# Results from the Programme for the International Assessment of Adult Competencies (PIAAC):

## Low proficiency social trust, political efficacy and volunteering - literacy, numeracy and problem solving in technology rich environments (PSTRE).

## Introduction

In 2012 AONTAS, the National Adult Learning Organisation was invited by the Department of Education and Skills to assume the role of National Co-ordinator for the Implementation of the European Agenda for Adult Learning (EAAL). Key stakeholders in the project include Education and Training Boards Ireland (ETBI) and The National Adult Literacy Agency (NALA). Projects are funded under the Lifelong Learning Programme across 27 European countries to promote adult learning and increase participation by adults, especially those with low or no qualifications. The Irish project is co-financed by the Department of Education and Skills through SOLAS, the Further Education and Training Authority. One of the objectives of the project was to carry out an analysis of the OECD's Programme for the International Assessment of Adult Competencies (PIAAC) data around specific themes, present the information in a seminar to inform the work of the Further Education and Training (FET) Strategy, and use the data to improve services for those most distanced from education, training and the labour market.

This research work was undertaken by NALA and is presented in a series of Research Bulletins which draw on the rich data from PIAAC which was collected in Ireland between August 2011 and March 2012.

In the first section of this Research Bulletin we explore the relationship between low adult skills and social wellbeing. In this analysis we have taken the approach that adult skills influence a person's level of social wellbeing and not the other way around. This approach follows the social participation framework which underpins the PIAAC survey. This argues that adult skills are necessary for engagement in society. However we do recognise that this relationship is likely to work both ways; those who are engaged in society are likely to have increased opportunity to use and increase their proficiency level. We explore the relationship between low literacy, low numeracy and low PSTRE and several health and social wellbeing outcomes and characteristics. These include:

- Trusting only a few people (social trust)
- Perceived ability to influence on the government (political efficacy)
- Perception that other people take advantage (social trust)
- Participation in voluntary work for a non-profit organisation
- Self-reported health status
- Parental education

We explore the likelihood that adults with level 1 or less proficiency for each domain (compared with adults at level 2) reported having good health, reported volunteering, reported low political efficacy and reported low social trust in the PIAAC survey. In terms of parental education, we investigate the odds of an adult in the sample having low proficiency based on their parent's level of educational attainment.

In the second section of this Bulletin we focus is on the impact of parental educational attainment on the proficiency of adults in the PIAAC survey.

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## Policy Context

In 2013, data from PIAAC was published by the Central Statistics Office. The results showed that Ireland had the third highest response rates of participating counties at 72% (5,983 adults) between the ages of 16 and 65 years. PIAAC focuses on adult skills and competencies in the areas of literacy, numeracy and problem solving in technology rich environments (PSTRE). According to the OECD, the Irish PIAAC results show that there is a significant number of adults aged 16 to 65 with low skills proficiency (at or below level 1): 17.5% in literacy, 25.3% in numeracy and 62.5% in PSTRE. Low proficiency levels are often associated with negative outcomes for the individual. These outcomes include poorer economic circumstances through lower wages and a higher probability of unemployment both short and long term.

When the PIAAC results are compared with the results of the 1997 International Adult Literacy Survey (IALS) the literacy trends for Ireland show no statistical change between the average scores in the IALS and PIAAC. However, in IALS 22% of Irish adults were assessed as being at Level 1. Current DES policy states that adult literacy programmes should be focused on learning outcomes at Quality and Qualifications Ireland (QQI) Levels 1-3.

In 2013, prior to the publication of the PIAAC results the Government published its Review of the adult literacy provision in Ireland. The Review set out 32 recommendations to improve adult literacy provision. Following the publication of the Review the Government enshrined an Adult Literacy and Numeracy Strategy as part of the Further Education and Training (FET) Strategy in the Further Education and Training Act.

In 2014, two major publications were launched that focus on the development of further education and training in Ireland. Further Education and Training in Ireland: Past, Present and Future (ESRI, 2014) sets out the historical evolution of further education and training provision in Ireland. It details patterns of provision in terms of overall distribution of places and the balance between full-time labour market programmes and part-time provision with a more community education and adult literacy focus. The Further Education and Training Strategy 2014-2019, accompanied by implementation plans, aims to develop a high quality integrated system of further education and training in Ireland. The two broad objectives of the FET Strategy are that it will meet the further education and training needs of citizens and promote economic development (SOLAS, 2014).

## Methodology

Through intensive testing, the PIAAC survey produced an estimate of the literacy, numeracy and PSTRE skills proficiency of the study participants. These estimates were categorized into meaningful skill levels. We focus on profiling differences in every day skills use between adults who have low proficiency at or below level 1 and level 2 proficiency as measured in the PIAAC survey. The subsample comprises 55% of the total sample of adults for whom a literacy level was estimated, 58% of the sample for whom a numeracy score was estimated and 95% of the sample for whom a PSTRE score was estimated.

## Measures

### Low proficiency

Low proficiency is defined as a proficiency score at or below level 1. For the purpose of this analysis, a dichotomous variable with two categories was created whereby low proficiency = 1 and level 2 = 0. Within the low proficiency category below level 1 and level 1 are combined. Levels 3, 4 and 5 are not included in this analysis for reasons outlined in the analytic strategy below.

### Social outcomes

Information is collected information on three dimensions of social well-being: the level of trust in others measured as the level of agreement (agree, neutral and disagree) with the statement "there are only a few people you can trust completely"; and political efficacy or the sense of influence on the political process measured by the level of agreement with the statement that "people like me don't have any say about what the government does". Volunteering is measured as frequency of participation in associative, religious, political or charity activities (never, less than once a month, at least once a month, or once a week or more often).

### Self-reported health status

Self-reported health in includes the following categories: excellent; very good; good; fair; and poor.

### Parent's education

For both mothers and fathers, educational attainment is measured using the following categories: lower than upper secondary; upper-secondary, non-tertiary; and tertiary. These classifications were based on the International Standard Classification of Education (ISCED) (UNESCO, 2011).

## PIAAC sample and study subsample(s)

A total of 5,983 adults aged 16 and older participated in the PIAAC survey in Ireland. These participants had varying levels of proficiency in literacy, numeracy and PSTRE. The percentage of the sample at each proficiency level is summarised in the table below. The shaded area indicates the subsample of adults that this study focuses on.

### Literacy

- More than half (53.9%) of adults with level 1 or less, and (56.8%) of adults with level 2 literacy are women.
- The average age of the respondents with level 1 or less is 43.7 years and respondents with level 2 is 40.8 years.
- Over half (54.9%) of the sample with level 1 or less has lower secondary education or less.
- Approximately one third (33.6%) of the sample with level 1 or less have had no paid work in the last 5 years.

### Numeracy

- Over half (59.5%) of the sample with level 1 or less and (58.2%) of the sample with level 2 are women.
- The average age of the respondents with level 1 or less is 43 years.
- Almost half (49.1%) of the sample with level 1 or less has lower secondary education or less, whereas almost half (47.8%) of the sample with level 2 has upper secondary education or less.
- Almost one third (31.1%) of the sample with level 1 or less have had no paid work in the last 5 years.

### Problem-solving in Technology Rich Environments (PSTRE)

- Over half (57.6%) of the sample with level 1 or less and (51.6%) of the sample with level 2 are women.
- The average age of the respondents with level 1 or less is 39.1 years and respondents with level 2 is 34.4 years.
- Over one quarter (26%) of respondents with level 2 have upper secondary education or less and 22.3% have tertiary education bachelor degree. The data shows that (41%) of respondents with level 1 or less have upper secondary education or less, and (21.8%) have post-secondary (non-tertiary) education

### Key points:

- Across all proficiencies more adults with level 1 compared with level 2 have poorer social wellbeing outcomes: less social trust; less perceived influence on the government and volunteer less.
- Having low literacy was not significantly associated with increased odds of having low social trust and having low political efficacy. Both low numeracy and low PSTRE were associated with increased odds of having low social trust and low political efficacy.
- Low proficiency in each domain was associated with lower odds of volunteering. Across all domains, adults with low proficiency were significantly less likely to report having good health.
- Across each domain, compared with adults at level 2, between 10% and 20% more adults with level 1 or less in literacy, numeracy and PSTRE reported that their fathers and mothers had a low level of educational attainment.

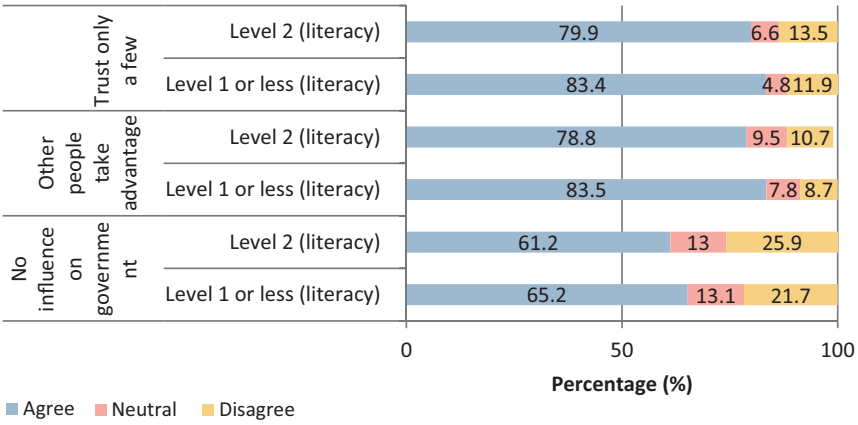
**Table: Percentage of adults at each literacy, numeracy and problem solving in technology rich environments level in Ireland**

| | Below Level 1 | At Level 1 | At Level 2 | At Level 3 | At Level 4 | At Level 5 |
|---|---|---|---|---|---|---|
| Literacy | **4.3** | **13.2** | **37.7** | 36.2 | 8.1 | # |
| Numeracy | **7.1** | **18.2** | **38.2** | 29.0 | 7.0 | 0.6 |
| PSTRE | **18.7** | **43.8** | **32.9** | 4.7 | | |

Source: OECD (PIAAC), 2012. Note: # indicates less than 1% (rounds to zero). Note: The research sample is the shaded area.

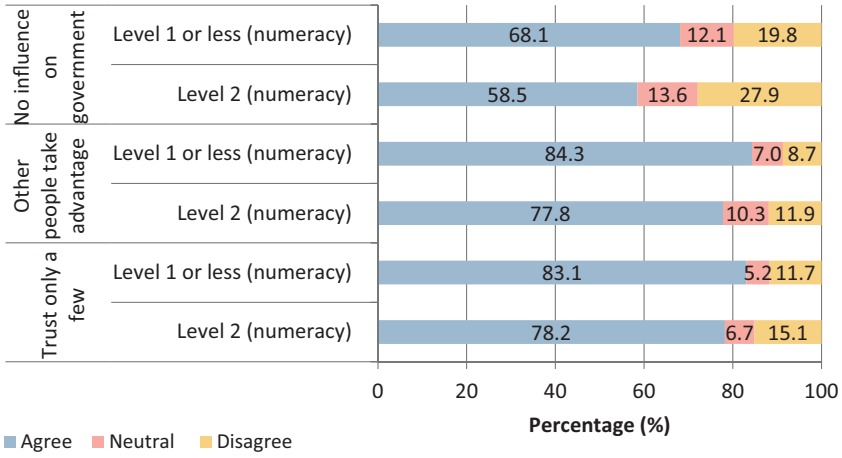
## Figure 1: Literacy, social trust and political efficacy

- This figure shows that a high proportion of adults with both level 1 or less and level 2 literacy have low social trust according to both measures; approximately 80% in both cases.
- A smaller percentage of adults have low perceived political efficacy, although this is more than 60% for both adults at or below level 1 and at level 2.



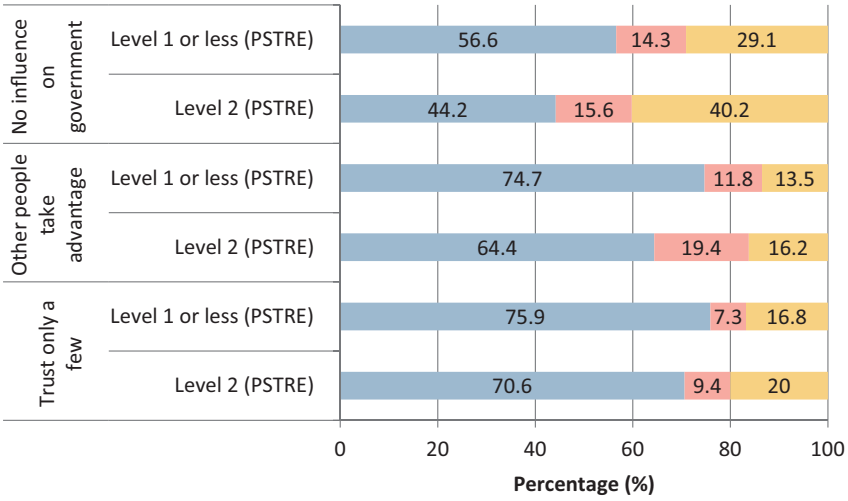

## Figure 2: Numeracy, trust and political efficacy

- Over three quarters of adults with level 1 or less and level 2 numeracy have low social trust based on both measures.
- A smaller proportion of adults at or below level 1 and at level 2 (numeracy have low perceived political efficacy, however these are still relatively high percentages (68.1% level 1 and 58.5% level 2).




## Figure 3 PSTRE, trust and political efficacy

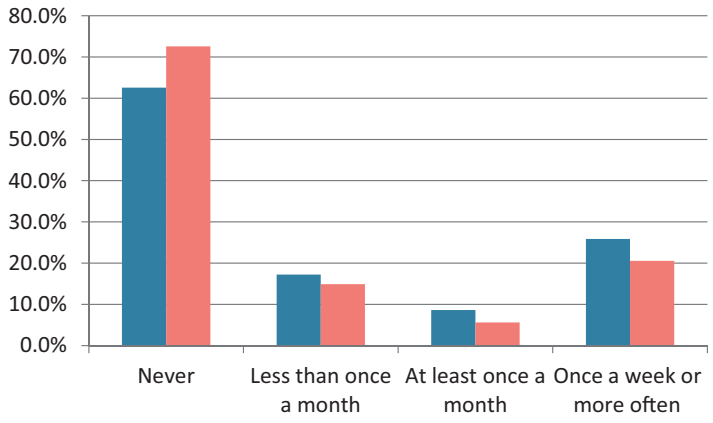
- Compared with low literacy and numeracy, a smaller percentage of adults with low PSTRE have low perceived political efficacy, although this is still more than half (56.6%) and more than 10% more than adults with level 2 PSTRE.



## *In this section we investigate the difference in how often adults with level 1 and level 2 literacy, numeracy and PSTRE volunteer.*

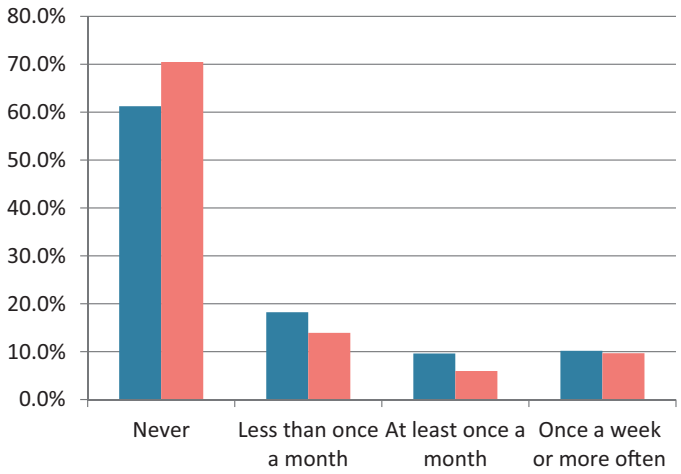
### Figure 4: Literacy and frequency of volunteering

- Almost three quarters (72.6%) of adults with Level 1 or less literacy never volunteer compared with 62.6% of adults with Level 2.
- At the other end of the scale, one quarter (25.9%) of adults with Level 2 and one fifth (20.5%) of adults with Level 1 volunteer once a week or more often.



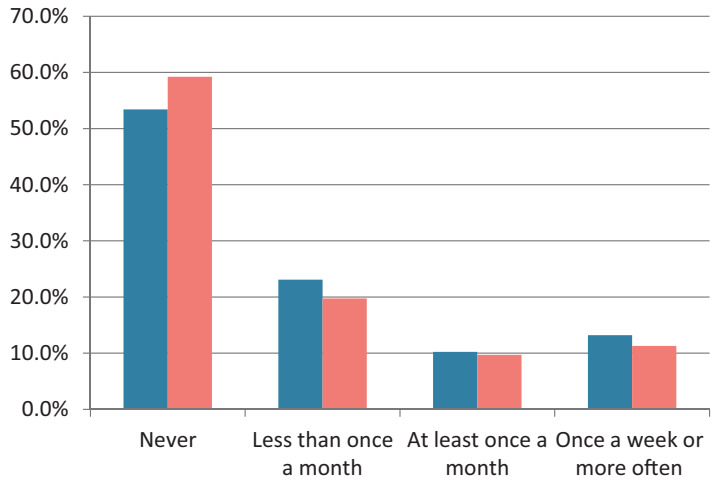

### Figure 5: Numeracy and frequency of volunteering

- Similar to literacy, a high proportion (70.5%) of adults with Level 1 or less numeracy (70.5%) and Level 2 (61.2%) never volunteer.




### Figure 6: PSTRE and frequency of volunteering

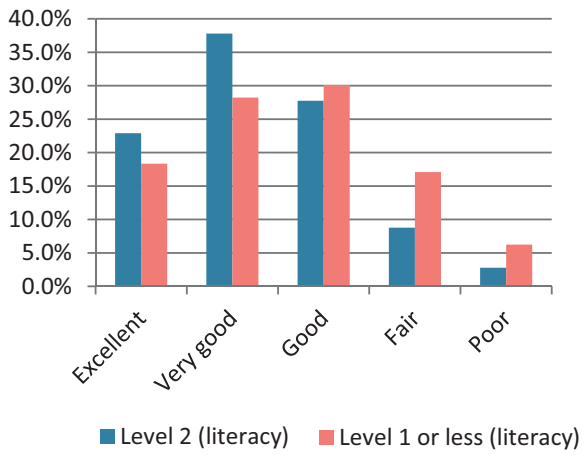
- More than half (59.2%) of the adults with Level 1 or less and Level 2 PSTRE (53.4%) never volunteer.
- One third (33.3%) of adults with Level 2 and over one quarter (29.4%) of adults with Level 1 or less volunteer several times a year or more (at least once a month and several times a year, but not every month).



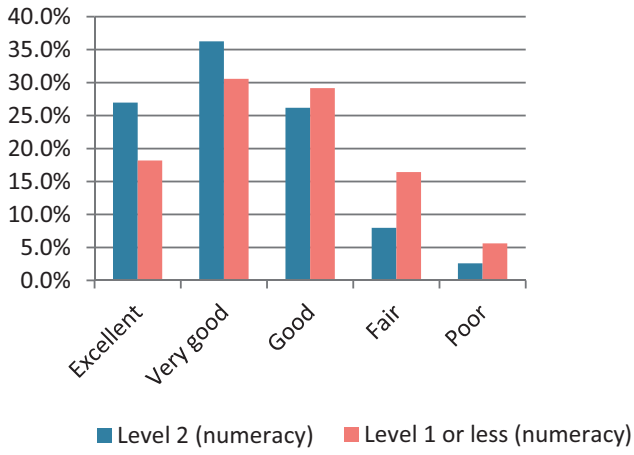
## *Health*

The next three graphs illustrate the distribution of participants with Level 2 and Level 1 (or less) across five categories of health status.

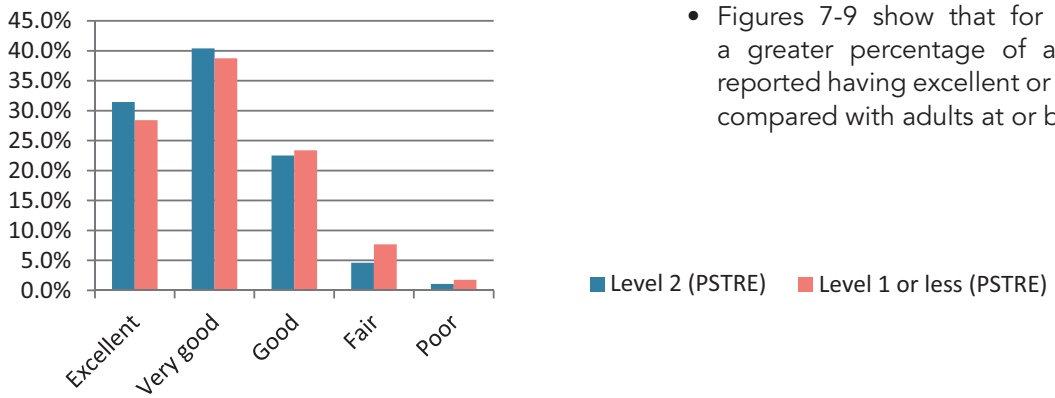
### Figure 7: Literacy and health




### Figure 8: Numeracy and health




### Figure 9: PSTRE and health




- Figures 7-9 show that for all proficiencies, a greater percentage of adults at level 2 reported having excellent or very good health compared with adults at or below level 1.

In this following section we investigate the likelihood that an adult who score at or below level 1 for literacy, numeracy and PSTRE reported: 1) low social trust and low political efficacy, 2) volunteering and 3) good health. Adults at level 1 or less are compared with adults at level 2 for each domain. Therefore these results should be interpreted as, for example, the likelihood that an adult with level 1 or less in literacy reported having low social trust compared with the an adult with level 2 literacy.

Social trust was measured by whether the respondent agreed or disagreed with the statement "There are only a few people you can trust completely". Political efficacy was measured by whether the respondent agreed or disagreed with the statement "People like me don't have any say about what the government does". Only adults with low PSTRE were significantly more likely to agree with these two statements.

Volunteering was measured as whether or not a respondent ever does any voluntary work for a non-profit organisation. Respondents are in two categories, either 'never' or 'ever'. The results below illustrate the likelihood that an adult with low proficiency 'ever' participates in any volunteering activities.

Self-reported health status was measured as having good health or not. The results below illustrate the odds that an adult with low proficiency reported having good compared with poor health.

### Table 1: Odds of low social trust, low political efficacy and poor health associated with low skills proficiency

| | Proficiency level and domain | OR estimate |
|---|---|---|
| **Low social trust (versus high social trust)** | *At or below level 1 (literacy)* | n/s |
| | *At or below level 1 (numeracy)* | 1.26 |
| | *At or below level 1 (PSTRE)* | 1.50 |
| **Low perceived political efficacy (versus high political efficacy)** | *At or below level 1 (literacy)* | n/s |
| | *At or below level 1 (numeracy)* | 1.26 |
| | *At or below level 1 (PSTRE)* | 1.46 |
| **Good health (versus poor health)** | *At or below level 1 (Literacy)* | 0.54 |
| | *At or below level 1 (numeracy)* | 0.57 |
| | *At or below level 1 (PSTRE)* | 0.74 |
| **Volunteering (ever versus never)** | *At or below level 1 (Literacy)* | 0.78 |
| | *At or below level 1 (numeracy)* | 0.78 |
| | *At or below level 1 (PSTRE)* | 0.80 |

Note: OR = Odds Ratios; n/s = not statistically significant. For all regressions the reference category is Level 2 proficiency. See the note at the end of this bulletin for a guide to reading Odds Ratios. Odds ratios are adjusted for age, gender, educational attainment and immigrant status and language background. Source: PIAAC (2012)

- Having low literacy was not significantly associated with the odds of having low social trust or low political efficacy. Both low numeracy and low PSTRE were associated with increased odds of having low social trust and low political efficacy.
- Compared with adults with level 2 proficiency in each domain, adults with level 1 (or less) are significantly less likely to participate in volunteering activities. The effect of low proficiency in each domain on the likelihood of and adult participating in volunteer activities is similar.
- Across all domains, adults with low proficiency had significantly lower odds of report having good health.

## Parental education

The next section investigates the likelihood that an adult has level 1 or less proficiency based on their parents education. The educational attainment of both parents was combined into a single measure with three categories:

1. Neither parent has attained upper secondary education (category 1)
2. At least one parent has attained secondary and post-secondary education (non-tertiary) (category 2)
3. At least one parent has attained tertiary education (category 3)

### Table 2: Combined parental education and proficiency level

| Parental education | Literacy | | Numeracy | | PSTRE | |
|---|---|---|---|---|---|---|
| | Level 1 or less | Level 2 | Level 1 or less | Level 2 | Level 1 or less | Level 2 |
| | *Percentage (%)* | | | | | |
| Neither parent has attained upper secondary | 71.8 | 57.1 | 70.1 | 51.9 | 49.0 | 28.1 |
| At least one parent has attained secondary and post-secondary but not tertiary | 19.4 | 26.1 | 21.3 | 29.3 | 30.9 | 35.1 |
| At least one parent has attained tertiary | 8.8 | 16.8 | 8.7 | 18.8 | 20.1 | 36.8 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

The table on page 7 shows that approximately 70% of adults at or below level 1 in literacy and numeracy reported that neither of their parents had attained upper secondary education. Over half of adults with level 2 literacy and numeracy reported that neither parent had attained upper secondary education. Almost half of adults at or below level 1 in PSTRE (49%) reported that neither parent had attained upper secondary education. However, 20.1% of adults with level 1 PSTRE reported that at least one of their parents had attained tertiary education.

We now investigated the likelihood of a respondent having at or below level proficiency based on their parents level of education. In this analysis we controlled for several background characteristics which are known to be associated with adult skills: age, gender, education, immigration and language background, education, and occupational status. In the analysis we included having 'at least one parent has attained tertiary education' (category 3) as a reference category. This means that the results should be interpreted as the increased likelihood of having level 1 or lower proficiency that is associated with your parent's education being category 1 or 2 compared with respondents who had parents in category 3.

**Table 3: Low skills proficiency and parental education attainment**

| Educational attainment level | OR |
|---|---|
| ***Odds of low literacy*** | |
| Neither parent has attained upper secondary | 1.47 |
| ***Odds of low numeracy*** | |
| Neither parent has attained upper secondary | 1.78 |
| ***Odds of low PSTRE*** | |
| Neither parent has attained upper secondary | 1.73 |
| At least one parent has attained secondary and post-secondary but not tertiary | 1.29 |

- Compared with adults with at least one parent with tertiary education, the likelihood of having level 1 or less literacy significantly increases if neither parent has attained upper secondary education.
- Compared with adults with at least one parent with tertiary education, the likelihood of having level 1 or less numeracy significantly increases if neither parent has attained upper secondary education.
- Compared with adults with at least one parent with tertiary education, the odds of having level 1 or less PSTRE significantly increases if neither parent has attained upper secondary education.
- Compared with adults with at least one parent with tertiary education, the odds of having low PSTRE are also significantly higher among adults who have at least one parent with secondary and post-secondary education, but not tertiary education.

# Summary

## The results presented in this bulletin show that there is a wide reaching relationship between low proficiency and social wellbeing and health.

Low levels of proficiency can be negatively linked with social, political and health outcomes net of other factors which influence these outcomes. The data clearly shows that the impact of proficiency skills goes beyond employment or potential earning ability. They can impact on health, involvement in society, engagement in political processes and participation in wider activities such as volunteering. The data shows that across all proficiencies more adults with level 1 compared with level 2 have poorer social wellbeing outcomes; less trust, less perceived influence on the government, less volunteering, a greater perception that other people take advantage and an increased likelihood of reporting being in poor health. We have also profiled the relationship between parents' education and adult skills.

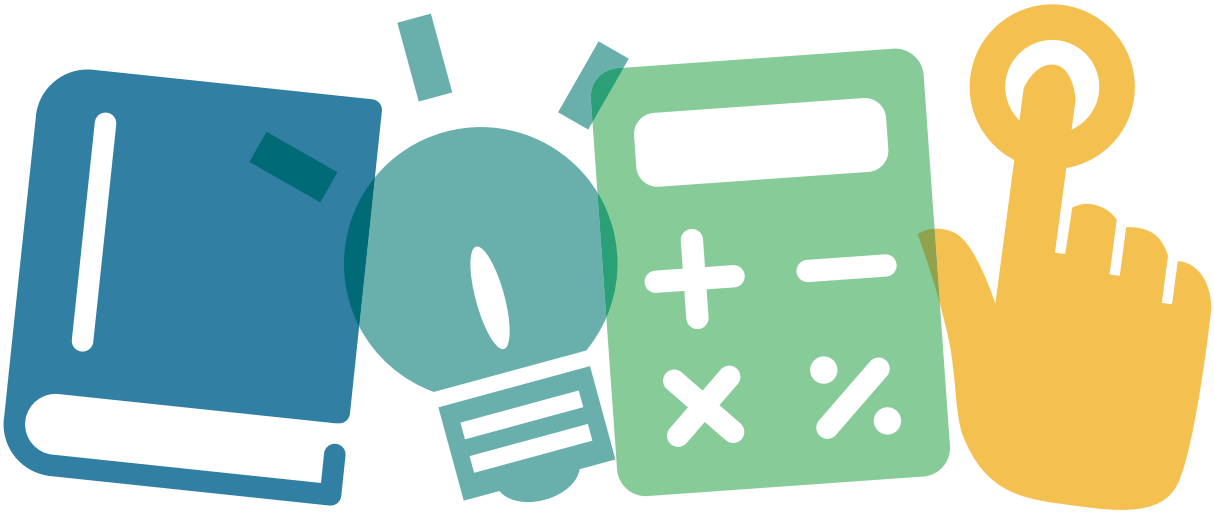
Good literacy, numeracy and PSTRE skills are essential to understand social, political and economic issues. The retention and development of these skills enable an individual to feel that they fully participate in society and gain a better understanding of the complexities of social, political and economic issues.

Investment in improving the proficiency skills of those at the lower end of the spectrum. Further investment in education and training including widening access adult education and training programmes can result in considerable economic and social returns for society as a whole.

**Note: Interpreting Odds Ratios**

For the logistic regression analysis, results are presented as Odds Ratios (OR). An Odds Ratio (OR) is a measure of association between an exposure and an outcome. The OR represents the odds that an outcome will occur given a particular exposure, compared to the odds of the outcome occurring in the absence of that exposure. For the purpose of interpretation:

- OR=1 Exposure does not affect odds of the outcome
- OR>1 Exposure is associated with higher odds of outcome
- OR<1 Exposure is associated with lower odds of outcome



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