SOURCE: International Adult Literacy Survey, 1994-1995.

Table 12: Unemployment of Youth Not in School, By Age, 1996

Country	Unemployment Rate	
	15-24	25-29
Anglo		
Canada	20.7	10.6
Ireland	20.1	11.7
United Kingdom	19.1	11.2
United States	12.4	5.8
Northern Europe		
Denmark	12.9	7.4
Finland	32.9	13.3
Western Europe		
Austria	7.6	5.4
Belgium	20.7	10.6
France	29.9	15.8
Germany	13.5	8.7
Netherlands	9.9	6.6
Southern Europe		
Greece	29.8	14.7
Italy	33.0	17.7
Spain	38.9	27.6
Country Mean	20.4	11.4

United Kingdom: Data refer to 1994.

United States: Data are for 16-24 yr.-olds not in school,
and all 25-29 yr.olds in labor force

Sources: European Countries: European Union Labour Force
Survey (EUROSTAT);

United States: Current Population Survey; Canada: Labour Force
Survey.

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98-11	Beginning Postsecondary Students Longitudinal Study First Follow-up (BPS:96-98) Field Test Report	Aurora D'Amico
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97-15	Customer Service Survey: Common Core of Data Coordinators	Lee Hoffman
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2000-13	Non-professional Staff in the Schools and Staffing Survey (SASS) and Common Core of Data (CCD)	Kerry Gruber
Data Development		
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2000-16b	Lifelong Learning NCES Task Force: Final Report Volume II	Lisa Hudson
Decennial Census School District Project		
95-12	Rural Education Data User's Guide	Samuel Peng
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Education Finance Statistics Center (EDFIN)		
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1999-06	1998 Revision of the Secondary School Taxonomy	Dawn Nelson
HS Transcript Studies		
1999-05	Procedures Guide for Transcript Studies	Dawn Nelson
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International Adult Literacy Survey (IALS)		
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97-44	Development of a SASS 1993-94 School-Level Student Achievement Subfile: Using State Assessments and State NAEP, Feasibility Study	Michael Ross
98-15	Development of a Prototype System for Accessing Linked NCES Data	Steven Kaufman
1999-05	Procedures Guide for Transcript Studies	Dawn Nelson
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95-07	National Education Longitudinal Study of 1988: Conducting Trend Analyses HS&B and NELS:88 Sophomore Cohort Dropouts	Jeffrey Owings
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96-21	1993 National Household Education Survey (NHES:93) Questionnaires: Screener, School Readiness, and School Safety and Discipline	Kathryn Chandler
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97-02	Telephone Coverage Bias and Recorded Interviews in the 1993 National Household Education Survey (NHES:93)	Kathryn Chandler
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96-23	Linking Student Data to SASS: Why, When, How	Dan Kasprzyk
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97-09	Status of Data on Crime and Violence in Schools: Final Report	Lee Hoffman
97-10	Report of Cognitive Research on the Public and Private School Teacher Questionnaires for the Schools and Staffing Survey 1993-94 School Year	Dan Kasprzyk
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1999-13	1993-94 Schools and Staffing Survey: Data File User's Manual, Volume IV: Bureau of Indian Affairs (BIA) Restricted-Use Codebook	Kerry Gruber
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96-22	1995 National Household Education Survey (NHES:95) Questionnaires: Screener, Early Childhood Program Participation, and Adult Education	Kathryn Chandler
98-03	Adult Education in the 1990s: A Report on the 1991 National Household Education Survey	Peter Stowe
98-10	Adult Education Participation Decisions and Barriers: Review of Conceptual Frameworks and Empirical Studies	Peter Stowe
1999-11	Data Sources on Lifelong Learning Available from the National Center for Education Statistics	Lisa Hudson
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97-30	ACT's NAEP Redesign Project: Assessment Design is the Key to Useful and Stable Assessment Results	Larry Ogle
97-31	NAEP Reconfigured: An Integrated Redesign of the National Assessment of Educational Progress	Larry Ogle
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97-37	Optimal Rating Procedures and Methodology for NAEP Open-ended Items	Larry Ogle
97-44	Development of a SASS 1993-94 School-Level Student Achievement Subfile: Using State Assessments and State NAEP, Feasibility Study	Michael Ross
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96-19	Assessment and Analysis of School-Level Expenditures	William J. Fowler, Jr.
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School districts, public – demographics of		
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Schools		
97-42	Improving the Measurement of Staffing Resources at the School Level: The Development of Recommendations for NCES for the Schools and Staffing Survey (SASS)	Mary Rollefson
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Schools – safety and discipline		
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Science		
2000-11	Financial Aid Profile of Graduate Students in Science and Engineering	Aurora D'Amico
Software evaluation		
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Staff		
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Staff – higher education institutions		
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Staff – nonprofessional		
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Survey methodology		
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97-35	Design, Data Collection, Interview Administration Time, and Data Editing in the 1996 National Household Education Survey	Kathryn Chandler
98-06	National Education Longitudinal Study of 1988 (NELS:88) Base Year through Second Follow-Up: Final Methodology Report	Ralph Lee
98-11	Beginning Postsecondary Students Longitudinal Study First Follow-up (BPS:96-98) Field Test Report	Aurora D'Amico
98-16	A Feasibility Study of Longitudinal Design for Schools and Staffing Survey	Stephen Broughman
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1999-17	Secondary Use of the Schools and Staffing Survey Data	Susan Wiley
2000-01	1999 National Study of Postsecondary Faculty (NSOPF:99) Field Test Report	Linda Zimbler
2000-02	Coordinating NCES Surveys: Options, Issues, Challenges, and Next Steps	Valena Plisko
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2000-17	National Postsecondary Student Aid Study:2000 Field Test Methodology Report	Andrew G. Malizio
Teachers		
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1999-14	1994-95 Teacher Followup Survey: Data File User's Manual, Restricted-Use Codebook	Kerry Gruber
2000-10	A Research Agenda for the 1999-2000 Schools and Staffing Survey	Dan Kasprzyk
Teachers – instructional practices of		
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Teachers – opinions regarding safety		
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Teachers – performance evaluations		
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1999-04	Measuring Teacher Qualifications	Dan Kasprzyk
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Training		
2000-16a	Lifelong Learning NCES Task Force: Final Report Volume I	Lisa Hudson
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Variance estimation		
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Violence		
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Vocational education		
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1999-06	1998 Revision of the Secondary School Taxonomy	Dawn Nelson