

Chapter 1. Skills proficiency and labour market outcomes in Chile

Skills can have a major impact in people's life opportunities. Proficiency in information processing skills is positively associated with labour market outcomes: on average, adults with higher skills proficiency tend to earn more and have better employment prospects. This chapter examines the proficiency of the Chilean population in literacy, numeracy and problem-solving in a technological-rich environment; disentangles the relationship between proficiency and labour market outcomes in Chile; and sheds light on differences between sociodemographic groups.

The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

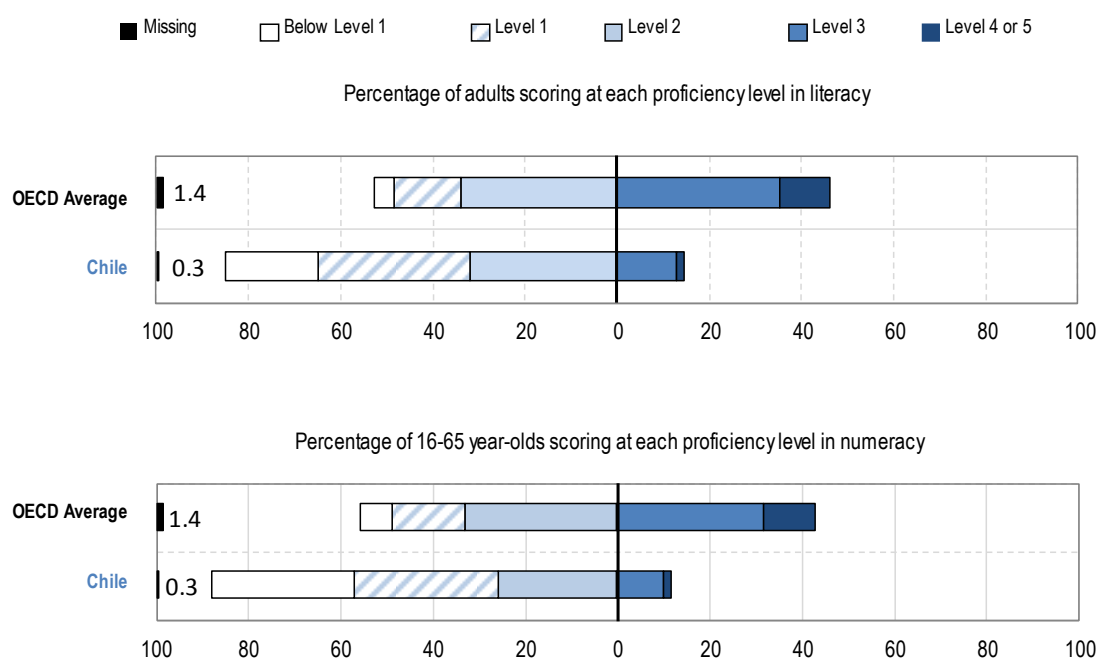
Distribution of skills proficiency

What people know and what they do with what they know can have a major impact in their life opportunities. This is supported by the positive association of skills proficiency and labour market outcomes: on average, adults with higher skills proficiency tend to have more chances of becoming employed and have higher wages than their less proficient peers (OECD, 2016^[1]). The results on skills proficiency from the Survey of Adult Skills show that a much-larger-than-average proportion of adults in Chile have poor literacy and numeracy skills, and around half of Chilean workers have only basic proficiency problem solving in technology-rich environments (Figure 1.1).

More than one in two adults (53.4%) in Chile is proficient at or below Level 1 in literacy, compared to the OECD average of 18.9%. In numeracy, 61.9% of adults score at or below Level 1, compared to the OECD average of 22.7%. At Level 1 in literacy, adults can read brief texts on familiar topics and locate a single piece of specific information identical in form to information in the question or directive. In numeracy, adults at Level 1 can perform basic mathematical processes in familiar, concrete contexts, performing basic arithmetic operations and understanding simple percentages.

Around one in eight adults (12.9%) attains Level 3 in literacy (below the OECD average of 35.4%), and one in ten adults (10%) attains the same level in numeracy (below the OECD average of 31.8%). At this level of literacy, adults can understand and respond appropriately to dense or lengthy texts, can identify, interpret or evaluate one or more pieces of information, and make appropriate inferences using knowledge of text structures and rhetorical devices. In terms of numeracy, adults have a good sense of number and space, can work with mathematical relationships, patterns and proportions expressed in verbal or numerical form, and can perform basic analyses of data and statistics in texts, tables and graphs.

Only about one in 60 adults (1.6%) in Chile attains the highest levels of proficiency (Level 4 or 5) in literacy, compared to around one in 10 adults (10.6%) on average across the OECD countries that participated in the survey. And around 1.9% of adults in Chile attain Level 4 or 5 in numeracy, far below the OECD average of 11.2%. At or above Level 4, adults can integrate, interpret and synthesise information from complex or lengthy texts that contain conditional and/or competing information.

Figure 1.1. Literacy proficiency among adults

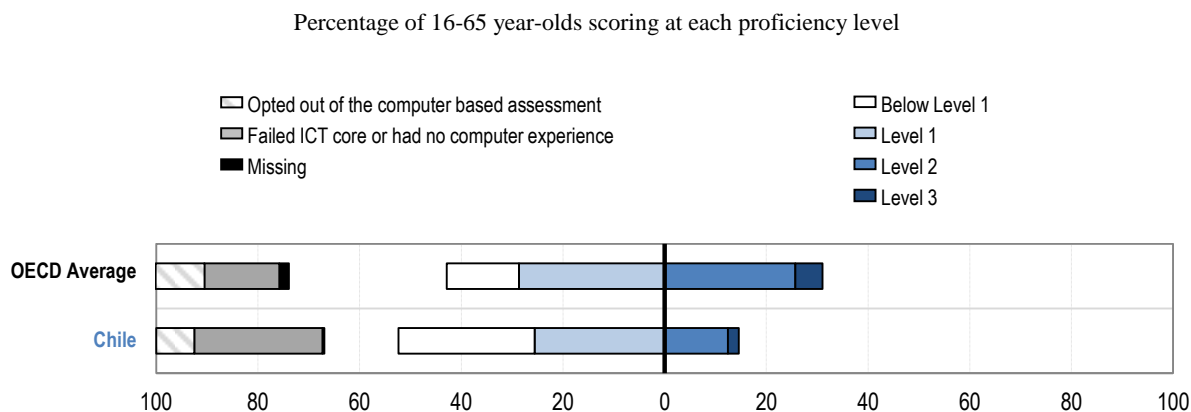
Note: Adults in the missing category were not able to provide enough background information to impute proficiency scores because of language difficulties, or learning or mental disabilities (referred to as literacy-related and numeracy-related non-response).

Source: Survey of Adult Skills (PIAAC) (2012, 2015), Table A2.1, Table A2.4 (<http://dx.doi.org/10.1787/888933366458>).

In terms of problem solving in technology-rich environments, 52.4% of adults scored at or below Level 1, higher than the OECD average of 42.9%, as depicted Figure 1.2. At this level, adults can use familiar technology applications, such as e-mail software or a web browser, to solve problems involving few steps, do simple reasoning and little or no navigation across applications.

Around one in eight adults (12.4%) attains proficiency Level 2 in problem solving, compared with the OECD average of one in four adults (25.7%). At this level, adults can complete problems that involve a small number of computer applications, and require several steps and operations to reach a solution. Only 2.1% of adults in Chile attain Level 3, the highest proficiency level, in problem solving in technology-rich environments. This is the third lowest percentage observed among all participating countries/economies, after Turkey and Greece, all below the OECD average of 5.4%. Adults that reach this proficiency level can complete tasks involving multiple computer applications that require a large number of steps, discovery and use of ad hoc commands in a novel environment.

Additionally, some 17.4% of adults in Chile reported no prior experience with computers, and 7.8% failed the ICT core test, compared to the OECD average of 10% and 4.7%, respectively. The proportion of adults that opted out of the computer-based assessment (7.5%), while important, is less compared to the OECD average of 9.6%.

Figure 1.2. Proficiency in problem solving in technology-rich environments among adults

Note: Adults included in the missing category were not able to provide enough background information to impute proficiency scores because of language difficulties, or learning or mental disabilities (referred to as literacy-related non-response). The missing category also includes adults who could not complete the assessment of problem solving in technology-rich environments because of technical problems with the computer used for the survey. France, Italy and Spain did not participate in the problem solving in technology-rich environments assessment, hence they are not included in the OECD average.

Source: Survey of Adult Skills (PIAAC) (2012, 2015), Table A2.6 (<http://dx.doi.org/10.1787/888933366458>).

Determinants of proficiency levels

Sociodemographic differences

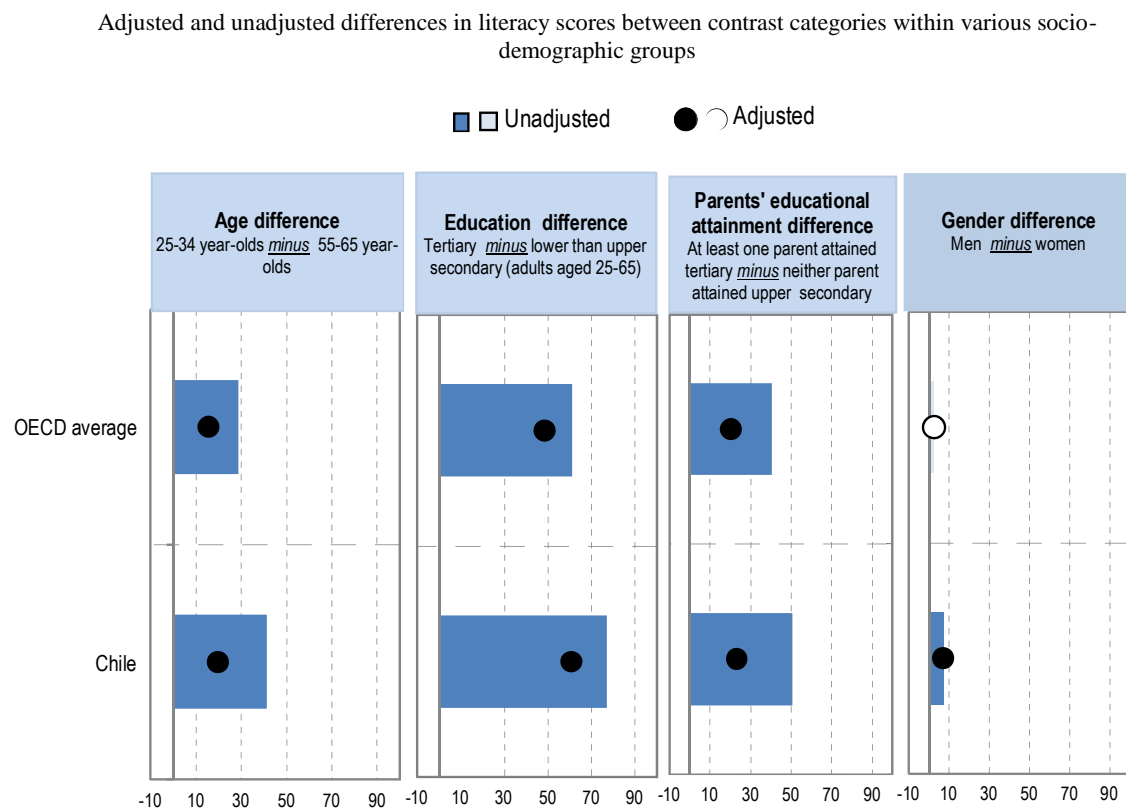
In most countries, including Chile, there are differences in skills proficiency related to socio-demographic characteristics, such as age, level of education and socio-economic status. Across OECD countries in the Survey of Adult Skills, educational attainment shows the strongest relationship with proficiency, both before and after accounting for the influence of other socio-demographic characteristics. When considering the relationship between educational attainment and differences in proficiency between different population groups, the adjusted differences are generally close to the unadjusted differences. This means that other background characteristics like age, gender or family background have little impact on the strength of the relationship. In fact, accounting for differences in educational attainment generally results in a much weaker association between proficiency and other background characteristics. In other words, while education explains a substantial part of the difference in proficiency between older and younger adults, the opposite is not true: differences in proficiency among adults with different levels of education remain substantial, even after taking account of age (OECD, 2016_[1]).

Differences in proficiency related to age, education and parents' education are especially large in Chile, with a gap that is up to 20% bigger than the score difference for the average of OECD countries. Figure 1.3 presents an overview of proficiency differences in literacy associated with various socio-demographic characteristics.¹ For Chile, all sociodemographic differences are statistically significant.

Younger adults score (adjusted), on average, 20 points higher than older adults, with a gap that is 20% bigger than the OECD average literacy score difference (16 points). Similarly, workers with tertiary education score (adjusted) on average 60 points higher than those with lower than upper secondary education, with a score difference that is also

20% bigger than the OECD average gap (48 points). In terms of parents' educational attainment, workers with at least one parent who completed tertiary education show an average score (adjusted) that is 13% bigger than OECD average difference (23 versus 20 points, respectively). While the score difference in terms of gender is found not to be significantly different from 0 for the average of OECD countries, for Chile not only is the gender gap significant, but it is also the third highest among all OECD countries after Jakarta (Indonesia) and Turkey. On average, female workers score 7 points (adjusted) lower in literacy, when compared to male workers.

Figure 1.3. Socio-demographic differences in literacy proficiency



Note: Statistically significant differences are marked in a darker tone. Unadjusted differences are the differences between the two means for each contrast category. Adjusted differences are based on a regression model and take account of differences associated with the following variables: age, gender, education, immigrant and language background and parents' educational attainment. Only the score-point differences between two contrast categories are shown, which is useful for showing the relative significance of each socio-demographic variable in relation to observed score-point differences.

Source: Survey of Adult Skills (PIAAC) (2012, 2015), Tables A3.1 (L), A3.2 (L), A3.5 (L), A3.9 (L), A3.12 (L) and A3.14 (L).

Difference in proficiency by educational attainment

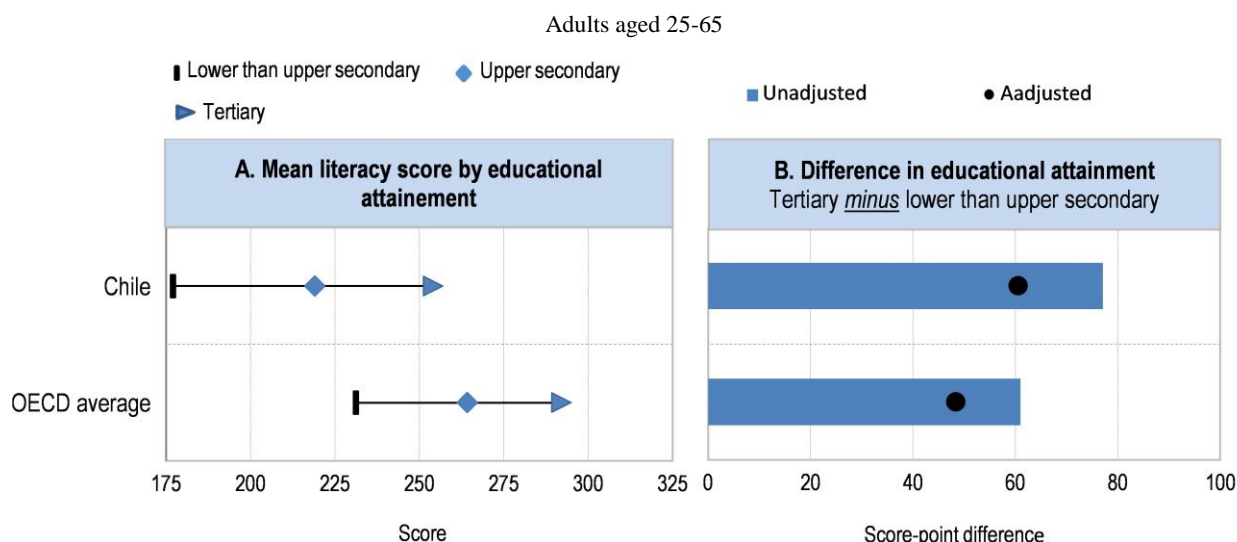
Data from the Survey of Adult Skills shows a positive correlation between levels of educational attainment and skills proficiency, regardless of other individual characteristics such as age, gender or family background. Figure 1.4 shows this correlation by summarising the average literacy proficiency by level of educational attainment (in the left panel), and proficiency differences between tertiary-educated adults

and adults without an upper secondary education (on the right), for the average of OECD countries and Chile.

Across OECD countries and economies participating in the survey, high-educated 25-65 year-olds (those who have attained at least a tertiary degree) scored higher in both literacy and numeracy than adults with an upper secondary education as their highest level of attainment. The latter, in turn, scored higher than adults who have not completed upper secondary education (hereafter “low-educated adults”). As noted in Figure 1.4, across all countries and economies tertiary-educated adults scored 292 points on the literacy scale, while adults with upper secondary education scored 264 points, and low-educated adults scored 231 points. The score differences by educational attainment are generally even larger in the case of numeracy proficiency.

In contrast, all adults in Chile, regardless of their level of educational attainment, score lower than the OECD average adult that has attained upper secondary education. Tertiary-educated adults in Chile scored on average 254 points on the literacy scale, while adults with upper secondary education scored 219 points, and low-educated adults scored 177 points. This means that Chilean adults with at least or lower than upper secondary education reach on average a Level 1 of proficiency in literacy, and those with tertiary education score reach on average a Level 2 of literacy proficiency.

Across the surveyed population for all OECD countries, 42% of low-educated adults scored on average at or below Level 1, more than double the proportion of upper secondary graduates at that level (slightly below 20%). Less than 10% of tertiary-educated adults scored below Level 2, and 21% scored at Level 4 or 5. In Chile, the proportion of low educated adults that score at or below Level 1 doubles the OECD average with 87%. This is particularly significant, given that in Chile low-educated adults make up 32% of the total population. The vast majority of tertiary graduates scored below Level 3 in literacy; less than 5% scored at Level 4 or 5, compared to an average of 21% among OECD countries/economies participating in the survey (OECD, 2016_[2]).

Figure 1.4. Differences in literacy proficiency, by educational attainment

Note: All differences in panel B are statistically significant. Unadjusted differences are the differences between the two means for each contrast category. Adjusted differences are based on a regression model and take account of differences associated with other factors: age, gender, immigrant and language background and parents' educational attainment. Only the score-point differences between two contrast categories are shown in panel B, which is useful for showing the relative significance of educational attainment vis-a-vis observed score-point differences. Lower than upper secondary includes ISCED 1, 2 and 3C short. Upper secondary includes ISCED 3A, 3B, 3C long and 4. Tertiary includes ISCED 5A, 5B and 6. Where possible, foreign qualifications are included as the closest corresponding level in the respective national education systems.

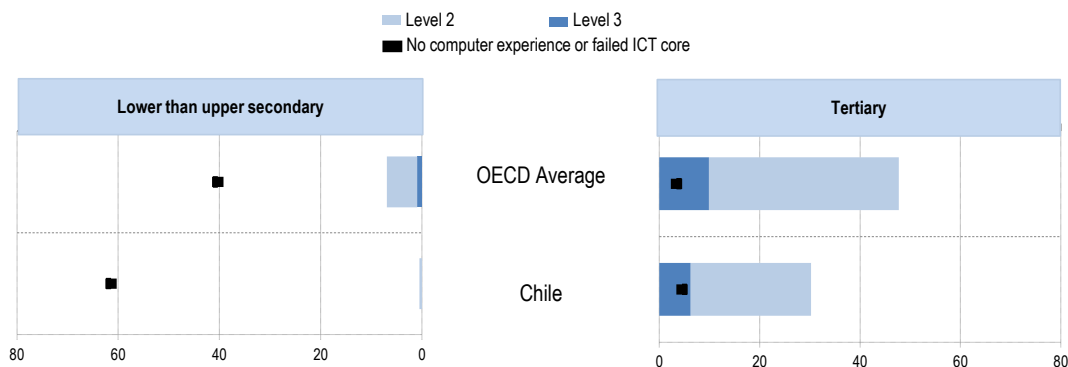
Source: Survey of Adult Skills (PIAAC) (2012, 2015), Tables A3.1 (L) and A3.2 (L).

The proficiency advantage among high-educated adults is even more striking when looking at proficiency in problem solving in technology-rich environments from a cross sectional perspective (Figure 1.5). For the average of OECD countries, only about 7% of low-educated adults scored at Level 2 or 3 on the problem-solving assessment, compared to 48% of adults who had attained tertiary education. In this respect, between-country/economy differences are small. In Chile, the difference is smaller but the overall performance is worse than the OECD average, putting the country at the bottom of the distribution for the entire group of participant countries. The share of low-educated adults that reach high proficiency in problem solving is around 0.5%, and around 30% of high-educated adults reach Level 2 or 3 on the problem solving assessment.

There is much more variation at the bottom of the proficiency distribution for all countries, with an average of 41% of low-educated adults reporting having no experience at all with ICTs, or failing the ICT core test. In the case of Chile, around 62% of low-educated adults reported no experience with ICTs or failed the test. The percentage of high-educated adults in this category is considerably smaller, with 5% of the subgroup reporting no experience or failing the test.

Figure 1.5. Problem-solving proficiency, by educational attainment

Percentage of low- and high-educated adults scoring at Level 2 or 3 in problem solving in technology-rich environments or having no computer experience (adults aged 25-65)



Note: Percentages on the problem solving in technology-rich environments scale are computed so that the sum of percentages for the following mutually exhaustive categories equals 100%: opted out of the computer-based assessment; no computer experience; failed ICT core test; below Level 1, Level 1, Level 2 and Level 3. For more detailed results for each category, see corresponding table mentioned in the source below. Lower than upper secondary includes ISCED 1, 2 and 3C short. Upper secondary includes ISCED 3A, 3B, 3C long and 4. Tertiary includes ISCED 5A, 5B and 6. Where possible, foreign qualifications are included as the closest corresponding level in the respective national education systems. France, Italy, and Spain did not participate in the problem solving in technology-rich environments assessment, hence they are not included in the OECD average.

Source: Survey of Adult Skills (PIAAC) (2012, 2015), Table A3.3 (P).

Difference in proficiency by age

By looking at proficiency levels across different age groups, it is possible to understand how information-processing skills are distributed, and design policies that target more accurately vulnerable individuals. Additionally, between-country comparisons of age distributions in proficiency, coupled with detailed knowledge of how policies and institutions evolved in individual countries/economies, can help identify where strengths and weaknesses lie.² Figure 1.6 plots the average age-proficiency profile in literacy and numeracy for Chile and the OECD countries/economies that participated in the Survey of Adult Skills.

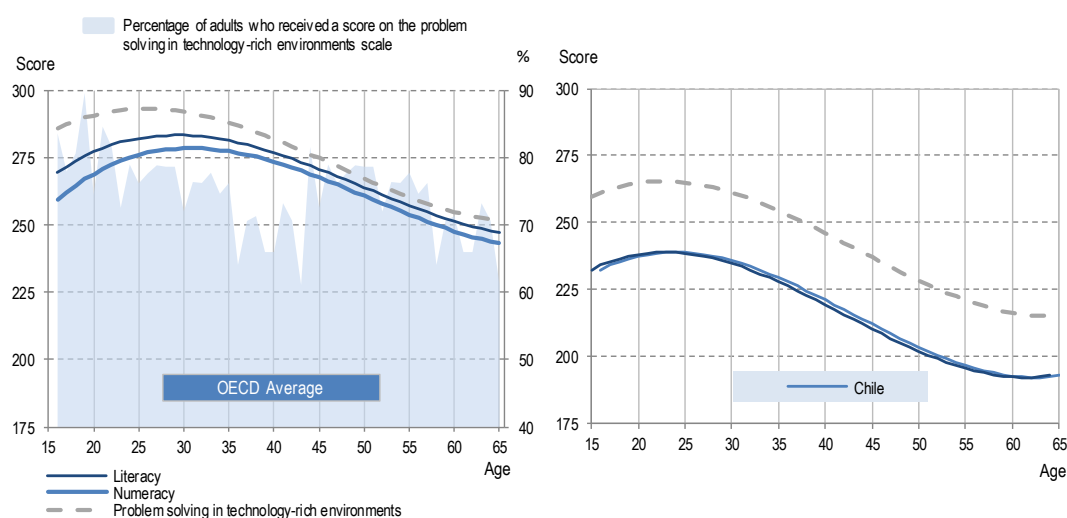
Although the age-proficiency profiles vary considerably across countries, on average and in the majority of countries, proficiency tends to peak at around age 30, and then gradually decline with age (Desjardins and Warnke, 2012_[31]) (Paccagnella, 2016_[41]). Additionally, there seems to be very little improvement in proficiency between the ages 16 and 30. In the case of Chile, proficiency in literacy and problem solving in technology-rich environments reaches the highest score around 24 years old, and proficiency in numeracy reaches its highest score around 27 years old. As age increases after the peak, the rate of decline in proficiency scores is greater for Chile when compared to the OECD Average. For example, the score for the average 65 years old in Chile is 19-29% lower than the average younger adult with the highest score in the country. For the OECD average, the average oldest adult shows a decline in proficiency scores that is 12-14% lower when compared to its respective average younger individual with the highest score.

One explanation for this skills proficiency difference between age brackets lays in the depreciation of skills due to ageing: cognitive abilities develop during youth and into adulthood, and then inevitably decline as people grow older. Yet, biological ageing is not the only reason behind the decline of cognitive skills. Skills at different ages are influenced by individual choices, such as pursuing higher education and/or a particular career, and practicing information-processing skills both in and outside the workplace. Moreover, the extent to which such individual choices affect the age-proficiency profile varies across countries, because of differences in the quality of education, the quality of and access to lifelong learning, industry structure and labour market institutions, to name just a few factors (OECD, 2016_[1]).

Thus, the changes observed in this snapshot can also account for proficiency improvements across different generations (cohorts improving proficiency). Nevertheless, literacy scores in Chile have not improved since the 1990s, when the country started its participation in the International Adult Literacy Survey. This, in spite of the expansion of education opportunities in Chile, evidenced by the 20 percentage points increase in the share of tertiary-educated 25-34 year-olds when compared to the share of tertiary-educated 55-65 year-olds. If the large expansion of education over the past few decades has improved cohorts' literacy scores, this improvement may have been offset by Chile's population ageing, so the national average has remained the same (OECD, 2016_[1]).

Figure 1.6. Relationship between skills proficiency and age

Trend scores by age, foreign-born adults excluded



Note: A cubic specification of the trend curves is found to be most accurate in reflecting the distribution of scores by age in most countries/economies. Results account for cross-country differences in OECD average scores by age cohort. Foreign-born adults are excluded from the analysis. See corresponding tables mentioned in the source below for regression parameters and significance estimates. Only countries/economies participating in the second round of the survey are shown. Similar results for the countries/economies participating in the first round are available in the OECD Skills Outlook 2013, Figure 5.2b (L).

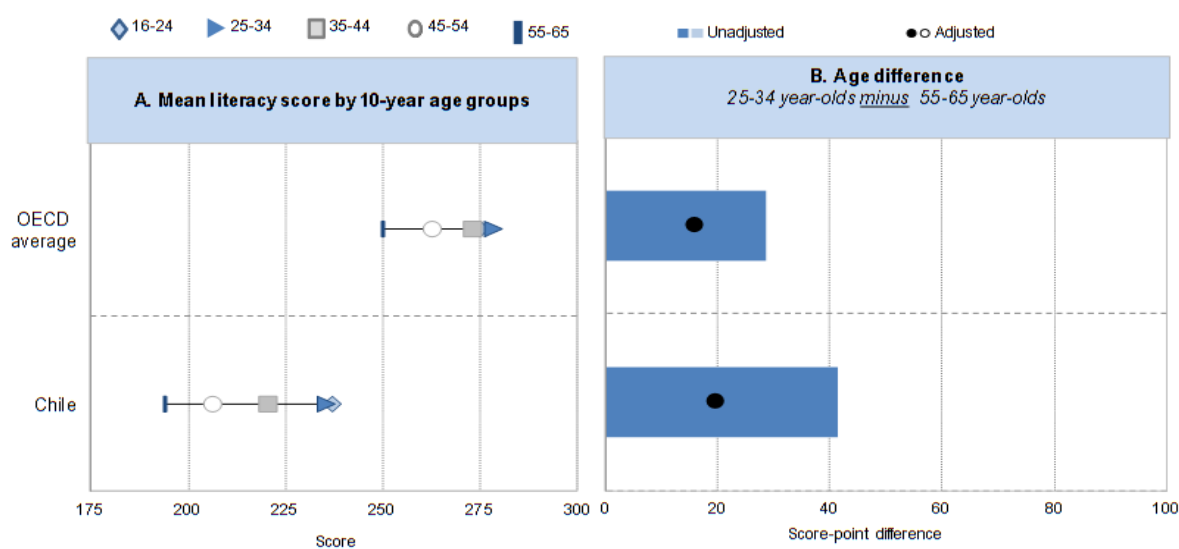
Source: Survey of Adult Skills (PIAAC) (2012, 2015), Tables A3.6 (L), A3.6 (N) and A3.6 (P).

Figure 1.7 presents the average proficiency among different age groups (left panel) and differences in literacy proficiency among 55-65 year-olds and 25-34 year-olds, i.e. the

two age groups that, in most countries, show the lowest and the highest literacy proficiency, respectively (right panel). Similar to Figure 1.4 on literacy scores by educational attainment, all age groups in Chile score, on average, lower than the lowest performing age group from the average of OECD countries/economies. The literacy proficiency of 55-65 year-olds is particularly low in Chile, with a 73% of older adults scoring below Level 1 on the literacy scale. Adults aged 25-34, and that scored the highest compared to other age groups in Chile, also have particularly low proficiency levels relatively to the OECD average: 40% of them scored at or below Level 1, while the OECD average of less than 15% (OECD, 2016_[1]).

As shown in the right panel of the figure (also detailed in Chapter 3), adjusting for other characteristics, including educational attainment, has different effects on the magnitude of differences related to age.³ In Chile, adjusted differences are much smaller than unadjusted differences, moving closer to the OECD average score gap among the two age groups, and having a similar score difference to Korea and France.

Figure 1.7. Age differences in literacy proficiency



Note: Statistically significant differences in Panel B are marked in a darker tone. Unadjusted differences are the differences between the two means for each contrast category. Adjusted differences are based on a regression model and take account of differences associated with other factors: gender, education, immigrant and language background and parents' educational attainment. Only the score-point differences between two contrast categories are shown in Panel B, which is useful for showing the relative significance of age in relation to observed score-point differences.

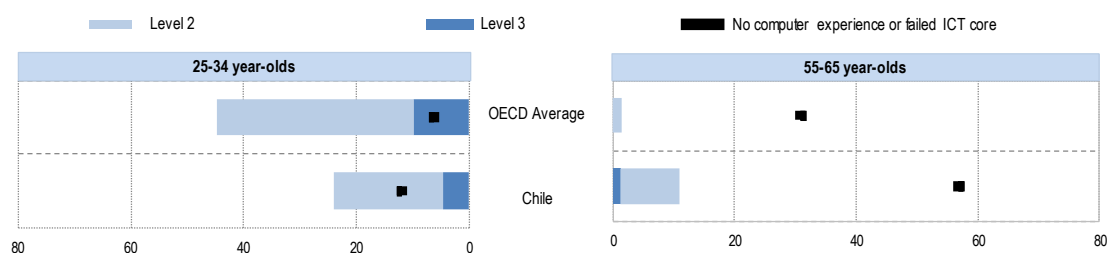
Source: Survey of Adult Skills (PIAAC) (2012, 2015), Tables A3.1 (L) and A3.5 (L).

The gap across different groups becomes more pronounced when considering age-related differences for problem solving in technology-rich environment (Figure 1.8). For every level of proficiency, 25-34 year-olds are more likely than older adults to score at Level 2 or 3. Given that the widespread use of ICTs is a relatively recent phenomenon, older adults were in a position of relative disadvantage compared to younger adults, as indicated by the large share of 55-65 year-olds who skipped the problem-solving assessment because of their lack of computer experience, or because they failed the ICT core test.

On average for all OECD countries/economies, some 45% of 25-34 year-olds scored at Level 2 or 3 in the problem solving assessment, compared to only 11% of older adults. At the same time, few 25-34 year-olds skipped the problem-solving assessment (well below 10% in most countries). In Chile, only 24% of younger adults scored at Level 2 or 3, ranking among the bottom three countries by the proportion of 25-34 year-olds reaching these levels, along with Greece (20%) and Turkey (12%). Moreover, around 12% of younger workers, and 58% of older workers in Chile, had no computer experience or failed the ICT core test (OECD, 2016_[2]).

Figure 1.8. Problem-solving proficiency among younger and older adults

Percentage of adults aged 25-34 and 55-65 scoring at Level 2 or 3 in problem solving in technology-rich environments or having no computer experience.



Note: Percentages on the problem solving in technology-rich environments scale are computed so that the sum of percentages for the following mutually exhaustive categories equals 100%: opted out of the computer-based assessment; no computer experience; failed ICT core test; below Level 1, Level 1, Level 2 and Level 3. For more detailed results for each category, see corresponding table mentioned in the source below. France, Italy, France and Spain did not participate in the problem solving in technology-rich environments assessment, hence they are not included in the OECD average.

Source: Survey of Adult Skills (PIAAC) (2012, 2015), Table A3.7 (P).

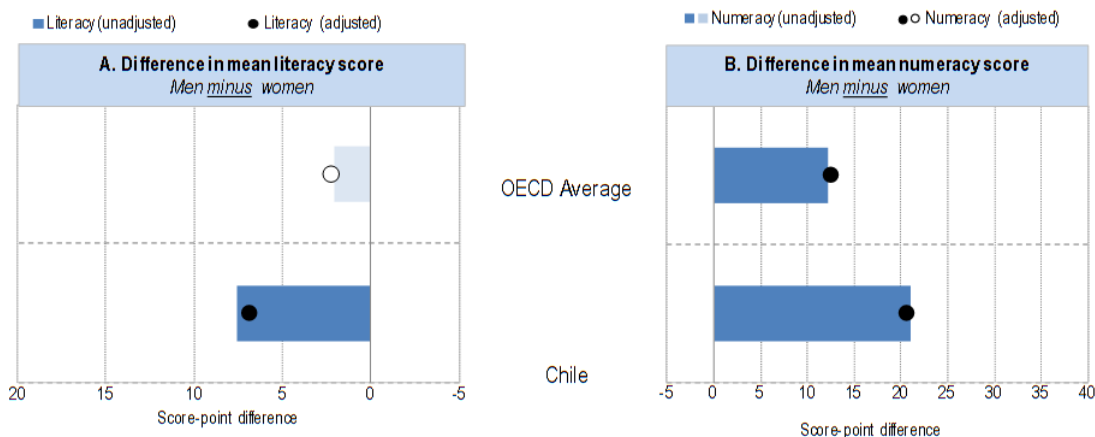
Difference in proficiency by gender

In regards to gender-related differences in proficiency, the Survey of Adult Skills shows small differences in literacy, and larger differences in numeracy, favouring male workers. Given that gender gaps in educational attainment have shrunk considerably over the past few decades, differences in skills proficiency are much more pronounced among older adults, and are almost non-existent among younger adults. This is a result of the expansion of education in many countries over the past decades. Populations' average level of schooling has not only risen, but also resulted in a substantial narrowing of the gender gap in educational achievement. Today, girls outperform boys in reading at age 15, and are more likely to enrol in tertiary education (OECD, 2015_[5]).

Survey data, as summarised in Figure 1.9, shows that in most countries there is no significant difference in literacy proficiency between men and women. And, even in countries/economies where a statistically significant difference can be detected, such as Chile (8 score points), the gap is relatively small when compared to differences found for other sociodemographic groups. However, this difference tends to be larger in numeracy, when compared to the average OECD difference of 12 score points. Chile has the second larger gap in numeracy proficiency scores by gender among all countries, and right after Turkey, with a 21 and 27 score point difference each. Similar to literacy and numeracy, gender differences in proficiency in problem solving are small, although men tend to have a slight advantage over women (Figure 1.10). On average for all OECD countries, 33% of

men scored at Level 2 or 3, compared to 29% of women. In Chile, 17% of men score at Level 2 or 3, compared to 12% of women that reach the same level. The proportion of men and women who have no computer experience, or who failed the ICT core test, is more balanced both for the average of OECD countries and for Chile.

Figure 1.9. Gender differences in literacy and numeracy proficiency

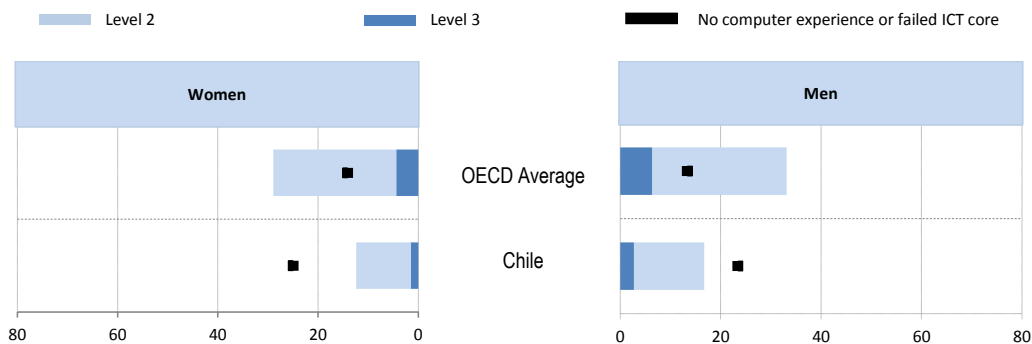


Note: Statistically significant differences are marked in a darker tone. Unadjusted differences are the differences between the two means for each contrast category. Adjusted differences are based on a regression model and take account of differences associated with other factors: age, education, immigrant and language background and parents' educational attainment.

Source: Survey of Adult Skills (PIAAC) (2012, 2015), Tables A3.1 (L), A3.9 (L) and A3.9 (N).

Figure 1.10. Problem-solving proficiency among women and men

Percentage of women and men scoring at Level 2 or 3 in problem solving in technology-rich environments or having no computer experience



Note: Percentages on the problem solving in technology-rich environments scale are computed so that the sum of percentages for the following mutually exhaustive categories equals 100%: opted out of the computer-based assessment; no computer experience; failed ICT core test; below Level 1, Level 1, Level 2 and Level 3. For more detailed results for each category, see corresponding table mentioned in the source below. France, Italy, and Spain did not participate in the problem solving in technology-rich environments assessment, hence they are not included in the OECD average.

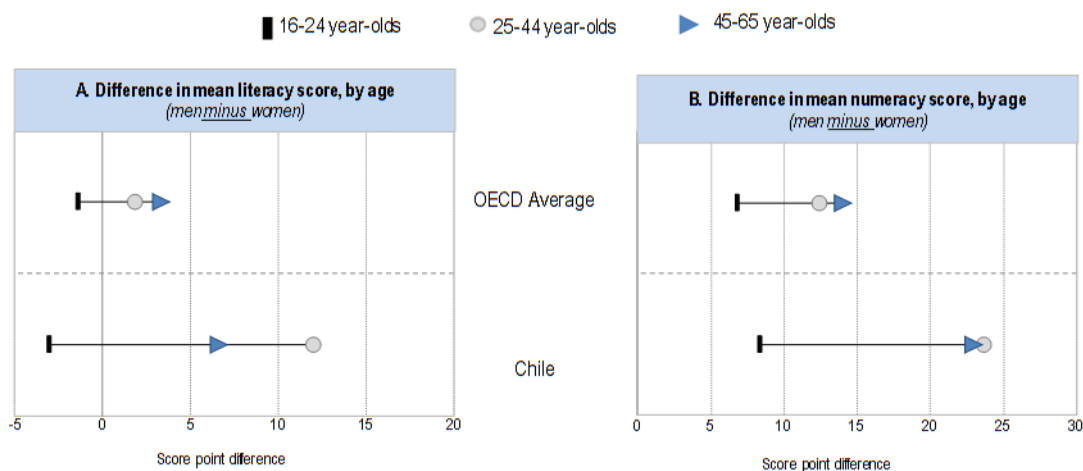
Source: Survey of Adult Skills (PIAAC) (2012, 2015), Table A3.11 (P).

Gender gaps in literacy and numeracy proficiency by age appear to be narrower at the younger cohorts (16-24 year-olds), and significantly wider among 25-44 and 45-65 year-olds. Age and cohort effects are both likely to play a role, but it is difficult to disentangle those effects. Accounting for differences in other observable characteristics, particularly educational attainment, generally leads to a small reduction of the gender gap among 45-65 year-olds, and to a small increase among 16-24 and 25-44 year-olds.

As shown in Figure 1.11, the overall score point difference across age groups in Chile is much larger than the OECD average. In literacy, even though with a small difference, younger women (16-24 year-olds) in Chile outperform the OECD average difference, with an average score that is 3 points higher than men in the same group. However, for prime-age adults (25-44 year-olds), the gap widens up to 12 points higher on average for men. This gap is six times larger than the OECD average for the same group. In numeracy, men either retain or increase their advantage. These processes seem to stop once people complete their transition into adulthood, as the gender gaps are of similar magnitude among 25-44 year-olds and 45-65 year-olds.

One possible explanation for the observed evolution of gender gaps is the higher employment rates among men than women (possibly for reasons unrelated to skills proficiency). Arguably, reading is a transversal skill that is practiced across a wide range of occupations, so that men may have more opportunities to practice their reading skills than women do. Men are also much more likely than women to pursue careers in fields that require more intensive use of numeracy skills - which may explain why they tend to retain or increase their advantage in numeracy (OECD, 2016_[11]).

Figure 1.11. Gender gap in literacy and numeracy, by age



Source: Survey of Adult Skills (PIAAC) (2012, 2015), Tables A3.10 (L) and A3.10 (N).

Skills and labour market outcomes

The Survey of Adult Skills provides more precise, recent and comparative information on how a person's current skills proficiency influences his or her likelihood to work and his or her wages (e.g. (Hanushek et al., 2015_[6]) (OECD, 2013_[7]) (Vignoles, 2016_[8])).⁴ This is relevant under the assumption that workers' productivity is related to the knowledge and skills they have, and that wages reflect such productivity, even if imperfectly. Thus,

individuals with more skills should expect higher returns from labour market participation and would be more likely to participate in the labour market.

For countries/economies that participated in the first round of the survey, after accounting for educational attainment, an increase of one standard deviation in an individual's literacy proficiency (46 score points⁵) is associated with a 20% increase in the probability of being employed, as opposed to being unemployed. In this group of countries, and for salaried employees, the same increase in proficiency is also associated with an 8% increase in hourly wages (OECD, 2013_[7]). Similar findings hold when considering countries and economies that participated in the second round of the survey.

Particularly in Chile, the relationship between proficiency and labour market outcomes is seen most clearly in wages. The impact of literacy on wages is stronger than the OECD average, and similar to that observed in Canada and Germany. This relationship remains strong, even after educational attainment and the use of reading skills at work are considered. For the majority of OECD countries/economies, employed adults show higher proficiency than unemployed adults. But in Chile, as in Singapore, employed adults do not have higher literacy and problem solving proficiency levels than unemployed adults. For numeracy however, employed adults perform better than the rest of individuals.

Proficiency in the labour force

Proficiency plays an important and independent role as a determinant of success in the labour market, over and above the role played by formal education. Although it may be intuitive that adults with higher skills proficiency are more likely to be employed, the direction of causality is unclear. For example, employment may itself favour skills acquisition or prevent the depreciation of workers' skills that are not put to use when adults are unemployed.

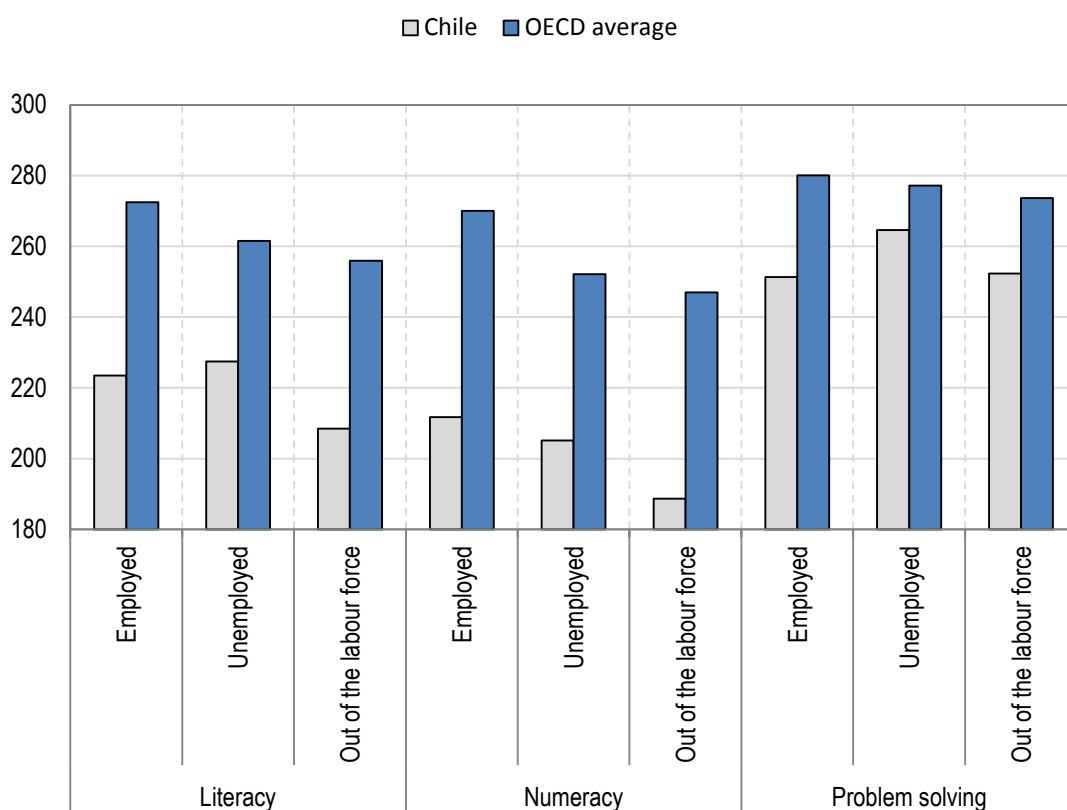
As described in Figure 1.12, the average proficiency in literacy among employed adults is generally higher than that among unemployed and inactive adults. However, the differences in proficiency are surprisingly small.⁶ Across OECD countries/economies that participated in the survey, the average literacy score of employed adults is about 11 score points higher (about 4%) than that of unemployed adults, which, in turn, is almost identical to that of inactive adults. This relatively small difference can be partly attributed to the high rate of unemployment among young people, and the fact that many are inactive as they remain in education. Additionally, young people may be more proficient than their older counterparts, driving up the average literacy score of unemployed or inactive adults. In addition, the difference in proficiency between employed and unemployed adults is much larger when only those individuals who have been unemployed for longer than 12 months – the long-term unemployed – are used in the comparison (OECD, 2016_[1]).

Individuals in Chile, regardless of their labour force status, score lower than the OECD average in all proficiency domains. On average, Chilean employed and unemployed adults reach just Level 1 in numeracy, and the unemployed show higher proficiency in literacy, attaining Level 2 on average. Problem solving in both groups is also at a Level 2 on average, yet this is low considering that the OECD average indicates a Level 3 proficiency in almost all domains. In terms of proficiency scores, unemployed individuals show a slightly better proficiency in literacy and problem solving skills, as opposed to numeracy, in which employed individuals show a higher score on average. There are various possible explanations for these differences. For instance, individuals with low

skills would find it more difficult to access the labour market and would also be more likely to be in unstable jobs, with spells of unemployment in between. On the other hand, high youth unemployment rates could justify the small positive difference in proficiency scores between the unemployed and the employed in literacy and problem solving. More generally, identifying the structural and institutional constraints preventing skilled people from engaging in employment is key to well-targeted skill-development programmes (OECD, 2016^[11]).

Figure 1.12. Literacy and employment status

Mean proficiency score in literacy, numeracy and problem solving in technology-rich environments, by labour force status.



Note: Proficiency scores are scaled between 0 and 500 score points.

Source: Survey of Adult Skills (PIAAC) (2012, 2015), Table A5.1 (L), A5.1 (N), A5.1 (P).

Even though it is found that on average skills proficiency plays an important role in the labour market outcomes of individuals, educational attainment remains a strong predictor of the likelihood of being employed. Since it is difficult for employers to judge workers' actual skills proficiency before or outside of work, they are more likely to rely on readily available signals, albeit potentially imperfect, such as educational qualifications. Skills thus become a stronger predictor of labour market outcomes when workers have more experience and have shown in work what they are capable of doing, a phenomenon called "employer learning" (OECD, 2014^[9]).

Figure 1.13 shows the effect of education and skills proficiency on the likelihood of being employed. Both are found to play a significant role in improving employment outcomes.

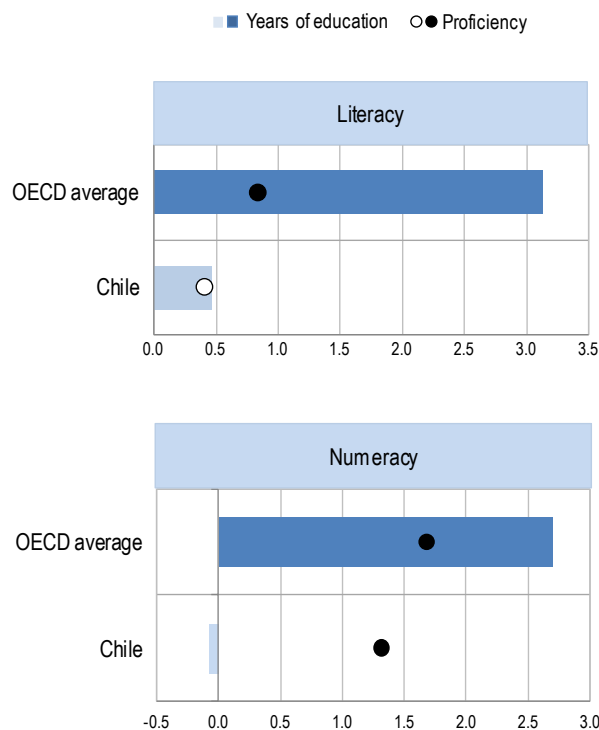
The effect of literacy/numeracy proficiency is computed by comparing the likelihood of being employed among adults with different proficiency in literacy/numeracy, but who have spent the same number of years in education. Similarly, the effect of years of education is computed by comparing adults with similar proficiency in literacy/numeracy but who have spent a different number of years in education. Such a calculation is possible because of the imperfect overlap of education and proficiency.

For the OECD average an increase of 3.2 years in formal education (the equivalent of one standard deviation) is related to up to a 3.1 percentage-point increase in the likelihood of being employed. The relationship between literacy proficiency and the likelihood of employment is weaker, with a 0.84 percentage point change in the likelihood of being employed with an increase of one standard deviation of the literacy score. However, at the aggregate level for Chile, neither skills proficiency nor years of education are found to be predictive of workers' employment status.

For numeracy, even though skills proficiency shows a small magnitude on the probability of being employed (1.3 percentage point change) in Chile, the effect is statistically significant and close to the OECD average. Years of education remains not relevant to predict the probability of being employed, which suggests higher rewards to lifelong learning and the development of skills than to educational attainment. In Chile, skills proficiency is recognised and valued in finding employment, highlighting the importance of skills development in active labour market policies to help unemployed adults find work.

Figure 1.13. Effect of education, literacy and numeracy proficiency on the likelihood of being employed

Marginal effects (as percentage point change) of a one standard deviation increase in years of education and literacy, and years of education and numeracy, on the likelihood of being employed among adults not in formal education



Note: The reference category is "unemployed". Results are adjusted for gender, age, marital and foreign-born status. One standard deviation in proficiency in literacy for the working population is 48 score points. One standard deviation in years of education for the working population is 3.2 years. Statistically significant values (at the 10% level) are shown in a darker tone.

Source: Survey of Adult Skills (PIAAC) (2012, 2015), Table A5.2 (L) and Table A5.2 (N).

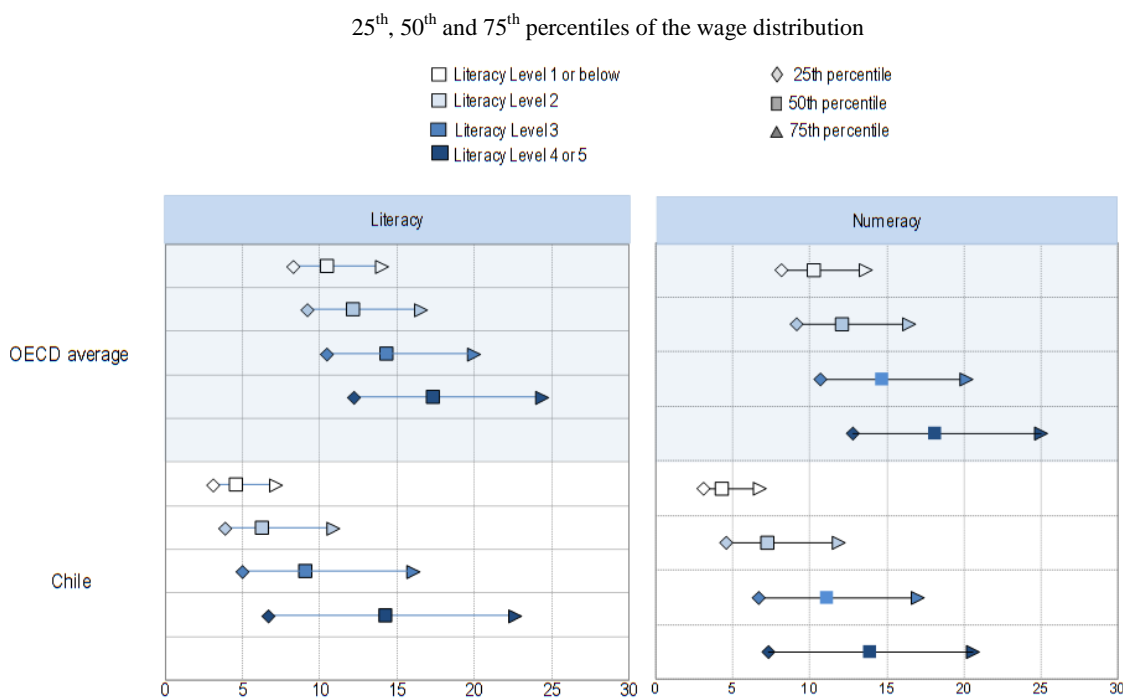
Wages in the labour force

In Chile, hourly wages are strongly associated with skills proficiency, and this relationship is particularly strong for Chile.⁷ On average across the OECD countries/economies that participated in the survey, the median hourly wage of salaried employees scoring at Level 4 or 5 on the literacy scale is 65% higher than that of workers scoring at or below Level 1. However, differences in returns to proficiency vary across countries and economies, more so than for employment status. Also, there is significant overlap in the distribution of wages by proficiency level within and in between countries. Figure 1.14 presents a summary of this wage distribution by proficiency levels for Chile and the OECD average. On average across the OECD countries/economies in the survey, the top 25% best-paid workers scoring at Level 2 earn about the same as the median worker scoring at Level 4 or 5, a result that is also observed in Israel, Singapore and Turkey.

The wage distribution at high proficiency levels is broader in Chile than in the OECD on average and this is particularly the case for literacy. In Chile, the median worker scoring

at literacy proficiency Level 4 or 5 earns almost 30% more than the top earners in Level 2, suggesting that literacy skills are accurate predictors of higher wages. Additionally, the median adult in the highest proficiency level earns almost three times more than the median worker scoring at or below Level 1. This translates in USD 20 more per hour than the worst-paid workers who score at or below Level 1. Across all countries, the difference in hourly wages between the most- and least-skilled adult is USD 16. Finally, wages in Chile are much lower than the OECD average at every proficiency level, except for adults who score at Level 4 or 5 in literacy. The wages of adults who score at proficiency Level 4 or 5 are in the 75th percentile of the earnings distribution. These adults earn only USD 1.8 less per hour than the average among similarly proficient high-earning workers across OECD countries (OECD, 2016_[1]).

Figure 1.14. Distribution of wages, by literacy and numeracy proficiency levels



Note: Employees only. Hourly wages, including bonuses, in purchasing-power-parity-adjusted USD (2012).

Source: Survey of Adults Skills (PIAAC) (2012, 2015), Table 5.3 (L), Table 5.3 (N) (<http://dx.doi.org/10.1787/888933366489>).

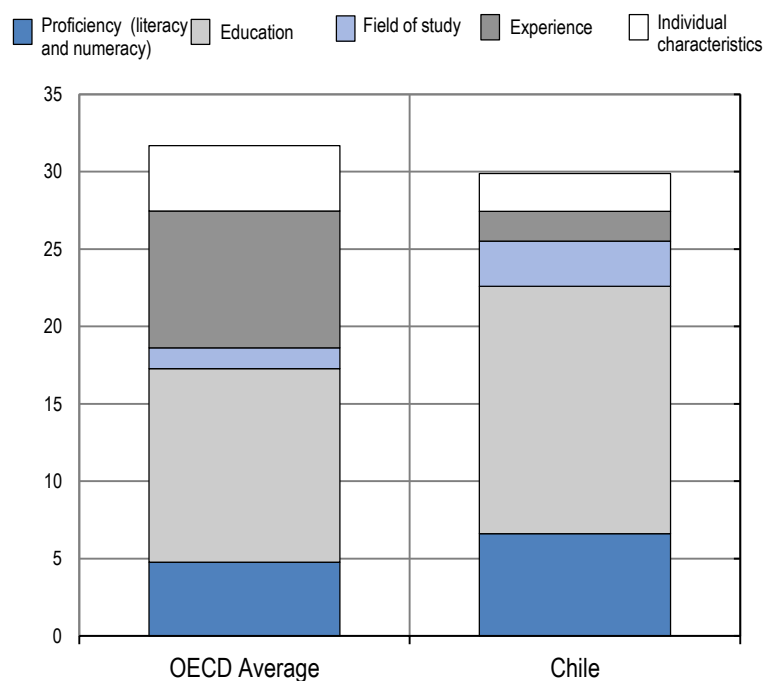
Looking at the distribution of wages by proficiency levels, however, is only a first approximation of the relationship between the two. Other human capital variables may also contribute to determine wage levels and mediate the effect of skills proficiency.

The Survey of Adult Skills finds that human capital components, such as experience, years of education, field of study and proficiency in literacy and numeracy, account for about one third of the explained variation in wages, on average across countries/economies. As described in Figure 1.15, information-processing skills contribute 5%, and educational attainment accounts for 13% of the explained variation in the hourly wages of the OECD average. In Chile, their contribution is larger, with 7% of the explained variation explained by proficiency, and 15% explained by educational attainment. The remaining of human capital components account for 10% of the

explained variation of hourly wages, on average, for OECD countries, and only for 5% of the explained variation in Chile. Additionally for Chile, around 2% of the explained variation is explained by individual characteristics such as gender, immigrant background, marital status and language spoken at home. The remaining 70% of the explained variation is related to other individual and human capital characteristics, such as occupation, industry and firm characteristics.

Figure 1.15. Contribution of education, literacy and numeracy to the variation of hourly wages

Contribution of each factor to the percentage of the explained variance (R-squared) in hourly wages



Note: Results obtained using a regression-based decomposition following the methods in Fields (2003). Each bar summarises the results from one regression and its height represents the R-squared of that regression. The sub-components of each bar show the contribution of each factor (or set of regressors) to the total R-squared. The Fields decomposition is explained in more detail in Box 5.4 of the OECD Employment Outlook 2014 (OECD, 2014b). The dependent variable in the regression model is the log of hourly wages, including bonuses in PPP-adjusted USD (2012). The regressors for each factor are: years of working experience and its squared term for "Experience"; proficiency in literacy and numeracy for "Proficiency"; years of education for "Education"; and gender, marital status, migration status and language spoken at home for "Individual characteristics".

Source: Survey of Adult Skills (PIAAC) (2012, 2015), Table A5.5.

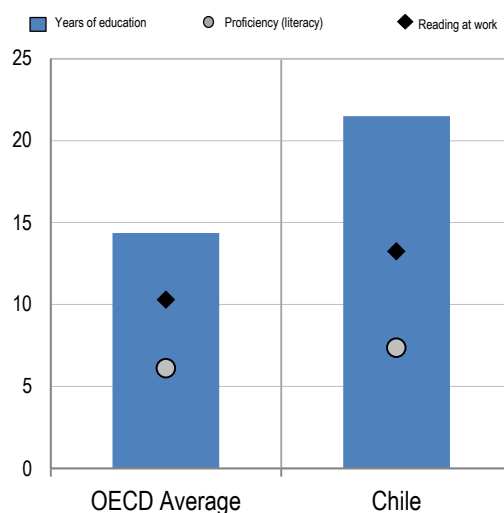
The relative importance of human capital components is also reflected in the effect they appear to have on the level of wages. Figure 1.16 summarises how hourly wages change with education, literacy proficiency and reading at work, for Chile and the average of OECD countries. On average, one standard deviation rise in years of education (around 3.4 years for the working population) is associated with a 14% increase in wages. For Chile, this correlation is larger, with an expected change of around 21%. Moreover, one standard deviation increase in literacy proficiency (around 48 points for the working population) for the OECD average is associated with a 6% increase in wages. Similar to

schooling, in Chile the effect is larger, with an expected change of 7% increase in hourly wages. This is not that more proficient workers earn more because they are selected for more skills-intensive jobs, but rather that they earn higher wages even when compared to workers in jobs with similar skill requirements, reflecting the importance of skills proficiency beyond the type of work they do.

In addition to years of education and skills proficiency, Figure 1.16 also presents the correlation between the use of reading skills at work and hourly wages. Workers in jobs that require more intense use of reading also earn higher wages, pointing to the fact that wages do not just reflect the supply of skills (workers), but also the demand for skills (employers). Overall, the number of years spent in education tends to have a bigger impact on wages in countries/economies with a more unequal wage distribution, such as Chile, Israel, Jakarta (Indonesia), Singapore and the United States. However, this only suggests a link between the earnings distribution and returns to education, as other factors affect the ranking of countries/economies (OECD, 2016_[1]).

Figure 1.16. Effect of education, literacy proficiency and reading use at work on wages

Percentage change in wages associated with a change of one standard deviation in years of education, proficiency in literacy and reading use at work



Note: Hourly wages, including bonuses, in PPP-adjusted USD (2012). Coefficients from the OLS regression of log hourly wages on years of education, proficiency and use of reading skills at work, directly interpreted as percentage effects on wages. Coefficients adjusted for age, gender, foreign-born status and tenure. The wage distribution was trimmed to eliminate the 1st and 99th percentiles. One standard deviation in proficiency in literacy is 48 points. One standard deviation in years of education is 3.2 years.

Source: Survey of Adult Skills (PIAAC) (2012, 2015), Table A5.4.

Notes

1. Differences in numeracy proficiency are found to be generally similar.
2. Foreign-born adults are excluded from the analysis below because the demographic structure of the immigrant population tends to be different from that of native-born adults.
3. However, controlling for observable characteristics, such as educational attainment, is not enough to separately identify age and cohort effects, because of, among other things, changes in unobservable quality of education (Green and Riddell, 2013^[10])(Paccagnella, 2016^[4]).
4. Although literacy, numeracy and problem-solving competencies – the skill domains that are explicitly tested in the PIAAC assessment exercise – are important elements of people’s productive capacity, it should be kept in mind that they only imperfectly proxy workers’ overall set of skills.
5. Among the countries and economies that conducted the Survey of Adult Skills in 2011-12, the standard deviation in literacy skills was 46 points. Among the OECD countries and economies that have participated in the survey (in either 2011-12 or 2014-15), the standard deviation for the sub-population of workers is 48 points.
6. A result that might reflect that in some of these countries relatively few unemployed adults participated in the survey or those higher-skilled workers may have more support during unemployment to find a well-matched job.
7. The measure of hourly wages includes bonuses.

References

- Desjardins, R. and A. Warnke (2012), “Ageing and Skills: A Review and Analysis of Skill Gain and Skill Loss Over the Lifespan and Over Time”, *OECD Education Working Papers*, No. 72, OECD Publishing, Paris, <http://dx.doi.org/10.1787/5k9csvgw87ckh-en>. [3]
- Green, D. and W. Riddell (2013), “Ageing and literacy skills: Evidence from Canada, Norway and the United States”, *Labour Economics*, Vol. 22, pp. 16-29, <http://dx.doi.org/10.1016/J.LABECO.2012.08.011>. [10]
- Hanushek, E. et al. (2015), “Returns to skills around the world: Evidence from PIAAC”, *European Economic Review*, Vol. 73, pp. 103-130, <http://dx.doi.org/10.1016/J.EUROECOREV.2014.10.006>. [6]
- OECD (2013), *OECD Skills Outlook 2013: First Results from the Survey of Adult Skills*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264204256-en>. [7]
- OECD (2014), *OECD Employment Outlook 2014*, OECD Publishing, Paris, http://dx.doi.org/10.1787/empl_outlook-2014-en. [9]
- OECD (2015), *OECD Employment Outlook 2015*, OECD Publishing, Paris, http://dx.doi.org/10.1787/empl_outlook-2015-en. [5]
- OECD (2016), *Skills Matter: Further Results from the Survey of Adult Skills*, OECD Skills Studies, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264258051-en>. [1]
- OECD (2016), “CHILE 1 Key results”, <https://www.oecd.org/skills/piaac/Skills-Matter-Chile.pdf> (accessed on 01 March 2018). [2]
- Paccagnella, M. (2016), “Age, Ageing and Skills: Results from the Survey of Adult Skills”, *OECD Education Working Papers*, No. 132, OECD Publishing, Paris, <http://dx.doi.org/10.1787/5jm0q1n38lvc-en>. [4]
- Vignoles, A. (2016), “What is the economic value of literacy and numeracy?”, *IZA World of Labor*, <http://dx.doi.org/10.15185/izawol.229>. [8]



From:
Getting Skills Right: Chile

Access the complete publication at:
<https://doi.org/10.1787/9789264293151-en>

Please cite this chapter as:

OECD (2018), "Skills proficiency and labour market outcomes in Chile", in *Getting Skills Right: Chile*, OECD Publishing, Paris.

DOI: <https://doi.org/10.1787/9789264293151-4-en>

This work is published under the responsibility of the Secretary-General of the OECD. The opinions expressed and arguments employed herein do not necessarily reflect the official views of OECD member countries.

This document and any map included herein are without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area.

You can copy, download or print OECD content for your own use, and you can include excerpts from OECD publications, databases and multimedia products in your own documents, presentations, blogs, websites and teaching materials, provided that suitable acknowledgment of OECD as source and copyright owner is given. All requests for public or commercial use and translation rights should be submitted to rights@oecd.org. Requests for permission to photocopy portions of this material for public or commercial use shall be addressed directly to the Copyright Clearance Center (CCC) at info@copyright.com or the Centre français d'exploitation du droit de copie (CFC) at contact@cfcopies.com.