An overview of the cognitive domains and health-related variables in the Program for the International Assessment of Adult Competencies (PIAAC)

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Emily Pawlowski
American Institutes for Research
PIAAC is an international large-scale assessment administered in 2011-12 in 23 countries. It assessed 16- to 65-year-olds, non-institutionalized, residing in each country, irrespective of nationality, citizenship, or language status.

<table>
<thead>
<tr>
<th>Year</th>
<th>Sample Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012 US main study</td>
<td>• 5,000 nationally representative</td>
</tr>
<tr>
<td>sample size:</td>
<td></td>
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<tr>
<td>2014 US National</td>
<td>• 3,600 in household: focus on young adults 16-34 &amp; unemployed &amp; 66-74</td>
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<tr>
<td>Supplement study</td>
<td>• 1,200 (16-74) in state, federal and private prisons</td>
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<tr>
<td>sample size:</td>
<td></td>
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<tr>
<td>Total Sample</td>
<td>9,800</td>
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</tbody>
</table>

Assessment was conducted only in English in the U.S.: The background survey was conducted in English or Spanish. About 4% could not complete the BQ because of language difficulties or learning or mental disabilities, and 1% could not complete it for other reasons.
## Participating Countries

<table>
<thead>
<tr>
<th>2012</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>Italy</td>
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<tr>
<td>Austria</td>
<td>Japan</td>
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<tr>
<td>Belgium</td>
<td>Korea, Rep of</td>
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<tr>
<td>Canada</td>
<td>Netherlands</td>
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<tr>
<td>Cyprus</td>
<td>Norway</td>
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<td>Czech Republic</td>
<td>Poland</td>
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<td>Denmark</td>
<td>Slovak Republic</td>
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<td>Estonia</td>
<td>Spain</td>
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<td>Finland</td>
<td>Sweden</td>
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<td>France</td>
<td>United Kingdom</td>
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<td>Germany</td>
<td>United States</td>
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<td>Ireland</td>
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<td></td>
<td>Chile</td>
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<td></td>
<td>Greece</td>
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<td>Indonesia</td>
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<td></td>
<td>Israel</td>
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<td></td>
<td>Lithuania</td>
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<td></td>
<td>New Zealand</td>
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<td></td>
<td>Singapore</td>
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<tr>
<td></td>
<td>Slovenia</td>
</tr>
<tr>
<td></td>
<td>Turkey</td>
</tr>
</tbody>
</table>

*Note: The table shows the participating countries in 2012 and 2015.*
How is PIAAC Carried Out?

- PIAAC is administered in face-to-face interviews in the homes of nationally representative samples of adults.
- The primary mode of delivery is laptop computers.
- Adults who are unable to use or unwilling to take the assessment on a computer are provided with a paper and pencil assessment booklet.
- Adults who took the paper and pencil assessment and those with very low literacy skills also responded to a set of reading component measures.
Definitions of PIAAC direct assessment domains

**Literacy** is understanding, evaluating, using and engaging with written texts to participate in society, to achieve one’s goals, and to develop one’s knowledge and potential.

**Numeracy** is 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.

**Problem solving in technology-rich environments** involves using digital technology, communication tools and networks to acquire and evaluate information, communicate with others and perform practical tasks.
What PIAAC Reports

**Average Scores:** Reported on a scale of 0-500 for all domains.

**Proficiency Levels:** Reported as the percentages of adults scoring at six performance levels in literacy and numeracy and at four performance levels in problem solving in technology-rich environments.
These descriptions of the PIAAC Proficiency Levels for Literacy define what adults can do at each level.

Below Level 1 (0-175)
Locate single piece of information in familiar texts.

Level 1 (176-225)
Read relatively short digital, print or mixed texts to locate single text.

Level 2 (226-275)
Make matches between text & information that may require low level paraphrasing and drawing low-level inferences.

Level 3 (276-325)
Identify, interpret, or evaluate one or more pieces of information and often require varying levels of inference.

Level 4 (326-375)
Perform multiple-step operations to integrate, interpret, or synthesize information from complex texts, and may require complex inferences.

Level 5 (376-500)
Integrate information across multiple, dense texts; construct syntheses, ideas or points of view; or evaluate evidence based arguments.
Look at the job search results webpage. Click the box next to a company name to answer the question below.

Which company is looking for an employee to work at night?

Literacy item
Level = 1
Tackle Gender Gap to Boost Growth

Breaking down barriers to gender equality in education, employment and entrepreneurship would create new sources of economic growth and help make better use of everyone’s skills, according to a new report by the OECD, an organization of some 34 countries promoting policies to improve economic and social well being.

Overall, good progress has been made in education. Increased educational attainment is responsible for half of the GDP growth across the OECD over the last 50 years. Every extra year of education of the population leads to an average increase of around 9% in GDP per capita, says the report. More progress will be essential for countries to benefit from the economic contributions women can make and to not waste the years of investment in the education of girls and young women. Ensuring that more girls have access to higher levels of education is also key for developing countries.

Employment rates are 13 percentage points lower for women than for men in OECD countries. As Figure 1 shows, gender differences in employment rates vary considerably in different regions of the world. Women are also much more likely to work part-time. Better and more affordable child care and more flexible work conditions are key to helping women to be in paid work or increase hours and work full time, says the report.

Figure 1: Gender gap in employment rates worldwide, 2010

Pay gaps also remain stubbornly high. On average in OECD countries women earn 16% less than men...
PIAAC Background Questionnaire

Focused on identifying:
- Skills that are critical to functioning successfully in today’s society,
- How participants acquire those skills, and
- How those skills are distributed.

Areas of BQ include:
- Education and training, present and past,
- Work experience,
- Literacy, numeracy and ICT skill use at work and at home,
- Other 21st century skills used at work,
- Personal traits, and background information.
US Background Questionnaire

Countries are allowed to:

- Add up to 5 minutes of country-specific items.
- Adapt items (subject to permission)
- US additions and adaptations are related to:
  - Education (current/past/required)
  - Country of origin/language/ethnicity
  - Training courses
  - Occupation
  - **Health**
  - Economic Sector
  - Earnings
Overview of U.S. Results: Literacy, Numeracy, Digital Problem-Solving
How did we do compared to other countries?

<table>
<thead>
<tr>
<th>Literacy</th>
<th>Numeracy</th>
<th>PS-TRE</th>
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<tbody>
<tr>
<td>Finland</td>
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<td>Netherlands</td>
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<td>Estonia</td>
<td>Slovak Rep.</td>
<td>Austria</td>
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<td>Flanders-Belgium</td>
<td>Czech Rep.</td>
<td>Finland</td>
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<td>Germany</td>
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<td>Canada</td>
<td>Germany</td>
<td>Czech Rep.</td>
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<td>Korea, Rep. of</td>
<td>Australia</td>
<td>Korea, Rep. of</td>
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<td>U.K.</td>
<td>Canada</td>
<td>Korea, Rep. of</td>
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<td>France</td>
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<tr>
<td>Italy</td>
<td></td>
<td></td>
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</tbody>
</table>

- The U.S. ranked lower than most other countries in all three domains.
- The US ranked better in Literacy than in Numeracy or Problem Solving in technology-rich environments.
The U.S. average literacy score (270) was lower than the international average (273).

Scores on literacy ranged from 296 (Japan) to 250 (Italy)

U.S. scores were:
- Lower than in 12 countries
- Not significantly different than in 5 countries
- Higher than in 5 countries
The U.S. average is low because a higher proportion of U.S. adults are at the lowest levels (level 1 and below level 1) of literacy.
PIAAC Health Information
Previous adult literacy assessments have found health literacy to be highly correlated with literacy.

- In the National Assessment of Adult Literacy (NAAL), the correlations between the health scale and the 3 other scales, prose, document and quantitative, were .87, .83, and .86, respectively.
- The domains assessed for PIAAC were decided at the international level.
Health Measures in the U.S. Background Questionnaire

The U.S. Background Questionnaire included questions on:

- Health status
- Health insurance coverage
- Sources of information about health issues
- Preventive health practices
Health Status Questions

- In general, would you say your health is excellent, very good, good, fair, or poor?

- Do you have any difficulty seeing the words and letters in ordinary newspaper print even when wearing glasses or contact lenses if you usually wear them?

- Do you have any difficulty hearing what is said in a normal conversation with another person even when using a hearing aid if you usually wear one?

- Have you ever been diagnosed or identified as having a learning disability?
Health insurance coverage

- Do you have any kind of medical insurance or are you enrolled in any kind of program that helps to pay for your health care?
How much (a lot, some, a little, none) information about health issues do you get from ...

- newspapers?
- magazines?
- internet?
- radio?
- television?
- books or brochures?
- family members, friends, or co-workers?
- talking to health care professionals, such as doctors, nurses, therapists, or psychologists?
Preventive health practices

In the past year, have you ...

- gotten a flu shot?
- had your vision checked?
- visited a dentist?
Preventative health practices

In the past year, have you ...

- had a mammogram? (females, ages 40+)
- had a pap smear? (females, ages 18+)
- been screened for colon cancer? (all genders, ages 50+)
- been screened for prostate cancer? (males, ages 50+)
- been screened for osteoporosis? (all genders, ages 50+)
Indirect Health-related questions

Please look at this card and tell me which ONE of the statements best describes your current situation.

- Full-time employed (self-employed, employee)
- Part-time employed (self-employed, employee)
- Unemployed
- Pupil, student
- Apprentice, internship
- In retirement or early retirement
- Permanently disabled
- ...
- Other
Indirect Health-related questions

- In the last 4 weeks, for which of the following reasons did you not look for work?
  - I was waiting for the results of an application…
  - I was a student
  - I was looking after the family or home
  - I was temporarily sick or injured
  - I have a long-term illness or disability
  - ...

- Could you tell me the main reason you stopped working in your last job?
  - I gave up work for health reasons
Indirect Health-related questions

Please look at this card and tell me which of the statements best describes the current situation of your spouse or partner.

- Full-time employed (self-employed, employee),
- Part-time employed (self-employed, employee),
- unemployed,
- Pupil/student, Apprentice/internship,
- In retirement or early retirement,
- **Permanently disabled**
- Fulfilling domestic tasks or looking after children/family, Other)
PIAAC Health Results
More U.S. adults reported having “excellent” or “very good” health and fewer reported having lower levels of health when compared to the international average.

*$p < .05$. United States is significantly different from PIAAC international average.
Distribution of U.S. adults by health status and proficiency in literacy

The chart shows the distribution of U.S. adults by health status and proficiency in literacy. The data is categorized into different health statuses: Excellent, Very good, Good, Fair, and Poor. The proficiency levels are represented by different colors:

- Below Level 1
- Level 1
- Level 2
- Level 3
- Level 4/5

The chart illustrates the percentage of adults in each category across different levels of literacy proficiency.
U.S. gaps in literacy scores larger than international average by health
Percentage of U.S. adults reporting that they get a lot of health information from each source

<table>
<thead>
<tr>
<th>Source</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internet</td>
<td>48</td>
</tr>
<tr>
<td>Health Professional</td>
<td>45</td>
</tr>
<tr>
<td>Television</td>
<td>29</td>
</tr>
<tr>
<td>Family Members, Friends, Co-workers</td>
<td>26</td>
</tr>
<tr>
<td>Books/Brochures</td>
<td>15</td>
</tr>
<tr>
<td>Magazines</td>
<td>9</td>
</tr>
<tr>
<td>Radio</td>
<td>9</td>
</tr>
<tr>
<td>Newspapers</td>
<td>7</td>
</tr>
</tbody>
</table>
Average literacy scores of U.S. adults by amount of health information from source

- **Internet**
  - A lot (48%): 279
  - None (14%): 224

- **Health Professional**
  - A lot (45%): 268
  - None (7%): 246

- **Family, Friends, Co-workers**
  - A lot (26%): 266
  - None (6%): 246

- **Books/Brochures**
  - A lot (15%): 265
  - None (22%): 256

- **Magazines**
  - A lot (9%): 258
  - None (25%): 258

- **Newspapers**
  - A lot (7%): 251
  - None (36%): 271

- **Television**
  - A lot (29%): 251
  - None (12%): 282

- **Radio**
  - A lot (9%): 246
  - None (34%): 274
Average literacy score of U.S. adults by seeing, hearing, and learning disability status

- **Difficulty seeing print**
  - Yes (11%): 244
  - No (89%): 273

- **Difficulty hearing conversation**
  - Yes (9%): 262
  - No (91%): 271

- **Diagnosed learning disability**
  - Yes (8%): 246
  - No (92%): 272
Distribution of U.S. adults by whether they practiced preventative health measures and proficiency in literacy

- Flu shot
  - Yes (39%): 36, 32, 15, 13
  - No (61%): 35, 35, 14, 11

- Vision check
  - Yes (55%): 34, 37, 13, 11
  - No (45%): 34, 34, 16, 11

- Seen dentist
  - Yes (67%): 39, 39, 32, 15
  - No (33%): 19, 29, 12, 7

Legend:
- Below Level 1
- Level 1
- Level 2
- Level 3
- Level 4/5
Distribution of U.S. adults by whether they practiced preventative health measures and proficiency in literacy

<table>
<thead>
<tr>
<th>Preventative Health Measure</th>
<th>Yes (Percentage)</th>
<th>No (Percentage)</th>
<th>Below Level 1</th>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
<th>Level 4/5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pap smear (Females, Age 18+)</td>
<td>63%</td>
<td>37%</td>
<td>4</td>
<td>12</td>
<td>13</td>
<td>13</td>
<td>38</td>
</tr>
<tr>
<td>Mammogram (Females, Age 40+)</td>
<td>59%</td>
<td>41%</td>
<td>5</td>
<td>14</td>
<td>12</td>
<td>12</td>
<td>38</td>
</tr>
<tr>
<td>Screen for prostate cancer (Males, Age 50+)</td>
<td>52%</td>
<td>48%</td>
<td>4</td>
<td>13</td>
<td>13</td>
<td>13</td>
<td>39</td>
</tr>
</tbody>
</table>

Levels:
- Below Level 1
- Level 1
- Level 2
- Level 3
- Level 4/5
Distribution of U.S. adults by whether they practiced preventative health measures and proficiency in literacy

- Yes (22%)
  - Screen for osteoporosis (Age 50+):
    - Below Level 1: 6
    - Level 1: 18
    - Level 2: 36
    - Level 3: 32
    - Level 4/5: 34
  - Screen for colon cancer (Age 50+):
    - Below Level 1: 6
    - Level 1: 15
    - Level 2: 35
    - Level 3: 34
    - Level 4/5: 35

- No (78%)
  - Screen for osteoporosis (Age 50+):
    - Below Level 1: 8
    - Level 1: 15
    - Level 2: 35
    - Level 3: 34
    - Level 4/5: 32
  - Screen for colon cancer (Age 50+):
    - Below Level 1: 7
    - Level 1: 17
    - Level 2: 32
    - Level 3: 34
    - Level 4/5: 32

- Yes (30%)
  - Screen for osteoporosis (Age 50+):
    - Below Level 1: 5
    - Level 1: 16
    - Level 2: 36
    - Level 3: 34
    - Level 4/5: 34
  - Screen for colon cancer (Age 50+):
    - Below Level 1: 5
    - Level 1: 16
    - Level 2: 36
    - Level 3: 34
    - Level 4/5: 33

- No (70%)
  - Screen for osteoporosis (Age 50+):
    - Below Level 1: 9
    - Level 1: 16
    - Level 2: 36
    - Level 3: 34
    - Level 4/5: 34
  - Screen for colon cancer (Age 50+):
    - Below Level 1: 9
    - Level 1: 16
    - Level 2: 36
    - Level 3: 34
    - Level 4/5: 34
Distribution of U.S. adults by whether they have medical insurance and proficiency in literacy
U.S. PIAAC Findings Summary:

- Lower overall scores than international average in all three subjects.
- Ranked better in literacy than in numeracy or problem solving in technology-rich environments.
- Higher percentages of low performers than internationally.
- Health status of U.S. adults better than international average.
- Larger gap in U.S. than international average in literacy achievement by health status.
- Those who get a lot of health information from the internet, health professionals, and family/friends have higher literacy scores, while those who get a lot of health information from radio, television, and newspapers score lower compared to those who get no information from these sources.
Contact Us

AIR PIAAC team: piaac@air.org
               piaacgateway.com

NCES Website: http://nces.ed.gov/surveys/piaac/

Holly Xie, NCES: Holly.Xie@ed.gov

Stephen Provasnik, NCES: Stephen.Provasnik@ed.gov

OECD Website: http://www.oecd.org/site/piaac/