Chapter 3

Education and Skills

3

Summary

This chapter examines the relationship between individual educational experiences and observed measures of skill. First, evidence of a strong positive association between skills and educational attainment is established. Both theory and evidence suggest that education plays a key role in the formation of the skills measured in ALL, but the imperfect association between education and skills also suggests that other factors are implicated in the development of skills over the lifespan. Second, the analysis focuses on comparing the skills of younger adults with varying experiences of upper secondary education. In particular, the skills of early school leavers are considered (youth and young adults aged 16 to 30 who have not completed upper secondary education and have not been in school for at least one year). Finally, the relationships between individual skills and additional years and levels of post secondary schooling are studied in detail.

Table of Contents

Summary 57

Chapter 3

Education and Skills 57

3.1 Overview and highlights 59

3.2 The relationship between education and cognitive skills 60

3.3 Skills of upper secondary graduates 64

3.4 Skills of post-secondary graduates 66

References 70

Annex 3

Data Values for the Figures 71

Education and Skills

3

3.1 Overview and highlights

This chapter examines the relationship between individual educational experiences and observed measures of skill. First, evidence of a strong positive association between skills and educational attainment is established. Both theory and evidence suggest that education plays a key role in the formation of the skills measured in ALL, but the imperfect association between education and skills also suggests that other factors are implicated in the development of skills over the lifespan. Second, the analysis focuses on comparing the skills of younger adults with varying experiences of upper secondary education. In particular, the skills of early school leavers are considered (youth and young adults aged 16 to 30 who have not completed upper secondary education and have not been in school for at least one year). Finally, the relationships between individual skills and additional years and levels of post-secondary schooling are studied in detail.

The main findings presented in this chapter are:

- There is a strong positive relationship between educational attainment and skills on all domains measured in ALL. But there are also substantial variations in performance within each level of education, with as many as 25 per cent of adults who completed tertiary education scoring less than over 25 per cent of those who completed less than upper secondary.
- Age differences do not explain the variation within levels of education. In fact, comparisons between younger and older age cohorts reveal that skill dispersions are more pronounced among older cohorts. On the one hand, this suggests that the predictive capacity of education can, for many persons, diminish over time. On the other hand, the stability of the average trend among younger and older age cohorts suggests that education has a strong and persistent effect on skills over time.
- Despite the strong relationship between education and skills, it is imperfect. This suggests that relying on measures of educational attainment to predict adult skills will lead to considerable

measurement error. It also suggests that the development and maintenance of cognitive skills is more complex than simply attending school or achieving a certificate of completion, and that education does not "fix" skill levels for life. There are other factors that play an important role in the acquisition, development, maintenance and loss of skills over the lifespan.

- Individual differences in upper secondary education status are strongly related to differences in observed skills. In all countries, early school leavers are the most likely to score at Levels 1 or 2 when compared to those who have stayed in school, or completed upper secondary education or higher.
- In all countries, youth and young adults aged 16 to 35 with more years of post-secondary schooling, on average, consistently show higher skill proficiencies than those with fewer or no years of post-secondary schooling.
- Compared to other countries, Norway and Switzerland display, on average, the highest skill proficiencies associated with each additional year of schooling beyond upper secondary education. Switzerland also displays the sharpest average differences in skill proficiencies for every additional year of post-secondary schooling.

3.2 The relationship between education and cognitive skills

Previous research suggests that educational attainment is a key determinant of cognitive skills proficiency including adult literacy and numeracy (e.g., Kirsch *et al.*, 1993; OECD and Statistics Canada, 2000; Boudard, 2001; Desjardins, 2004). This is not surprising since, in most societies, a principal and widely accepted goal of educational systems is to produce a population able to read, write and count. But despite the strong relationship, it is imperfect; hence supporting the assertion that the development and maintenance of cognitive skills is more complex than simply attending school or achieving a certificate of completion.

Figures 3.1a-b depict the strong positive relationship between education and skills. In all countries considered, higher levels of educational attainment are associated with higher average proficiency scores. Beyond average scores, however, higher levels of education do not necessarily imply higher proficiencies for all. As the gradation bars depict in Figures 3.1a-b, sizeable proportions of persons attaining higher levels of education obtain lower scores than persons with less education. For example, in Canada, Italy and Switzerland, 25 per cent of persons (below the 25th percentile) who completed some kind of tertiary education score less than over 25 per cent of persons (over the 75th percentile) who completed less than upper secondary education.

It was suggested in Chapter 2 that differences in the quality of educational provision among age cohorts may systematically contribute to the above mentioned pattern. For example, younger persons who may have benefited from better educational provision may consistently score above average for each level of educational attainment; and vice-versa, older persons may consistently score below average. But Figures 3.2a-b show that the general pattern holds even among groups aged 26 to 35 and 56 to 65, respectively.

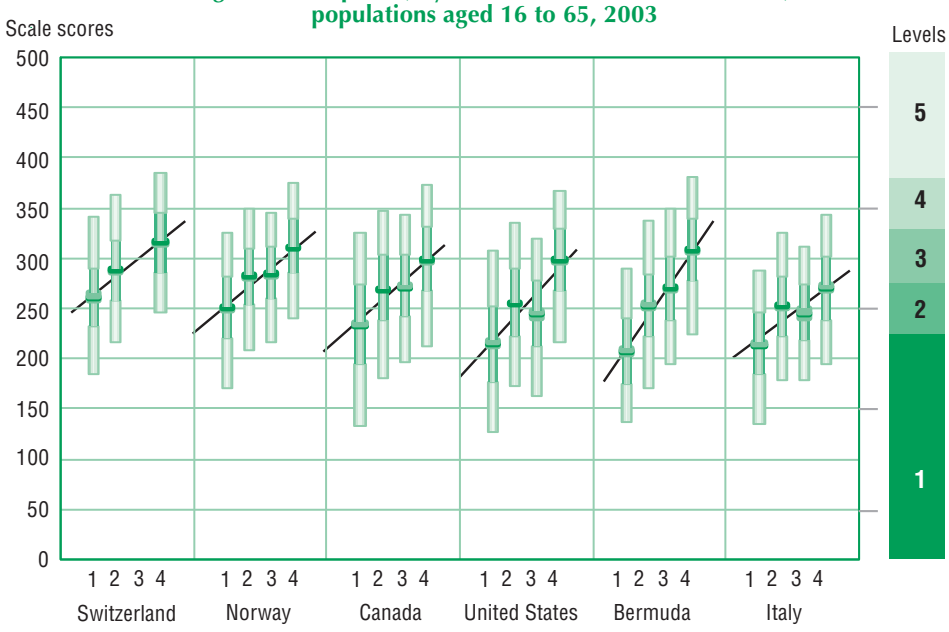
One notable difference among those aged 26 to 35 and 56 to 65 is the dispersion in proficiency scores within the levels of educational attainment. The extent of the dispersion is indicated by the length of the gradation bars in Figures 3.2a-b. Comparisons reveal that dispersions are more pronounced among older cohorts. Hence the predictive capacity of education diminishes over time. This is consistent with the findings of previous research and the proposition from Chapter 2 that as age related processes play out with time, some older adults gain skills while many others lose them, independent of education. On the other hand the stability of the average trend amongst the two age groups suggests that education has a strong and persistent effect over time.

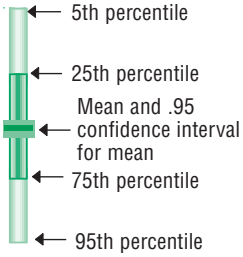
In summary, although education and skills are strongly related, exclusive reliance on measures of educational attainment to predict adult skills will lead to considerable error. This is consistent with the long standing observation that the impact of education cannot be measured only in terms of the number of years an individual has been exposed to it (Coombs and Ahmed, 1974). Hence other factors are implicated in the acquisition, development, maintenance and loss of skills over the lifespan. Some of these are explored in further detail in subsequent chapters.

FIGURE 3.1 A and B

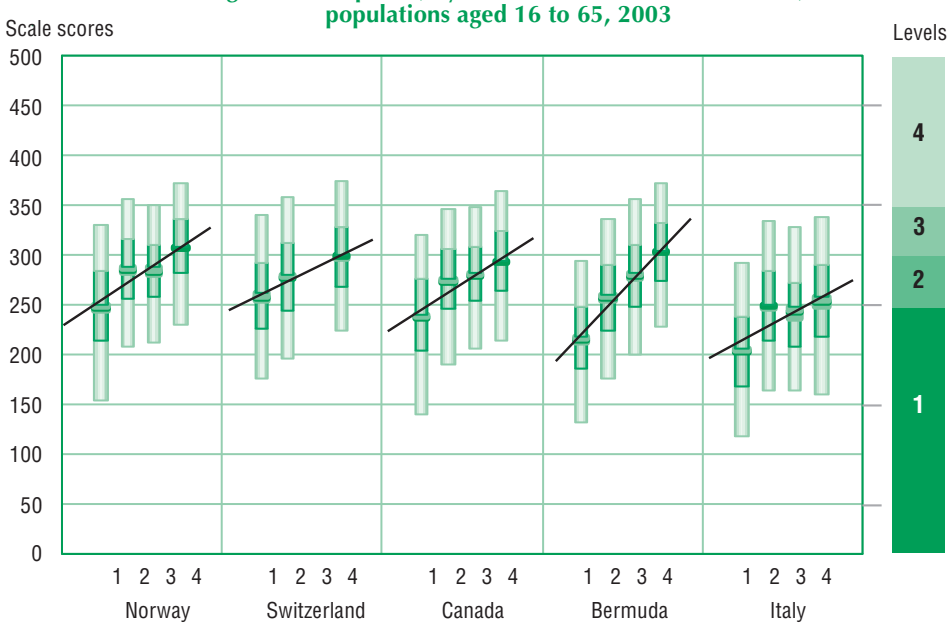
Educational attainment and skills proficiencies

A. Mean numeracy scores on a scale with range 0 to 500 points, by level of educational attainment, populations aged 16 to 65, 2003





B. Mean problem solving scores[1, 2] on a scale with range 0 to 500 points, by level of educational attainment, populations aged 16 to 65, 2003



Legend

1. Less than upper secondary
2. Upper secondary
3. Post-secondary, non-tertiary
4. Tertiary type B or higher

A. The countries are ranked by the mean of the numeracy score of those completed upper secondary.

B. The countries are ranked by the mean of the problem solving score of those who completed upper secondary.

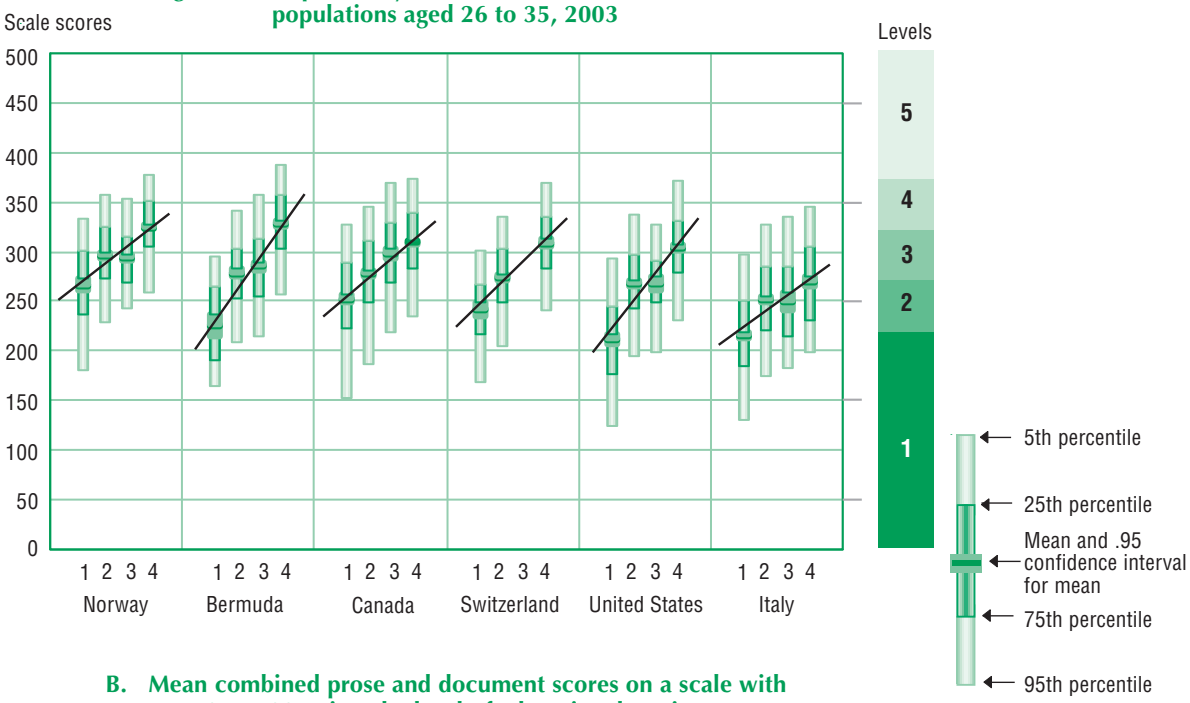
1. United States did not field the problem solving skills domain.
2. The problem solving skills scores for Switzerland apply to the German and French speaking communities only since they did not field the problem solving skills domain in the Italian speaking community.

Source: Adult Literacy and Life Skills Survey, 2003.

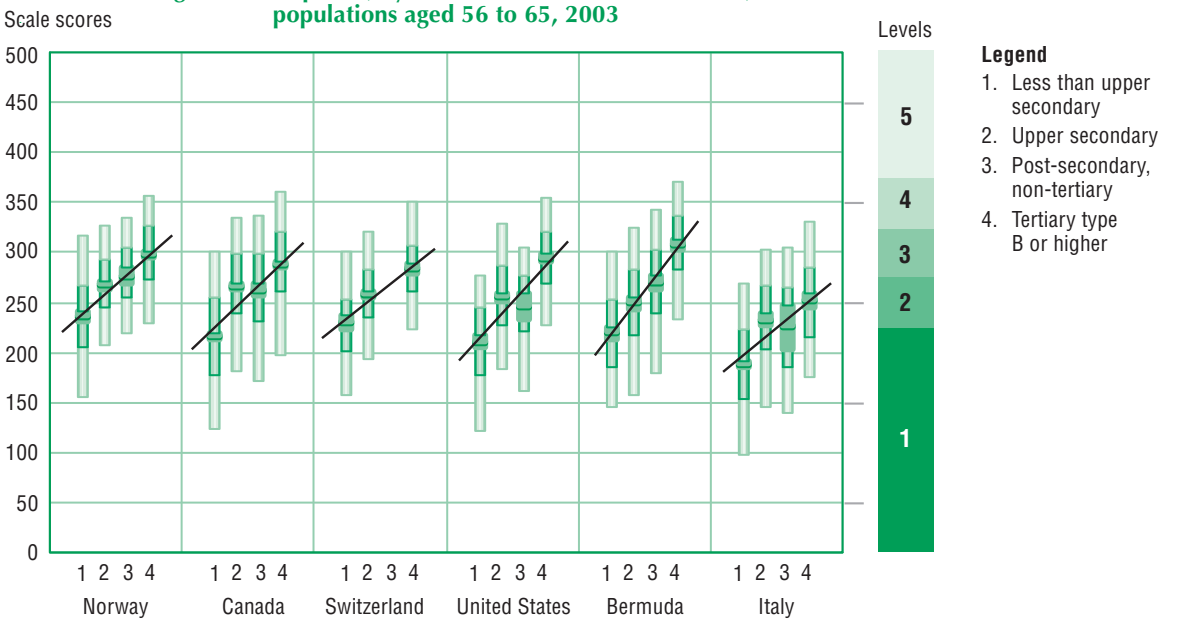
FIGURE 3.2 A and B

Age, educational attainment and skills proficiencies

A. Mean combined prose and document scores on a scale with range 0 to 500 points, by level of educational attainment, populations aged 26 to 35, 2003



B. Mean combined prose and document scores on a scale with range 0 to 500 points, by level of educational attainment, populations aged 56 to 65, 2003



The countries are ranked by the mean of the combined prose and document skills score of those who completed upper secondary.

Source: Adult Literacy and Life Skills Survey, 2003.

3.3 Skills of upper secondary graduates

This section examines the skills of those with varying experiences of upper secondary education. According to the 1997 International Standard Classification of Education (ISCED 1997), upper secondary education corresponds to ISCED Level 3. It typically begins at the end of full-time compulsory education, requires the completion of some nine years of full-time education for admission, involves more specialization than at Level 2, and the entrance age to this level is typically 15 or 16 years (UNESCO, 1997). As of 2001, more than 70 per cent of young adults in Canada, Norway, Italy, the United States and Switzerland between the ages of 15 to 19 attend upper secondary education and complete this level (OECD, 2003, p. 40; Statistics Canada, 2003). Thus while a majority of young adults complete a full cycle of upper secondary education, there still is a substantial proportion who do not.

The results presented in Figures 3.1a-b show that lower levels of educational attainment are associated with lower levels of skills. For young adults, low skill proficiencies in turn signal serious risks in their initial transition from education to work and of failing to benefit fully from further education and learning opportunities throughout life. Even further, early school leavers with low skill proficiencies are more likely to face difficulties entering the labour market and maintain employment (see Chapter 5). The importance of completing upper secondary education is highlighted by OECD's annual indicators on education and associated labour market outcomes, which suggest that it marks the minimum threshold for successful labour market entry and continued employability (OECD, 2003).

The ALL survey provides skills measures of young adults aged 16 or higher who are:

- Still in upper secondary education;
- Not pursuing upper secondary education;
- Upper secondary graduates and are not pursuing post-secondary education;
- Upper secondary graduates and are pursuing post-secondary education; or
- Upper secondary graduates and have completed one or more higher levels of education.

Figure 3.3 presents results of an analysis of the relationship between the upper secondary education status of young adults and their skills using logistic regression (see Box 3A). This method makes it possible to estimate the likelihood that young adults with varying education status will perform at low levels of skill proficiency. The results indicate that differences in upper secondary education status are strongly related to differences in observed skills. Youth and young adults aged 16 to 30 who have not completed upper secondary education and have not been in school for at least one year are dubbed early school leavers. In all countries, early school leavers are the most likely to score at Levels 1 or 2 when compared to those who have stayed in school, or completed upper secondary or higher.

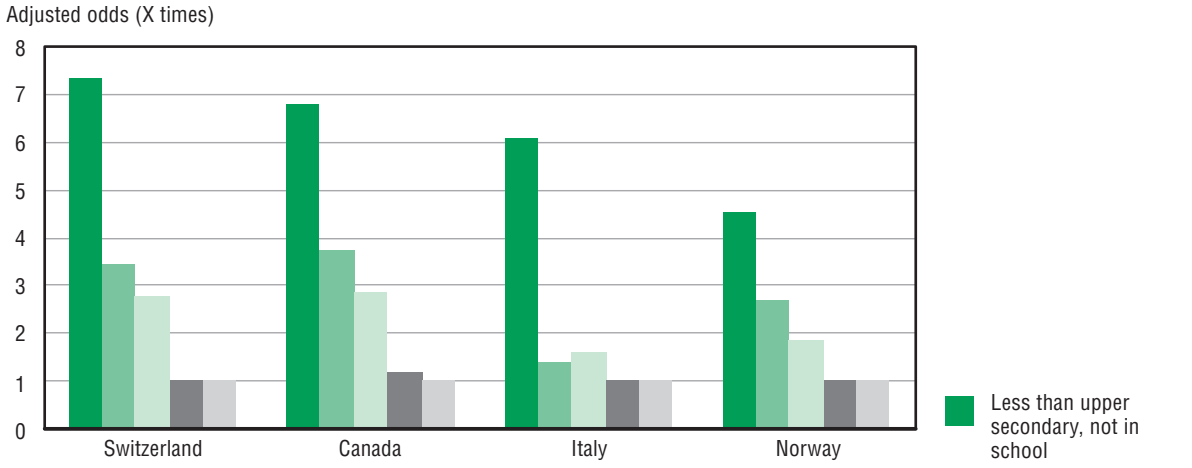
As shown in Figure 3.3a, the likelihood of Canadian and Swiss early school leavers scoring at Levels 1 or 2 on the problem solving scale is about seven times that of those who have completed an educational level higher than upper secondary.

In Italy and Norway it is about six and four times, respectively. Similarly, young adults completing upper secondary but who do not pursue post-secondary education are more likely to score at Levels 1 or 2 than those completing higher levels of education. Results presented in Figure 3.3b also suggest that early school leavers are much more likely to score at low levels of numeracy.

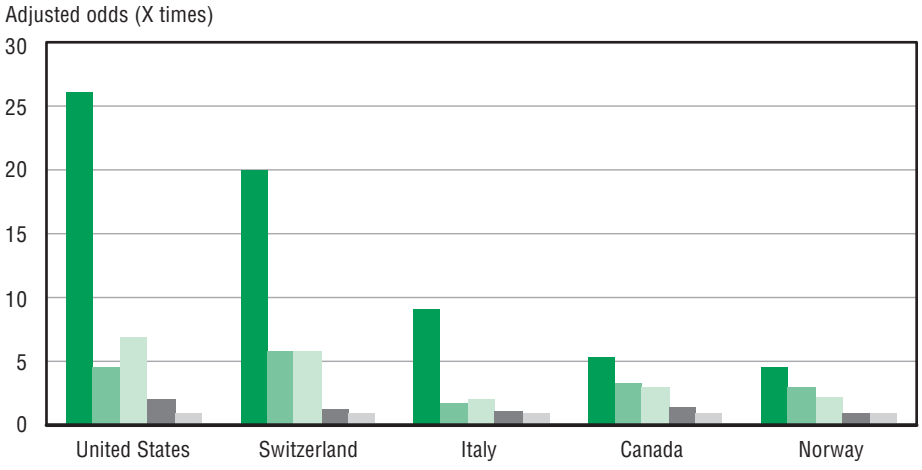
FIGURE 3.3 A and B

Likelihood of scoring at low skill levels by upper secondary education status

A. Odds of scoring at Levels 1 or 2 on the problem solving scale by upper secondary education status, adjusted for age and native language status, persons aged 16 to 30, 2003



B. Odds of scoring at Levels 1 or 2 on the numeracy scale by upper secondary education status, adjusted for age and native language status, persons aged 16 to 30, 2003



The countries are ranked by the odds ratio of those who completed less than upper secondary and not in school.

1. United States did not field the problem solving skills domain.
2. The problem solving skills scores for Switzerland apply to the German and French speaking communities only since they did not field the problem solving skills domain in the Italian speaking community.

Note: Data for Bermuda are not reported due to low sample sizes for this indicator.

Source: Adult Literacy and Life Skills Survey, 2003.

Box 3A

Using odds ratios

Odds ratios reflect the relative likelihood of an event occurring for a particular group compared to a reference group. An odds ratio of one represents equal chances of an event occurring for a particular group vis-à-vis the reference group. Coefficients with a value below one indicate less chance of the event occurring for a particular group compared to the reference group, and coefficients greater than one represent increased chances (Hosmer and Lemeshow, 1989).

For the purpose of the analyses presented in Figures 3.3, the likelihood or odds of adults scoring at Levels 1 and 2 was set to one for adults who have completed higher than upper secondary education. Odds greater than one for persons completing less education indicate that those persons have increased chances to score at Levels 1 and 2.

3.4 Skills of post-secondary graduates

Previous research suggests that education is a major factor affecting the acquisition, maintenance and development of skills. At the same time, however, because skills are required to succeed in education, and increasingly so at higher levels, higher skill proficiencies are likely to lead to enrolment in and completion of higher education. Often these two aspects of the education-skills relationship reinforce each other: skills learned in schools facilitate access to further schooling that in turn builds skill. It is impossible to separate these two effects when working with cross-sectional data. Because without a longitudinal design there is no way to know for sure that the skills of post-secondary graduates are not the same as they were before they entered post-secondary. Nevertheless, the survey results provide compelling evidence confirming the strong and positive education-skills relationship.

Figures 3.4a-f show the relationship between post-secondary schooling and skill proficiencies after controlling for the effects of age and native language status (see Box 3B). On average, individuals with more years of schooling consistently show higher skill proficiencies. The charts in Figure 3.4 indicate the level of skills associated with each additional year of schooling (the height of the line), as well as the difference in level of skills among additional years of schooling (the shape of the line). It is important to keep in mind that these differences are not only the product of skills gained through participation but also reflect selection effects associated with the fact that more able students gain access to these higher levels of education.

The height and shape of lines differ among countries. For example, Norway and Switzerland have the highest lines; that is, each additional year of schooling is associated with higher skill proficiencies compared to other countries. Norway displays a steady increase between 12 and 20 years of schooling, whereas Switzerland displays a sharper increase between 12 and 18 years. By contrast, the line for Italy is low and flattens out after 16 years of schooling, implying that most persons who report additional years of post-secondary schooling beyond 16 years do not perform better on the problem solving scale.

Note that there are country differences in the average number of years taken to complete comparable levels of education. Each education level point is mapped according to the average number of years associated with completing that level and the average skill proficiencies associated with that level as predicted by the regression (See Box 3B). Education level points above the trend line indicate that, on average, persons completing this level score better than is predicted by the mean years of formal education associated with completing the level. Points on the trend line indicate no additional effect and points below indicate that, on average, persons completing this level perform less than is otherwise predicted by the mean years of formal education associated with completing the level.

For example, one reason for the observed difference in the shape of the line between Norway and Switzerland appears to be a skill premium associated with completing a higher level of schooling. Those who complete tertiary level programs in Norway score higher than those who report having completed the same average years of schooling but have not completed the corresponding level of education. This partly reflects differences in access to and progression in tertiary education, repeated years of schooling as well as completion rates associated with tertiary programs.

Box 3B

Reading the figures on skills of post-secondary graduates

The graphs in Figures 3.4a-f show the effect of formal education on skill scores for persons aged 16 to 35 who have completed at least upper secondary education. The effect of education is separated into two additive components, namely years of formal education and highest level of education ever completed.

The trend line indicates the effect of years of formal education on problem solving scores. The values plotted are those predicted by a regression equation reflecting the country specific relationship between years of formal education and problem solving proficiency. The observed relationship is independent of the highest levels of education ever completed and adjusted for respondents' age and native language status.

Separately, education level points indicate the additional skill effect of the highest level of education ever completed. The values are plotted according to this additional effect, which is predicted by the same regression, and the country specific mean years of formal education associated with each level. Education level points above the trend line indicate that, on average, persons completing this level score better than is predicted by the mean years of formal education associated with completing the level. Points on the trend line indicate no additional effect and points below indicate that, on average, persons completing this level perform less than is otherwise predicted by the mean years of formal education associated with completing the level.

Skills-education profiles are also compared to the ALL international mean score on the problem solving scale for the same population. The international mean score is 284. Scale scores above or below the 284 reference line indicate differences to the international mean that are statistically significant at conventional levels.

FIGURE 3.4 A to F

Skills of post-secondary graduates

ALL skills-education profiles for persons aged 16 to 35 who have completed at least upper secondary education, adjusted for age and native language status, problem solving scale (United States[1] on combined prose and document scale), 2003

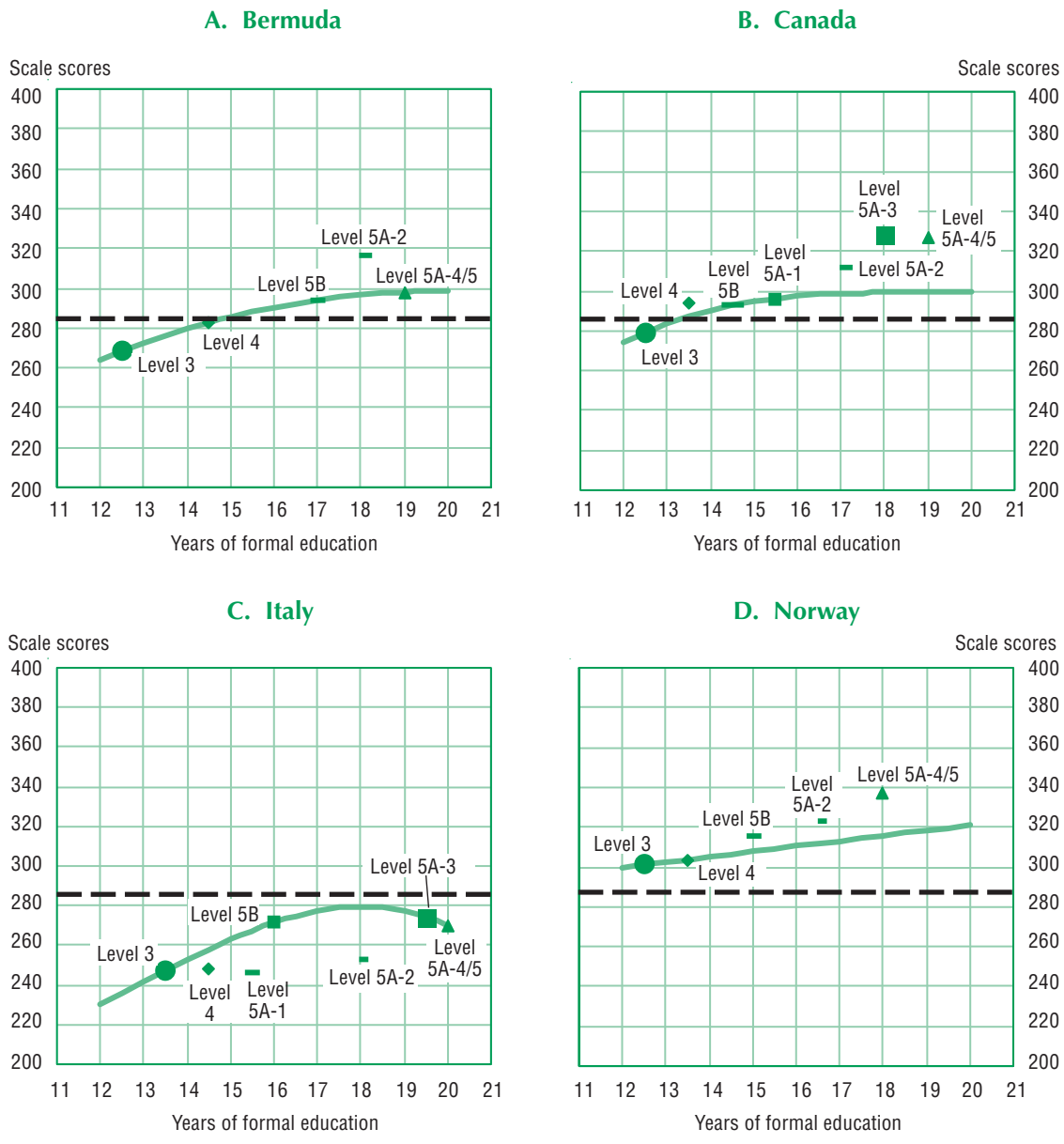
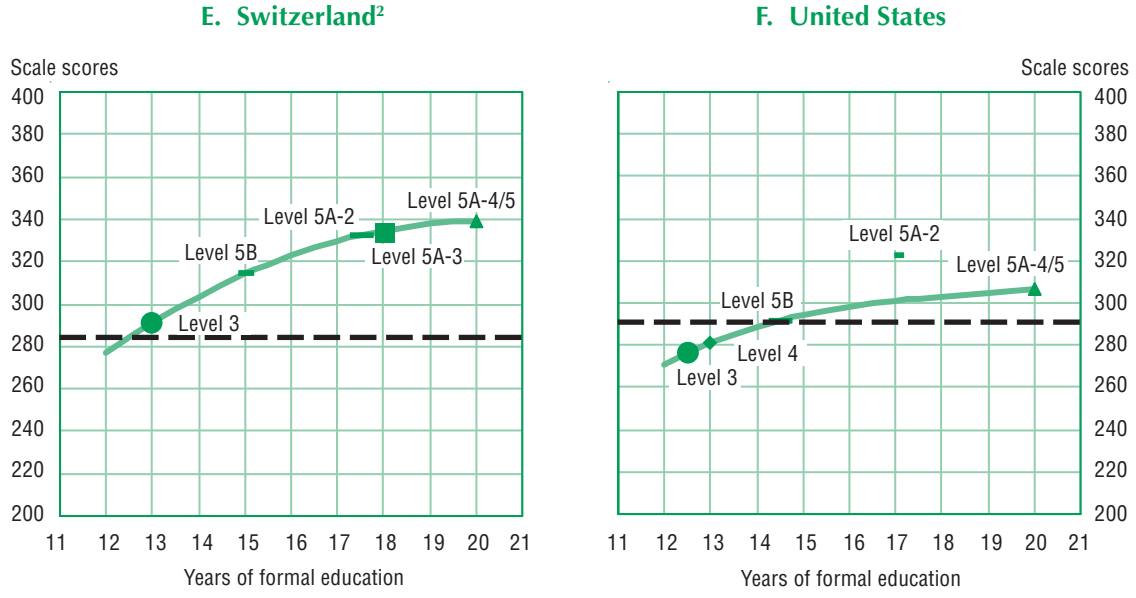


FIGURE 3.4 A to F (concluded)

Skills of post-secondary graduates

ALL skills-education profiles for persons aged 16 to 35 who have completed at least upper secondary education, adjusted for age and native language status, problem solving scale (United States[1] on combined prose and document scale), 2003



1. The skills scores for the United States are combined prose and document scale since they did not field the problem solving skills domain.
2. The problem solving skills scores for Switzerland apply to the German and French speaking communities only since they did not field the problem solving skills domain in the Italian speaking community.

Notes: The international mean is calculated for persons aged 16 to 35 who have completed at least upper secondary education.

Upper secondary completion is set as a reference group.

The international means years of formal education corresponding to upper secondary completion is 13 years.

The trend line reflects the observed relationship between years of formal education and problem solving skills, adjusting for completed levels of education, age and native language status.

Education level points are mapped according to the additional effect of having completed the level and the mean years of formal education for persons who completed this level. This is done within each country.

Education level points above the trend line indicate that on average persons completing this level perform better than is predicted by the mean years of formal education associated with completing the level.

Education level points on the trend line indicate that on average persons completing this level do not perform better than is predicted by the mean years of formal education associated with completing the level.

Education level points below the trend line indicate that on average persons completing this level perform less than is predicted by the mean years of formal education associated with completing the level.

Source: Adult Literacy and Life Skills Survey, 2003.

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Contributor

Richard Desjardins, *Statistics Canada*

Annex 3

Data Values for the Figures

3

TABLE 3.1 A

Mean numeracy scores on a scale with range 0 to 500 points, by level of educational attainment, populations aged 16 to 65, 2003

Level of educational attainment	5th percentile		25th percentile		Mean		75th percentile		95th percentile	
Bermuda										
Less than upper secondary	137.2	(8.8)	174.6	(4.7)	207.5	(3.0)	239.8	(5.6)	289.0	(9.8)
Upper secondary	170.1	(5.6)	222.3	(3.9)	253.5	(2.8)	284.5	(4.8)	337.5	(4.7)
Post-secondary, non-tertiary	193.9	(6.1)	238.0	(3.4)	270.1	(2.3)	302.1	(3.3)	348.9	(5.0)
Tertiary type B or higher	224.8	(7.9)	277.8	(2.3)	307.6	(1.5)	339.9	(1.6)	380.9	(5.4)
Canada										
Less than upper secondary	133.9	(4.5)	195.3	(3.2)	233.9	(1.6)	274.1	(2.5)	326.1	(5.7)
Upper secondary	180.9	(3.3)	237.5	(2.6)	268.6	(1.4)	302.9	(1.5)	346.4	(3.5)
Post-secondary, non-tertiary	196.1	(5.4)	241.9	(2.5)	271.6	(2.1)	303.4	(3.9)	343.0	(2.7)
Tertiary type B or higher	211.9	(4.0)	267.9	(2.0)	297.9	(1.7)	332.1	(2.3)	372.4	(3.3)
Italy										
Less than upper secondary	134.7	(3.0)	183.6	(2.6)	213.7	(1.8)	245.2	(1.7)	287.5	(2.5)
Upper secondary	177.8	(6.2)	223.2	(2.8)	252.5	(1.8)	282.6	(2.2)	324.5	(2.3)
Post-secondary, non-tertiary	179.2	(7.9)	218.2	(8.9)	245.6	(5.1)	274.7	(6.8)	312.0	(73.6)
Tertiary type B or higher	195.2	(6.9)	238.9	(5.4)	270.7	(3.4)	301.4	(4.6)	343.2	(8.8)
Norway										
Less than upper secondary	171.1	(5.6)	219.6	(3.5)	250.5	(1.9)	282.3	(2.6)	326.2	(3.3)
Upper secondary	208.9	(5.3)	254.5	(2.6)	281.8	(1.5)	309.7	(1.9)	349.4	(4.0)
Post-secondary, non-tertiary	215.9	(6.0)	259.8	(1.9)	284.1	(2.4)	311.1	(3.6)	345.0	(7.7)
Tertiary type B or higher	240.8	(3.0)	286.3	(1.5)	310.8	(1.1)	338.5	(1.0)	374.2	(2.6)
Switzerland										
Less than upper secondary	184.5	(8.9)	231.2	(3.2)	261.8	(3.2)	290.3	(5.5)	340.8	(11.2)
Upper secondary	215.9	(3.4)	258.4	(2.3)	288.2	(1.5)	317.7	(2.8)	362.9	(4.4)
Post-secondary, non-tertiary	...	...	...	...	...	...	...	...	...	...
Tertiary type B or higher	245.9	(5.2)	285.1	(3.0)	315.6	(1.9)	345.9	(2.6)	384.4	(5.8)
United States										
Less than upper secondary	127.1	(4.6)	176.9	(2.9)	215.0	(2.6)	251.7	(2.8)	307.8	(7.2)
Upper secondary	173.0	(3.5)	222.2	(2.1)	255.0	(1.9)	289.0	(2.1)	335.0	(4.0)
Post-secondary, non-tertiary	162.9	(14.9)	213.1	(10.3)	244.4	(4.4)	278.6	(4.7)	319.2	(5.7)
Tertiary type B or higher	217.0	(7.1)	268.3	(3.3)	297.8	(2.6)	329.7	(3.1)	367.9	(3.9)

... Not applicable

Source: Adult Literacy and Life Skills Survey, 2003.

TABLE 3.1 B

Mean problem solving[1] scores on a scale with range 0 to 500 points, by level of educational attainment, populations aged 16 to 65, 2003

Level of educational attainment	5th percentile		25th percentile		Mean		75th percentile		95th percentile	
Bermuda										
Less than upper secondary	133.0	(11.7)	185.7	(3.5)	215.5	(3.0)	247.8	(4.7)	294.2	(8.0)
Upper secondary	176.0	(5.2)	224.4	(4.7)	256.6	(2.9)	290.8	(3.2)	335.4	(6.2)
Post-secondary, non-tertiary	199.2	(6.5)	248.7	(4.4)	279.0	(2.6)	310.2	(3.7)	355.9	(5.3)
Tertiary type B or higher	228.7	(5.4)	274.7	(2.7)	302.9	(1.8)	332.9	(2.8)	372.7	(5.9)
Canada										
Less than upper secondary	140.3	(6.0)	203.3	(2.8)	237.6	(1.7)	275.8	(1.9)	319.5	(3.9)
Upper secondary	189.5	(4.4)	245.4	(1.9)	273.7	(1.8)	306.1	(2.0)	346.2	(3.7)
Post-secondary, non-tertiary	205.5	(5.9)	253.7	(2.4)	279.8	(2.4)	308.6	(4.0)	348.2	(6.3)
Tertiary type B or higher	213.2	(4.9)	264.8	(2.4)	293.2	(1.5)	324.5	(1.7)	364.9	(2.6)
Italy										
Less than upper secondary	117.8	(5.2)	167.4	(2.7)	203.7	(2.1)	238.4	(2.5)	291.9	(3.0)
Upper secondary	163.7	(4.2)	213.4	(2.9)	248.0	(1.8)	283.7	(2.4)	334.2	(3.6)
Post-secondary, non-tertiary	163.2	(12.8)	207.5	(11.4)	242.3	(6.1)	273.0	(7.7)	328.6	(15.9)
Tertiary type B or higher	160.5	(14.9)	218.1	(6.1)	252.9	(5.3)	289.5	(6.4)	337.9	(7.2)
Norway										
Less than upper secondary	154.4	(12.0)	213.5	(4.4)	247.0	(2.7)	284.8	(3.4)	330.3	(2.9)
Upper secondary	207.6	(4.4)	255.3	(3.4)	285.0	(2.2)	316.7	(2.1)	356.1	(2.5)
Post-secondary, non-tertiary	213.0	(7.0)	258.3	(5.3)	283.7	(4.2)	311.0	(4.9)	350.4	(8.0)
Tertiary type B or higher	230.2	(5.8)	282.2	(1.3)	306.6	(1.1)	335.2	(1.4)	371.2	(2.0)
Switzerland[2]										
Less than upper secondary	176.2	(18.0)	226.4	(7.9)	257.9	(3.4)	292.3	(4.4)	340.3	(10.4)
Upper secondary	196.1	(5.3)	244.1	(2.8)	277.6	(1.7)	311.1	(1.9)	358.8	(3.8)
Post-secondary, non-tertiary	...	...	...	...	...	...	...	...	...	...
Tertiary type B or higher	223.1	(4.3)	268.9	(3.0)	298.5	(2.1)	327.9	(2.9)	374.8	(10.3)

... Not applicable

1. United States did not field the problem solving skills domain.
2. The problem solving skills scores for Switzerland apply to the German and French speaking communities only since they did not field the problem solving skills domain in the Italian speaking community.

Source: Adult Literacy and Life Skills Survey, 2003.

TABLE 3.2 A

Mean combined prose and document scores on a scale with range 0 to 500 points, by level of educational attainment, populations aged 26 to 35, 2003

Level of educational attainment	5th percentile		25th percentile		Mean		75th percentile		95th percentile	
Bermuda										
Less than upper secondary	164.5 [1]	(8.0)	191.5 [1]	(14.5)	226.5 [1]	(11.0)	265.0 [1]	(16.7)	295.5 [1]	(70.9)
Upper secondary	209.1	(14.1)	253.9	(9.2)	278.5	(4.4)	302.7	(7.6)	340.9	(16.7)
Post-secondary, non-tertiary	215.5	(13.0)	254.2	(4.8)	285.4	(4.2)	313.6	(6.6)	357.9	(8.3)
Tertiary type B or higher	257.1	(8.3)	303.7	(4.3)	328.3	(3.5)	356.8	(5.7)	388.2	(10.6)
Canada										
Less than upper secondary	152.8	(13.1)	222.1	(9.3)	252.8	(4.3)	288.8	(5.3)	326.8	(8.6)
Upper secondary	187.8	(9.8)	249.2	(5.2)	277.5	(2.9)	311.5	(3.8)	346.2	(7.9)
Post-secondary, non-tertiary	219.1	(11.1)	269.8	(5.9)	297.9	(4.9)	329.4	(5.7)	369.5	(85.9)
Tertiary type B or higher	235.7	(5.6)	283.1	(4.6)	309.6	(2.6)	338.7	(4.4)	373.5	(5.5)
Italy										
Less than upper secondary	130.2	(7.8)	185.0	(5.1)	216.4	(3.3)	250.6	(3.9)	297.8	(7.1)
Upper secondary	174.8	(5.8)	220.0	(3.5)	251.4	(3.0)	284.7	(5.0)	327.4	(5.2)
Post-secondary, non-tertiary	183.6	(9.4)	213.9	(16.6)	250.2	(9.4)	285.3	(23.2)	335.2	(74.5)
Tertiary type B or higher	198.5	(6.3)	230.1	(13.6)	269.9	(5.2)	305.4	(10.5)	345.0	(9.6)
Norway										
Less than upper secondary	180.2	(24.1)	236.6	(8.8)	266.4	(6.1)	302.2	(10.7)	333.9	(73.8)
Upper secondary	229.4	(10.2)	273.4	(4.2)	296.9	(2.9)	324.5	(4.8)	356.9	(6.4)
Post-secondary, non-tertiary	243.1	(5.9)	268.8	(7.5)	294.2	(4.0)	315.6	(4.3)	354.0	(10.8)
Tertiary type B or higher	258.6	(9.1)	305.4	(2.7)	325.0	(1.7)	350.7	(2.0)	378.2	(3.6)
Switzerland										
Less than upper secondary	169.5	(14.4)	216.7	(14.8)	242.1	(7.5)	266.4	(8.9)	301.5	(68.1)
Upper secondary	205.3	(10.7)	248.2	(4.4)	274.2	(2.9)	303.0	(3.2)	336.1	(4.3)
Post-secondary, non-tertiary	...	...	...	...	...	...	...	...	...	...
Tertiary type B or higher	241.5	(11.9)	283.6	(4.7)	308.8	(3.6)	336.3	(6.4)	369.6	(7.0)
United States										
Less than upper secondary	124.8	(10.7)	176.3	(8.9)	211.0	(5.0)	244.5	(7.7)	292.4	(12.4)
Upper secondary	194.0	(9.9)	242.2	(3.8)	268.5	(2.9)	297.9	(3.3)	337.8	(5.1)
Post-secondary, non-tertiary	198.1	(24.0)	248.4	(11.9)	268.0	(7.2)	292.1	(6.4)	328.2	(18.7)
Tertiary type B or higher	230.7	(9.5)	278.3	(6.0)	304.4	(3.6)	331.7	(6.8)	371.3	(8.4)

... Not applicable

1. Unreliable estimate.

Source: Adult Literacy and Life Skills Survey, 2003.

TABLE 3.2 B

Mean combined prose and document scores on a scale with range 0 to 500 points, by level of educational attainment, populations aged 56 to 65, 2003

Level of educational attainment	5th percentile		25th percentile		Mean		75th percentile		95th percentile	
Bermuda										
Less than upper secondary	146.3	(14.7)	184.6	(6.2)	219.6	(5.7)	253.2	(6.8)	301.2	(69.0)
Upper secondary	157.1	(20.2)	217.3	(10.2)	249.4	(5.6)	282.7	(8.0)	324.0	(14.1)
Post-secondary, non-tertiary	180.0	(15.4)	239.2	(11.0)	270.5	(6.7)	303.6	(7.6)	342.1	(19.9)
Tertiary type B or higher	234.1	(33.4)	283.3	(12.8)	307.7	(5.3)	335.7	(8.5)	369.7	(85.1)
Canada										
Less than upper secondary	122.9	(4.5)	176.8	(7.3)	216.1	(3.3)	255.9	(3.9)	300.5	(6.1)
Upper secondary	180.3	(9.4)	239.6	(5.2)	266.6	(2.7)	298.9	(4.1)	334.9	(6.7)
Post-secondary, non-tertiary	171.5	(37.7)	231.2	(4.2)	262.6	(5.5)	299.2	(4.6)	337.1	(6.2)
Tertiary type B or higher	196.3	(16.7)	260.7	(5.2)	287.7	(2.4)	320.1	(3.1)	360.1	(6.2)
Italy										
Less than upper secondary	98.6	(4.3)	153.4	(4.6)	188.0	(2.5)	222.1	(3.5)	268.7	(6.9)
Upper secondary	145.4	(13.1)	204.1	(10.7)	232.7	(6.2)	267.9	(8.3)	303.4	(12.0)
Post-secondary, non-tertiary	139.1	(10.3)	184.9	(31.9)	225.4	(21.6)	265.0	(15.0)	304.2	(74.6)
Tertiary type B or higher	175.6	(14.2)	215.1	(8.6)	251.9	(6.9)	284.7	(9.0)	330.8	(10.2)
Norway										
Less than upper secondary	156.0	(7.8)	205.7	(6.6)	236.2	(4.5)	267.4	(7.2)	317.0	(8.6)
Upper secondary	208.1	(14.7)	246.0	(6.6)	267.5	(3.7)	292.1	(5.3)	326.4	(9.9)
Post-secondary, non-tertiary	219.5	(13.3)	255.0	(12.4)	276.5	(7.5)	305.0	(11.1)	335.5	(78.9)
Tertiary type B or higher	229.5	(15.4)	273.4	(5.6)	298.2	(3.0)	327.2	(3.6)	356.1	(5.4)
Switzerland										
Less than upper secondary	157.0	(22.7)	201.4	(12.1)	229.8	(7.3)	253.9	(9.0)	301.3	(64.9)
Upper secondary	192.7	(8.6)	235.1	(3.2)	257.8	(3.0)	282.7	(5.8)	321.2	(5.4)
Post-secondary, non-tertiary	...	...	...	...	...	...	...	...	...	...
Tertiary type B or higher	223.4	(13.7)	261.7	(6.7)	283.7	(4.8)	306.0	(5.6)	350.9	(78.5)
United States										
Less than upper secondary	122.2	(20.0)	177.7	(10.9)	210.7	(5.9)	245.4	(9.3)	277.6	(16.1)
Upper secondary	184.0	(18.1)	227.0	(4.6)	255.3	(4.1)	286.3	(5.9)	328.0	(11.2)
Post-secondary, non-tertiary	161.3 [1]	(28.0)	220.9 [1]	(22.1)	245.5 [1]	(13.2)	277.2 [1]	(22.9)	304.0 [1]	(71.5)
Tertiary type B or higher	227.2	(13.4)	269.6	(6.6)	294.6	(3.3)	321.3	(4.3)	354.2	(9.1)

... Not applicable

1. Unreliable estimate.

Source: Adult Literacy and Life Skills Survey, 2003.

TABLE 3.3 A

Odds of scoring at Levels 1 or 2 on the problem solving[1] scale by upper secondary education status, adjusted for age and native language status, persons aged 16 to 30, 2003

	Less than upper secondary, not in school	Less than upper secondary, still in school	Completed upper secondary, not in school	Completed upper secondary, still in school	Completed higher than upper secondary
Canada	6.77*** (0.33)	3.73*** (0.27)	2.84*** (0.18)	1.19 (0.17)	1.00
Italy	6.08** (0.79)	1.38 (0.58)	1.58 (0.47)	0.53 (0.41)	1.00
Norway	4.51*** (0.27)	2.67* (0.45)	1.83** (0.24)	0.75 (0.25)	1.00
Switzerland[2]	7.33*** (0.60)	3.43** (0.54)	2.75** (0.36)	0.97 (0.39)	1.00

TABLE 3.3 B

Odds of scoring at Levels 1 or 2 on the numeracy scale by upper secondary education status, adjusted for age and native language status, persons aged 16 to 30, 2003

	Less than upper secondary, not in school	Less than upper secondary, still in school	Completed upper secondary, not in school	Completed upper secondary, still in school	Completed higher than upper secondary
Canada	5.29*** (0.25)	3.30*** (0.22)	2.94*** (0.19)	1.38* (0.16)	1.00
Italy	9.04*** (0.39)	1.73 (0.59)	1.98* (0.32)	1.02 (0.37)	1.00
Norway	4.58*** (0.31)	2.97*** (0.35)	2.13*** (0.22)	1.01 (0.29)	1.00
Switzerland	19.94*** (0.74)	5.73* (0.82)	5.78** (0.60)	1.18 (0.60)	1.00
United States	26.03*** (0.37)	4.46*** (0.34)	6.93*** (0.23)	1.98** (0.32)	1.00

* p<0.10, statistically significant at the 10 per cent level

** p<0.05, statistically significant at the 5 per cent level

*** p<0.01, statistically significant at the 1 per cent level

1. United States did not field the problem solving skills domain.
2. The problem solving skills scores for Switzerland apply to the German and French speaking communities only since they did not field the problem solving skills domain in the Italian speaking community.

Notes: Data for Bermuda are not reported due to low sample sizes for this indicator.
See Box 3A in text for further information on odds ratios.
Odds ratios are adjusted for the age and native language status.
Standard errors are of the logarithm of the odds ratios.

Source: Adult Literacy and Life Skills Survey, 2003.

TABLE 3.4

ALL skills-education profiles for persons aged 16 to 35 who have completed at least upper secondary education, adjusted for age and native language status, problem solving scale (United States[1] on combined prose and document scale), 2003

	Unstandardized coefficients			
	B	Standard error	t-value	Significance
A. Bermuda				
(Constant)	-0.25	0.05	-4.95	0.00
Years of education (13 years = 0)				
Linear	0.16	0.03	5.42	0.00
Quadratic	-0.12	0.05	-2.43	0.01
Cubic	--	--	--	--
Highest level of education completed (Level 3 upper secondary = 0)				
Level 4 post-secondary, non-tertiary	--	--	--	--
Level 5B tertiary	--	--	--	--
Level 5A tertiary, Intermediate	--	--	--	--
Level 5A tertiary, First degree, 3 to 5 years	0.42	0.09	4.62	0.00
Level 5A tertiary, First degree, 5+ years	--	--	--	--
Level 5A/6 tertiary, Second or higher degree	--	--	--	--
Test language (Same as mother tongue = 0)	-0.20	0.10	-1.96	0.06
Age (25 years = 0)				
Linear	0.03	0.02	1.50	0.10
Quadratic	--	--	--	--
Cubic	0.00	0.00	--	0.07
B. Canada				
(Constant)	-0.02	0.04	-0.49	0.60
Years of education (13 years = 0)				
Linear	0.17	0.02	8.46	0.00
Quadratic	-0.28	0.08	-3.56	0.00
Cubic	0.02	0.01	1.58	0.02
Highest level of education completed (Level 3 upper secondary = 0)				
Level 4 post-secondary, non-tertiary	0.15	0.05	2.98	0.01
Level 5B tertiary	0.07	0.08	0.89	0.36
Level 5A tertiary, Intermediate	--	--	--	--
Level 5A tertiary, First degree, 3 to 5 years	0.28	0.10	2.81	0.01
Level 5A tertiary, First degree, 5+ years	0.61	0.15	4.07	0.00
Level 5A/6 tertiary, Second or higher degree	0.57	0.17	3.34	0.00
Test language (Same as mother tongue = 0)	-0.56	0.04	-14.00	0.00
Age (25 years = 0)				
Linear	-0.02	0.01	-1.62	0.07
Quadratic	0.04	0.01	3.89	0.00
Cubic	0.00	0.00	--	0.15

TABLE 3.4 (continued)

ALL skills-education profiles for persons aged 16 to 35 who have completed at least upper secondary education, adjusted for age and native language status, problem solving scale (United States[1] on combined prose and document scale), 2003

	Unstandardized coefficients			
	B	Standard error	t-value	Significance
C. Italy				
(Constant)	-0.89	0.09	-9.93	0.00
Years of education (13 years = 0)				
Linear	0.24	0.04	5.91	0.00
Quadratic	--	--	--	--
Cubic	-0.03	0.01	-3.08	0.02
Highest level of education completed (Level 3 upper secondary = 0)				
Level 4 post-secondary, non-tertiary	-0.21	0.12	-1.78	0.09
Level 5B tertiary	--	--	--	--
Level 5A tertiary, Intermediate	-0.44	0.23	-1.91	0.07
Level 5A tertiary, First degree, 3 to 5 years	-0.56	0.12	-4.70	0.00
Level 5A tertiary, First degree, 5+ years	--	--	--	--
Level 5A/6 tertiary, Second or higher degree	0.86	0.71	1.21	0.24
Test language (Same as mother tongue = 0)	--	--	--	--
Age (25 years = 0)				
Linear	--	--	--	--
Quadratic	0.06	0.03	1.85	0.09
Cubic	0.00	0.00	--	0.18
D. Norway				
(Constant)	0.38	0.03	12.62	0.00
Years of education (13 years = 0)				
Linear	0.06	0.02	2.80	0.00
Quadratic	--	--	--	--
Cubic	--	--	--	--
Highest level of education completed (Level 3 upper secondary = 0)				
Level 4 post-secondary, non-tertiary	--	--	--	--
Level 5B tertiary	0.17	0.08	2.08	0.05
Level 5A tertiary, Intermediate	--	--	--	--
Level 5A tertiary, First degree, 3 to 5 years	0.24	0.08	3.01	0.00
Level 5A tertiary, First degree, 5+ years	--	--	--	--
Level 5A/6 tertiary, Second or higher degree	0.45	0.11	4.08	0.00
Test language (Same as mother tongue = 0)	-0.43	0.08	-5.41	0.00
Age (25 years = 0)				
Linear	-0.03	0.01	-3.15	0.01
Quadratic	-0.03	0.01	-2.50	0.01
Cubic	0.00	0.00	--	0.05

TABLE 3.4 (concluded)

ALL skills-education profiles for persons aged 16 to 35 who have completed at least upper secondary education, adjusted for age and native language status, problem solving scale (United States[1] on combined prose and document scale), 2003

	Unstandardized coefficients			
	B	Standard error	t-value	Significance
E. Switzerland[2]				
(Constant)	0.15	0.07	2.15	0.04
Years of education (13 years = 0)				
Linear	0.28	0.03	9.20	0.00
Quadratic	-0.19	0.06	-3.19	0.00
Cubic	--	--	--	--
Highest level of education completed (Level 3 upper secondary = 0)				
Level 4 post-secondary, non-tertiary	--	--	--	--
Level 5B tertiary	--	--	--	--
Level 5A tertiary, Intermediate	--	--	--	--
Level 5A tertiary, First degree, 3 to 5 years	--	--	--	--
Level 5A tertiary, First degree, 5+ years	--	--	--	--
Level 5A/6 tertiary, Second or higher degree	--	--	--	--
Test language (Same as mother tongue = 0)	-0.26	0.17	-1.51	0.15
Age (25 years = 0)				
Linear	-0.04	0.01	-4.10	0.00
Quadratic	--	--	--	--
Cubic	--	--	--	--
F. United States				
(Constant)	-0.16	0.04	-4.09	0.00
Years of education (13 years = 0)				
Linear	0.20	0.03	6.54	0.00
Quadratic	-0.29	0.09	-3.20	0.00
Cubic	0.02	0.01	1.75	0.02
Highest level of education completed (Level 3 upper secondary = 0)				
Level 4 post-secondary, non-tertiary	--	--	--	--
Level 5B tertiary	--	--	--	--
Level 5A tertiary, Intermediate	--	--	--	--
Level 5A tertiary, First degree, 3 to 5 years	0.49	0.09	5.40	0.00
Level 5A tertiary, First degree, 5+ years	--	--	--	--
Level 5A/6 tertiary, Second or higher degree	0.66	0.62	1.07	0.29
Test language (Same as mother tongue = 0)	-0.82	0.11	-7.49	0.00
Age (25 years = 0)				
Linear	-0.02	0.00		0.00
Quadratic	--	--	--	--
Cubic	--	--	--	--

-- Estimate was not statistically different from zero at the five per cent level of significance in the first step of the analysis. Hence this parameter was not estimated in the country specific model.

1. The skills scores for the United States are combined prose and document scale since they did not field the problem solving skills domain.
2. The problem solving skills scores for Switzerland apply to the German and French speaking communities only since they did not field the problem solving skills domain in the Italian speaking community.

Source: Adult Literacy and Life Skills Survey, 2003.

Table of Contents

Introduction

Foreword 3

Introduction 15

Overview of the study 15

Definitions of skill 15

Measurement of skills 16

Table I.1 Five levels of difficulty for the prose, document and numeracy domains 17

Table I.2 Four levels of difficulty for the problem solving domain 18

Data collection 18

Organization of the report 19

References 20

Note to Readers 21

Chapter 1

The Why, What and How of the ALL Survey 23

1.1 Goals of the ALL survey 25

1.2 The conceptual approach to the ALL survey 26

References 28

Chapter 2

Comparative Profiles of Adult Skills 29

2.1 Overview and highlights 31

2.2 Comparative distributions of adult skills 32

2.3 Changes in skills profiles from IALS to ALL 39

2.4 Adult skills and age 43

2.5 Adult skills and gender 46

References 48

Annex 2 Data Values for the Figures 49

Chapter 3

Education and Skills 57

3.1 Overview and highlights 59

3.2 The relationship between education and cognitive skills 60

3.3 Skills of upper secondary graduates 64

3.4 Skills of post-secondary graduates 66

References 70

Annex 3 Data Values for the Figures 71

Chapter 4

Skills and Adult Learning 79

4.1 Overview and highlights 81

4.2 Participation in organised forms of adult education and training 82

4.3 Who is excluded from adult learning opportunities? 84

4.4 Patterns of informal learning 87

4.5 Financial support for adult learning 90

References 95

Annex 4 Data Values for the Figures 97

Table of Contents

Chapter 5
Skills and the Labour Force 105
5.1 Overview and highlights 107
5.2 Competitiveness of labour force populations 108
5.3 Employability of working-age populations 112
5.4 Employability of younger and older working-age populations 116
References 119
Annex 5 Data Values for the Figures 121

Chapter 6
Skills and the Nature of the Workplace 129
6.1 Overview and highlights 131
6.2 Skills in knowledge economies 132
6.3 The relationship between job tasks and skills 137
6.4 Match and mismatch between job tasks and observed skills 143
References 147
Annex 6 Data Values for the Figures 149

Chapter 7
Skills and Economic Outcomes 163
7.1 Overview and highlights 165
7.2 Earnings returns to skills and education 166
7.3 Skills, social assistance and investment income 171
References 173
Annex 7 Data Values for the Figures 175

Chapter 8
Skills and Information and Communications Technologies 179
8.1 Overview and highlights 181
8.2 Connectivity and income as a key determinant 182
8.3 ICTs and literacy skills 184
8.4 ICT use and familiarity by key demographic characteristics 187
8.5 ICT use and outcomes 193
References 195
Annex 8 Data Values for the Figures 197

Chapter 9
Skills and Immigration 203
9.1 Overview and highlights 205
9.2 The significance of immigration in OECD countries 206
9.3 Education credentials and observed skills of immigrants 208
9.4 The relationship between language status and skills 212
9.5 Skills and labour market outcomes of immigrants 213
References 216
Annex 9 Data Values for the Figures 217

Table of Contents

Chapter 10
Skills, Parental Education and Literacy Practice in Daily Life 225
10.1 Overview and highlights 227
10.2 The relationship between parents' education and skills of youth 228
10.3 Comparison of socio-economic gradients for three cohorts of adults 234
10.4 Engagement in literacy practices at home and in daily life 237
References 241
Annex 10 Data Values for the Figures 243

Chapter 11
Skills and Health 247
11.1 Overview and highlights 249
11.2 Skills and general health status 250
11.3 Skills and work-related health status 256
References 261
Annex 11A Data Values for the Figures 263
Annex 11B General and Work Related Health Questions 267

Conclusion
Directions for further work 269
Figure C1 The depth of risk 270
Priorities for further analysis 270
Priorities for future adult skill assessments 271
References 272
Data Values for the Figures 273
Table C1 Number of adults aged 16 to 65 at Levels 1 and 2 in prose literacy, document literacy and numeracy as a per cent of the total population at Level 1 and 2 in any domain by country, 2003 273

Annex A
A Construct-Centered approach to Understanding What was Measured in the Adult Literacy and Life Skills (ALL) Survey 275
Overview 277
Introduction 277
Scaling the literacy, numeracy and problem solving tasks in ALL 278
Measuring prose and document literacy in ALL 280
Defining prose and document literacy 280
Measuring numeracy in ALL 291
Defining numeracy in ALL 291
Measuring problem solving in ALL 302
Defining problem solving in ALL 302
Conclusion 309
References 311

Annex B
Adult Literacy and Life Skills Survey Survey Methodology 313
Survey methodology 315
Assessment design 315
Target population and sample frame 316
Sample design 317

Table of Contents

Sample size 320
Data collection 321
Scoring of tasks 324
Survey response and weighting 326

Annex C
Principal Participants in the Project 329

List of Figures

Chapter 2

Figure 2.1 Multiple comparisons of skills proficiencies 34
Figure 2.2 Comparative distributions of skills scores 36
Figure 2.3 Comparative distributions of skills levels 37
Figure 2.4 Changes in distributions of skills scores 40
Figure 2.5 Changes in mean scores from IALS to ALL 41
Figure 2.6 Changes in distributions of skills levels 42
Figure 2.7 Age and adult skills 44
Figure 2.8 Skills-age profiles controlling for educational attainment 45
Figure 2.9 Gender differences in skills 47

Chapter 3

Figure 3.1 Educational attainment and skills proficiencies 62
Figure 3.2 Age, educational attainment and skills proficiencies 63
Figure 3.3 Likelihood of scoring at low skill levels by upper secondary education status 65
Figure 3.4 Skills of post-secondary graduates 68

Chapter 4

Figure 4.1 Adult education and training participation rates 83
Figure 4.2 Changes in adult education and training participation rates 83
Figure 4.3 Literacy and adult education participation 85
Figure 4.4 Likelihood of participation by literacy levels 86
Figure 4.5 Changes in participation rates by literacy levels 86
Figure 4.6 Engagement in informal learning 88
Figure 4.7 Informal learning by level of education 89
Figure 4.8 Likelihood of participation in active modes of informal learning by literacy levels 89
Figure 4.9 Sources of financial support for adult education and training 91
Figure 4.10 Sources of financing by document literacy levels 92
Figure 4.11 Employer sponsored training by level of practice engagement 93

Chapter 5

Figure 5.1 Skills among labour force populations in the top 25 per cent 109
Figure 5.2 Skills among labour force populations in the bottom 25 per cent 111
Figure 5.3 Likelihood of labour force inactivity by skills levels 113
Figure 5.4 Likelihood of experiencing unemployment by skills levels 114
Figure 5.5 Probability of exiting unemployment by skills levels 115
Figure 5.6 Probability of younger workers exiting unemployment by skills levels 116
Figure 5.7 Probability of older workers exiting unemployment by skills levels 117

Table of Contents

Chapter 6

Figure 6.1 Knowledge- and technology-based industry classification by skills 134
Figure 6.2 Knowledge-based occupational classification by skills 136
Figure 6.3 Practice engagement at work by skills levels 139
Figure 6.4 Practice engagement at work and skills, controlling for education 140
Figure 6.5 Practice engagement at work by occupational types 142
Figure 6.6 "Match" and "mismatch" between individual skills and practice engagement in the workplace 145

Chapter 7

Figure 7.1 Returns to skills and education 168
Figure 7.2 Earnings premiums associated with occupational types 170
Figure 7.3 Likelihood of low-skilled adults collecting social assistance payments 171
Figure 7.4 Likelihood of medium to high-skilled adults earning investment income 172

Chapter 8

Figure 8.1 Home computer and internet access at home 183
Figure 8.2 Home computer access by income quartiles 184
Figure 8.3 Skills of computer users and non-users 185
Figure 8.4 Index scores of ICT use and familiarity 185
Figure 8.5 Use of computers for task-oriented purposes by literacy skills 186
Figure 8.6 Use of computers for task-oriented purposes by age groups 188
Figure 8.7 Use of computers for task-oriented purposes by gender 189
Figure 8.8 Use of computers for task-oriented purposes by educational attainment 190
Figure 8.9 Use of computers for task-oriented purposes by type of occupation 191
Figure 8.10 Likelihood of being a high-intensity computer user by literacy skill levels 192
Figure 8.11 Combined literacy and computer use profiles 194
Figure 8.12 Likelihood of being a top income quartile earner by combined skill and user profiles 194

Chapter 9

Figure 9.1 Natural population growth in OECD countries 207
Figure 9.2 Per cent of foreign-born in population and in labour force for OECD countries participating in ALL, 2001 208
Figure 9.3 Recent versus established immigrant status by educational attainment 209
Figure 9.4 Recent versus established immigrant status by skill level 210
Figure 9.5 Native versus foreign language status of immigrants by skill level 213
Figure 9.6 Likelihood of being unemployed among native-born and foreign-born by skill level 214
Figure 9.7 Likelihood of earning low income among native-born and foreign-born by skill level 215

Chapter 10

Figure 10.1 Socio-economic gradients of youth 230
Figure 10.2 Changes in socio-economic gradients of youth from IALS to ALL 233
Figure 10.3 Socio-economic gradients for three cohorts of adults 235
Figure 10.4 Literacy skills and literacy practices at home and in daily life 239

Table of Contents

Chapter 11

Figure 11.1 Classification of general health status 252
Figure 11.2 General health status by country 254
Figure 11.3 Skills and general health status by key demographic variables 255
Figure 11.4 Classification of work-related health status 257
Figure 11.5 Work-related health status by country 259
Figure 11.6 Skills and work-related health status by key demographic variables 260

List of Tables

Chapter 2

Table 2.1 Comparisons of countries based on average scores, populations aged 16 to 65, 2003 34
Table 2.2 Mean scores with .95 confidence interval and scores at the 5th, 25th, 75th and 95th percentiles on skills scales ranging from 0 to 500 points, populations aged 16 to 65, 2003 49
Table 2.3 Per cent of populations aged 16 to 65 at each skills level, 2003 50
Table 2.4 Mean scores with .95 confidence interval and scores at the 5th, 25th, 75th and 95th percentiles on skills scales ranging from 0 to 500 points, populations aged 16 to 65, IALS 1994/1998 and ALL 2003 51
Table 2.5 Summary of changes in mean scores from IALS to ALL, by statistical significance at the five per cent level, populations aged 16 to 65, IALS 1994/1998 and ALL 2003 41
Table 2.6 Differences between IALS 1994/1998 and ALL 2003 in the per cent of adults aged 16 to 65 at each skills level 52
Table 2.7A Mean scores with .95 confidence interval and scores at the 5th, 25th, 75th, and 95th percentiles on the document scale, population aged 16 to 25, 26 to 45 and 46 to 65, 2003 52
Table 2.7B Per cent of populations aged 16 to 25, 26 to 45 and 46 to 65 at each level on the document scale, 2003 53
Table 2.8 Relationship between age and literacy scores on the document literacy scale, with adjustment for level education and language status, populations aged 16 to 65, 2003 53
Table 2.9 Mean skills proficiencies between men and women on the prose, document, numeracy and problem solving scales, 2003 55

Chapter 3

Table 3.1A Mean numeracy scores on a scale with range 0 to 500 points, by level of educational attainment, populations aged 16 to 65, 2003 71
Table 3.1B Mean problem solving scores on a scale with range 0 to 500 points, by level of educational attainment, populations aged 16 to 65, 2003 72
Table 3.2A Mean combined prose and document scores on a scale with range 0 to 500 points, by level of educational attainment, populations aged 26 to 35, 2003 73
Table 3.2B Mean combined prose and document scores on a scale with range 0 to 500 points, by level of educational attainment, populations aged 56 to 65, 2003 74
Table 3.3A Odds of scoring at Levels 1 or 2 on the problem solving scale by upper secondary education status, adjusted for age and native language status, persons aged 16 to 30, 2003 75
Table 3.3B Odds of scoring at Levels 1 or 2 on the numeracy scale by upper secondary education status, adjusted for age and native language status, persons aged 16 to 30, 2003 75
Table 3.4 ALL skills-education profiles for persons aged 16 to 35 who have completed at least upper secondary education, adjusted for age and native language status, problem solving scale (United States on combined prose and document scale), 2003 76

Table of Contents

Chapter 4

Table 4.1 Per cent of populations aged 16 to 65 receiving adult education and training during the year preceding the interview, by type of participation, 2003 97

Table 4.2 Per cent of populations aged 16 to 65 receiving adult education and training during the year preceding the interview, IALS 1994/1998 and ALL 2003 97

Table 4.3 Per cent of populations aged 16 to 65 receiving adult education and training during the year preceding the interview, by document literacy levels, 2003 98

Table 4.4 Adjusted odds ratios showing the likelihood of adults aged 16 to 65 receiving adult education and training during the year preceding the interview, by document literacy levels, 2003 98

Table 4.5 Changes in the per cent of adults aged 16 to 65 in adult education and training between IALS 1994/1998 and ALL 2003, by document literacy levels 99

Table 4.6 Per cent of populations aged 16 to 65 participating in informal learning activities during the year preceding the interview, by mode of engagement, 2003 99

Table 4.7 Per cent of populations aged 16 to 65 participating in active modes of informal learning in the year preceding the interview, by education attainment, 2003 100

Table 4.8 Adjusted odds ratios showing the likelihood of adults aged 16 to 65 participating in active modes of informal adult learning during the year preceding the interview, by document literacy levels, 2003 101

Table 4.9 Per cent of men and women participating in adult education and training who receive financial support from various sources, populations aged 16 to 65, 2003 101

Table 4.10 Per cent of participants in adult education and training who received financial support from various sources, by document literacy, populations aged 16 to 65 who worked in the last 12 months, 2003 102

Table 4.11 Adjusted odds ratios showing the likelihood of receiving employer sponsored adult education and training during the year preceding the interview, by combined levels of engagement in reading, writing and numeracy practices at work, populations aged 16 to 65, 2003 103

Chapter 5

Table 5.1 Score of the 75th percentile on a scale with range 0 to 500 points, labour force populations aged 16 to 25, 26 to 45 and 46 to 65, 2003 121

Table 5.2 Score of the 25th percentile on a scale with range 0 to 500 points, labour force populations aged 16 to 25, 26 to 45 and 46 to 65, 2003 123

Table 5.3 Odds ratios showing the likelihood of experiencing labour force inactivity for 6 months or more in the last 12 months compared to being employed all year, by numeracy levels, populations aged 16 to 65, excluding students and retirees, 2003 124

Table 5.4 Odds ratios showing the likelihood of experiencing unemployment for 6 months or more in the last 12 months compared to being employed all year, by numeracy levels, labour force populations aged 16 to 65, 2003 125

Table 5.5 The probabilities of unemployed adults aged 16 to 65 to exit unemployment over a 52 week period, by low (Levels 1 and 2) and medium to high (Levels 3 and 4/5) skills, document scale, 2003 125

Table 5.6 The probabilities of unemployed adults aged 16 to 30 to exit unemployment over a 52 week period, by low (Levels 1 and 2) and medium to high (Levels 3 and 4/5) skills, document scale, 2003 126

Table 5.7 The probabilities of unemployed adults aged 50 to 65 to exit unemployment over a 52 week period, by low (Levels 1 and 2) and medium to high (Levels 3 and 4/5) skills, document scale, 2003 127

Chapter 6

Table 6.1 Per cent of labour force populations aged 16 to 65 at document literacy Levels 3 and 4/5, by type of industry, 2003 149

Table 6.2 Per cent of labour force populations aged 16 to 65 at skills Levels 3 and 4/5, by type of occupation, 2003 151

Table 6.3 Index scores of reading, writing and numeracy engagement at work on a standardized scale (centred on 2), by skills levels, labour force populations aged 16 to 65, 2003 154

Table 6.4 Relationship between combined index scores of reading, writing and numeracy engagement at work on a standardized scale (centred on 2) and skills scores on scales 0 to 500 points, adjusted for years of schooling and native language status, labour force populations aged 16 to 65, 2003 155

Table 6.5 Index scores of reading, writing and numeracy engagement at work on a standardized scale (centred on 2) by aggregated occupational types, labour force populations aged 16 to 65, 2003 159

Table 6.6 Per cent of labour force populations aged 16 to 65 whose skills match or mismatch their level of practice engagement at work, 2003 162

Chapter 7

Table 7.1 Three stage least squares estimates of the effect of observed skills (percentile scale) on weekly log-earnings, prose, document, numeracy and problem solving scales, labour force populations aged 16 to 65, 2003 175

Table 7.2 Per cent difference of expected weekly earnings for each occupational type relative to "goods related" occupations, labour force populations aged 16 to 65, 2003 177

Table 7.3 Adjusted and unadjusted odds ratios showing the likelihood of low skilled adults (Levels 1 and 2) collecting social assistance payments, numeracy scale, populations aged 16 to 65, 2003 178

Table 7.4 Adjusted and unadjusted odds ratios showing the likelihood of medium to high skilled adults (Levels 3 and 4/5) earning investment income, numeracy scale, populations aged 16 to 65, 2003 178

Chapter 8

Table 8.1 Per cent of adults aged 16 to 65 who report having access to a computer and the Internet at home, 2003 197

Table 8.2 Per cent of adults aged 16 to 65 who report having access to a computer at home, by household income quartiles, 2003 197

Table 8.3 Mean scores on the prose literacy scale ranging from 0 to 500 points, by whether respondents are computer users or non-users, populations aged 16 to 65, 2003 198

Table 8.4 Mean index scores on three scales of ICT use and familiarity, perceived usefulness and attitude toward computers, diversity and intensity of Internet use, and use of computers for specific task-oriented purposes, populations aged 16 to 65, 2003 198

Table 8.5 Mean index scores on a scale measuring the intensity of use of computers for specific task-oriented purposes, by prose literacy levels, populations aged 16 to 65, 2003 198

Table 8.6 Mean index scores on a scale measuring the intensity of use of computers for specific task-oriented purposes, by age groups, populations aged 16 to 65, 2003 199

Table 8.7 Mean index scores on a scale measuring the intensity of use of computers for specific task-oriented purposes, by gender, populations aged 16 to 65, 2003 199

Table 8.8 Mean index scores on a scale measuring the intensity of use of computers for specific task-oriented purposes, by educational attainment, populations aged 16 to 65, 2003 199

Table 8.9 Mean index scores on a scale measuring the intensity of use of computers for specific task-oriented purposes, by type of occupations, populations aged 16 to 65, 2003 200

Table of Contents

Table 8.10	Adjusted odds ratio showing the likelihood of adults aged 16 to 65 of being high-intensity computer users, by prose literacy levels, 2003	200
Table 8.11	Per cent of adults aged 16 to 65 in each combined literacy and computer use profile, 2003	200
Table 8.12	Adjusted odds ratio showing the likelihood of adults aged 16 to 65 of being a top income quartile earning, by combined literacy and computer user profiles, 2003	201

Chapter 9

Table 9.1	The number of births minus number of deaths from 1950 to 1999 and projections to 2050	217
Table 9.2	Per cent of foreign-born in population and in labour force for OECD countries participating in ALL, 2001	208
Table 9.3	Per cent of populations aged 16 to 65 at each level of educational attainment, by recent vs established immigration status, 2003	218
Table 9.4	Per cent of populations aged 16 to 65 at each skill level, by recent vs established immigrant status, 2003	219
Table 9.5	Per cent of adults aged 16 to 65 at each literacy level on the prose scale, by whether their native tongue is same or different from the official language(s) of host country, 2003	223
Table 9.6	Adjusted odds ratios indicating the likelihood of low skilled (Levels 1 and 2) and medium to high skilled (Levels 3 and 4/5) foreign-born and native-born populations aged 16 to 65 of being unemployed, prose literacy scale, 2003	224
Table 9.7	Adjusted odds ratios indicating the likelihood of low skilled (Levels 1 and 2) and medium to high skilled (Levels 3 and 4/5) foreign-born and native-born populations aged 16 to 65 of being in the lowest personal earnings income quartile, prose literacy scale, 2003	224

Chapter 10

Table 10.1	Relationship between respondent's prose literacy scores and parents' education in years, populations aged 16 to 25, 2003	243
Table 10.2	Relationship between respondent's prose literacy scores and parents' education in years, populations aged 16 to 25, IALS 1994/1998	244
Table 10.3	Relationship between respondent's prose literacy scores and parents' education in years, populations aged 16 to 25, 26 to 45 and 46 to 65, 2003	244
Table 10.4	Relationship between prose literacy scores and engagement in literacy practices at home and in daily life, adjusted for respondent's and parents' education, populations aged 16 to 25, 26 to 45 and 46 to 65, 2003	245

Chapter 11

Table 11.1	Response profiles in the four latent classes based on general health status, populations aged 16 to 65, 2003	263
Table 11.2	Per cent of adults in each of four general health status groups by country, populations aged 16 to 65, 2003	263
Table 11.3	Mean scores on the prose, document and numeracy scales ranging from 0 to 500 points by key demographic variables, populations aged 16 to 65, 2003	264
Table 11.4	Response profiles in the four latent classes based on work-related health status, populations aged 16 to 65, 2003	265
Table 11.5	Per cent of adults in each of four work-related health status groups by country, populations aged 16 to 65, 2003	265
Table 11.6	Mean scores on the prose, document and numeracy scales ranging from 0 to 500 points by key demographic variables, populations aged 16 to 65, 2003	266

Table of Contents

Annex A

Table A1	Problem-solving steps and instantiations	305

Annex B

Table B1	Sample frame and target population exclusions	317
Table B2	Sample size by assessment language	321
Table B3	Survey collection period	322
Table B4	Interviewer information	323
Table B5	Scoring – percent reliability by domain	325
Table B6	Scoring operations summary	325
Table B7	Benchmark variables by country	327
Table B8	Sample size and response rate summary	327