What can we learn from the PISA reading-fluency test?
Proficient readers use and engage with a variety of texts, including books, online articles and social media. They can find information, understand both the literal and the implied meaning, and reflect critically on content and form. But before students can become proficient readers, they must become fluent readers. This involves mastering several foundational skills that are typically taught in elementary grades – such as decoding characters to produce sounds and words, recognising words, or identifying parts of a sentence to extract meaning. As long as these building blocks of reading require conscious effort and attention, the cognitive resources available to engage in more complex reading processes are reduced. In contrast, once students read fluently, they can devote their effort and attention to higher-level comprehension tasks and engage more deeply with texts.

In 2018, the PISA test included a three-minute-long assessment of students’ reading fluency. Students were asked to evaluate the sensibility of 21 or 22 sentences. The same question was asked about each sentence: “Does the sentence make sense? Yes/No”. Each set of sentences included both sensible sentences (e.g. “The student read the book last night”) and nonsensical sentences (e.g. “Airplanes are made of dogs”). The instructions given to students, including a short practice test, can be seen online at https://doi.org/10.1787/098bab1a-en.

To read fluently, readers must recognise words within a text accurately and automatically, then parse and process the words into a coherent whole in order to comprehend the overall meaning of the text. A lack of fluency suggests that students have not yet fully mastered the component skills which contribute to reading.

The reading-fluency test aimed to measure the pace at which students can read for understanding. In the second segment of the reading assessment, the speed at which students solved the tasks was of no consequence: their proficiency scores were only based on whether answers were correct or incorrect.

Fluent reading is related to proficient reading in every language

New analyses of the PISA assessment of reading fluency, prepared for this “PISA in Focus”, confirm that fluency is, across all languages, a significant predictor of reading comprehension (as assessed by the typical PISA reading tasks).

Figure 1 shows that across all major language groups represented in PISA, students who score below Level 2 in reading require the longest time to read short sentences for understanding. These students struggle to identify the main idea in a text of moderate length, to find information based on explicit though sometimes complex criteria, or to reflect on the purpose and form of texts even when explicitly directed to do so.

What can we learn from the PISA reading-fluency test?

- Students who master complex reading processes, such as understanding implied meaning, can read simple sentences faster than other students.
- The correlation between reading speed and literacy is particularly strong amongst students who live in multilingual environments.
- Reading-fluency tests can help teachers identify struggling readers early in the school year, as well as the reasons why they have limited ability, at little cost.
Box 1: How is the fluency score defined?

Six fluency scores were computed - two for each student. Each score corresponds to the total time (in seconds) required to read all sentences in a particular set (or “block”) of 10–11 sentences and classify them as sensible or nonsensical. Students who completed the test quicker indicated higher levels of reading fluency. Fluency scores should be compared only within language groups, not across language groups, because differences in script and orthography, as well as the length of sentences presented to students, might affect their comparability across languages. Each language group may include students from multiple countries/economies.

Figure 1. How reading fluency relates to reading proficiency across major language groups in PISA

Notes: Fluency scores should be compared only within language groups, not across language groups, due to differences such as sentence length and other factors. The median fluency score divides the 50% fastest readers from the 50% slowest readers; the fluency score for one particular set of sentences (“Block 1”) is used for illustrative purposes; data for all language groups and all 6 blocks are available as supplementary material online. See Box 1 for definitions.

The chart shows that among students who took the PISA reading test in English, half of those who scored below Level 2 needed 50 seconds or more to read the 11 sentences in Block 1; in contrast, half of those who scored at or above Level 5 needed, at most, 30 seconds to read the same set of sentences.

Perhaps more surprisingly, Figure 1 also shows that fluency scores are related to reading proficiency not only among low-achieving students (those who score at or below Level 2), but up to the highest levels of proficiency (e.g. among students who score at Levels 4, 5 and 6 in PISA). The strength of the relationship between reading fluency and the ability of students to use and understand longer texts varies, however, across countries and languages. It can be summarised by the percentage of variation in reading proficiency that is related to reading-fluency scores.\(^3\)

Figure 2 shows that for most language groups within countries and economies, fluency scores account for 10-20% of the variation in overall PISA reading results. But the predictive power of reading fluency scores often exceeds 20% for students who grow up in multi-lingual environments. For example, students in the German-speaking region of Italy or those in the Arab Emirates and Qatar whose language of instruction is English. For comparison, students’ socio-economic status accounts for about 12% of the variation in reading performance on average.
These results confirm that assessments of reading fluency can be efficient tools to detect struggling readers in need of targeted support: students who score at the lower levels of proficiency in PISA are likely to read at a significantly slower pace than higher-performing students. Fluency tests can be easily implemented in the classroom and do not take much time. For example, at the beginning of the school year in France, all 6th-grade students are asked to read aloud the same page of text. After 60 seconds, the teacher counts the number of words that were correctly read. This simple test can detect severe reading difficulties very early on in the school year. This helps teachers identify students who potentially need extra help and to put in place appropriate remedial measures to aid the transition from elementary to middle school.4

How many low achievers in PISA are (not yet) fluent readers?

In contrast to traditional PISA assessments, whose goal is to compare performance across countries, the reading-fluency assessment is intended to be used within language groups, in conjunction with the reading scores based on more complex, extended comprehension tasks. Its development was guided by the question of understanding what causes the poor performance of many students in the PISA reading literacy test, which focuses on higher-order reading processes and therefore assumes that students have already mastered basic component skills. The reading speed of students who demonstrated, in the remaining part of the PISA reading test, good mastery of all reading processes, can be used as a reference for what constitutes “fluent” reading in each language (see Box 2).

Box 2: Using fluency tasks to classify test-takers

In order to examine whether low-achieving students can read fluently, language-specific norms have been derived for response time on reading fluency tasks. The norms correspond to the pace at which at least 50% of Level-3 students read (excluding those few Level-3 students who made more than one mistake in their sensibility judgements). Level 3 corresponds to the average proficiency of 15-year-old students across OECD countries. Students who read at this level can take many features into account when comparing, contrasting or categorising information, even if the required information is not prominent or there may be a considerable amount of competing information.

The number of correct sensibility judgments and the time taken to form these judgements has then been used to classify students who took the PISA fluency test in four categories:

- “Fluent” readers made no more than one mistake in their sensibility judgements and took, at most, twice as long as the norm defined for their language group.5 About 69% of 15-year-old students, across PISA-participating countries and economies, are in this category.
- “Slow” readers are those who took more than twice as long to complete the reading-fluency test as the norm defined for their country and language group (regardless of whether the answers were accurate or not). This category includes about 11% of students overall.
- “Speeded” test-takers are those who tried to rapidly guess the correct answers. They made more than one mistake in their sensibility judgements, and completed the assessment faster than 99% of those test-takers in their country and language group who made at most one mistake. These students did not engage with the reading-fluency task as expected, and have been excluded from previous analyses in this PISA in Focus. About 10% of 15-year-old students behaved in this way.
- “Inaccurate” test-takers are the remaining students, who made more than one mistake but completed the test neither too fast, nor too slowly. About 10% of students are in this category.
The bottom line

Reading-fluency tests can help teachers identify struggling readers early in the school year and at little cost. PISA data show that their use beyond early grades remain justified. Together with assessments of reading comprehension, fluency tests can help understand the reasons for low performance and align educators’ response to reading difficulties with the needs of students.

PISA data show that on average across OECD countries, more than one in five 15-year-old students do not reach a baseline level of reading proficiency and score below Level 2 on the reading test. The fluency scores of low-achieving students also suggest that many of them are not yet fluent readers.

Students who cannot read fluently should not be stigmatised. Instead, they should be given the opportunity to regularly practice reading, including reading aloud in safe settings. Basic reading skills (such as phonics, in English) may need to be revised, even in post-elementary years. Games can also be used to enrich student’s vocabulary.
Figure 3. How many low-achieving students in reading are fluent readers?

Note: See Box 2 for the definitions of the various types. Countries and economies are sorted in ascending order of the proportion of low-achieving students (below Level 2) who are classified as “fluent” readers.

For more information

Contact: Francesco Avvisati (francesco.avvisati@oecd.org).

Also see:


Notes

1. There were six sets of sentences in the item pool; each student’s test included two sets.
2. Fluency scores were computed only for students who demonstrated that they were reading for understanding by taking the time required to make sound sensibility judgements. No fluency score was computed for students who gave two or more inaccurate answers (out of 10 or 11), if they completed the reading-fluency block faster than 99% of all accurate respondents who took the fluency test in the same language: indeed, the detailed analysis of timing data showed that multiple errors often reflected speediness and a lack of engagement with the task.
3. The percentage of variation in reading scores that is accounted for by the reading-fluency scores is computed as the r-square coefficient from a linear regression of PISA reading scores on fluency scores. Higher percentages mean that a similar difference in reading fluency scores is associated with a greater difference in PISA score points, or that for a given PISA score, there is less variation in reading fluency scores (and vice versa).
5. Different choices of these cut-off values will result in different percentages of students who are classified as “fluent”; the comparisons across countries, as described in the text, are nevertheless robust to small variations around the chosen cut-off values.

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

PISA collects reliable and comparable data from participating countries and territories. Following OECD data regulations, a visual separation between countries and territories has been used in all charts to reduce the risk of data misinterpretation.

This document, as well as any data and 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.

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.

This work is available under the Creative Commons Attribution–NonCommercial–ShareAlike 3.0 IGO (CC BY-NC-SA 3.0 IGO). For specific information regarding the scope and terms of the licence as well as possible commercial use of this work or the use of PISA data please consult Terms and Conditions on www.oecd.org.