



Executive summary

Schools are not only places where students acquire academic skills; they are also where children develop many of the social and emotional skills that they need to thrive. Schools that nurture children's development in these ways help students attain a sense of control over – and satisfaction with – their life. They can help students become more resilient in the face of adversity, feel more connected with the people around them, and aim higher in their aspirations for their future. In other words, what happens in school is crucial for well-being. Students' well-being, as defined in this report, refers to the psychological, cognitive, social and physical qualities that students need to live a happy and fulfilling life.

PISA 2015 examined students' well-being in four main areas of their life: their performance in school, their relationships with peers and teachers, their home life, and how they spend their time outside of school. On average across OECD countries, students reported a level of 7.3 on a life-satisfaction scale ranging from 0 to 10. Roughly speaking, this suggests that the "average" adolescent in an OECD country is satisfied with life. However, about 12% of students, on average across OECD countries – and more than 20% of students in some countries – reported that they are not satisfied with their life (they rated their satisfaction with life 4 or less on the scale). Satisfaction with life varies considerably between boys and girls (on average across OECD countries, 29% of girls but 39% of boys reported that they are very satisfied with their life), while there is little difference in reported life satisfaction between top-achieving and low-achieving students.

Anxiety about schoolwork is one of the sources of stress most often cited by school-age children and adolescents. On average across OECD countries, students who reported the highest levels of anxiety also reported a level of life satisfaction that is 1.2 points lower (on a scale of from 0 to 10) than students who reported the lowest levels of anxiety.

A greater motivation to achieve can give students a sense of purpose in life. It is thus not surprising that, across all countries and economies that participated in PISA 2015, students with greater overall motivation to achieve reported higher satisfaction with life.

SOCIAL RELATIONS AND STUDENTS' WELL-BEING

In many countries, verbal and psychological bullying occur frequently at school. More than one in ten students – which means at least a couple of students in a typical class – in 34 out of 53 countries and economies reported that their peers make fun of them at least a few times per month. Physical bullying is less frequent, but still a major problem in many schools. Around 4% of students – that is, roughly one per class – reported that they are hit or pushed at least a few times per month, and another 7.7% of students reported they are physically bullied a few times per year. On average across OECD countries, 42% of students who reported that they are frequently bullied also reported feeling like an outsider at school. Students in OECD countries who feel like they are outsiders at school were three times more likely to report that they are not satisfied with their life than those who do not feel like they are outsiders. In many countries and economies, students' sense of belonging at school has declined since PISA 2003.

PISA data show that certain types of parental activities are positively related not only to students' performance, but also to students' satisfaction with their life. Students whose parents reported "spending time just talking to my child", "eating



the main meal with my child around a table” or “discussing how well my child is doing at school” every week were between 22% and 62% more likely to report high levels of life satisfaction than students whose parents reported engaging in these activities less frequently.

In most countries, students reported less satisfaction with life if they perceive that they are not as wealthy as most of the other students in the school. But attending school with more advantaged schoolmates can also have a positive impact on students. On average across 28 countries and economies with available data, the children of blue-collar workers who attend schools where students have parents with white-collar occupations were around twice as likely to expect to earn a university degree than children of blue-collar workers who perform similarly but who attend other schools.

WHAT STUDENTS DO OUTSIDE OF SCHOOL AND THEIR WELL-BEING

On average across OECD countries, students who reported taking part in some moderate or vigorous physical activity were less likely to report that they feel very anxious about schoolwork and that they feel like an outsider at school. But around 6% of boys and 7% of girls reported that they do not participate in any form of physical activity outside of school. Many students spend a lot of their time on the Internet: 26% of students reported that they spend more than six hours per day on line during weekends, and 16% spend a similar amount of time on line during weekdays. These “extreme Internet users” are more likely to feel lonely at school, have low expectations of further education, and tend to arrive late for school.

Students who work for pay outside of school reported a level of satisfaction with life that is similar to that of students who do not work. But students who work for pay were more likely to report disengagement from school.

WHAT THE PISA RESULTS IMPLY FOR POLICY

The data from PISA 2015 show that many of the differences, both between and within countries, in students’ well-being are related to students’ perceptions about the disciplinary climate in the classroom or about the support their teachers give them. In particular, schools can help eradicate bullying in partnerships with parents, community organisations and health or social services. The data also show that parental involvement and adolescents’ perceptions about the support their parents give them are associated with students’ feelings about schoolwork, their performance in PISA and their well-being, in general. These results suggest that forging stronger relationships between schools and parents to give adolescents the support they need – academically and psychologically – could go a long way towards improving the well-being of all students.



Reader's guide

Data underlying the figures

The data referred to in this volume are presented in Annex B and, in greater detail, including some additional tables, on the PISA website (www.pisa.oecd.org).

Five symbols are used to denote missing data:

- a The category does not apply in the country concerned. Data are therefore missing.
- c There are too few observations or no observation to provide reliable estimates (i.e. there are fewer than 30 students or fewer than 5 schools with valid data).
- m Data are not available. These data were not submitted by the country or were collected but subsequently removed from the publication for technical reasons.
- w Data have been withdrawn or have not been collected at the request of the country concerned.

Country coverage

This publication features data on 72 countries and economies, including all 35 OECD countries and 37 partner countries and economies (see Map of PISA countries and economies in “What is PISA”).

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.

Two notes were added to the statistical data related to Cyprus:

Note by Turkey: The information in this document with reference to “Cyprus” relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Turkey shall preserve its position concerning the “Cyprus issue”.

Note by all the European Union Member States of the OECD and the European Union: The Republic of Cyprus is recognised by all members of the United Nations with the exception of Turkey. The information in this document relates to the area under the effective control of the Government of the Republic of Cyprus.

B-S-J-G (China) refers to the four PISA-participating China provinces: Beijing, Shanghai, Jiangsu and Guangdong.

FYROM refers to the Former Yugoslav Republic of Macedonia.

For the countries below, when results are based on students’ or school principals’ responses:

Argentina: Only data for the adjudicated region of Ciudad Autónoma de Buenos Aires (CABA) are reported in figures and in the text (see Annex A4).

Kazakhstan: Results for Kazakhstan are reported in a selection of figures (see Annex A4).

Malaysia: Results for Malaysia are reported in a selection of figures (see Annex A4).

International averages

The OECD average corresponds to the arithmetic mean of the respective country estimates. It was calculated for most indicators presented in this report.

In this publication, the OECD average is generally used when the focus is on comparing characteristics of education systems. In the case of some countries, data may not be available for specific indicators, or specific categories may not apply. Readers should, therefore, keep in mind that the term “OECD average” refers to the OECD countries included in the respective comparisons. In cases where data are not available or do not apply for all sub-categories of a given population or indicator, the “OECD average” may be consistent within each column of a table but not necessarily across all columns of a table.



In analyses involving data from multiple years, the OECD average is reported on consistent sets of OECD countries, and several averages may be reported in the same table. The “OECD average-35” refers to the average across all the 35 OECD countries, and is reported as missing if fewer than 35 OECD countries have comparable data; for instance, the “OECD average-34” includes only 34 OECD countries that have non-missing values. This restriction allows for valid comparisons of the OECD average over time. A number in the label used in figures and tables indicates the number of countries included in the average.

In analyses involving data from optional questionnaires, in addition to the OECD average, an average across all countries and economies with available data is also reported:

Average-18: Arithmetic mean across all countries which participated in the parent questionnaire.

Average-19: Arithmetic mean across all countries which participated in the teacher questionnaire.

Average-22: Arithmetic mean across all countries which participated in the educational career questionnaire.

In cases where data are not available for all countries that participated in the optional questionnaire, the number of countries included in the average is indicated in a footnote.

Rounding figures

Because of rounding, some figures in tables may not add up exactly to the totals. Totals, differences and averages are always calculated on the basis of exact numbers and are rounded only after calculation.

All standard errors in this publication have been rounded to one or two decimal places. Where the value 0.0 or 0.00 is shown, this does not imply that the standard error is zero, but that it is smaller than 0.05 or 0.005, respectively.

Reporting student data

The report uses “15-year-olds” as shorthand for the PISA target population. PISA covers students who are aged between 15 years 3 months and 16 years 2 months at the time of assessment and who are enrolled in school and have completed at least 6 years of formal schooling, regardless of the type of institution in which they are enrolled, and whether they are in full-time or part-time education, whether they attend academic or vocational programmes, and whether they attend public or private schools or foreign schools within the country.

Reporting school data

The principals of the schools in which students were assessed provided information on their schools’ characteristics by completing a school questionnaire. Where responses from school principals are presented in this publication, they are weighted so that they are proportionate to the number of 15-year-olds enrolled in the school.

Focusing on statistically significant differences

This volume discusses only statistically significant differences or changes. These are denoted in darker colours in figures and in bold font in tables. See Annex A3 for further information.

Changes in the PISA methodology

Several changes were made to the PISA methodology in 2015:

- **Change in assessment mode** from paper-based to computer. Over the past 20 years, digital technologies have fundamentally transformed the ways in which we read and manage information. To better reflect how students and societies access, use and communicate information, starting with the 2015 round, the assessment was delivered mainly on computers, although countries had the option to use a paper-based version. In order to ensure comparability of results between paper-based tasks that were used in previous PISA assessments and the computer-delivered tasks used in 2015, the 2015 assessment was anchored to previous assessments through a set of items that showed, across countries, the same characteristics in paper- and computer-delivered form. The statistical models used to facilitate the mode change are based on an approach that examines measurement invariance for each item in both modes. In effect, this both accounts for and corrects the potential effect of



mode differences by assigning the same parameters only for item-response variables that are comparable on paper and computer. It is conceivable, however, that country differences in familiarity with computers, or in student motivation to take the test on computer or on paper could influence differences in country performance. Box I.5.1 in Volume I examines the country-level correlation between students' exposure to computers and changes in mean mathematics performance between 2012 and 2015. The results show that countries where students have greater familiarity with ICT tools are roughly as likely to show positive and negative performance trends, as are countries where students have less familiarity with ICT. For more information, see Annex A5.

- **Change in the framework and set of PISA science items.** New science items were developed for PISA 2015 to reflect advances in science and other changes that countries had prioritised for the PISA 2015 assessment. Among other goals, the revision of the science framework included the aim to more fully use the capabilities of the new technology-based delivery mode. To verify that the new science assessment allowed for the establishment of reliable trends with previous PISA assessments, an evaluation of dimensionality was conducted. When new and existing science items were treated as related to distinct latent dimensions, the median correlation (across countries/language groups) between these dimensions was 0.92, a very high value (similar to the correlation observed among subscales from the same domain). Model-fit statistics confirmed that a unidimensional model fits the new science assessment, supporting the conclusion that new and existing science items form a coherent unidimensional scale with good reliability. For more information, see Annex A5.
- **Changes in scaling procedures include:**
 - Change from a one-parameter model to a hybrid model that applies both a one- and two-parameter model, as appropriate. The one-parameter (Rasch) model is retained for all items where the model is statistically appropriate; a more general 2-parameter model is used instead if the fit of the one-parameter model could not be established. This approach improves the fit of the model to the observed student responses and reduces model and measurement errors.
 - Change in treatment of non-reached items to ensure that the treatment is consistent between the estimation of item parameters and the estimation of the population model to generate proficiency estimates in the form of plausible values. This avoids introducing systematic errors when generating performance estimates.
 - Change from cycle-specific scaling to multiple-cycle scaling in order to combine data, and retain and aggregate information about trend items used in previous cycles. This change results in consistent item parameters across cycles, which strengthen and support the inferences made about proficiencies on each scale.
 - Change from including only a subsample for item calibration to including the total sample with weights, in order to fully use the available data and reduce the error in item-parameter estimates by increasing the sample size. This reduces the variability of item-parameter estimation due to the random selection of small calibration samples.
 - Change from assigning internationally fixed item parameters and dropping a few dodgy items per country, to assigning a few nationally unique item parameters for those items that show significant deviation from the international parameters. This retains a maximum set of internationally equivalent items without dropping data and, as a result, reduces overall measurement errors.

The overall impact of these changes on trend comparisons is quantified by the link errors. As in previous cycles, a major part of the linking error is due to re-estimated item parameters. While the magnitude of link errors is comparable to those estimated in previous rounds, the changes in scaling procedures will result in reduced link errors in future assessment rounds. For more information on the calculation of this quantity and how to use it in analyses, see Annex A5 and the *PISA 2015 Technical Report* (OECD, forthcoming).

- **Changes in population coverage and response rates.** Even though PISA has consistently used the same standardised methods to collect comparable and representative samples, and population coverage and response rates were carefully reviewed during the adjudication process, slight changes in population coverage and response rates can affect point estimates of proficiency. The uncertainty around the point estimates due to sampling is quantified in sampling errors, which are the major part of standard errors reported for country mean estimates. For more information, see Annexes A2 and A4.



- **Change in test design** from 13 booklets in the paper-based design to 396 booklet instances. Despite the significant increase in the number of booklet types and instances from previous cycles, it is important to bear in mind that all items belonging to the same domain were delivered in consecutive clusters. No student had more than one hour of test questions related to one domain only. This is an improvement over the existing design, which was made possible by computer delivery. It strengthens the overall measurement of each domain and each respondent's proficiency.
- **Changes in test administration.** As in PISA 2000 (but different from other cycles up to 2012), students in 2015 had to take their break before starting to work on test clusters 3 and 4, and could not work for more than one hour on clusters 1 and 2. This reduces cluster position effects. Another change in test administration is that students who took the test on computers had to solve test questions in a fixed, sequential order, and could not go back to previous questions and revise their answers after reaching the end of the test booklets. This change prepares the ground for introducing adaptive testing in future rounds of PISA.

In sum, changes to the assessment design, the mode of delivery, the framework and the set of science items were carefully examined in order to ensure that the 2015 results can be presented as trend measures at the international level. The data show no consistent association between students' familiarity with ICT and with performance shifts between 2012 and 2015 across countries. Changes in scaling procedures are part of the link error, as they were in the past, where the link error quantified the changes introduced by re-estimating item parameters on a subset of countries and students who participated in each cycle. Changes due to sampling variability are quantified in the sampling error. The remaining changes (changes in test design and administration) are not fully reflected in estimates of the uncertainty of trend comparisons. These changes are a common feature of past PISA rounds as well, and are most likely of secondary importance when analysing trends.

The factors below are examples of potential effects that are relevant for the changes seen from one PISA round to the next. While these can be quantified and related to, for example, census data if available, these are outside of the control of the assessment programme:

- **Change in coverage of PISA target population.** PISA's target population is 15-year-old students enrolled in grade 7 or above. Some education systems saw a rapid expansion of 15-year-olds' access to school because of a reduction in dropout rates or in grade repetition. This is explained in detail, and countries' performance adjusted for this change is presented in Chapters 2, 4 and 5 in Volume I.
- **Change in demographic characteristics.** In some countries, there might be changes in the composition of the population of 15-year-old students. For example, there might be more students with an immigrant background.
- **Change in student competency.** The average proficiency of 15-year-old students in 2015 might be higher or lower than that in 2012 or earlier rounds.

Abbreviations used in this report

% dif.	Percentage-point difference	ISCO	International Standard Classification of Occupations
Dif.	Difference	PPP	Purchasing power parity
ESCS	PISA index of economic, social and cultural status	S.D.	Standard deviation
GDP	Gross domestic product	S.E.	Standard error
ICT	Information and Communications Technology	Score dif.	Score-point difference
ISCED	International Standard Classification of Education		

Definition of immigrant students in PISA

PISA classifies students into several categories according to their immigrant background and that of their parents:

- **Non-immigrant students** are students whose mother or father (or both) was/were born in the country or economy where they sat the PISA test, regardless of whether the student was born in that country or economy. In this chapter, these students are also referred to as "students without an immigrant background".



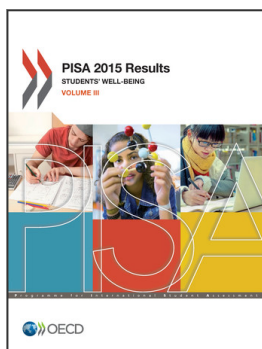
- **Immigrant students** are students whose mother and father were both born in a country/economy other than that where the student sat the PISA test. In this chapter, they are also referred to as “students with an immigrant background”. Among immigrant students, a distinction is made between those born in the country/economy of assessment and those born abroad:
 - **First-generation immigrant students** are foreign-born students whose parents are also both foreign-born.
 - **Second-generation immigrant students** are students born in the country/economy where they sat the PISA test and whose parents were both foreign-born.

In some analyses, these two groups of immigrant students are, for the purpose of comparison, considered along with non-immigrant students. In other cases, the outcomes of first- and second-generation immigrant students are examined separately. PISA also provides information on other factors related to students' immigrant background, including the main language spoken at home (i.e. whether students usually speak, at home, the language in which they were assessed in PISA or another language, which could also be an official language of the host country/economy) or, for first-generation immigrant students, the number of years since the student arrived in the country where he or she sat the PISA test.

Further documentation

For further information on the PISA assessment instruments and the methods used in PISA, see the *PISA 2015 Technical Report* (OECD, forthcoming).

This report uses the OECD StatLinks service. Below each table and chart is a URL leading to a corresponding Excel™ workbook containing the underlying data. These URLs are stable and will remain unchanged over time. In addition, readers of the e-books will be able to click directly on these links and the workbook will open in a separate window, if their Internet browser is open and running.



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