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**Article**

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## Introduction to the special issue on the Survey of Adult Skills (PIAAC)

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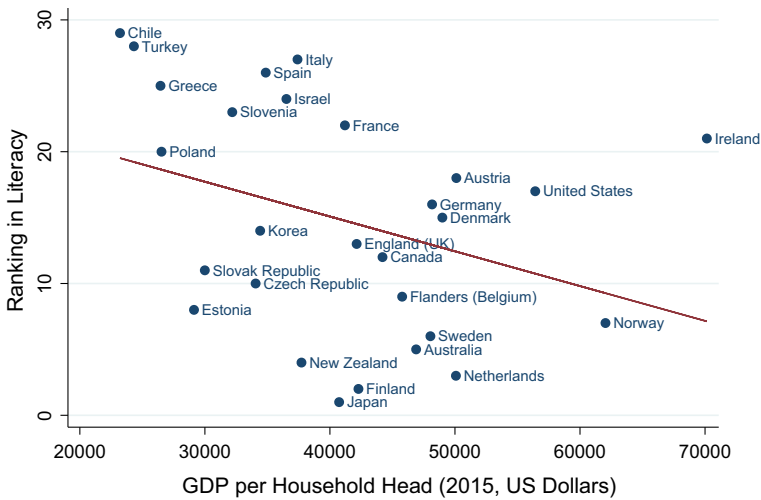
This special issue brings together five articles on the Survey of Adult Skills (PIAAC). The PIAAC measures the proficiency of 16–65 year-olds in literacy, numeracy and problem solving in technology-rich environments. The main motivation for the survey is that these cognitive skills are critical inputs for success in the labor market. There were two rounds of data collection for the PIAAC. In the first round, which took place during 2011 and 2012, a total of 166,000 adults between the ages of 16 and 65 were surveyed in 21 countries: Australia, Austria, Belgium (only Flanders), Canada, Cyprus, the Czech Republic, Denmark, England (and separately Northern Ireland), Estonia, Finland, France, Germany, Ireland, Italy, Japan, Korea, the Netherlands, Norway, Poland, Russia, the Slovak Republic, Spain, Sweden and the United States. The second round took place during 2014 and 2015 in 9 additional countries with a total of 50,250 adults. The countries that participated in the second round were Chile, Greece, Indonesia, Israel, Lithuania, New Zealand, Singapore, Slovenia and Turkey. OECD (2016) provides details on the survey and an overview of the key facts.

Table 1 documents the levels of literacy and numeracy proficiency across the OECD countries. The literacy outcomes measure “the ability of individuals to understand, evaluate, use and engage with written texts in order to participate in society, achieve one’s goals, and develop one’s knowledge and potential” (OECD 2016, p. 38), while numeracy measures “the ability to access, use, interpret and communicate mathematical information and ideas in order to engage in and manage the mathematical demands of a range of situations in adult life” (OECD 2016, p. 47). The maximum score is 400 in for both measures and the table report average scores for each country. There is a large variation in the average levels of proficiency of literacy and numeracy across

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**Fig. 1** GDP per capita and literacy ranking

countries. The gap between the country that performs the best (Japan) and the worst (Chile) in literacy is about 97 point or about 28% of the OECD average for literacy. For the numeracy, the gap between the top and the bottom (again Japan and Chile) is about 31% of the mean numeracy score. In addition to Turkey and Chile, the poorest OECD members, the Southern European countries, Greece, Italy and Spain perform consistently poorer along both dimensions. Indeed, across the set of countries in Table 1, the two measures are very highly correlated; the correlation coefficient between the two rankings is about 89%.

The last column of Table 1 documents GDP per household head. While there is a negative relationship between the GDP per capita and adult skills, i.e. the richer countries are ranked higher, the relationship is quite far from perfect (the correlation between the GDP per household head and a country's rank in literacy is about  $-0.35$ ). Figure 1 provides a cross country plot of the GDP per household head and rankings in literacy. Around 40,000\$, there is a very large variation in skill outcomes, with Japan and Finland doing great and Italy and Spain lagging significantly behind.

What can researchers do with the PIACC survey? An obvious question is whether individuals with better skills, controlling for other observable characteristics, do better in the labor market, in term of earnings and employment opportunities. One can also use the adult skills to build better measures of a country's human capital stock, which goes beyond the measured years of schooling. The PIACC can also help us to understand how different education choices by individuals (vocational or academic) affect their skills as adults. Alternatively, by comparing different cohorts within the PIACC, we can evaluate how education reforms, which might alter the length or the content of formal education, affect adult outcomes. The PIACC can also be used to study whether individuals who receive training in their firms improve their skills, and how labor market institutions, such as labor market duality, affect firms' incentive to train their workers. While Table 1 documents results for the cognitive skills, the PIACC can also

**Table 1** Performance in literacy and numeracy. *Source:* Columns 2–5, OECD (2016, Figure 1.1.); column 6, <http://stats.oecd.org>, the level level of GDP per capita and productivity

| Country               | Literacy | Literacy ranking | Numeracy | Numeracy ranking | GDP per household head (2015) |
|-----------------------|----------|------------------|----------|------------------|-------------------------------|
| Australia             | 280.40   | 5                | 267.63   | 14               | 46,894.4                      |
| Austria               | 269.45   | 18               | 275.04   | 10               | 50,108.9                      |
| Canada                | 273.49   | 12               | 265.46   | 15               | 44,205.0                      |
| Chile                 | 220.15   | 29               | 206.06   | 29               | 23,210.9                      |
| Czech Republic        | 274.01   | 10               | 275.73   | 9                | 34,058.3                      |
| Denmark               | 270.79   | 15               | 278.28   | 7                | 48,992.1                      |
| England (UK)          | 272.58   | 13               | 261.81   | 17               | 42,136.9                      |
| Estonia               | 275.88   | 8                | 273.12   | 11               | 29,130.7                      |
| Finland               | 287.55   | 2                | 282.23   | 2                | 42,281.9                      |
| Flanders (Belgium)    | 275.48   | 9                | 280.39   | 3                | 45,776.3                      |
| France                | 262.14   | 22               | 254.19   | 22               | 41,199.2                      |
| Germany               | 269.81   | 16               | 271.73   | 12               | 48,170.0                      |
| Greece                | 253.89   | 25               | 251.86   | 24               | 26,450.0                      |
| Ireland               | 266.54   | 21               | 255.59   | 21               | 70,146.4                      |
| Israel                | 255.24   | 24               | 251.05   | 25               | 36,519.8                      |
| Italy                 | 250.48   | 27               | 247.13   | 26               | 37,407.1                      |
| Japan                 | 296.24   | 1                | 288.17   | 1                | 40,737.3                      |
| Korea                 | 272.56   | 14               | 263.39   | 16               | 34,421.5                      |
| Netherlands           | 284.01   | 3                | 280.35   | 4                | 50,077.6                      |
| New Zealand           | 280.67   | 4                | 271.13   | 13               | 37,724.8                      |
| Northern Ireland (UK) | 268.70   | 19               | 259.17   | 19               |                               |
| Norway                | 278.43   | 7                | 278.30   | 6                | 62,038.2                      |
| Poland                | 266.90   | 20               | 259.77   | 18               | 26,529.6                      |
| Slovak Republic       | 273.85   | 11               | 275.81   | 8                | 29,995.3                      |
| Slovenia              | 256.39   | 23               | 257.56   | 20               | 32,189.2                      |
| Spain                 | 251.79   | 26               | 245.82   | 27               | 34,867.4                      |
| Sweden                | 279.23   | 6                | 279.05   | 5                | 48,037.8                      |
| Turkey                | 226.54   | 28               | 219.43   | 28               | 24,324.2                      |
| United States         | 269.81   | 17               | 252.84   | 23               | 56,420.4                      |
| OECD average          | 267.69   |                  | 263.04   |                  | 41,199.5                      |

be used to measure how non-cognitive skills affect earnings, by exploiting information on skipped questions or average time per question on the test. These are among the questions that the papers in this issue try to answer. Answers to these questions are critical for countries, like Spain, that perform poorly on the PIACC, have high levels

of unemployment and in particular long-term unemployment (Bentolila et al. 2017), suffer from low and stagnant levels of TFP (Diaz and Franjo 2016; Conesa and Kehoe 2017), have dual labor markets in which workers with temporary and permanent contract face very different levels of severance payments (Bentolila et al. 2012), and are characterized by high levels of mismatch or over-education of workers for the tasks they perform (Obiols-Holms and Sanchez-Marcos 2017).

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